THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) ON DEVELOPMENT: A CASE STUDY OF THE INFLUENCE OF TELECENTRES ON THE EDUCATION OF USERS

by

NTOMBIZANDILE CAROL LESAME

submitted in accordance with the requirements for the
degree of

DOCTOR OF LITERATURE AND PHILOSOPHY

in the subject of

COMMUNICATION SCIENCE

at the

UNIVERSITY OF SOUTH AFRICA

PROMOTER: PROF PJ FOURIE
JOINT PROMOTER: PROF G MADDEN
PROF E BORNMAN

JUNE 2008

Student number: 893-232-8

I declare that **THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) ON DEVELOPMENT: A CASE STUDY OF THE INFLUENCE OF TELECENTRES ON THE EDUCATION OF USERS** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

....

SIGNATURE DATE

(Mrs N C Lesame)

THESIS SUMMARY

This study investigates the use of telecentres for educational purposes in telecommunications under-serviced regions of South Africa. The problem addressed by this research has both equity and efficiency aspects. In particular, the thesis examines the impact of telecentres on the formal and non-formal education outcomes of recipient communities - four telecentres, two in townships and two in rural areas. The urban telecentres are Siyabonga in Orange Farm near Johannesburg and Mamelodi Communication and Information Services (MACIS), in Mamelodi township, near Pretoria in Gauteng Province. The rural telecentres are Tombo near Port St Johns in the Eastern Cape Province and Hoxani near Bushbuckridge on the Mpumalanga-Limpopo Province border.

The main aim of the research is to conduct a quantitative survey of the telecentre users' use of telecentres in the above mentioned locations. On the basis of this, the thesis seeks to come to some conclusions about the use and effectiveness of the South African telecentre program. The quantitative analysis of users is supported by a qualitative report and analysis of data gathered through personal interviews of telecentre operators and employees. The thesis reports on the outputs of the centres, limitations in their function, inhibitors to their economic performance, and recommendations for improving their operations.

Some of the findings are that telecentres established through public-private partnership (PPP) funding are more effective and successful, computer literacy is a major resource offered, Hoxani telecentre offers outcomes-based education management skills training for local teachers, while Tombo, MACIS and Siyabonga telecentres offer additional business and electronic courses. The thesis also reviews the South African telecentre program against the background of similar programs in selected Asian and Latin American countries, Australia, Canada, and Europe and against the background of an analysis of South African post-apartheid telecommunications sector reforms (1996 to 2007). Insights into the unique nature of challenges facing geographically located telecentres as well as a new model for understanding telecentre operations in South Africa are offered.

Key terms:

Telecentres; Formal and non-formal education; Telecentre users; Universal service; Universal access; Capacity building; Information and Communication Technology; Electronic communications and broadcasting services; Internet; New media; Electronic education;

Electronic government; Electronic health; Electronic business or commerce. Computer literacy skills training; Outcomes-based education; Rural development; Digital divide.

ACKNOWLEDGEMENTS

I wish to thank the following people for assisting and supporting me towards the completion of this thesis and degree:

1. My promoters, Prof P. J. Fourie of UNISA for academic guidance, motivation and support; and Prof G. Madden, of Curtin University of Technology, Perth, Australia, for capacity building, academic guidance, motivation and academic wisdom. Your academic wisdom and vision and teachings are highly appreciated. Prof E. Bornman of UNISA is also thanked for imparting some of her knowledge and expertise of research methodology aspects to me.
2. Statisticians and research experts, Prof M. Lesaoana of the Statistics Department, University of Limpopo, and Prof S. Mmusi, of the Department of Media Studies, University of Limpopo, Limpopo Province, for assistance regarding visits to eight telecentres in Limpopo Province and analysis of quantitative data. Mr Cas Coetzee of the Department of Psychology, UNISA, also for assistance with quantitative data analysis. A special thanks to Prof Mmusi, who spent her valuable time and resources taking me on a Limpopo Province tour, showing me rural areas in Limpopo Province where telecentres and community radio stations are located, with the purpose of laying the necessary groundwork for analysing the role of telecentres and ICT in the development of Limpopo Province;
3. Dr F. G. Netswera, formerly of the National Research Foundation (NRF), now with UNISA's Research Directorate, who also assisted with analysis of quantitative data;
4. Colleagues from the Free University of Brussels, Prof L. van Audenhove, Mr G. Nulens and Mr B. Lievens, who motivated me to undertake the study and supported me with information upon request;
5. Communication Economics and Electronic Research Centre (CEEM) Staff at Curtin University of Technology, for support, updated information and ICT expert knowledge;

6. Mr D. Levey, of the Department of English, UNISA and my sincerest gratitude also goes to Dr C. D. Schutte of UNISA' Editorial Department, who finally editing the thesis. I also wish to thank Mr M. Magocha who acted as an editorial assistant.
7. Mr D. Wigston, of the Department of Communication Science, UNISA, for his assistance with production of some graphics;
8. Telecentre managers, and their assistants, of Tombo, Siyabonga, MACIS and Hoxani telecentres for support and help while conducting field research. The managers are Mrs P. Makoro and Mr Msimango of Siyabonga, Mr Njenge and Miss Smauza of Tombo, Mr Maako of MACIS and Miss Ndlovu of Hoxani telecentre. Your help is highly appreciated as this study would not have been complete without your assistance. I also thank the managers of those telecentres visited but not selected for research, especially at Limpopo Province because the information they provided me is also important for South African rural development and may be useful in future, for other projects;
9. Research assistants, the late Mr Benedict Mnisi (may his soul rest in peace). I am honoured to have worked with Mr Mnisi, who spent his time and energy showing me the area of Bushbuckridge and telecommunication services in Mpumalanga (and some parts of Limpopo) Province. Mr Mnisi also provided translation services of Shangaan to English and vice versa. Mr Mnisi's untimely death in 2006 in a car accident is tragic and sad. However, he will be remembered and his work will enlighten the living (as they did myself and others who will gain some knowledge from this work), about Bushbuckridge, Tembisa township, as well as Mpumalanga and Limpopo Provinces;
10. National government Department of Communications and former Universal Service Agency staff who assisted with documents, information and study-related interviews;
11. The National Research Foundation for research funds to conduct the field research in 2005;
12. Special thanks to my extended family, brothers and sisters, brothers-in law and sisters-in-law, and the rest of the family for mutual love and admiration throughout the journey of my life. I love you people! Always Bantu bakuthi abanobubele nokuhle kodwa. Nangomso MaHlubi nani nonke abanye bethu; Ke a leboga!

13. My immediate family, husband and children, William, Pepe, Phesana and Thandoza, for love and support. I love you more;
14. My parents, my late father Mtimkulu Thomas (may your sould rest in peace Daddy) and my mother, Edith Elda Vuyiswa Mpondwana, for lessons in hard work and discipline and for love and emotional support. I love you. *Siyabulela ke Mbongwe, Sondisa, Mvemnyama ngako konke osiphe kona*!!; Thank you Mama, these are also the fruits of the foundation you laid when you taught me education basics at Mapassa Farm School, your school. Thank you very much, where there is will, there is a way and last but not least
15. Other persons who made some contribution to the production of this thesis in one way or another, but whose names I may have forgotten as a result of some pressure, stress or credit crunch, and any other temporary human and social challenges I endured while compiling this thesis. Ndiyanibulela nonke ngokundakha nokundinceda. Impumelelo yona inyanzelekile.

DEDICATION

This thesis is dedication to my late father who was an educator in the Eastern Cape Province, **MR THOMAS "THOS" MTIMKULU MPONDWANA**. Your discipline and dedication to serving humanity and developing other persons shines through us. We will always honour your memory through our work and lives, *Rhadebe, Mthimkhulu, Ndlebentle zombini*!. *Siphumle phantsi kwaloo mthumnzi wothi omkhulu*. Zonke zihamba ngendlela, kuba kaloku wasibonisa indlela. Unethamsanqa lowo afumane isisekelo esisiso kwangethuba, kuba wophila ngaso ebomini.

Tribute is also paid to my research assistant **Mr Benedict Mnisi** of Bushbuckridge who passed away in 2006. May your souls rest in peace and God be with you.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

ABET	-	Adult Basic Education and Training
AD	-	Another Development
ADB	-	African Development Bank
Aids	-	Acquired Immune Deficiency Syndrome
AISGWG	-	African Information Society Gender Working Group
ANC	-	African National Congress
ANOVA	-	Analysis of variance
ARTA	-	Australian Rural Telecommunications Association
ASGISA	-	Accelerated and Shared Growth Initiative for South Africa
ATI	-	Agence Tunisienne d'Internet,Tunisia
AT&T	-	American Telephone and Telegraph
ATM	-	Automatic Teller Machine
ATU	-	African Telecommunications Union
AU	-	African Union
B&B	-	Bed and Breakfast
BBC	-	British Broadcasting Corporation
BDT	-	Bureau for Telecommunications Development, ITU
BEE	-	Black Economic Empowerment
BMCC	-	Broadcasting Monitoring and Complaints Committee
BOG	-	Board of Governors
CBO	-	Community Based Organisation
CBPWP	-	Community Based Public Works Programme
CCI	-	Communications Commission of India
CD	-	Compact Disk
CEE	-	Central and Eastern Europe
CEO	-	Chief Executive Officer
CI	-	Community Informatics
CIC	-	Communications Information Centre
COL	-	Commonwealth of Learning
COC	-	Chipata Chamber of Commerce, Zambia
COE	-	Centre of Excellence

COSATU -	Congress of South African Trade Unions
CPE -	Customer Premise Equipment
CREAD -	Caribbean Electronic Distance Education Forum
CRWRC -	Christian Reformed World Relief Council
CSIR -	Centre for Scientific and Information Research
CSO -	Community Service Obligation
CSSA -	Computer Society of Southern Africa
CWU -	Communications Workers' Union
DA -	Democratic Alliance
DBSA -	Development Bank of Southern Africa
DE -	Distance Education
DECT -	Digital Enhanced Cordless Technology
DG -	Director General
DoC -	Department of Communications, South Africa
DOE -	Department of Education
DOI -	Digital Opportunity Initiative
DotForce -	Digital Opportunity Task Force
DSC -	Development Support Communication
DP -	Democratic Party
DPIE -	Department of Primary Industries and Energy, Western Australia.
DsTV -	Digital Satellite Television
DVD -	Digital Video Disk
EC -	Eastern Cape Province, South Africa
ECA -	Economic Commission for Africa
ECLA -	Economic Commission for Latin America
E-Citizen -	Electronic Citizen
ECA -	Electronic Communications Act of South Africa
E-commerce -	Electronic Commerce
E-democracy -	Electronic Democracy
E-education -	Electronic Education or Tele-education
Edu-Net -	Education Network
E-government -	Electronic Government
ELCT -	Evangelical Lutheran Church of Tanzania

E-learning -	Electronic Learning
E-mail -	Electronic Mail
EPG -	Eminent Persons Group
E-Rate -	Education Rate
E-security -	Electronic Security
E-shops -	Shops on the Internet or Electronic Shops
e-touch -	Electronic Touch
EUC -	End User Computing
E-voting -	Electronic Voting
FAO -	Food and Agriculture Organisation
FCC -	Federal Communications Commission (American)
FDI -	Foreign Direct Investment
FEI -	Freedom of Expression Institute
FET -	Further Education and Training
FRIENDS -	Fast, Reliable, Instant, Efficient Network for Disimbursement of Services, Kerala Province, India
GATT -	General Agreement on Trade and Tariffs
G7/G8 -	Group of 7 or Group of 8 Developed Countries
GCIS -	Government Communication and Information Services
GDP -	Gross Domestic Product
GEAR -	Growth, Economic Advancement and Restructuring
GET -	General Education and Training
GII -	Global Information Infrastructure
GIS -	Global Information System
GP -	Gauteng Province, South Africa
GREEN -	Greater Edendale Environmental Network
GSM -	*Groupe Speciale Mobile*
HBU -	Historically Black University
HDI -	Historically Disadvantaged Institution or Individual
HE -	Higher Education
HIV -	Human Immune Virus
HP -	Hewlett Packard
HRD -	Human Resources Development
HSRC -	Human Sciences Research Council

IBA	-	Independent Broadcasting Authority
ICASA	-	Independent Communications Authority of South Africa
IC	-	Information Centre
ICDL	-	International Computer's Drivers License
ICDL-F	-	International Computer's Drivers License Foundation
ICT	-	Information and Communication Technology
ICTs	-	Information and Communication Technologies
IDRC	-	Independent Development Research Centre
ILO	-	International Labour Organisation
IMCC	-	Inter-Ministerial Communications Committee
Info-Lit	-	Information Literacy
INR	-	Institute of National Resources
IPO	-	Initial Public Offering
IRD	-	Integrated Rural Development
IRDP	-	Integrated Rural Development Programme (SA)
IS	-	Information System
ISAD	-	Information Society and Development
ISC	-	Internet Software Consortium
ISDN	-	Integrated Services Digital Network
ISP	-	Internet Service Provider/s
ISRDS	-	Integrated Sustainable Rural Development Strategy
IT	-	Information Technology
ITA	-	Invitation To Apply
IT&T	-	Information Technology and Telecommunications
ITU	-	International Telecommunication Union
ITU-T	-	International Telecommunication Union-Telecom
JSE	-	Johannesburg Stock Exchange
KZN	-	KwaZulu-Natal
LAN	-	Local Area Network
LDC	-	Less Developed Country
LED	-	Local Economic Development
LEOs	-	Low Earth Orbit satellites
LP	-	Limpopo Province
LSC	-	Local Steering Committee

LSF -	Labour Force Survey
MACIS -	Mamelodi Community Information Services
MAP -	Millenium Africa (Recovery) Plan or Programme
MCT -	Multipurpose Community Telecentre
MPCC -	Multipurpose Community Centre
MDC -	More Developed Country
MEO -	Middle Earth Orbit Satellite
MFN -	Most Favoured Nation
MKMVA -	Umkhonto WeSizwe Military Veterans' Association, South Africa
MITE -	Modular Interactive Telecommunications Environment
MITT -	Ministry of Tourism, Trade and Industry, Egypt
MMS -	Multimedia services
MNC -	Multinational Corporation
MOE -	Ministry of Education, Egypt
MPCC/s -	Multipurpose Community Centre/s
MPC -	Multi-User Card
MSC -	Multimedia Super Corridor
MTN -	Mobile Telephone Networks
NSF -	National Skills Fund
NSW -	New South Wales, Australia
NEPAD -	New Economic Partnership for Africa's Development
NFA -	National Framework Agreement
NGBT -	Negotiating Group on Basic Telecommunications
NGO -	Nongovernmental Organisation
NMT -	New Media Technology
NP -	Northern Province (now Limpopo Province)
NRA -	National Regulatory Agency
NRF -	National Research Foundation
NQF -	National Qualifications Framework
NTF -	National Telecommunications Forum
NTIF -	National Telecommunications and Information Forum
NTPP -	National Telecommunications Policy Project
NTU -	National Technological University, United States

NUTN	-	National University Teleconferencing Network
NRF	-	National Research Foundation
NW	-	Northwest Province, South Africa
NYSE	-	New York Stock Exchange
OBE	-	Outcomes-based Education
OFTA	-	Office of Telecommunications Authority, China
OFTEL	-	Office of Telecommunications, United Kingdom
O R Tambo	-	Oliver Reginald Tambo
OSF	-	Open Society Foundation
OSISA	-	Open Society Institute for Southern Africa
PBX	-	Private Branch Exchange
PCM	-	Please Call Me
PCN	-	Presidential National Commission
PCO	-	Public Call Office in India
PE	-	Port Elizabeth (Technikon)
PIC	-	Public Investment Commissioners
PIT	-	Public Information Terminal
PMC	-	Project Management Committee
POP	-	Point of Presence
POTS	-	Plain Old Telephone Service
PPP	-	Public Private Partnership
PSTN	-	Public Service Telecommunication Network
PSTS	-	Public Service Telecommunication System
PTN	-	Public Telecommunications Network
PTO	-	Public Telecommunications Operator
PTT	-	Public Telephone and Telegraph
QoS	-	Quality of Service
RDP	-	Reconstruction and Development Programme
Seta	-	Sectoral Education and Training Authority
SA	-	South Africa
SABC	-	South African Broadcasting Corporation
SADC	-	Southern African Development Community
SAFE	-	South Africa Far East

SAIDE	-	South African Institute for Distance Education
SAITIS	-	South African Information Technology Industry Strategy
SAPO	-	South African Post Office
SAPT	-	South African Posts and Telecommunications
SAQA	-	South African Qualifications Authority
SAT3	-	South Africa Atlantic Telephony
SATRA	-	South African Telecommunications Regulatory Authority
SAVA	-	South African Vans Association
SBC	-	Southwestern Bell Corporation (America)
SEIDET	-	Siyabuswa Education Empowerment and Development
SEP	-	Strategic Equity Partnership
SETA	-	Sector Education and Training Authority
SME	-	Small and Medium Enterprise
SMME	-	Small, Medium and Micro Enterprise
SMS	-	Short Message System
SNO	-	Second National Operator
SOE	-	State-Owned Enterprise
Sonatel	-	Senegal Telecommunications Operator
SOTE	-	State-owned Telecommunications Enterprise
SPSS	-	Statistical Package for the Social Sciences
TACC	-	Technology Access Community Centre in Egypt
TAFE	-	Technical and Further Education, Australia
TAM	-	Technology Acceptable Model
TASA	-	Telecentre Association of South Africa
TDC	-	Tombo Development Centre
TECD	-	Tombo Entrepreneurial Development Centre
TRASA	-	Telecommunications Regulatory Authority of Southern Africa
TSCs	-	Thusong Service Centres, South Africa
TUT	-	Tshwane University of Technology
TV	-	Television
TWIB	-	Technology for Women in Business
UCARC	-	Umtata Child Abuse Resource Centre
UFH	-	University of Fort Hare

UNECA	-	United Nations Commission for Africa
UK	-	United Kingdom
UN	-	United Nations
UNCSTD	-	United Nations Commission on Science and Technology for Development
UNDP	-	United Nations Development Program
UNISA	-	University of South Africa
UNRISD	-	United Nations Research Institute for Social Development
UPS	-	Uninterruptible Power Supply
U.S.	-	United States of America
USA	-	Universal Service Agency, South Africa
USAA	-	Universal Service and Access Agency
USAASA	-	Universal Service and Access Agency of South Africa
USALs	-	Under-serviced Area Licenses
USF	-	Universal Service Fund, South Africa
USO	-	Universal Service Obligation
UWC	-	University of the Western Cape, South Africa.
VUDEC	-	Vista University Distance Education Campus
VANS	-	Value Added Network Services
WADoT	-	Western Australia Department of Training
WHO	-	World Health Organisation
WILs	-	Wireless Internet Laboratories, South Africa
WSIS	-	World Summit on the Information Society
Wits	-	University of Witwatersrand
WP	-	Western Cape Province, South Africa
WST	-	World Systems Theory
WTO	-	World Trade Organisation
WWW	-	World Wide Web

LIST OF FIGURES

LIST OF TABLES

Student number: 893-232-8

I declare that **THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) ON DEVELOPMENT: A CASE STUDY OF THE INFLUENCE OF TELECENTRES ON THE EDUCATION OF USERS** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

....

SIGNATURE DATE

(Mrs N C Lesame)

THESIS SUMMARY

This study investigates the use of telecentres for educational purposes in telecommunications under-serviced regions of South Africa. The problem addressed by this research has both equity and efficiency aspects. In particular, the thesis examines the impact of telecentres on the formal and non-formal education outcomes of recipient communities - four telecentres, two in townships and two in rural areas. The urban telecentres are Siyabonga in Orange Farm near Johannesburg and Mamelodi Communication and Information Services (MACIS), in Mamelodi township, near Pretoria in Gauteng Province. The rural telecentres are Tombo near Port St Johns in the Eastern Cape Province and Hoxani near Bushbuckridge on the Mpumalanga-Limpopo Province border.

The main aim of the research is to conduct a quantitative survey of the telecentre users' use of telecentres in the above mentioned locations. On the basis of this, the thesis seeks to come to some conclusions about the use and effectiveness of the South African telecentre program. The quantitative analysis of users is supported by a qualitative report and analysis of data gathered through personal interviews of telecentre operators and employees. The thesis reports on the outputs of the centres, limitations in their function, inhibitors to their economic performance, and recommendations for improving their operations.

Some of the findings are that telecentres established through public-private partnership (PPP) funding are more effective and successful, computer literacy is a major resource offered, Hoxani telecentre offers outcomes-based education management skills training for local teachers, while Tombo, MACIS and Siyabonga telecentres offer additional business and electronic courses. The thesis also reviews the South African telecentre program against the background of similar programs in selected Asian and Latin American countries, Australia, Canada, and Europe and against the background of an analysis of South African post-apartheid telecommunications sector reforms (1996 to 2007). Insights into the unique nature of challenges facing geographically located telecentres as well as a new model for understanding telecentre operations in South Africa are offered.

Key terms:

Telecentres; Formal and non-formal education; Telecentre users; Universal service; Universal access; Capacity building; Information and Communication Technology; Electronic communications and broadcasting services; Internet; New media; Electronic education;

Electronic government; Electronic health; Electronic business or commerce. Computer literacy skills training; Outcomes-based education; Rural development; Digital divide.

ACKNOWLEDGEMENTS

I wish to thank the following people for assisting and supporting me towards the completion of this thesis and degree:

1. My promoters, Prof P. J. Fourie of UNISA for academic guidance, motivation and support; and Prof G. Madden, of Curtin University of Technology, Perth, Australia, for capacity building, academic guidance, motivation and academic wisdom. Your academic wisdom and vision and teachings are highly appreciated. Prof E. Bornman of UNISA is also thanked for imparting some of her knowledge and expertise of research methodology aspects to me.
2. Statisticians and research experts, Prof M. Lesaoana of the Statistics Department, University of Limpopo, and Prof S. Mmusi, of the Department of Media Studies, University of Limpopo, Limpopo Province, for assistance regarding visits to eight telecentres in Limpopo Province and analysis of quantitative data. Mr Cas Coetzee of the Department of Psychology, UNISA, also for assistance with quantitative data analysis. A special thanks to Prof Mmusi, who spent her valuable time and resources taking me on a Limpopo Province tour, showing me rural areas in Limpopo Province where telecentres and community radio stations are located, with the purpose of laying the necessary groundwork for analysing the role of telecentres and ICT in the development of Limpopo Province;
3. Dr F. G. Netswera, formerly of the National Research Foundation (NRF), now with UNISA's Research Directorate, who also assisted with analysis of quantitative data;
4. Colleagues from the Free University of Brussels, Prof L. van Audenhove, Mr G. Nulens and Mr B. Lievens, who motivated me to undertake the study and supported me with information upon request;
5. Communication Economics and Electronic Research Centre (CEEM) Staff at Curtin University of Technology, for support, updated information and ICT expert knowledge;

6. Mr D. Levey, of the Department of English, UNISA and my sincerest gratitude also goes to Dr C. D. Schutte of UNISA' Editorial Department, who finally editing the thesis. I also wish to thank Mr M. Magocha who acted as an editorial assistant.
7. Mr D. Wigston, of the Department of Communication Science, UNISA, for his assistance with production of some graphics;
8. Telecentre managers, and their assistants, of Tombo, Siyabonga, MACIS and Hoxani telecentres for support and help while conducting field research. The managers are Mrs P. Makoro and Mr Msimango of Siyabonga, Mr Njenge and Miss Smauza of Tombo, Mr Maako of MACIS and Miss Ndlovu of Hoxani telecentre. Your help is highly appreciated as this study would not have been complete without your assistance. I also thank the managers of those telecentres visited but not selected for research, especially at Limpopo Province because the information they provided me is also important for South African rural development and may be useful in future, for other projects;
9. Research assistants, the late Mr Benedict Mnisi (may his soul rest in peace). I am honoured to have worked with Mr Mnisi, who spent his time and energy showing me the area of Bushbuckridge and telecommunication services in Mpumalanga (and some parts of Limpopo) Province. Mr Mnisi also provided translation services of Shangaan to English and vice versa. Mr Mnisi's untimely death in 2006 in a car accident is tragic and sad. However, he will be remembered and his work will enlighten the living (as they did myself and others who will gain some knowledge from this work), about Bushbuckridge, Tembisa township, as well as Mpumalanga and Limpopo Provinces;
10. National government Department of Communications and former Universal Service Agency staff who assisted with documents, information and study-related interviews;
11. The National Research Foundation for research funds to conduct the field research in 2005;
12. Special thanks to my extended family, brothers and sisters, brothers-in law and sisters-in-law, and the rest of the family for mutual love and admiration throughout the journey of my life. I love you people! Always Bantu bakuthi abanobubele nokuhle kodwa. Nangomso MaHlubi nani nonke abanye bethu; Ke a leboga!

13. My immediate family, husband and children, William, Pepe, Phesana and Thandoza, for love and support. I love you more;
14. My parents, my late father Mtimkulu Thomas (may your sould rest in peace Daddy) and my mother, Edith Elda Vuyiswa Mpondwana, for lessons in hard work and discipline and for love and emotional support. I love you. *Siyabulela ke Mbongwe, Sondisa, Mvemnyama ngako konke osiphe kona*!!; Thank you Mama, these are also the fruits of the foundation you laid when you taught me education basics at Mapassa Farm School, your school. Thank you very much, where there is will, there is a way and last but not least
15. Other persons who made some contribution to the production of this thesis in one way or another, but whose names I may have forgotten as a result of some pressure, stress or credit crunch, and any other temporary human and social challenges I endured while compiling this thesis. Ndiyanibulela nonke ngokundakha nokundinceda. Impumelelo yona inyanzelekile.

DEDICATION

This thesis is dedication to my late father who was an educator in the Eastern Cape Province, **MR THOMAS "THOS" MTIMKULU MPONDWANA**. Your discipline and dedication to serving humanity and developing other persons shines through us. We will always honour your memory through our work and lives, *Rhadebe, Mthimkhulu, Ndlebentle zombini*!. *Siphumle phantsi kwaloo mthumnzi wothi omkhulu*. Zonke zihamba ngendlela, kuba kaloku wasibonisa indlela. Unethamsanqa lowo afumane isisekelo esisiso kwangethuba, kuba wophila ngaso ebomini.

Tribute is also paid to my research assistant **Mr Benedict Mnisi** of Bushbuckridge who passed away in 2006. May your souls rest in peace and God be with you.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

ABET	-	Adult Basic Education and Training
AD	-	Another Development
ADB	-	African Development Bank
Aids	-	Acquired Immune Deficiency Syndrome
AISGWG	-	African Information Society Gender Working Group
ANC	-	African National Congress
ANOVA	-	Analysis of variance
ARTA	-	Australian Rural Telecommunications Association
ASGISA	-	Accelerated and Shared Growth Initiative for South Africa
ATI	-	Agence Tunisienne d'Internet,Tunisia
AT&T	-	American Telephone and Telegraph
ATM	-	Automatic Teller Machine
ATU	-	African Telecommunications Union
AU	-	African Union
B&B	-	Bed and Breakfast
BBC	-	British Broadcasting Corporation
BDT	-	Bureau for Telecommunications Development, ITU
BEE	-	Black Economic Empowerment
BMCC	-	Broadcasting Monitoring and Complaints Committee
BOG	-	Board of Governors
CBO	-	Community Based Organisation
CBPWP	-	Community Based Public Works Programme
CCI	-	Communications Commission of India
CD	-	Compact Disk
CEE	-	Central and Eastern Europe
CEO	-	Chief Executive Officer
CI	-	Community Informatics
CIC	-	Communications Information Centre
COL	-	Commonwealth of Learning
COC	-	Chipata Chamber of Commerce, Zambia
COE	-	Centre of Excellence

COSATU -	Congress of South African Trade Unions
CPE -	Customer Premise Equipment
CREAD -	Caribbean Electronic Distance Education Forum
CRWRC -	Christian Reformed World Relief Council
CSIR -	Centre for Scientific and Information Research
CSO -	Community Service Obligation
CSSA -	Computer Society of Southern Africa
CWU -	Communications Workers' Union
DA -	Democratic Alliance
DBSA -	Development Bank of Southern Africa
DE -	Distance Education
DECT -	Digital Enhanced Cordless Technology
DG -	Director General
DoC -	Department of Communications, South Africa
DOE -	Department of Education
DOI -	Digital Opportunity Initiative
DotForce -	Digital Opportunity Task Force
DSC -	Development Support Communication
DP -	Democratic Party
DPIE -	Department of Primary Industries and Energy, Western Australia.
DsTV -	Digital Satellite Television
DVD -	Digital Video Disk
EC -	Eastern Cape Province, South Africa
ECA -	Economic Commission for Africa
ECLA -	Economic Commission for Latin America
E-Citizen -	Electronic Citizen
ECA -	Electronic Communications Act of South Africa
E-commerce -	Electronic Commerce
E-democracy -	Electronic Democracy
E-education -	Electronic Education or Tele-education
Edu-Net -	Education Network
E-government -	Electronic Government
ELCT -	Evangelical Lutheran Church of Tanzania

E-learning -	Electronic Learning
E-mail -	Electronic Mail
EPG -	Eminent Persons Group
E-Rate -	Education Rate
E-security -	Electronic Security
E-shops -	Shops on the Internet or Electronic Shops
e-touch -	Electronic Touch
EUC -	End User Computing
E-voting -	Electronic Voting
FAO -	Food and Agriculture Organisation
FCC -	Federal Communications Commission (American)
FDI -	Foreign Direct Investment
FEI -	Freedom of Expression Institute
FET -	Further Education and Training
FRIENDS -	Fast, Reliable, Instant, Efficient Network for Disimbursement of Services, Kerala Province, India
GATT -	General Agreement on Trade and Tariffs
G7/G8 -	Group of 7 or Group of 8 Developed Countries
GCIS -	Government Communication and Information Services
GDP -	Gross Domestic Product
GEAR -	Growth, Economic Advancement and Restructuring
GET -	General Education and Training
GII -	Global Information Infrastructure
GIS -	Global Information System
GP -	Gauteng Province, South Africa
GREEN -	Greater Edendale Environmental Network
GSM -	*Groupe Speciale Mobile*
HBU -	Historically Black University
HDI -	Historically Disadvantaged Institution or Individual
HE -	Higher Education
HIV -	Human Immune Virus
HP -	Hewlett Packard
HRD -	Human Resources Development
HSRC -	Human Sciences Research Council

IBA	-	Independent Broadcasting Authority
ICASA	-	Independent Communications Authority of South Africa
IC	-	Information Centre
ICDL	-	International Computer's Drivers License
ICDL-F	-	International Computer's Drivers License Foundation
ICT	-	Information and Communication Technology
ICTs	-	Information and Communication Technologies
IDRC	-	Independent Development Research Centre
ILO	-	International Labour Organisation
IMCC	-	Inter-Ministerial Communications Committee
Info-Lit	-	Information Literacy
INR	-	Institute of National Resources
IPO	-	Initial Public Offering
IRD	-	Integrated Rural Development
IRDP	-	Integrated Rural Development Programme (SA)
IS	-	Information System
ISAD	-	Information Society and Development
ISC	-	Internet Software Consortium
ISDN	-	Integrated Services Digital Network
ISP	-	Internet Service Provider/s
ISRDS	-	Integrated Sustainable Rural Development Strategy
IT	-	Information Technology
ITA	-	Invitation To Apply
IT&T	-	Information Technology and Telecommunications
ITU	-	International Telecommunication Union
ITU-T	-	International Telecommunication Union-Telecom
JSE	-	Johannesburg Stock Exchange
KZN	-	KwaZulu-Natal
LAN	-	Local Area Network
LDC	-	Less Developed Country
LED	-	Local Economic Development
LEOs	-	Low Earth Orbit satellites
LP	-	Limpopo Province
LSC	-	Local Steering Committee

LSF -	Labour Force Survey
MACIS -	Mamelodi Community Information Services
MAP -	Millenium Africa (Recovery) Plan or Programme
MCT -	Multipurpose Community Telecentre
MPCC -	Multipurpose Community Centre
MDC -	More Developed Country
MEO -	Middle Earth Orbit Satellite
MFN -	Most Favoured Nation
MKMVA -	Umkhonto WeSizwe Military Veterans' Association, South Africa
MITE -	Modular Interactive Telecommunications Environment
MITT -	Ministry of Tourism, Trade and Industry, Egypt
MMS -	Multimedia services
MNC -	Multinational Corporation
MOE -	Ministry of Education, Egypt
MPCC/s -	Multipurpose Community Centre/s
MPC -	Multi-User Card
MSC -	Multimedia Super Corridor
MTN -	Mobile Telephone Networks
NSF -	National Skills Fund
NSW -	New South Wales, Australia
NEPAD -	New Economic Partnership for Africa's Development
NFA -	National Framework Agreement
NGBT -	Negotiating Group on Basic Telecommunications
NGO -	Nongovernmental Organisation
NMT -	New Media Technology
NP -	Northern Province (now Limpopo Province)
NRA -	National Regulatory Agency
NRF -	National Research Foundation
NQF -	National Qualifications Framework
NTF -	National Telecommunications Forum
NTIF -	National Telecommunications and Information Forum
NTPP -	National Telecommunications Policy Project
NTU -	National Technological University, United States

NUTN	-	National University Teleconferencing Network
NRF	-	National Research Foundation
NW	-	Northwest Province, South Africa
NYSE	-	New York Stock Exchange
OBE	-	Outcomes-based Education
OFTA	-	Office of Telecommunications Authority, China
OFTEL	-	Office of Telecommunications, United Kingdom
O R Tambo	-	Oliver Reginald Tambo
OSF	-	Open Society Foundation
OSISA	-	Open Society Institute for Southern Africa
PBX	-	Private Branch Exchange
PCM	-	Please Call Me
PCN	-	Presidential National Commission
PCO	-	Public Call Office in India
PE	-	Port Elizabeth (Technikon)
PIC	-	Public Investment Commissioners
PIT	-	Public Information Terminal
PMC	-	Project Management Committee
POP	-	Point of Presence
POTS	-	Plain Old Telephone Service
PPP	-	Public Private Partnership
PSTN	-	Public Service Telecommunication Network
PSTS	-	Public Service Telecommunication System
PTN	-	Public Telecommunications Network
PTO	-	Public Telecommunications Operator
PTT	-	Public Telephone and Telegraph
QoS	-	Quality of Service
RDP	-	Reconstruction and Development Programme
Seta	-	Sectoral Education and Training Authority
SA	-	South Africa
SABC	-	South African Broadcasting Corporation
SADC	-	Southern African Development Community
SAFE	-	South Africa Far East

SAIDE	-	South African Institute for Distance Education
SAITIS	-	South African Information Technology Industry Strategy
SAPO	-	South African Post Office
SAPT	-	South African Posts and Telecommunications
SAQA	-	South African Qualifications Authority
SAT3	-	South Africa Atlantic Telephony
SATRA	-	South African Telecommunications Regulatory Authority
SAVA	-	South African Vans Association
SBC	-	Southwestern Bell Corporation (America)
SEIDET	-	Siyabuswa Education Empowerment and Development
SEP	-	Strategic Equity Partnership
SETA	-	Sector Education and Training Authority
SME	-	Small and Medium Enterprise
SMME	-	Small, Medium and Micro Enterprise
SMS	-	Short Message System
SNO	-	Second National Operator
SOE	-	State-Owned Enterprise
Sonatel	-	Senegal Telecommunications Operator
SOTE	-	State-owned Telecommunications Enterprise
SPSS	-	Statistical Package for the Social Sciences
TACC	-	Technology Access Community Centre in Egypt
TAFE	-	Technical and Further Education, Australia
TAM	-	Technology Acceptable Model
TASA	-	Telecentre Association of South Africa
TDC	-	Tombo Development Centre
TECD	-	Tombo Entrepreneurial Development Centre
TRASA	-	Telecommunications Regulatory Authority of Southern Africa
TSCs	-	Thusong Service Centres, South Africa
TUT	-	Tshwane University of Technology
TV	-	Television
TWIB	-	Technology for Women in Business
UCARC	-	Umtata Child Abuse Resource Centre
UFH	-	University of Fort Hare

UNECA	-	United Nations Commission for Africa
UK	-	United Kingdom
UN	-	United Nations
UNCSTD	-	United Nations Commission on Science and Technology for Development
UNDP	-	United Nations Development Program
UNISA	-	University of South Africa
UNRISD	-	United Nations Research Institute for Social Development
UPS	-	Uninterruptible Power Supply
U.S.	-	United States of America
USA	-	Universal Service Agency, South Africa
USAA	-	Universal Service and Access Agency
USAASA	-	Universal Service and Access Agency of South Africa
USALs	-	Under-serviced Area Licenses
USF	-	Universal Service Fund, South Africa
USO	-	Universal Service Obligation
UWC	-	University of the Western Cape, South Africa.
VUDEC	-	Vista University Distance Education Campus
VANS	-	Value Added Network Services
WADoT	-	Western Australia Department of Training
WHO	-	World Health Organisation
WILs	-	Wireless Internet Laboratories, South Africa
WSIS	-	World Summit on the Information Society
Wits	-	University of Witwatersrand
WP	-	Western Cape Province, South Africa
WST	-	World Systems Theory
WTO	-	World Trade Organisation
WWW	-	World Wide Web

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1
INTRODUCTION

1.1 THE PURPOSE OF THIS CHAPTER

This thesis is aimed at investigating and highlighting the important role played by telecentres in the improvement of formal and non-formal education of people who use telecentres in South Africa. The study therefore focuses on how telecentres bridge the digital and information divide between rural and urban South Africa by teaching telecentre users certain information and communication technology (ICT) skills. The purpose of this introductory chapter is to explain the need for the study, against the background of the South African telecommunications (hereafter telecoms) landscape and socio-economic conditions. This first chapter also states the aim of the study, poses the research question, and discusses theoretical approaches to the study and the research methodology. It also explores why telecentres are necessary to bridge the digital divide in South Africa. The role of telecentres in education, in South Africa and other countries, is briefly discussed.

A summary of the chapter and an outline of forthcoming chapters are provided. At this point it is necessary to explain why this study was undertaken in the first instance. This chapter is expounded mainly because it was necessary to describe the historical background and development of the telecommunication (hereafter telecom) industry and the education challenge facing South Africa. It was equally important to define and introduce concepts employed in this thesis and explain how telecentres can assist local people to address the high illiteracy challenge. African ICT statistics, among them those of Sub-Saharan Africa, were included as this background is crucial because of the important political and economic development role played by South Africa in the rest of Africa.

1.2 THE NEED FOR THIS STUDY

There is a need for this study to assess and understand how information and communication technology (ICT) in South African telecentres contributes to formal and non-formal education of telecentre users. The focus falls on telecentres in rural and semi-urban areas. The reason is that

these areas do not have adequate telecoms services and are in need of shared communication facilities – which makes the services more affordable if they are in public institutions because connection (to networks) and usage charges are shared amongst the users. Information gathered from this study aims to provide data on how information and communication technologies (ICTs) in these telecentres contribute to the improvement of the education of the users, which in turn contributes to their socio-economic development.

Former South African Minister of Communications, the late Dr Ivy Matsepe-Casaburri (2001a: 2), stated that her government recognised that the ICT sector is at the epicentre of growth and development of the country, and that this will be achieved through lowering input costs, increasing efficiency and development of skills. Against this background, and because of other similar sentiments and statements that have been publicly expressed by government department representatives to the effect that ICT should be employed to develop people in this country and improve lives, it is necessary to assess *how* ICT - in telecentres – contributes to this development of skills and reduces illiteracy.

South Africa has high illiteracy levels and it is believe that telecentres should be employed by South Africans, especially by government departments such as Education, Science and Technology and Communications to assist in the reduction of illiteracy by teaching local residents pertinent issues and courses which are geared towards the improvement of their education and computer skills. *Mail and Guardian* (December 2006 to January 2007:5) argued that the television Learning Channel is attempting to solve South Africa's education crisis. The article stated that South Africa is facing an educational crisis and the sooner the problem is addressed by institutions such as universities with the assistance of other less formal ones, such as telecentres and other concerned parties, the better.

According to the same *Mail and Guardian* (2006-7:5) article, South Africa has a population of 47 million people, 30, 6 million of whom are over the age of 16 – which means about 16, 4 million South Africans are children of 16 or younger. Altogether 35 per cent of South Africans have a matric exemption and only 9, 9 per cent have a post matric qualification. Research conducted by the Human Sciences Research Council (HSRC) on South African education has produced results which require immediate attention and solutions to the problems identified. In particular, in 2002 only 23, 9 per cent of Africans aged 18-24 had a matric and 3, 8 per cent had tertiary education

(ibid.). This lost potential can also be seen in the 551 000 youth who drop out of school between Grades 1 and 11 each year (ibid.).

Furthermore, according to Statistics South Africa (*Mail and Guardian* 2006-7:5), unemployment among 20 to 30 year-olds increased significantly between 1995 and 2002 and in 1995 approximately 100 000 20 year olds were unemployed. In 2002 that figure had grown to about 250 000 (ibid.). Stats SA stated that young people find it difficult to find employment, and when they do, many of them are underemployed. Almost 69 per cent of employed youth work in the service industry and 24 per cent of employed youth work in temporary jobs. It takes an average of 14, 5 months for young people to become employed after leaving school, 16 months for Africans and 12 months for white people. Seventy-three per cent of African youths between the ages of 18 and 35 have never had a job, while 20 per cent of young people believe they will never get a job (ibid.). In view of this reality, the challenge for the education (and business) sector is to reduce high illiteracy levels. In this regard, telecentres could be employed by educational institutions to seek to alleviate this problem in a small way but meaningful way. It is reasonable to assume that young people are prepared to learn. Accordingly educational institutions should manage these educational challenges effectively by providing society, inter alia, with the necessary information, digital and strategic skills.

Benjamin (2003:19), who conducted a few studies on South African telecentres that identified deficiencies (cf. Chapter 4), and concluded that telecentres do have a role to play in educating the South African public:

> A few of the USA's telecentres have been very successful, such as Mamelodi, Gaseleka and Acornhoek. However, many are struggling with the technology not finding much local application. From the past few years we have seen how technology is wasted if there is not sufficient training and infrastructure support where local applications of the technology are not developed, the technology serves little purpose. This work must now change in focus. Work should now focus on exploring ways in which these technologies can be of use in increasing the capacity of people in poverty.

Much has been written about the success of Gaseleka telecentre (Latchem and Walker 2001; Hulbert 2006). In his writings about South African telecentres (cf. Chapter 4), Benjamin does not

suggest the writing-off of South African telecentres as instruments of development, but acknowledges that these telecentres have sustainability challenges. Benjamin (2003:12) suggests that new ways should be found to make these telecentres more useful for the communities they are located in and a large part of this involves providing ICT training. This study concurs with Benjamin's view and further emphasises that working telecentres (e.g., Gaseleka and the four sampled for this research), should serve as models to establish more telecentres, rather than some telecom analysts lamenting that the telecentres have failed. Besides, if the communities or telecentre owners wish to continue running the telecentres, they will continue to operate the centres regardless of whether some critics regard these centres as "failures". This is partly a consequence of community members' positive view about the telecentres' role in their communities and this researcher's research observations among local residents, among whom she conducted research on local telecentres since 2001. Thus local community members often speak of their telecentres and how they view the centres as having a positive impact on their lives. The researcher was also intrigued by why published works on telecentres maintained that telecentres were failing whereas telecentre operators, when interviewed, stated that the telecentres had a positive impact on the lives of users and communities. This dichotomy of views between academics and telecentre operators induced this researcher to conduct this study to find out in real terms what the telecentre impact is, from the user's perspective.

Conducting this study was one way of specifying what the impact is in tangible terms, especially regarding user education. The experience of this researcher with several urban and rural telecentres in four provinces she visited (Ndevana, Machibini, Ntselamanzi, Tombo, Hoxani, Modimosana, Botlokwa, Mankweng, Mohodi, Moletji, Moteti, Rustenburg, Siyabonga and MACIS), is that local community members at the centres were optimistic and enthusiastic about the positive role played by the centres in their communities and very few were pessimistic. Therefore, user views and benefits required further research and recording.

This researcher was also mystified by suggestions that telecentres are "failed interventions to ICT problems" because telecentres are successful in many countries employed to bring ICT services to rural areas. Therefore, the question arose why telecentres are failing in South Africa, if indeed they are, and how this failure could be remedied or avoided in future. Moreover, if telecentres indeed fail, then how can ICT services be deployed in rural areas as telecentres are a practical and cheap way of introducing ICT to rural (and poor) areas because they offer affordable (worldwide)

shared services. Also, an abundance of literature suggests that ICT has been proven to play a crucial role in developing poor countries, reducing poverty and societal inequality, and bridging the digital and information divides, e.g., in Latin America and rural China (see Ameriles, Paz, Russell and Johnson [Sa]; Coward 2008; India, Brazil and South Africa Dialogue Forum 2008; Fuchs and Horak 2008; Ki-Moon 2007; Sawhney and Jayakar 2005; Xia and Lu 2005, 2008).

Additionally, Coward (2008:1) states there are three reasons that necessitate more research attention to telecentres despite previous studies leaning to the conclusion that "telecentres are not fulfilling their potential in achieving self-sustainability, reaching disadvantaged populations or bringing about noticeable socio-economic change" (ibid.). Coward states that most previous research on telecentres is more qualitative in nature and based on perceptions; and that from a research perspective, this is far from ideal.

Unlike most previous studies on telecentres, this study offers both qualitative and quantitative investigation of telecentre impact, with impact measured using variables such as use of ICT for communicating with other human beings in geographically different locations, increase in telecentre user ICT awareness and use, improved educational qualifications, e.g., diplomas passed at the centres, improved computer literacy and software usage skill, access to government services using telecentre building and Internet, access to other Internet services e.g., access to multimedia services such as music, CDs and movies (as two users were watching movies on earphones at MACIS), doing school homework and writing (and posting mail) university assignments at the centre, and gaining business skills (computer related) and other gains. Most of these benefits (in relation to the four telecentres under study) are stated in Chapters 7 and 8.

The quantitative part of the study adds breadth and depth to understanding the use and contribution of telecentres in communities. Qualitative studies do not offer the same detail that quantitative studies do. In this regard, Coward (2008:2) states that research (mostly qualitative) conducted on telecentres "does not bode well for the general-purpose telecentre model and any linked to impact is tenuous at best". An example of a general-purpose telecentre in this study, is Siyabonga telecentre which offers all services required by community members, including those not ICT-related but business-related. There is no need for telecentres to offer services not providing solutions to local problems, so when a telecentre offers unique services not offered by other telecentres, this indicates that the telecentre is innovative enough to offer services required

by local people. Furthermore, there is a need to conduct further research on telecentres because "the challenges faced by telecentres are onerous" (ibid.), hence the need to continue researching telecentres in a quest to address these challenges. Coward suggests that there are three reasons for the continued research into telecentres aiming mainly at developing underdeveloped areas through ICT:

First, "Even if one concedes that general-purpose telecentres have largely failed, the fact that increasing efforts are being devoted to providing public access through community organisations that have long-standing community roots and libraries with information access as a primary mission illustrates for many that the model has evolved and more governments and donors are becoming more savvy in their support of public access. However, this trend is not very visible (in part because public access is delivered through a wide array of existing organisations rather than under national umbrella programmes). Furthermore, these types of `telecentres' have not been studied with the same level of scrutiny as the traditional ICT-centric telecentres. So, sufficient evidence has not been mounted to support any claims of positive impact. Some studies suggest these sorts of telecentres are having a more positive impact, but this path is still in a very nascent stage".

Second, "Many earlier studies conflated impact with financial self-sustainability. It is clear that sustainability is a huge challenge and most research concur that telecentres have largely failed to be sustainable. Yet, financial sustainability is not the only requirement for development, and one question is whether they offer enough value that they should be supported as public goods like schools and libraries. This argument is closely aligned with information as a basic right, launched under such slogans as `information for all' and `universal public access'. Governments, therefore, justify remote money-losing telecentres as they do remote post offices and other public services".

Third, "Much of the research is in the form of case studies and project evaluations. Both of these have faults. Case studies tend to highlight success stories and paint an overly optimistic picture of this sector. Not surprisingly, telecentre sponsors fund much of this research to make the case for this model. Evaluations, on the other hand, tend to paint an overly pessimistic picture. In sum, we really do not have a complete picture of telecentre impact." Therefore, this study aims to shed some light on the four centres sampled but results obtained from this study are not generalised to telecentres not researched, as explained in Chapter 6 which discusses the methodology in detail.

The limitations of the study in terms of case study disadvantages are stated in Chapters 6 and 9.

The value of this study's quantitative data cannot be overstated. Much of the quantitative data provide details of differences between the telecentres (post hoc tests, e.g. in terms of different telecentre usage variables; differences between user answers about a particular telecentre benefit (illustrated by standard deviations); and means (which differentiate between centres that concentrate on one service more than others, or states in which telecentre users obtained a certain benefit more than in other telecentres, e.g. computer skills training, e-government services, Internet services, business skills such as the A+ computer course, human resources skills, e.g., Batho Pele Principles). These data are crucial to know as they specify what each telecentre offers and to what extent. The quantitative data also reveal which other ICT and services are required by users that the telecentres did not offer during the survey period. Whyte (cf. 2000) states that quantitative research data are more valuable than qualitative data as the latter sometimes relies on perception which may not always be accurate. Quantitative data further provide specific answers with detailed respondent information.

Variables employed in this study to measure impact have been used in previous telecentre impact studies (cf. Amariles, Paz, Russell and Johnson [Sa]; Whyte 2000). According to Whyte (cf. 2000) "A telecentre-impact evaluation may include changes in a state or condition (as in family income), an attitude (as in more interest in consumer goods), knowledge (as in learning a new language or new skills), and behaviour (as in using innovative farming methods)." Educational changes may include activities that influence distance and adult education, homework or student support, training classes, offering typing tutors, general self-learning or self-improvement, group education sessions, e.g. using audio-visual equipment, skills upgrading and certification, learning new income-generating crafts and other activities undertaken at telecentres which impact on user education (ibid.). Whyte (cf. 2000) further states that business impact involves use of ICT services such as photocopying, word processing, spreadsheet applications, database services, typing and printing services as well as electronic commerce (e-commerce). All these aspects of telecentre impact were analysed in this study.

Other economic impact considerations include money transfers for family business, undertaken at the telecentres, requests of information for jobs and employment applications undertaken at the telecentres (Whyte 2000: 23). Economic impact is also scientifically measured by saved travel

time and money, as a result of using ICT and postal services closer to one's home (cf. Madden and Savage 1998; Milne 2006). Economic impact is also measured by how persons use technology (telephones, the facsimile) to pursue personal, family and business interests (cf. Skuse and Cousins 2009). These educational and economic factors are analysed in this study and results of this analysis and considerations are stated in Chapters 7 and 9.

Amariles et al. [Sa] indicate scientific indicators that could be employed to assess social benefits of telecentres which include acquisition of computer skills, increase in one's employability, gaining access to markets, impact on community groups such as schools, health centres and local businesses, impact on individual capacity building (e.g., change in individual ICT skills which can help that individual improve performance at work or obtain a pay rise, changes in individual behaviour, changes in staff capacity, resources and linkages with other social or community organisations) and changes in local organisations and their ability to introduce new ideas to communities or strengthen communities. These changes have been assessed in this study and results of how the four telecentres sampled have changed individual behaviour and interacted with community and national organisations and government departments are discussed in Chapters 6, 7 and 8 of this thesis.

In sum, the growing perception in South Africa that telecentres should not be developed any further because they are failing especially in rural areas, should be revisited because there are possibilities that this perception was made too early in telecentre development. The possibility exists that some telecentres may recover from their teething problems and work better towards various areas of community development. This is a continuing debate which will not end when this study is completed. The success of ICT projects also depends on how these projects are managed and also on who manages them, supported by which other organisations with financial, technical and human resources. If the projects are run or operated by local development champions which have an interest in developing their communities, these centres succeed (cf. Chapter 4). See also Chapter 3 on the role of these local development champions in participatory development communication). Some of the successful rural ICT projects in South Africa are the Dwesa ICT project and the Tsilitwa tele-medicine project in the Eastern Cape Province.

According to Mapi, Dalvit and Terzoli (2006:1), Dwesa, a rural area in the former Transkei region of the Eastern Cape Province, adopted ICTs to promote development in the area, foster ICT

awareness and a sense of ownership by the community. These are viewed as crucial factors in community development and computer literacy education in the region. Mapi, Dalvit and Terzoli (ibid.) further stated that their preliminary investigation highlighted a difference between elderly people owning small businesses, who were the most interested in the possibility of integrating ICT into their activities, and young people, who were more skeptical about the benefits of ICT, and that in general, females seemed to be particularly more enthusiastic about ICT, possibly seeing it as a way to gain status in a particular society.

The Tsilitwa village tele-medicine project – a collaborative project between the village and the University of Cape Town – allows for communication between the clinic in Tsilitwa village and the hospital in Sulenkama village, about 20 kilometres apart and is experienced to be successful (Chetty, Blake and McPhie 2006:8). The Tsilitwa project is a Voice over the Internet Protocol (VoIP) project. VoIP has been regarded by some South African telecom policy critics (Chetty, Blake and McPhie, Gillwald 2003a), as a technology that should be opened up more by legislation to facilitate more competition in order to make telecom services available and cheaper in rural areas where fixed-line networks do not work (cf. Chapter 5).

Conradie, Morris and Jacobs (2003:214-215) also state that the Tsilitwa project not only facilitated tele-medicine in the area but also improved quality of life and developed local business initiatives including a bakery, a soil or cement block making enterprise, and a guest house. It is therefore suggested that the government should create necessary new legislation which will make sure that the correct technology is employed for rural areas in order to bridge the digital divide and also to promote competition between more companies which can provide the required services in rural areas.

With the above as examples of successful ICT projects demonstrating a positive ICT impact on development, further research on telecentre role in development and education is suggested. It is not practical for South Africans to write off telecentres as instruments of development. Rural areas and those areas (e.g. some townships and informal settlements) without telecom services need telecentres, not only for communication purposes but also to help bridge the huge rural-urban divide that exists in this country. If local people are provided with ICT training and with business management skills of how to run such projects or ICT centres, these projects may succeed.

This research therefore seeks to identify how telecentres develop communities and also establish ICT skills gained by community members at telecentres. The study also seeks to identify ICT skills still required by community members. Once it is revealed how ICT contributes to skills development, researchers, academics and policy makers can be better informed on the role of ICT in local community development. Furthermore, policy makers can be better informed about the role of ICT in local persons' development. Such information and knowledge can be used to provide better services aimed at improving and developing persons. The thesis therefore, delineates the role of ICT in the development of the skills of previously disadvantaged South Africans living in rural and semi-urban or semi-rural areas for the betterment of skills transfer processes in the future.

Guest-speaking at the opening of the academic year of the University of South Africa (UNISA) in February 2007, former South African Deputy President Phumzile Mlambo-Ngcuka (2007) stated that South Africa lacks ICT skills especially amongst women, and urged universities such as UNISA to change their curricula to include practical ICT skills training in the quest to solve the mounting socio-economic problems such as unemployment and poverty. Mlambo-Ngcuka said that the time for local universities to conduct socially-irrelevant research passed a long time ago. She urged local academics to conduct research aimed at solving the existing social and economic problems, stating that ICT will play a crucial role in that research and processes of solving those problems.

Mlambo-Ngcuka (ibid.) echoed views expressed by the Ministers of India, Brazil and South Africa Dialogue Forum (IBSA), in the Brasilia Declaration (cf. IBSA 2003), that large parts of the world have not benefited from globalisation although the IBSA Ministers welcomed the expansion of economic growth, employment and social development and the accompanying rise in standards of living in several developing countries as result of freer movements of trade, capital and technology. However, in South Africa, ICT has not brought a rise in the standard of living of many, and ways of ensuring that this improves should be investigated through research such as this. In the Rio Communique (cf. IBSA 2006), the IBSA Ministers committed themselves to work together with international fora to promote ICT as a tool for development and to build multilateral, democratic and transparent Internet governance mechanisms. Further IBSA (cf. IBSA 2008) agreed to advance "technology transfer" for "capacity building", which also advances

South Africa's Information Society vision which is:

> "to establish South Africa as an advanced information society in which information and communication technology tools and information are key drivers of economic and societal development" (Matsepe-Casaburri 2008:1).

Against the background of this South African Information Society vision which also, indirectly, pursues the achievement of the United Nations (UN) Millennium Development Goals (MDGs) and the World Society on the Information Society (WSIS) targets, it is believed that telecentres have a role to play in national development. The vision espoused by Matsepe-Casaburri has yet to be achieved, but South Africa is implementing several ICT projects, in addition to telecentres, towards its realisation (cf. Maphathane 2006; Maphathane and Mooko 2006; Matsepe-Casaburri 2006a, 2006b). This thesis, therefore, seeks to be an additional contribution to knowledge on the role of ICT in the improvement of the lives of local people.

1.3 BACKGROUND TO THE STUDY

In African countries ICT *still* has to be proven, to a large extent, to contribute to rural development and development of the poor, more specifically in terms of education. South Africa, the case study and focus of this research, is located in Sub-Saharan Africa and is categorised by the World Bank as a developing country in the "lower-middle-income group" (World Bank 2004). The telecoms infrastructure of Sub-Saharan Africa is very underdeveloped, despite South Africa's telecoms infrastructure, which is more advanced than that of its neighbouring countries in the region (Pitt and Levine 2003; Makhaya and Roberts 2003).

This unsatisfactory situation is being improved (by governments, development agencies and telecoms policy regulatory institutions such as the International Telecommunication Union (ITU) and by establishing, amongst other projects, telecentres in several African countries with the main purpose of improving poor access to telecom services in the region. Because of the demand for telecentres in Africa, more telecentres were due to be established by the ITU in 20 African countries from 2005 onwards. According to Moeng (2005:1) the ITU has launched a new telecentre network of about 100 telecentres in 20 African countries. The ITU continues to assist developing countries in telecentre establishment through its Bureau for Telecom Development

(BDT). These countries include Benin, Burundi, Central African Republic, the Democratic Republic of Congo (DRC), Gambia, Guinea Bissau, Kenya, Malawi, Congo, Rwanda, Tanzania, Zambia and Ethiopia. The ITU project aims to enable the African communities to obtain the social and economic benefits that accrue from participation in the information society (Nulens 2005:1).

These telecentres, also called multipurpose centres (MCTs) multi-purpose community centres (MPCCs) or Thusong Service Centres (TSCs), will be managed by women so that they can actively participate in the development and decision-making process (ibid.). Speaking at the "Social Development in Africa Conference" in Mafikeng, South Africa, in March 2007, the Chief Director of Provincial and Local Liaison which includes the MPCC rollout programme at the Government Communications and Information Services (GCIS), Nebo Legoabe said emphatically that women are leading telecentre development. Legoabe started the Mamelodi township telecentre sampled for this research in 1999. Legoabe (2007) stated that women only attended telecentre "iimbizo" (development meetings run by GCIS and other government ICT agencies), so it is imperative that women receive ICT skills training since they are preoccupied with telecentre development and operation, and advancing rural development through telecentres and other interventions. The GCIS vision and development of women ICT skill is aimed at fulfilling South Africa's MDGs.

Promoting gender equality in ICT access and usage and empowering women in ICT skills contributes towards the achievement of MDG 1 (eradicating poverty and hunger), MDG 2 (provision of primary education – infrastructure and services – to all children) and MDG 3 (promoting gender equality and empowering women) (cf. Maphathane 2006; Matsepe-Casaburri 2006b). As a member of the UN, South Africa pursues the achievement of the UN MDGs set in 2000, and teaching women ICT skills in an important MDG target will should be met, according to UN target deadlines, by 2015. Although South Africa may not reach this target by 2015 due to economic and high illiteracy challenges, the nation is making attempts at addressing this problem through educational institutions and lifelong learning education centres such as telecentres. This problem should be addressed, and women are willing to address it, however small their initiatives are.

In support of national ICT women skills development, Legoabe (ibid.) also exhibited graphics

demonstrating the work conducted by women at local telecentres and other development projects, stating that as far as these rural projects are concerned, “Development has become a woman’s problem and concern in South Africa as 90 per cent of men simply do not attend the arranged "iimbizo" (meetings) aimed at discussing development solutions to local problems”. To address male lip service or lack of response to the need to train women in ICT skills, Legoabe (ibid.) and the GCIS are taking a leading role to initiate ICT training programs for women. This initiative is also in line with the call by the 2005 second phase of the World Summit on the Information Society (WSIS), which emphasised that countries should spread ICT access and promote, more especially, women’s access to and training in ICT skill, because “ICTs are having a profound effect on people’s lives”, and that ICTs are “a tool for social and economic development” (ITU World Telecom/ICT Development Report 2006a:8).

South Africa also continues to establish new telecentres, under the guidance of institutions such as the ITU (as South Africa joined the ITU in 1995). The Universal Service Agency (USA, previously called the USAA and now known as the Universal Service and Access Agency of South Africa or USAASA), also believes that telecentres offer forms of social and economic development (cf. Chapter 4), such as use of the Internet for information, computer training and linkages with stakeholders via telephones and e-mail. According to Legoabe (2007) 94 TSCs were in existence in South Africa by end-2006 and that the centres provided more than 900 services including communication, marketing, municipal and government information. However, Schofield and Sithole (2006:28) state that 65 telecentres were established by the USA by 2001 and that only 31 were operational that year (2001). However, Maphathane and Mooko (2006:25 - 48) list 173 telecentres established by 2006, 19 in the Eastern Cape Province, 13 in the Free State Province, 16 in Gauteng Province, 20 in KwaZulu-Natal Province, 28 in Limpopo Province, 14 in Mpumalanga Province, nine in the Northern Cape Province, 13 in North West Province, and eight in the Western Cape Province.

In establishing telecentres in all nine provinces, South Africa is not only responding to international calls for countries to establish telecentres for development, but government is well aware of the fact that ICT will be crucial in the fight against illiteracy and will contribute to rural development (60 per cent of South Africa comprises rural areas that require development). In addition to the impact and role of international institutions such as the ITU on national governments’ telecoms and ICT policies, international processes such as globalisation and

changes in the telecom market structure, e.g., privatisation of state assets, development of telecentres and liberalisation have also changed national telecoms sectors and brought ICT from developed to less developed countries (LDCs), South Africa included.

As a result of the impact of these international organisations and processes, it is necessary that studies, such as this one, be conducted periodically in order to assess *how* ICT develops users in LDCs, especially in rural areas. Information from these studies is necessary to develop new theories or build on existing theoretical frameworks, and also to form new databases about the role of ICT in developing people in the developing world. The theoretical foundation of this study (cf. Chapter 3) rests on the viewpoints of various theorists who state that ICT has the potential to bring much-needed socio-economic development to LDCs. For example, the utopian school of thought regarding the relationship between ICT and development supports the deployment of ICT in communities and associates positive developments with this deployment. This perspective argues that in the economy, ICT expands productivity and improves employment opportunities, and upgrades the quality of work in many occupations. Moreover, ICT offers many opportunities for small-scale, independent and decentralised forms of production.

Regarding developing countries, technophiles envision that technology will aid countries to leapfrog stages of development (Naidoo 1997; Castells 1998; Nulens and van Audenhove 1999; Matsepe-Casaburri 2002). As much as there are optimists regarding the role of ICT in development, there are also pessimists that view ICT as not contributing positively to development. Known as technophobes, they regard ICT as having a negative effect on development and contributing towards the expansion of the rich-poor information gap, the literate and the illiterate. The third theoretical perspective on the role of ICT in development, which also lays some of the theoretical basis for this study, is the intermediary perspective, which acknowledges that while access to ICT might not directly lead equitably to development, this access may be necessary in order for a country to be part of the global economic activity (Bailur 2008:3). Chapter 3 elaborates on these theoretical perspectives in terms of their relevance to this study.

This study takes the more optimistic intermediary view that ICT should be employed to develop people by imparting ICT and computer skills (by those in educational institutions and other community institutions such as telecentres), to those who require such skills. This study is

therefore also located within the field of community informatics (CI), a theoretical approach that explains how innovations are adopted and employed by those who never accessed the technology (Benjamin and Dahms 1999; Gurnstein 2000a, 2000b; Harris 2001). The dominant paradigm (DP), as applied in this study, explains how technology diffuses from developed to developing countries in the latter's quest to modernise. Several proponents of the DP are referred to in Chapter 3 (Nulens and van Audenhove 1998; The Communication Initiative 2001). Development Support Communication (DSC) is also employed to explain the role of technology in the development of telecentre users (Melkote 1991; Obregón and Rivera 2001; Servaes 2001; The Communication Initiative 2001). DSC also supports the view that telecentres could play a crucial role in development of communication and education in South Africa, especially in rural areas, and should therefore be employed towards this goal. Technology in telecentres should be employed to advance education of those who use these telecentres in the quest to bridge the digital and information divides. Literacy and technology are becoming interdependent and neither is an end to itself, but each can improve human lives. Societies that do not work to improve the literacy of civil society will fall further behind in the digital divide. Using telecentres, South Africa is attempting not to fail in bridging this divide and reduce illiteracy through use of technology.

The dominant paradigm is employed to explain how technology is transferred from industrialised and developed countries to developing countries through processes of globalisation to promote development, and so is the new paradigm for capacity development and institutional innovations. The new paradigm for capacity development and institutional innovations promotes the notion that ICT includes global tools which can be employed to solve local problems and that ICT should be employed locally to impart new skills (Fukuda-Parr, Lopes and Malik 2002:19). In this study, it is evident that assertions of this theory are real because in the four telecentres researched in the field, users learnt computer skills that they did not have before visiting the telecentres. Some have employed these computer literacy skills to gain new jobs in urban areas (cf. Chapters 7 and 8). DSC is employed to explain how people communicate, using ICT in telecentres, toward achieving their development goals. These theories are elaborated on in Chapter 3.

In addition to this theoretical foundation, the study provides discussion of the role of ICT in development. This role is discussed against the background of the South African telecom and ICT policy and also South Africa's socio-economic conditions. South Africa's ICT policy aims to

promote the development and spread of more ICT services nationally, and ICT use for development of fields such as education, health and electronic government (e-government). As already referred to, according to Matsepe-Casaburri (2001a: 2), the government has recognised that the ICT sector is at the epicentre of growth and development of the country and that this will be achieved through lowering input costs, efficiency and development of skills.

Government policy statements were put into action through the promulgation of South African telecoms legislation and regulations that have laid the foundation for ICT usage in education and skills training in telecentres, universities and schools. These regulations include the Telecoms Act of 1996 (cf. South African Telecoms Act No. 103 of 1996) and the Telecoms Amendment Act of 2001 (cf. South African Telecoms Amendment Act No. 64 of 2001). The role of these Acts in this regard is summarised in Chapter 5.

The 2001 Act promotes the provision of computers and the Internet in all schools, especially through public-private partnerships (PPPs) because government departments can not fund provision of universal service to telecom services entirely on its own because of the expensive infrastructure development and governments obligations to fulfil other social development objectives, e.g., eliminate poverty and provide high quality education and health services. The growth in private sector participation has been a catalyst for the expansion of PPPs in the education sector, hence the elaborate explanation of this growing ICT-funding imperative and trend in this section. LaRocque and Latham (2003:19-20) define PPPs, at one extreme, as partnerships between public sector investors and businesses for the purpose of designing, planning, financing, constructing, or operating infrastructure projects that would normally be provided through traditional procurement mechanisms by the state. On the other extreme, they describe PPPs as any private and public cooperation or collaboration that aims to achieve a common goal, no matter whether the partnership is formal or informal. The developed countries' definitions of PPPs are slightly different to the South African definition and interpretation of this concept. These different definitions are elaborated on in Chapter 2.

PPPs are critically considered in this section, because there is a paradigm shift in the international communication and telecommunications sectors towards PPP-ICT project funding, a shift from previously either government-only or solely private sector funding. Fife, Hosman and Pereira (2008:1) explain that this shift towards PPP-ICT funding is globally viewed as a more effective

way to manage development assistance than previous means. Furthermore, they state that "although PPPs have been around for over a hundred years in the United States, growth in their use began in the 1980s and has continued in part because this kind of collaboration is thought to allow a more effective way to manage risk, garner capital for large scale efforts, and to deliver services in a cost-effective manner". However, they also acknowledge that "PPP ICT projects tend to be non-comparable on a global scale because there are no standard metrics for assessment due to the complexities involved in evaluating and documenting processes, and also because of the great variety in form and scale of PPPs, both in developed and developing countries, as well as cultural and geographical differences that make broad comparison difficult" (ibid.).

The examination of PPPs as an ICT project funding alternative is extended in this section because this funding method could work for developing countries with struggling and not-well-developed economies which can benefit from support from the private sector. Perhaps future research could determine the success of PPP-funded ICT projects in developing countries such as South Africa to further assess PPP potential for ICT development, and also report on already achieved development outcomes of these projects in the developing world. What is clear thus far, and visibly observed by ICT researchers globally, is that there is a growing trend in developing countries, of ICT private firms, such as Microsoft and Cisco (these two companies also support the telecentres included in this thesis), pursuing ICT funding of development projects in developing countries (cf. later sections of this chapter with examples of local PPP-funded ICT projects).

Furthermore, theoretically PPPs are supposed to achieve optimal outcomes by harnessing the synergies created by the combination of expertise and resources (human, financial and technological) of the private partner, with the administrative and political power of the governmental partner (cf. Gerrard 2001; Bekker and Patterson 2005). The World Bank also advocated the implementation of ICT-PPP projects for the advancement of development initiatives (cf. World Bank 2006). Additionally, the United Nations Millenium Declaration also recommended the creation of PPPs to ensure that the benefits of new technology, especially ICT, are available to all (cf. Weigel and Waldburger 2004). South Africa has followed this ICT-PPP-funding trend to ensure that South Africans reap some of the positive rewards which result from using ICT, and PPPs have proven to be a better option to sustain ICT projects.

Despite the fact that PPPs still have to be tested and passed as dependable or successful funding mechanisms for ICT projects in many developing countries, literature reviews indicate that there is a growing trend to increased use and enthusiasm towards implementing PPPs internationally (cf. Gerrard 2001; Bekker and Patterson 2005). Fife, Hosman and Pereira (2008:4) further summarise the theoretical and practical arguments for PPPs:

> For governments, PPPs offer access to infrastructure, hardware, software and expertise from world leaders in technology, and possibilities for bridging the digital divide, increasing efficiency and economic growth. Besides improving its social and political capital, other advantages for governments include increased private finance and investment, technological experience and expertise, risk-sharing, the public legitimacy that results from being associated with a successful global corporation, and a potential downsizing of the public sector or a decrease in governmentally subsidised programs. PPPs also potentially afford the benefits of increased exposure to technology, more efficient ways of doing business, and a stronger incentive to adhere to the policies of fiscal discipline. Private partners are motivated by the desire to shape new markets where future growth is anticipated. There is also recognition that these new markets behave differently and may require different technologies, and that the business models will be different than in the developed markets. Involvement in economic development activities also has contributed internally to improved workforce morale and a positive "global citizen" company image. For all these reasons the opportunity to work with international development agencies is a viable entry mechanism to get into developing markets.

Not surprisingly, with the aim of gaining these national PPP benefits stated above, South Africa followed this trend, the purpose of which is to empower citizenry and developing ICT capacity at the individual, group (in centres such as MPCCs and DoCWILs) and institutional levels, including schools, universities, post offices and libraries. The imperative to develop strong PPPs in the delivery of South African education is the result of the need to address educational challenges such as ICT skills shortages to ensure that the government's broader economic and social objectives are met. Private companies have advanced ICT skills, which government

departments may not have and the private sector has taken it upon itself to assist government in ICT skills development – examples of these private companies are provided later in this chapter. While PPPs are the key to education service delivery, what must be reconciled is the interest of government on the one hand to ensure service delivery at a low cost, with that of the private sector aimed at maximising returns on investment. The long term benefits of PPPs are that as a result of private sector participation in them, government can redirect extra resources to other priorities such as housing and health.

Several PPPs exist in South Africa for advancing electronic education (e-education, e.g., the Shoma Education Foundation, SchoolNet Africa and the Digital Partnership). The Shoma teacher development started in 1998 and has a number of private and public sector partners including Multichoice Media, Microsoft, and national and provincial government education departments (Shoma Education Foundation 1998). A telecentre sampled for this study's field research is Hoxani or Bushbuckridge multipurpose community centre (MPCC), and this telecentre is a successful Shoma project. SchoolNet Africa is an independent non-governmental organisation that promotes education through the use of ICTs in African schools. SchoolNet Africa's partners include the United Nations Economic Commission for Africa (UNECA), the Open Society Institute for Southern Africa (OSISA), Commonwealth of Learning (COL), ThinkQuest International (a non-profit organisation), national and provincial government departments (SchoolNet Africa 2001).

Addressing the Social Development in Africa Conference in Mafikeng, South Africa, in 2007, UNECA representative Nwuke (2007:10), stated that African universities have a responsibility to change or upgrade their curricula to include the much-needed ICT skills and that women should be at the centre of ICT-skills training because women were very much involved in African development projects. Nwuke urged African universities to engage in networking and peer learning between themselves and the private sector, in order to develop new ICT courses and also to provide women with ICT capacity building.

Another national education-promoting PPP is the Digital Partnership, which started in 2002 and its partners include the South African Department of Communications, Nestle, the World Bank, the John Ryder Memorial Trust, Cisco Systems, Vodacom (South Africa's leading mobile phone service provider), Intel, Women's Development Bank, and other South African development

organisations and private and public organisations (The Digital Partnership 2002).

PPPs have laid the foundations of a few local telecentres, e.g., some telecentres that were established by the government agency, the USA, are provided ICT support and training by the private sector including Microsoft and Cisco Systems - such as the Mamelodi township telecentre (Motshweni 2002; Microsoft South Africa Digital Villages 2003), and the Emdeni digital village or MPCC in South Western Townships or Soweto (Soweto Digital Village 1997; Modise 2001; Wessie 2001). Siyabonga telecentre in Orange Farm informal settlement outside Johannesburg (one of the case studies in this research) was established through a PPP project between government departments and the private sector such as a local petroleum company. Chapter 6 provides much more information about how these PPPs have contributed to local telecentre establishment and maintenance.

Langa, Conradie and Roberts (2006:132-133), state that the South African government and private-sector bodies have responded to South Africa's digital disparities by launching a range of policies and programmatic interventions. These have mostly been attempts to increase access to digital ICTs in rural areas, including the provision of email or Internet access to schools and installation of infrastructure at centres that serve previously disadvantaged communities. A number of community initiatives have also incorporated elements of computer training, as well as actions aimed at using ICT to promote some type of government-initiated or supported projects including telecentres, MPCCs, cyberlabs at rural schools, the "i-community" established by Hewlett-Packard Compaq at Mogalakwena district in Limpopo, the Department of Communications' Web Internet Laboratories (DoC-WILs), Public Information Terminals at post offices and other public information centres, the Department of Education's SchoolNet SA project and other interventions (Langa, Conradie and Roberts 2006:132).

Langa, Conradie and Roberts (ibid.), demonstrated that many of these developments have not produced the desired results, and that the USA telecentres have been considered as having "failed, with the major problem being their lack of long-term economic sustainability". Furthermore, they also state that the access provision projects established educational institutions have been more sustainable, and that the MPCCs are also more promising.

However, the former USAA considered that the telecentres sampled for this thesis are successful

(Mahao 2004: 2). However, the centres are faced by sustainability challenges such as low income generated for the managers and also low profits accrued by the centres. Although the telecentres do not make as much profit as the managers and ICT trainers expected, they are satisfied with the centres' progress (cf. Chapters 7 and 8). Those issues of sustainability could be improved by introducing new services required by community members at each centre. The centres are also supported by community members who enjoy their services so they have a better chance of surviving and being sustainable. International telecentre researchers, have established that telecentres that enjoy community support succeed (cf. Benjamin 2001a, 2001b; Conradie 2001; Kutu-Mphahlele and Maepa 2003; Hulbert 2006; Langa, Conradie and Roberts 2006).

In this regard, Hulbert (2006:152), states that the community's ownership of and involvement in ICT projects are key to their success, and those communities that are given an ICT centre may feel that the centre will be managed for them. Therefore, a centre must be driven by the local community and the danger of the "box drop" approach has shown clearly there is no real ownership by the community, which manifests itself in the failure of the centre. Therefore communities should decide what they need and why they need telecentres. Telecentres established with this background usually succeed.

It is also important that local telecentres should not be compared too much with successful telecentres in developed countries because South Africa does not necessarily have the same financial and human resources. It will take South Africans some time to have the capacity to provide citizens with the necessary ICT knowledge and skills because South Africa does not have much expertise in the issues and skills involved.

The following section provides a brief background concerning why telecentres are studied here.

1.3.1 Why study telecentres?

As stated earlier in this chapter, the South African government has emphasised the use of ICT for the advancement of education, from primary school to institutions of higher learning and distance education. The South African Telecoms Act of 1996 states that telecentres should be provided by the USAASA, throughout the country towards the achievement of universal access to telecom services (cf. South Africa Telecoms Act No 103 of 1996; South African Electronic

Communications Act of 2005). Furthermore, telecentres should contribute to the development of people in areas such as education (tele-education) and advancement of health education (tele-health or tele-medicine). According to van Audenhove (1999; 2003), universal access to technology, nationally and internationally, is therefore seen as one of the prime goals of South Africa's vision of the information society. Moreover, government regards ICT as important for national development.

Lie (2001a: 26-27) mentions that evaluation studies are needed to provide an assessment of the role and impact of community telecentres, as organisations and donors are implementing these facilities in many parts of Africa without an adequate understanding of how well they respond to the communication and information needs of African communities (particularly rural communities), or their impacts on social equity and economic development.

Education results in social change. An educational impact study could provide an indication of and insight into the social impact of ICT in South Africa. Information derived from the results of this study could be important for policy makers to adjust their policies so that these policies provide the needed ICT in the communities (cf. Chapter 5). In nations globally telecentres can provide support for education advancement by providing a wide-range of services that foster and improve informal education, computer training, cultural support and promotion, governance and economic prosperity. In South Africa this kind of knowledge is not widely available and well-documented. A further purpose of this study would thus be to disseminate such information, especially to the telecentres being studied and their communities so that the telecentre managers can provide users with better services.

Internationally, telecentre impact studies are conducted for the purpose of delineating the role of technology in development (Juma, Fang, Honca, Huete-Perez, Konde and Lee 2001:637). They state that the role of technology in development has not occupied its rightful place in international development policy and that today there is currently greater emphasis on science and technology as a tool for improved economic competitiveness, than as a vehicle for improving the human condition. As a result, the human side of technology use is not well researched. This study partly hopes to contribute to this overlooked area of research, within the South African context, and shares the view that technological capacity is an essential component of development.

The extensive discussion above of PPPs was necessary because: First, it has become apparent that government does not have the financial capacity to establish and run telecentres on its own. Therefore, government needs private sector support to establish and operate telecentres successfully – the failure of some government-only run telecentres has proven that government needs private sector support in running them (hence the importance of the PPP concept in telecentre operation). Government, on the other hand is preoccupied with addressing other socio-economic problems, including poverty alleviation, housing and electricity shortages, land distribution issues, preparing for the 2010 Soccer World Cup and building stadiums, addressing high inflation and reducing the cost of food, petrol, diesel and living, dealing with unemployment and fighting crime and xenophobic violence. Thus government has many problems to address, and ICT is just one of many issues confronting government officials. Therefore, government needs private sector support to establish ICT centres and train local persons in ICT skill at these centres. The private sector also provides ICT skills training which government officials lack.

Second, the discussion demonstrates that all ICT stakeholders, nationally and internationally, agree that telecentres should be established throughout the world, to contribute to knowledge sharing, information generation and solving other socio-economic ills. Nationally, these stakeholders (as several authors and ICT researchers acknowledge in the section above), include government departments (e.g., the Departments of Communications and Education), national ICT infrastructure development agencies (e.g., the USAASA and the GCIS), international ICT development supporting organisations (e.g., ITU, OSISA, COL and UNECA), and private sector companies that have partnered government departments and the USAASA to establish and sponsor the operations of national MPCCS.

Having argued why telecentres are the focus of this research, it is now appropriate that the role of telecentres in education, internationally, be briefly explored. First, education is briefly defined, and then the role of telecentres in education is discussed. The definitions of formal and non-formal education, in the next section are brief because a more elaborate explanation of these concepts is provided in Chapter 2.

1.4 A BRIEF EXPLANATION OF FORMAL AND NON-FORMAL EDUCATION

Formal education means knowledge and qualifications received from educational institutions such

as schools, universities and colleges. Qualifications and certificates enable those with formal education to gain employment and participate in national economic development. Non-formal education, or life-long learning, is knowledge not gained from formal educational institutions but received from other people, community organisations, cultural groups and other societal institutions, telecentres included.

Telecentres play a pivotal role in developing formal and non-formal (informal), education of local telecentre users, especially regarding training on how to use computers - this is elaborated on in Section 1.5. Chapter 7 of this thesis also provides specific details of how some South Africans' education, especially computer literacy skills, has been improved by computer training they received from telecentres. Benjamin (2001a:21) furnishes an example of how telecentres contribute to formal education of users and states that in 2001, there were seven telecentres in South Africa that ran the University of Witswatersrand (Wits) Information Literacy Computer Training Course (InfoLit). After completing this course, computer trainees at these telecentres received formal computer training certificates from Wits which they use to gain employment. A telecentre researched in this study, Mamelodi Information and Communication Services (MACIS), successfully runs the InfoLit computer course. Benjamin (2001a:4) comments that in 65 per cent of the telecentres he had conducted research on, there was "computer usage", which is defined as the Wits InfoLit Computer Programme.

The present study further defines "computer usage" in telecentres and provides other computer courses run by local telecentres (in Chapters 6 and 8), in addition to the InfoLit Programme. Other courses include the International Computer Driving License (ICDL), Further Education and Training (FET) teacher training modules and Outcomes-Based Education (OBE) computer skills training courses.

Computer literacy acquired by computer trainees at these centres encompasses what Lievrouw and Livingstone (2002:95) describe as use of "computer technologies to do research and gather information, as well as to perceive computer culture as a terrain which contains texts, games and interactive media which call for new literacies".

According to Lievrouw and Livingstone (ibid.), computer culture enables individuals to participate actively in the production of culture, ranging from the discussion of public issues to

the creation of their own cultural forms. Moreover, "computer culture is a discursive and political matrix in which students, and citizens can intervene, engaging in discussion groups and collaborative research projects, creating their Web sites, producing innovative multimedia for cultural dissemination and engaging in social in reaction and learning" (Lievrouw and Livingstone 2002:95). This research finds that this knowledge is gained by some telecentre users in certain local telecentres, e.g., Siyabonga telecentre, and this is described in Chapters 7 and 8.

At Siyabonga telecentre, for example, users already had a computer culture and produced brochures, newsletters and advertisements. They used different software programmes to carry out computer-related tasks. Other specific computer skills taught at this telecentre are mentioned in Addendum C.

1.5 TELECENTRES' ROLE IN FORMAL AND NON-FORMAL EDUCATION

It is a known fact that these new and mixed modes of learning include integration of face-to-face teaching combined with online learning activities, the delivery of lectures by videos and multimedia (such as DVDs), and use of technology such as video conferencing to support the verbal communication learning processes and learning through print media. University students who reside in rural areas make use of the Internet or virtual learning offered by telecentres to contact their educators at higher institutions of learning and fellow students asynchronously in case of need. South Africa adopted an ICT policy that includes the use of ICT for the advancement of education, whether this use be formal at schools, universities or informal at telecentres. In this regard, Matsepe-Casaburri (2001b: 5) declared that: "Government believes that the creation of an e-literate society is in the interest of both the private and public sectors."

Growing evidence demonstrates that more countries are equipping their schools with computers to achieve school reform or improvement. South Africa followed this global trend and introduced the Edu-Net policy in 2001 (Kekana 2002:56). This policy enables schools and tertiary institutions to be connected directly to the Internet using satellite dishes. Public schools, according to the 2001 South African Telecoms Amendment Act (cf. South African Telecoms Amendment Act No 64 of 2001), are entitled to a 50 per cent discount on all calls to Internet service providers.

However, it needs to be stated that up to now few South African schools have access yet to computers for teaching and learning purposes. According to the USA's 2005/6 Annual Report (2006b:16), the proportion of South African schools with computers (and the Internet) is five per cent in the Eastern Cape and Limpopo Provinces, 11 per cent in KwaZulu-Natal Province, 12 per cent in Mpumalanga Province, 13 per cent in the Free State Province, 22 per cent in North West Province, 50 per cent in the Northern Cape Province, 58 per cent in Gauteng Province, 62 per cent in the Western Cape Province, with a national average of 28 per cent.

Telecentres, backed by signal distributor Sentech, provide broadband Internet services via satellite and provide assistance where schools have no computers or Internet access. The first telecentre to benefit from this service was Siyabonga (which means we are thankful in local Zulu language) situated in the Orange Farm semi-urban or rural area or informal settlement. Orange Farm is located about 50 kilometres south of Johannesburg in Gauteng Province.

Other countries also promote ICT use in education, through schools and telecentres. For example, in rural Uganda, the Nakaseke Multipurpose Community Telecentre (MCT) offers users non-formal education by using ICTs to collect and distribute indigenous knowledge of traditional birth attendant practices, organic farming and medicinal properties of plants (The Commonwealth of Learning: Using Telecentres in Support of Distance Education 2001). In Paraguay, the Amic@s telecentres provide basic and civic education in the poorest neighbourhoods of Asunción, allowing people - including street children - to email, video conference, browse the World Wide Web and design web pages. Latchem and Walker (2001:199) state that the AMIC@s were designed to provide basic training and ICT services in support of democratising learning, decentralising public management and encouraging community participation in some of the poorest areas of the city.

In Chinese Taipei, telecentres provide information and training programs for labourers, farmers, indigene and senior citizens (Lin 2004:5). In Vietnam, telecentres promote culture and education, agriculture and rural development, tele-medicine and small and medium enterprises (SMEs) (Anh Dao 2004:14). In Latin America and the Caribbean, telecentres have frequently been employed to provide support to groups of students at the basic, secondary and university level, as well as to teachers (Delgadillo and Borja 1999:3). The latter further maintain that telecentres provide access to educational CD-ROMs. Telecentres provide public access to the Internet, for educational,

personal, social and economic development (Reilly and Gómez 2001:1).

In Nigeria, a non-governmental organisation (NGO) Fantsuam pursues micro-credit projects aimed at alleviating poverty among rural women and establish mobile telecentres employed for advancing education (Jensen 2001a:1). These telecentres provide ICT facilities such as computers and the Internet to rural dwellers, communication access to secondary school learners so that they can supplement their formal studies, Internet access to teachers to re-train for diplomas and degrees and ICT access to community health workers for information and skills up-date.

In the vast state of Western Australia (WA), the 90-centre WA Telecentre Network supports secondary, tertiary and governmental distance education programmes, after school homework clubs and ICT-based programmes for seniors - they contribute positively to the formal education of locals (The Commonwealth of Learning: Using Telecentres in Support of Distance Education 2001). These ICT-based programmes for seniors offer non-formal education and entertainment programmes for the elderly. In WA telecentres deliver education services to remote families and the greatest value of the Australian telecentre program appears to be gradual community learning (Latchem and Walker 2001:198). In Canada, Community Skills Centres in British Columbia offer online training for managers, workers, teachers, emergency services and small business. These courses are forms of non-formal education for these various types of workers and this kind of knowledge they receive from the telecentres helps them to perform better at work and sustain their jobs.

In Europe, observes Qvortrup (2001:1), telecentres are a means to social, cultural and economic development of rural communities and low-income urban settlements because they provide users with telecom access to computers, telecom services, general computer training and education, telework, online businesses, meeting rooms for community development meetings and Internet connectivity for inhabiting the virtual market place and using email for consulting business consultants. Latchem and Walker (2001:197), indicate that telecentres have been associated with ICT training since their inception, and that many of the early Scandinavian and North American telecentres were essentially ICT training and awareness-raising centres, funded under government training programmes aimed at improving computing and communication skills amongst remote and disadvantaged groups. In the UK, the development of community access or community learning centres is an important part of government policy to promote and expand lifelong

learning (ibid.:65).

While conducting research in 2005, it was discussed that in South African telecentres such as Tombo telecentre, in Port St Johns in the Eastern Cape Province, users can find further pamphlets on HIV-Aids and the telecentre manager could access the Internet for information on many issues. During this process, on a visit to the telecentre in 2004, students from local schools were surfing the Internet for information; two other students posted assignments to tertiary institutions at the telecentre's post office. There were also newspapers at the telecentre for information about education, health and government. More information on this centre is provided in Chapters 6 and 8. Similar to South African telecentres in this regard, are Vietnamese telecentres which also offer their users information on health education (Anh Dao 2004:14).

The Tembisa telecentre (in Tembisa township, near Kempton Park and Oliver Tambo International Airport, South Africa), offers library services to users (located next to the telecentre is the local municipal library and the telecentre manager is a librarian). The pilot study for this study was conducted at this Tembisa telecentre. In Africa, organisations and individuals use telecentres to obtain information and transfer knowledge (Jensen 2004:2). Students and teachers use educational software at telecentres; download courseware and access online libraries and distance education through the Internet and telecentres are a community library of the future, a business service and a local and regional news service point.

Against the above outline and possibilities of telecentres in and for education, it is argued that telecentres have the potential to play a substantial role in the advancement of the education of South Africans who don't have access to education or those unable to afford higher education. The educational services that telecentres can offer may be both formal and non-formal, synchronously (at the telecentre where those who are communicating are located at the same place), and asynchronously (linkages by technology and applications such as email - in the case where communicators are physically located far from each other) forms.

Gurnstein (2000a:7, 15) comments that telecentres should be an intermediary between the information (or service) provider and the information (or service) user, and that telecentres are media that are rapidly emerging in the community informatics (CI) application area of education , training and life-long learning in that telecentres provide online distribution material in text, oral

and even video format along with an asynchronous or synchronous interactive component through e-lists of chat facilities. Telecentres could also be linked with institutions of higher learning, or other virtual organisations, for the purpose of linking institutions with distance education students unable to contact lecturers to distribute reading material to such students and also provide email access.

Having explained how telecentres *do* promote education, a brief history of telecentres in South Africa is provided against the background of South Africa's socio-economic conditions and telecoms infrastructure and policy. This historical perspective is offered to create an understanding of the crucial social and political role telecentres have to play in South Africa in providing universal access to telecom services to those people who still do *not* have access, a result of the former apartheid system. In the rest of Africa, colonialisation and its economic effects have been equally blamed for African underdevelopment.

1.6 SOUTH AFRICAN TELECOMMUNICATIONS, SOCIO-ECONOMIC AND TELECENTRE DEVELOPMENT BACKGROUND

South Africa, although facing internal telecom infrastructure backlogs characterised by a huge rural-urban digital divide, with some rural areas still without sufficient telecoms services, still has the most developed telecoms infrastructure in Africa. This section reviews South Africa's telecom situation in terms of the infrastructure (including access to fixed-line and mobile telephones, computers and Internet services), ownership of telecoms service providers and telecom services pricing. The discussion sheds some light on the reasons why telecentres are needed in South Africa to provide more access to ICT. The first part of this section deals with access to and usage of telephony and ownership of telecom service providers. The second part of the discussion considers issues of access to and usage of computers and the Internet.

1.6.1 Telephone access and usage, and ownership of telecommunication service providers

South Africa's telecom infrastructure was developed along racial lines, with cities (which were "designated white areas under apartheid"), having a developed telecom infrastructure and rural areas with a poor or non-existent telecom infrastructure (Horwitz 1997; Horwitz and Currie 2007). Horwitz (1997:64) further stated that with a little over 3 million lines in service in 1990,

the then South African Posts and Telecoms Department did not provide telecom services to the rest of the population, which was far more than 3 million. This telecom infrastructure disparity is well recorded (cf. Horwitz 1997; Benjamin and Dahms 1999; Ali 2003; Makhaya and Roberts 2003). Butcher (1998:4) states that in many areas of South African life, there is a great imbalance in terms of access to telecoms services (this situation still existed beyond 2007 and is critically examined in Chapter 5).

Butcher (ibid.), further states that "The number of phone lines per 100 people (the teledensity) is 9.5 per cent overall for South Africa. In some wealthy suburbs this figure goes up to 50, whereas in parts of the Eastern Cape the teledensity is around 0.1". Between the late-1990s and 2004, South Africa's teledensity did not advance impressively (cf. Tables 1 and 2). Therefore, what Butcher described has existed beyond 2005, especially with reference to access to fixed-line telephones, computers and the Internet (Tables 4 and 5). However, the situation improved with regards to the availability of rapid access to mobile phones - as shown in Table 3.

Table 1 illustrates that developed countries (including Europe and "other") had the highest number of people (subscribers) with access to telephone lines, cellular phones, personal computers (PCs) and the Internet even in 1990. These figures were still higher in developed countries, in 2002, than in developing countries. Latin American and Caribbean countries such as Brazil, Mexico and others followed the developed countries in terms of better telecommunications infrastructure and population access to the ICT stated in Table 1. The next more advanced regions in 1998, and also 2002, were West and East Asia, following Latin America and the Caribbean. Other regions with more advanced telecom infrastructures than Sub-Saharan Africa were South-central Asia, South-east Asia, Oceania and North Africa. The telecom infrastructure in Sub-Saharan Africa was the east developed in the world, with reference to infrastructure not deployed to most areas in this region's countries and also the fact that most citizens in this region had no access to the ICT stated. South Africa is located in this region. One reason for the poor ICT development in Sub-Saharan Africa is lack of competition in service provision which results in companies operating engaging in abusive monopolistic and anti-competitive behaviour coupled with not satisfying consumer needs but pursuing profit generation and abusing consumers by charging high prices.

High telecom prices have been proven to stifle economic development because if a company does

not have externalities and engages in disconnecting clients from its network, this results in lack of profit and stifles economic development. These issues are broadly discussed in Chapter 5 which explores the South African telecommunications sector development in more detail. Other countries in Sub-Saharan Africa have also failed to develop their ICT sector probably due to economic reasons and lack of capacity on the part of the countries governments' to deploy ICT services. It is necessary that more competitive telecommunication environments should be created by governments in the region so that more companies are able to provide wider services to citizens. The competitive environments should be supported by stringent regulations which have to be enforced by authoritative regulators and governments should refrain from influencing regulators.

Table 1: Access to information and communication technology

	Telephone lines and cellular subscribers per 100 population	Telephone lines and cellular subscribers per 100 population	Personal computers in use per 100 population	Personal computers in use per 100 population	Internet users per 100 population	Internet users per 100 population
	1990	**2002**	**1990**	**2002**	**1990**	**2002**
World	10.1	36.5	2.5	9.9	0.3	10.1
Developed	38.1	102.5	8.9	36.4	0.3	34.3
Europe	29.4	94.8	4.2	23	0.1	23
Other	52.9	114.4	16.1	56.7	0.5	51.8
Developing	2.4	20.6	0.3	3.3	0	4.3
North Africa	2.9	16.7	0.1	1.7	0	2.6
Sub-Sahara Africa	1.1	5.3	0.3	1.2	0	1
Latin America and the Caribbean	6.4	36.2	0.6	6.8	0	8.2
East Asia	2.4	37.8	0.3	5.4	0	7
West Asia	10	40.5	1.2	5.5	0	6.1
South-central Asia	1	5.5	0	1	0	1.5
South-east Asia	1.4	16.3	0.3	2.7	0	5.2
Oceania	3.4	9.4	0	6.1	0	3.3

Source (ITU 2004).

2006 Africa (selected countries) ICT statistics are illustrated in Table 4 and 2008 Africa (selected countries) ICT access and usage statistics are illustrated in Table 5.

According to the ITU (2004) the number of telephone subscribers (fixed and mobile) rose in Africa from 530 million in 1990 to 2 257 million in 2002, a growth of 326 per cent. Botswana, Namibia and South Africa are some of the Southern African Development Community (SADC) countries that have better coverage than other countries as a result of the introduction of competition in their mobile telephony sectors. South Africa's fixed-line telephony growth has not been forthcoming because of lack of competition with a Second National Operator (SNO), Neotel, only commencing operation in 2006 but not yet competing seriously with the incumbent operator Telkom. Neotel is developing its network and gaining new clients. South Africa's telephony situation is illustrated in Table 2.

Table 2 indicates that in 1998, South Africa had the most developed fixed-line sector in Africa (comparing the countries sampled in the Table) and that Botswana had the least developed telephone infrastructure. South Africa was followed by Egypt, Algeria, Morocco and Mauritius in terms of advanced telecom infrastructure. In 2003, South Africa's teledensity dropped (because of churn due to high prices, lack of competition as Telkom dominated the industry and failed to satisfy consumer demands of affordable prices and other industry shortcomings – elaborated on in Chapter 5) and was overtaken by Egypt. Mauritius also experienced incredible growth as far as the telecom infrastructure is concerned, improving extensively from a teledensity of 21.16 per cent in 1998 to that of 28.52 per cent in 2003. South Africa, however, dropped in terms of teledensity from 12.03 per cent in 1998 to 10.66 in 2003. This is an indication that there were fewer citizens who had access to telephones in 2003 than in 1998. Reasons for the decrease in subscriber numbers were stated earlier on and are also discussed in greater detail in Chapter 5.

Table 2: African main telephone lines 1998-2003 (selected countries)

Country	Main telephone lines (000s) 1998	Main telephone lines (000s) 2003	Main telephone lines per 100 inhabitants (per cent) 1998	Main telephone lines per 100 inhabitants (per cent) 2003
Algeria	1 477.0	2 199.6	5.01	6.93
Botswana	102.0	142.4	6.51	8.28
Egypt	3 971.5	8 735.7	6.47	12.73
Mauritius	245.4	348.2	21.16	28.52
Morocco	1 393.4	1 219.2	5.03	4.05
South Africa	5 075.4	4 844.0	12.03	10.66
Africa (51 countries)	**16 442.3**	**24 711.9**	**2.26**	**3.01**

Source: ITU (2004).

The 2006 and 2008 statistics for ICT for selected African countries, are shown in Tables 5 and 6. The African region teledensity in 2003 is very low (3.01) when compared to the Americas' (34.12), Asia (13.64) and Europe (41.00) (ITU 2004). Telecentres assist in improving this low level. Mobile phone access in Africa has slightly improved access to telephony. According to Mureithi (2003:11), the last 10 years has seen a dramatic growth of cellular service in Africa. Currently and increasingly, cellular is the predominant mode of access to the information society for African citizens. By the end of January 2005, Africa had 82 million GSM customers (Vodaworld Magazine 2005:28). This figure represents a 9.25 per cent market penetration of the African population. In most African countries, including South Africa and Ghana (Bertolini 2002; Song 2003), in spite of universal access criteria set down by regulatory authorities and governments, substantial expansion of telecom networks (fixed and mobile), in the past decade and the improvement in connectivity, is yet to trickle down to rural areas. In this sense, African universal service and access policy has failed to achieve desired results in the past 10 years (cf. Chapter 5). The demand for telecentres is aimed at solving this urban-rural digital divide, while mobile telephony has assisted to partly bridge that divide, as Table 3 illustrates.

Table 3 indicates the number of persons in a country's (selected in table) population who had

access to mobile phones in 1998 and 2003 (numbers in thousands and millions). In 1998, 24.34 per cent of the population had access to mobile phones and this figure had grown to 85.7 per cent of the population having mobile phone access in 2003. Mobile phone penetration increased dramatically during this period in all the countries stated in Table 3, more especially in Botswana, Mauritius, Morocco and South Africa.

Table 3: African cellular subscribers, 1998 and 2003 (selected countries)

	Cellular subscription 1998 (in thousands)	Cellular subscription 2003	Mobile subscription 1998 (per cent)	Mobile total subscription 2003 (per cent)
Algeria	18.0	1 447.0	4.56	39.7
Botswana	15.2	435.0	25.29	75.3
Egypt	90.8	5 797.5	8.45	39.9
Mauritius	60.4	462.4	37.87	57.0
Morocco	116.6	7 332.8	24.34	85.7
South Africa	3 337.0	16 860.0	36.36	77.7

Source: ITU (2004)

Both Tables 3 and 4 demonstrate low African teledensity levels. The countries stated in the tables have developed ICT policy aimed at addressing these low levels.

Table 4 indicates the number of computer hosts and users in the selected countries in 2003. South Africa had more computer hosts and users than the other countries (7.26 per cent of the population had access to computers), followed by Egypt (with 2.9 per cent of the population with access to computers), Morocco (with 1.99 per cent of the population with access to computers), Algeria (with 0.77 per cent of the population having computer access) and Botswana (with 0.07 per cent of the population having access to computers). Similarly, there were most computer access points in South Africa in 2003, followed by Morocco, Egypt, Mauritius, Botswana and Algeria (see figures in Table 4). However, the following tables indicate that while other countries'

Internet statistics improved, South African statistics decreased as more people became less connected to computers and the Internet. Reasons for these changes are discussed later on in this chapter and also in Chapter 5.

Table 4: African access to IT in 2003 (selected countries)

	Hosts	Hosts per 10 000 inhabitants	Users (thousands)	Users per 10 000 inhabitants	Total (thousands)	Per 100 Inhabitants (per cent)
Algeria	866	0.27	500	159.78	242	0.77
Botswana	1 920	1.91	60	348.84	70	0.07
Egypt	3 338	1.49	2 700	393.31	1 500	2.19
Morocco	3 561	1.78	800	265.57	600	1.99
South Africa	288 633	62.25	3 100	682.01	3 300	7.26

Source: ITU (2004).

The situation depicted in Tables 3 and 4, is, however, slowly improving, as shown in Table 5. Table 2 indicated that Egypt had a teledensity of 6.47 per cent in 1998. Table 5 indicates that Egypt improved that level in 2003 and had a teledensity of 12.73 per cent and 14.33 per cent in 2006. Morocco, however, had a decreased teledensity level from 5.03 per cent in 1998 to 4.05 per cent in 2003 but the figure increased to 4.12 in 2006. South Africa, on the other hand, had its teledensity level dropping from 12.03 per cent in 1998 to 10.66 per cent in 2003 and dropping again between 2003 and 2006 to 9.97 per cent (see Table 5). While the number of people having access to telephones continued to increase in Egypt and Morocco, in South Africa these figures decreased between 1998 and 2006. These changes are depicted in Tables 2 and 5. Reasons for this decrease were stated earlier.

Table 5: Africa ICT Indicators, 2006 (selected countries)

Country	Population (millions)	Main Telephone Lines (millions)	Main Telephone Lines per 100 population
Egypt	75 437	10 807.7	14.33
Morocco	30 735	1 266.1	4.12
Tunisia	10 210	1.268.5	12.42
South Africa	47 594	4 729.0	9.97
Angola	15 802	98.2	0.62
Burkina Faso	13 634	94.8	0.70
Cameroon	16 601	100.3	0.61
Nigeria	134 375	1 688.0	1.26
Uganda	29 856	108.1	0.36
Zimbabwe	13 085	331.7	2.54

Source: ITU (2006)

2008 African fixed-line telephones and Internet indicators (selected countries) are illustrated in Table 6. In 2003 (see Table 4) 7.26 per cent of South Africans had access to computers. However, Table 6 indicates that this figure had increased, albeit Table 6 relates to Internet access and usage rather than access to computers – 15 per cent of South Africans had access to the Internet in 2008. The other country with that level (15 per cent of the population) was Kenya (see Table 6). South Africans also had the highest teledensity level (with respect to access to fixed-line telephones which had slightly increased in number from 2006 to 2008) amongst the countries stated in Table 6. Kenya and Cameroon had the lowest teledensity levels – with 2.3 per cent of the population (in both countries) having access to the fixed-line telephone network. Ethiopia had the fewest people using the Internet, 0.7 per cent of the Ethiopian population.

In 2003 (see Table 3) 77.7 per cent of the South African population had access to mobile phones. The 77.7 per cent of the population indicated that 16 million South Africans were using mobile phones. In 2006, this figure had improved to 39 million people, which was a dramatic and impressive increase.

Table 6: Africa Fixed-Line Telephones and Internet Statistics, 2008 (selected countries)

Country	Household With a Working Fixed-Line Telephone	Internet Usage
South Africa	18.2%	15.0%
Namibia	17.4%	8.8%
Botswana	11.0%	5.8%
Ethiopia	7.6%	0.7%
Cote d' Ivoire	4.8%	6.7%
Burkina Faso	4.7%	4.3%
Benin	4.6%	8.8%
Ghana	2.6%	5.6%
Uganda	2.4%	2.3%
Kenya	2.3%	15.0%
Cameroon	2.3%	2.3%
Mozambique	0.3%	1.0%

Source: Gillwald and Stork (2008:1)

In spite of the figures stated in Table 6, South Africa's teledensity level has been decreasing in the past few years (except for the slight increase between 2006 and 2008) – as discussed above and illustrated in the previous tables.

In the period 1999-2006, telecoms policies of the new South African government (elected in 1994, re-elected in 1999 and 2004) have attempted to develop the poor local telecom infrastructure but these attempts have not been adequate. They have to be revisited because there are still many people without these services for various reasons (cf. Chapter 2 and latest research on telephone statistics). The USAASA has recognised this fact because in 2008 the agency started a new process of re-defining universal service and access so that areas still without telecom services should be identified and served with such services. The new definitions arise in the light of the impact of convergence on telephony and also communications service provision in general, as telephony is no longer about the plain old telephone services (POTS) but is all about electronic communications and multimedia services. Policies discussed in Chapter 5 explain the infrastructural changes that have been brought about by convergence and how these policies have

assisted in the improvement of teledensity levels in Africa.

Policy changes introduced include partial deregulation and liberalisation of telecom, in most African countries, including South Africa. Despite explosive mobile growth, Africa remains a continent with extremely low telecom penetration, particularly sub-Saharan Africa.

> For the decade 1991 through 2000, developing country (with the exception of sub-Saharan Africa) telephone line and mobile subscription per capita growth outstripped that for North America, Scandinavia and Western Europe. However, this growth comes from a substantially lower base, and disguises wide disparity in terms of absolute levels and relative penetration. The story is much bleaker for Internet host penetration (Cooper and Madden 2004:317).

The conclusion above demonstrates that much more growth is needed in basic voice services and Internet host penetration in many African countries. Speaking at the ITU Africa Telecom conference held at Gallagher Estates in Midrand in 2001, President Mbeki (2001a: 3) said that:

> In April 1994, when we achieved democracy, South Africa had about 3, 5 million main telephone lines in operation and cellular telephony in the country was in its infancy. Just six years later, in the year 2000, we had 5.5 million main telephone lines and 5.3 million mobile subscribers. As Africa 2001 takes place, there are now over ten million cellular subscribers and we have a cellular teledensity of over 25 per cent.

It is apparent from former President Mbeki's comment that South Africa's teledensity had increased to satisfactory levels in 2001 but the problem is that after 2001 the teledensity level decreased instead of increasing. So the situation former President Mbeki mentioned above did not improve from 2001 to 2004 and beyond. Instead of the teledensity level improving from 25 per cent, it decreased.

Latest research has also revealed that South Africa's digital divide is not being reduced. For

example, one study states that 15 per cent of South Africans aged 16 years and older (or 4.25 million persons) reported that they had access to a computer in late 2003, while 11 per cent (or 3.03 million persons) reported that they had access to the Internet (Langa, Conradie and Roberts 2006:133). While these figures designate South Africa as one of the largest consumers of computers and the Internet in Africa, they also reflect that between 85 and 90 per cent of the population remains excluded. Access to computers, the Internet and the World Wide Web, are not evenly spread throughout the country. Sizeable differences between urban and rural environments are apparent (ibid.:134).

These statistics demonstrate a significant national urban-rural digital divide in relation to access and use of this digital technology (ibid.). Race features prominently, with coloured and black South Africans having significantly lower computer access, Internet access and usage than their white or Indian or Asian counterparts. There is also an association with age, with those 50 years and older displaying significantly less computer access, Internet access and usage than younger South Africans.

Furthermore, the study by Langa, Conradie and Roberts (2006), reveals exponential growth in access to cell phones in the past five years paired with stagnant growth in the proportion of people with home landline telephones (Langa, Conradie and Roberts 2006:137). These trends are consistent with those presented by Telkom in its annual reports. Theses indicate fixed-line telephone connections declined from approximately 12 per cent in 1999 to 11 per cent in 2003. However, cell phone subscriptions increased from 6 per cent of inhabitants in 1999 to 30 per cent in 2003. The decline in landline telephone connections is also associated with the increase in telephone tariffs from 1997 to 2004. The average residential monthly rental rose 65 per cent from R50 to R82.

The decline in landline telephones reported by the Human Sciences Research Council (HSRC) surveys between 1999 and 2001 is partly attributable to the privatisation of the telecoms sector commencing in this period (Langa, Conradie and Roberts 2006:138). While the South African telecoms sector, largely represented by the Telkom monopoly, grew from R7 billion in 1992 to R50 billion in 2001, the network did not double to the six million subscribers expected in the obligations imposed by the USA. Indeed, two million fixed-line subscribers were disconnected over the period – a marked policy failure. This failure was largely the result of an average increase

of 24 per cent per annum in local tariffs, despite efficiency gains which included the loss of 30 000 jobs within the same period.

Additionally, there remain significant urban-rural divides with regard to landline telephone access, personal cellphone access and cellphone usage (Langa, Conradie and Roberts 2006:138). This means that a higher percentage of urban respondents than rural respondents had:

(a) a working landline telephone in their dwelling;
(b) personal and regular access to a cellphone for private or business purposes, and
(c) employed a cellular phone not necessarily their own, for example sending or receiving either calls of SMSs, during the previous week.

There were also significant racial differences with regard to landline telephone access, personal mobile phone access, and cellular phone usage. In all three cases white and Indian or Asian respondents reported better access and usage than black and coloured respondents. Moreover, there are clear indications of age divides with regard to landline telephone access, personal mobile phone access and mobile phone usage. However, interestingly the age difference found for landline telephone access for mobile phone access and usage with older respondents, especially those over 50 years of age, displaying a relatively less access and usage than younger people (ibid.:139).

There were significant inroads into landline telephone access in the urban-rural environment (with increased access in urban areas), race (with least access amongst black respondents), education (with most access amongst those with tertiary education qualifications) and income (with most access amongst those in the higher income categories) (Langa, Conradie and Roberts 2006:140).

Research results by Langa, Conradie and Roberts (2006) support previous South African research (cf. Melody 2003a, 2003b; Gillwald 2003a, 2005), which calls for Telkom's tariffs to be reduced to promote universal telecom access. This research also shows that universal access obligations set by local legislation have not been met by telecom service. The research also reveals that South Africa has not yet dealt with the digital divide problem of bridging the imbalance between the "haves" and "have-nots", or "information-rich" and "information-poor". To deal with this problem, South Africa should first deal with social and economic inequality (created by apartheid

and racial discrimination) and poverty, illiteracy and other problems that prevent many people from participating fully in economic and social activities because they have no financial means and no education to seek and obtain employment). More jobs should be created to deal with inequality and other programs aimed at uplifting those extremely poor should also be implemented so that these groups have access to financial resources to enable them to deal with poverty and also be able to use facilities such as communications services. The problem in South Africa is that the present unequal society is chronic and its end is not in sight but it should eliminated, not be managed and maintained because it impacts negatively on the economy.

In this regard, an economist states that South Africa has a "social time bomb" waiting to explode because the economy has been deteriorating since 2007 and the national education system produces unskilled and unemployable people who will burden the state as their situation forces the state to maintain them by increasing the social spending which it cannot afford; and also that this economic burden results in the employed not being able to enjoy tax cuts (Masuku cited in Chuenyane 2009: 1). Another economist, Hart, stated that South African will not be able to compete with other emerging economies because South Africa's education system is "disempowering instead of empowering" (cited in Chuenyane 2009: 1). This poor education system influences how people access and use ICT as the more educated (very few) use ICT effectively while the uneducated and less educated (many in numbers) do not access and use ICT effectively.

Regarding how poor people access the use of ICT, the South African situation is similar to that in Latin American countries of Colombia, Mexico and Peru. According to Gutierrez and Gamboa (2008:1), who examined the determinants of ICT use and access of low-income people in Colombia, Mexico and Peru, education was by far the single most important factor limiting the digitalisation of low-income people. Income was another limiting factor, with the rich using ICT and the poor not; and gender to a lesser extent, where men were found to be using computers more than women. These findings therefore indicate that education and income are the most important indices that determine use of ICT by individuals. Thus it was found that poor persons in Colombia, Mexico and Peru do not use ICT much, and do not even access ICT, because they have no education and income. In addition to this, it was found that lack of education and income result from "managed" and "stochastic" (inherited and chronic) social inequality resulting from historical economic inequities.

South Africa has similar social and economic problems which should be dealt with by those in power if the country's problems, including education and lack of access to ICT, are to be dealt with correctly. Inequality is chronic and managed, thus affecting economic development negatively. Inequality is sustained by conditions such as gender, racial discrimination, ethnic, religious and other forms of discrimination, as well as social stratification-based prejudices and remains largely insensitive to economic and institutional conditions even in the long run (Bourdeau de Fontenay and Beltran 2008).

One indicator of social, economic and racial inequality (chronic and maintained) in South Africa is the unchanging state of affairs at the workplace, with white men and women occupying high positions and black people, more especially women, occupying lower positions. In this regard, Shűssler in Oyedemi (2009: 153) states that "while white workers on average earn 5.5 times more than black workers, the white population group had the highest income, about 450 per cent more than black income and 400 per cent more than coloured income". The latter authors (Shűssler in Oyedemi) further contend that "definitely, the income inequality affects affordability and access to many social resources including ICT services". Furthermore, "policy measures to correct these historic and present imbalances are not implemented in most organisations and these measures should be implemented.

The Employment Equity Commission Report (EECR) for 2007 is instructive in this regard (Qunta 2009:9). The EECR for 2007 shows that "as at September 2007, in all levels of management whites constitute 68 per cent of those employed and blacks 18 per cent, and black women only 5.5 per cent. The latter report therefore indicates that companies are not changing the status quo but maintaining it or even making it worse and also indicates that "between 2003 and 2007, the number of blacks employed in the professional sector dropped 14.9 per cent while the employment of whites rose 8 per cent". There should be urgent focus on the economic empowerment of black women as black women are also key in initiating and operating community development projects out of nothing in terms of finance. Other social prejudices which have negative economic consequences should also be eliminated or stopped by those who engage in them, e.g., "undertones that seek to associate equity with inefficiencies" (Manyi 2009: 2).

Additionally, Fuchs and Horak (2008:114) write that "structural inequality in society is the main cause of different types of the digital divide, the gender divide, the ethical divide, the age divide, the income divide, the educational divide, and the abilities divide". They further propose that social and economic inequality should be eliminated, e.g., wealth should be redistributed and Third World countries' economic debt cancelled, if issues such as poverty, the digital divide and its consequences of ICT poverty and non-usage are to be eliminated. In the case of South Africa, Oyedemi (2009: 155) argues that "the apartheid era policy of institutional and racial segregation is at the root of currect inequalities". South Africa should develop an economic policy aimed at removing the poverty and deprivation to reduce existing social and economic inequalities, and "develop a pro-poor policy framework for ICT services independent of the pro-poor service delivery in other sectors, but in tandem with these other social policies" (Oyedemi 2009: 164).

The discussion above suggests that diffusion of advanced ICT is more limited for the less educated and poorer people, partly not because they have no financial and educational resources to access and use such ICT. This situation therefore calls for those with such resources to avail the resources to them, instead of allowing unjust social imbalances to continue at the expense of national development. Public and private entities therefore aim to assist empower individuals in ICT skills capacity building and job creation.

ICT skills development is also crucial for South Africa to reduce the national "tripartite society" which Van Dijk (2006:185) characterises as having an "information elite" (approximately 15 per cent of the population are rich and have access to ICT and information), the "participating majority" (about 25 per cent of the population with partial access to ICT and information, i.e., inadequate access to ICT and information, and the "disconnected and excluded" (who have no access to ICT and information). Most of South Africa's "disconnected and excluded" reside in rural areas which form 60 per cent of the country.

Therefore, South Africa's present telecom infrastructure favours the rich and digital elite and does not well serve the poor and disconnected, regardless of the intention of universal service policy. It can be argued that the present South African telecom market structure works better for the educated and rich, e.g., business and international telephone users, and not poor and local telephone users who face high tariffs with their fixed-lines, instead of being subsidised as they cannot afford the high prices, commonly disconnected due to non-payment. In this context, policy

that neglects the poor is neither socially responsive nor democratic. Why, do South African telecom consumers pay R1, 25 per minute during March 2009 for voice calls when in Cyprus users paid 24 cents and in India (van Rensburg 2009:16) the users paid 38 cents for the same service over the same time? The answer to this questions is that Telkom is making the process of using telephones impossible for poor people who cannot afford R1, 25 but could possible afford 25 cents per minute but at the same time making if possible for rich people who can afford R1, 25 per minute and are making such calls which poor are unable to and not really subsidised in any visible way. Simpson (2004:233) states that whilst it is important to consider issues of economic efficiency in the telecoms sector, this should neither obscure nor compromise the need to create progressive, socially responsible universal service reflective of the requirements of 21st century users.

It is therefore important for South Africa to change policy to implement first rather than last mile solutions to solve local universal service and universal access telecom problems. The last mile perspective describes policy that satisfies the interests of business and international telecom users, while the first mile perspective defines and caters for user and community needs and gives priority to such identified needs by making use of subsidies or pricing schemes to users (Simpson 2004:243). The first and last mile perspectives and their application in the South African telecom policy are further discussed in Chapter 5.

In view of the above, it is important to state that Telkom's monopoly status (Telkom retains market dominance in the presence of Neotel), and high telephone tariffs have contributed to South Africa's stagnant growth of fixed-line telephony, while introduction of competition in mobile telephony market has promoted the fast growth in usage (cf. Gillwald 2005; Hodge 2005b). The USAA (2008a:21) agrees, and states that "the price of a three minute local call had increased dramatically between 1997 and 2003" and this increase diminished the number of persons with access to the fixed-line network. Although the South African teledensity has increased in the past few years because of the increased growth of mobile phones, this increased teledensity has not translated to increased usage, and therefore universal service to telephony, because mobile phones are expensive to many to use for communication purposes. Most pre-paid mobile phone users rely on the "please call me" service; they cannot make calls for communication purposes but have to request others to call them to communicate. Cost prohibits communication. This means that high costs of communication also retards the bridging of the digital divide but enriches monopolists

more while not serving the public interest. Hodge (2005b:494) states that mobile was initially viewed as a complement to fixed-line, offering consumers the opportunity to make calls when they were out of reach of their fixed-line phone. However, there is growing evidence that mobile is increasingly a substitute for fixed-line, not only in terms of call substitution but also access substitution.

The phenomenal growth of mobile phone ownership in South Africa (and Africa in general) has been attributed to a wide variety of factors, including institutional factors (such as competition and private foreign ownership), ease of access (low waiting times and no credit history for pre-paid access) and, of course, mobility. But most significantly, tariff structures (i.e., prices), have also influenced consumer preferences (between fixed monthly and usage fees). Mobile remains both affordable and cheaper than fixed-line for the bottom 50 to 60 per cent of households that spend relatively little on communication. Although lower-income households treat cellular as a substitute for fixed-line (owning one or the other), higher-income households treat the two as complements (own both) (ibid.).

Gillwald (2005: 476) also argues that given the high mobile-call tariffs in comparison to fixed-line rates, the apparent rise of mobile at the expense of fixed services may initially seem contradictory – all the more so when one considers that it was the introduction of expensive premium-rated, pre-paid airtime services that saw mobile growth rates increase exponentially. Despite the high cost of these mobile services, the convenience and flexibility or prepaid mobile services (e.g., pay-as-you-go service) have ensured that people adopt mobile phones on a massive scale. What these authors agree on is that pre-paid mobile phones have increased access to telephony nationally. However, this national mobile phone access has not translated to high levels of mobile phone use as the services are too expensive for many. This, therefore, has a negative effect on universal access to telephony because telephone services should be affordable to be usable (to many and by many). This view is supported by Oyedemi (cf. 2009)'s discussions of South African ICT policy and the fact that this policy has resulted in a decrease in the numbers of telecom clients because of high telephone prices.

South Africa’s mobile phone companies are Vodacom and Mobile Telephone Networks (MTN), which started operating in 1993 with Cell C, licensed to operate in 2001. Virgin Mobile from the UK entered the market in 2006.

Telecom price setting is determined by company owners but has to be regulated by the regulator, the Independent Communications Authority of South Africa (ICASA). Telkom is owned by the South African government, the public in a public initial offering at the Johannesburg Stock Exchange and New York Stock Exchange in March 2003 and the remaining 15.1 per cent by Thintana Communications until November 2004 (Telkom: Our shareholders 2004:1) but Thintana sold the shares to Elephant Consortium in 2005. Telkom (2005:14), states that at the end of March 2008, the company shareholders were:

(a) the South African government had a shareholding of 38.9 per cent (Anderson 2008:12). This shareholding includes three million shares held in a share trust, called the Diabo Share trust, for former and existing Telkom employees;
(b) approximately 8, 600 retail investors, including just over 5 700 former individual Khulisa (Xhosa and Zulu for "invest") investors, and 399 stokvels (township savings groups). Retail investors collectively hold 43 per cent of Telkom's shares. Stanlib owns 4.7 per cent of Telkom on behalf of clients;
(c) the Public Investment Corporation (PIC), with a 15.1 per cent shareholding; and
(d) a Telkom subsidiary, Rossal No 65 (Pty) Ltd with a 2.2 per cent shareholding. These shares were allocated for Telkom employees through the Telkom Conditional Share Plan and a second Telkom subsidiary, Acajou Investments (Pty) Ltd, which holds 2 per cent. This shareholding is intended for share repurchase activities.

This above Telkom shareholding structure changed by March 31, 2008, to a new ownership structure:

(a) the government is the largest shareholder, holding 39.4 per cent of Telkom's issued share capital;
(b) Black Ginger 33 (Pty) Limited, a wholly owned (100 per cent) subsidiary of the PIC holds 8.9 per cent of Telkom's shares;
(c) the PIC holds 6.4 per cent of Telkom's issued share capital;
(d) Elephant Consortium, which through Newshelf 772 (Pty) Ltd, holds 5.8 per cent of Telkom's share capital;
(e) Rossal No 65 (Pty) Ltd holds 10, 493, 141 shares, 2.0 per cent of Telkom's issued share

capital, which were purchased for the Telkom Conditional Share Plan; Acajou Investments (Pty) Ltd holds 10, 849, 058 shares, 2.1 per cent of Telkom's shares, which were purchased other than the Telkom Conditional Share Plan; and

(f) the free float of 35.4 per cent makes the remainder of Telkom's issued share capital. Included in the free float are 9 969, 22 shares held by 86, 729 retail shareholders representing 1.9 per cent of Telkom's issued share capital (Telkom Annual Report 2008:3).

This Telkom pattern of ownership represents a substantial reduction in government ownership prior to the Initial Public Offering (IPO) the government owned 70 per cent of Telkom. The Telkom listing at the JSE included a dedicated offer targeting historically disadvantaged individuals (HDIs). In this way South Africa broke ground in shareholder base by widening share ownership among the South African population (Lesame 2003b: 4). However, this ownership of Telkom shares by HDIs was criticised by unions, such as the Congress of South African Trade Unions (COSATU), as "misleading the public" (cf. Chapter 5). In May 1997, 30 per cent of Telkom was sold to a strategic equity partnership (SEP), Thintana Communications, a consortium comprising United States of America (U.S.) SBC Communications corporation and Malaysian Telekom Malaysia Berhad. Thintana sold 15 per cent in March and June 2004 to Telkom "shelf-subsidiaries Rossal 65 and Acajou respectively" (Mabanga and Pressly 2004:4).

In November 2004 Thintana sold 15, 1 per cent of its remaining shares to a black economic empowerment (BEE) consortium, Elephant Communications, led by former Director General of Communications Andile Ngcaba and head of Women Investment Holdings (Wiphold) Gloria Serobe for R7.2 billion (Brown 2004:1). This BEE deal was severely criticised by members of civil society and workers' unions, including COSATU, and other stakeholders as "the worst BEE deal ever" because Ngcaba was seen as "self-empowering" (Brown 2004:1). This deal was funded by the PIC, which "warehoused" the shares until Elephant Communications officially bought the shares from the PIC in 2005.

Political opposition parties such as the Democratic Alliance (DA) and the Independent Democrats (ID) also condemned the Elephant Communications sale as empowering already empowered black citizens while ignoring the poor. The ID leader, Patricia De Lille, said that the deal would "not benefit the poor" and represented "a transfer of wealth from one elite to another" (South

African Press Association/SAPA et al. 2004: 19). Dawes (2004:2) charged that Ngcaba "laid the ground for the deal by being the architect of sweetheart telecom policies" (when he was Director General of Communications), which "protected Telkom's monopoly and placed Ngcaba himself in pole position to benefit from the deal by playing off the government's conflicting interests". Ngcaba replied by stating that "policy-formulation is a consultative process among South African stakeholders" and that he could not have made policies "alone". However, it is noteworthy that the 2005 PIC deal which enabled Ngcaba and his business colleagues to purchase the Telkom stake did empower him and his colleagues *only*, and that the public had no idea that such a deal was being undertaken and this process is opposed to South Africa's democratic principles which promote transparency in operating public institutions.

Though much condemned in local media by members of civil society (ibid.), other African National Congress (ANC) power brokers such as the former Presidency Head of Communications, Smuts Ngonyama, and Nedbank, supported and funded the deal respectively (Barron 2004:12). Therefore, the manner in which this deal was conducted was viewed by most influential members of society as being undemocratic and said to illustrate how telecoms can contribute negatively to the democratization of society. This undemocratic and corporatist nature of the South African telecom policy implementation is critically analysed in Chapter 5.

During the finalisation of this deal, it emerged that 50 per cent of the shares would be held by broad-based empowerment groupings, which consist of 2 000 community service telephone operators, 300 000 women representatives of Wiphold and other women's organisations from South Africa's nine provinces (ibid.). Ngcaba is a dominant player in the ICT BEE stakes as an executive director of Dimension Data (Didata) and heads a consortium that owns 25 per cent of Didata. Didata is a supplier, and competitor, with Telkom, as a result of convergence of technologies, in certain areas of service provision, e.g., Internet services market. Telkom, however, barred Ngcaba and associates in 2007 from buying a BEE stake in the mobile phone company Vodacom, labeling the group "the usual suspects" (Piliso 2007:1). According to Piliso, Telkom's former Chief Executive Officer (CEO) Papi Molotsane objected to the domination of the telecom industry by the same black people by expressing concern over individuals who had benefited from Telkom's R6-billion empowerment deal from economically benefiting again by buying shares at Vodacom. The "usual suspects" included Ngcaba, Nkenke Kekana (former Communications Portfolio Committee chairman and former Telkom Senior Regulatory Affairs

Executive now businessman, S'busiso Mngadi, former Cell C employee and Mandla Langa, former Chairman of ICASA.

Other bidders for the Vodacom shares were ANC's Saki Macozoma's Safika Investments and Bulelani Ngcuka (the former Deputy President's husband and former Director of Public Prosecutions) Amabhubesi Investments (Piliso 2007:1). Currently the winners of the 7.5 per cent Vodacom stake have not yet been finalised but Macozoma' Safika Investments and Kekana's Mowana Five Mile Communications are shortlisted. It is, however, not surprising that other black people cannot afford to buy shares at Vodacom and Telkom as most black South Africans are the "ICT have-nots" or the disempowered while the group mentioned above are the "ICT elite". Chapter 5 critically assesses this issue and argues that ICT services have not reached millions because ownership rests with those who have no vested interest in delivering the services to the disempowered. The poor or previously disadvantaged South Africans have been better served by the mobile phone operators because most members of this group own pre-paid mobile phones, although the prices of mobile phone usage are also high.

Mobile phone leader, Vodacom was 50 per cent owned by Telkom at end of 2008 but 15 per cent of that stake was sold to UK's Vodaphone in early-2009. The Vodafone owned 50 per cent of Vodacom at the end of 2008 (Vodacom *Group Shareholders* 2006:1), but that changed in 2009 since buying the 15 per cent stake from Telkom. The second-largest South African mobile phone company, MTN, is owned by different groups, including Newshelf 664, the PIC, (12.55 per cent), Old Mutual, (8.7 per cent) and the Transnet Pension Fund (6.64 per cent) (Crotty 2005:1). The Transnet Group held an equity interest equivalent to 23.5 per cent in the MTN Group before December 2002 but the stake was sold to Newshelf (18.7 per cent) and the Umthunzi Telecom Consortium (4.8 per cent) (Schofield and Sithole 2006:63). The remaining MTN shares are held by local and international institutional and retail shareholders (Bidoli 2004:1).

The third largest mobile phone company, Cell C, is 60 per cent owned by a Saudi Arabia's Saudi Oger and 40 per cent owned by a local empowerment company Cellsaf (Lesame 2000: 33). Mobile phone companies also offer user-friendly and more affordable services (compared to Telkom) to consumers; e.g., pre-paid mobile services are cheaper and accessible to millions of unemployed people. Pre-paid is a more popular form of access in Africa because it is affordable and convenient (cf. Table 7 for a comparison of mobile and fixed-line costs).

Table 7: Comparison of African and Asian start-up and monthly costs for mobile and fixed-line phones (selected developing countries)

Countries	Fixed ($)	Start-up costs Pre-paid Mobile (US$)	Monthly costs or calls Fixed (US$)	Monthly costs or calls Pre-paid Mobile (US$)
India	$18.00	$91.85	$5.70	$6.15
Malaysia	$13.00	$60.00	$5.40	$8.80
Morocco	$47.00	$45.80	$6.50	$2.10
Philippines	$12.00	$56.30	$28.80	$5.10
South Africa	$30.00	$51.50	$9.45	$3.00
Thailand	$84.00	$89.60	$2.85	$1.80
Uganda	$103.00	$121.35	$6.80	$4.65
Average	**$81.65**	**$62.31**	**$9.64**	**$5.42**

Source: Oestmann (2003:6)

The prices illustrated in Table 7 (also see Table 13, Chapter 2), had, however, increased by mid-2008, as Gillwald and Stork (2008:2) state that with one of the highest gross domestic products (GDPs) per capita on the continent, it is not surprising that South Africa has the highest average expenditure on fixed-line and mobile among the countries they surveyed, at US$31 and US$15 (about R130 and R150 respectively) a month. "Averaging, however, is boosted by the high end users, while obscuring the large numbers of mobile users whose use of mobile phones is severely constrained by price". The new mobile phone prices are stated in Chapter 2.

From Table 7, on average pre-paid mobile tariffs are lower than those of fixed-line telephony in all the countries. Reasons for this are that the start-up costs (i.e., handset and SIM card activation or fixed-line connection costs) are cheaper for mobile telephony, and the monthly recurring (i.e., monthly rental or minimum monthly usage), including a minimum number of calls are lower than for fixed-lines (Oestmann 2003:2). The mobile start-up cost is approximately 25 per cent less than fixed service and the recurring monthly costs (including a minimum number of calls) of mobile services are more than 40 per cent less.

Cellular pre-paid service rollout, prompted by the threat of competition to the incumbent duopoly (Vodacom and Mobile Telephone Networks or MTN) in 2001, has been a key driver in retaining and attracting mobile cellular customers (Gillwald and Esselaar 2004:17). South Africa's deputy Minister for Communications, Roy Padayachie stated in a 2005 telecom colloquium stated that the penetration rate of mobile telephony is 45 per cent of households, and compares favourably with the average of 49 per cent in peer countries (Padayachie 2005:2-3).

Padayachie (ibid.) claimed that fixed-line penetration, as measured by fixed-line subscribers of incumbent Telkom's network continues to be poor by international standards. This is because Telkom's charges had grown at a faster rate than wages (and inflation). Padayachie conceded that because they operated in a developing country, telecom providers faced a high cost burden, which forced them to charge higher prices. Further, Padayachie stated that pricing policies would be developed to ensure that telecom costs did not affect the international competitiveness of South African business.

According to South African-based telecom market research firm, BMI-TechKnowledge (2003), the pre-paid market in South Africa, constituted over 75 per cent of cellular subscribers, and that more than 90 per cent of new connections were pre-paid. Cell C, estimated in 2003 that 98 per cent of its subscribers were pre-paid users. These data are in line with the broader African experience (especially in sub-Saharan Africa), where it was estimated that between 90 and 95 per cent of cellular customers are prepaid (Shapshak 2002:1).

The pre-paid mode of subscription is popular in Africa because:

(a) it is affordable to low-income customers;
(b) allows low-income customers to control their expenditure, to switch to receiving calls only in times of economic difficulty;
(c) it is easy to sign-up, with no credit-checking and no bank account requirements and binding long-term service contract (Oestmann 2003:3);
(d) being employed is not required for a pre-paid phone service with many unemployed people owning mobile phones and using pre-paid services. Some use these phones services from available finance, not necessarily salaries. With pre-paid mobile phones

users do not incur debt from usage, also with no airtime the phone can still be employed e. g., by using services such as Please Call Me (PCM), where the Calling Party Does Not Pay, but requests the Called Party to call the Calling Party Back. In South Africa this is common practice and places a financial burden on call recipients. To reduce this problem, mobile operators should make mobile services more affordable and subject to cost-based interconnection principles, which are currently being discussed in South Africa; and

(e) mobile operation is often commercially more viable and caters for rural and urban clients (Oestmann 2003:4).

Vodacom is South Africa's leading cellular network with an estimated 59 per cent market share, providing coverage to 95.1 per cent of the South African population and 64.6 per cent of the geographical area of South Africa (Vodacom 2005:1). Telkom, unlike mobile phone companies, is criticised for charging high landline tariffs, which are a cause for slow Internet access growth and disconnections (cf. Chapter 5). Many critics in South Africa argue that Telkom's tariffs should be halved (cf. Langa 2002; Gillwald 2003b; Melody 2003a). Further, Melody (2003a:1) considers that Telkom's high tariffs "put brakes on the economy".

A telecoms colloquium in October 2005 concerning Telkom's tariffs, resolved that ICASA and the Department of Communications would force Telkom to lower tariffs. Telkom has increased telephone tariffs for the past three years although they have been publicly condemned as unaffordable to many (cf. ICASA 2001; Goldstuck 2002; Langa 2002; Samson and Waiters 2002; Melody 2003a). Gillwald (2003a: 15) maintains that Telkom's increased telephone tariffs have not been in line with inflation or claimed productivity gains. The net effect is that prices on basic services increased in excess of 250 per cent during the 1999 to 2005 period. While there have been several public outcries against Telkom's high tariffs and monthly rental charges of R134 per month by May 2008 (Gillwald and Stork 2008:3), few complaints have been raised concerning mobile phone charges. A critique of the prices is provided in Chapter 5.

By comparison mobile phone companies offer more convenient and affordable services and hence, these have resulted in substantial market growth. However, South Africa's mobile phone charges remain amongst the highest in the world. Reasons for high tariffs are based on Telkom's advancement of its business interests rather than on satisfying individual consumers (cf. Chapter 5). According to Milne (2006: 18), the high tariffs charged by service operators internationally are

not always necessary or justifiable, with telecom operators commonly not disclosing reasons for high tariffs arguing that such information is commercially confidential. Therefore, because high tariffs are unjustifiable from the perspective of the consumer, there is a dire need for Telkom to reduce its present prices.

Tariff reduction could help Telkom avoid disconnections, which Gillwald (ibid.), says were over 600,000 between 2001 and 2003. Disconnection far exceeds rollout with the total number of lines actually falling by half a million (Makhaya and Roberts 2003:7). Disconnections are mainly in under-serviced areas and due to non-payment. Telecentres help this customer segment with shared access to telecom services.

Telkom also provides expensive Internet service. Because of low affordability most South Africans do not use the Internet. In this regard, Gillwald and Kane (2003:48) state that:

> ...in South Africa almost 90 per cent of end costs to connect to the Internet for 30 hours per week are direct public switched telecoms network (PSTN) charges. The ratio is higher than in any other Telecoms Regulatory Authority of Southern Africa (TRASA) country. While Poland and Turkey have a similar ratio of PSTN costs to total costs, their total cost to the end user is less than half of that charged in South Africa.

Gillwald and Kane (ibid.), also contend that with the exception of Morocco, Internet access in Africa is two or three times as expensive when compared to Korea, Poland, Mexico and Turkey, and claim that the high cost of Internet access in South Africa, both in absolute and relative terms, as a reason why Internet subscriber growth has slowed (cf. Goldstuck 2002).

Despite all the benefits brought about by mobile phones, the Internet and other technology, Table 8 illustrates that there are still disparities regarding access to ICT in South Africa, by mid-2008. These disparities should be bridged and the process of identifying unserved or disadvantaged areas and ICT needy persons, initiated by the USAASA (2008a), will probably, finally address these deficiencies.

Table 8: South African Household ICT Penetration, 2008

Number of persons with or without ICT service (millions)	Mobile Phone	Television	Telephone	Computer	Internet Access
No (i.e., number of persons without access to the technology or service)	3, 314, 312	4, 309, 489	10, 125, 590	10, 550, 448	11, 530, 222
Yes (i.e., number of persons with access to the technology or service)	9, 090, 236	8, 191, 115	2, 318, 420	1, 950, 168	900, 605

Source: The USAASA (2008a:22)

According to the USAASA (ibid.), Table 8 indicates that "national coverage of mobile communications telephone service has reached 95% of the South African national population" and that "there is more than 70% access to voice services which suggests that the concentration should shift to other advanced ICT services, taking into account that there are still those communities, households and individuals who do not have such access". Oyedemi (2009: 159) concurs arguing that "universal access to mobile telephony is almost complete, with the percentage of population covered by mobile signal at 99.7%, and the number of people with access to a cell phone at 87 per cent per 100. Attaining universal access to other ICT services,

such as the Internet, seems far from being achieved, it reveals a bleak picture".

1.6.2 Access and use of computers and the Internet

The Internet provides rapid access to education and information. Therefore, it is crucial that most Africans should have access to this service, if they are to reduce illiteracy and obtain some education and knowledge. Research has proven that the Internet is still available to a few and unavailable to many, mostly poor. Telecentres can assist in ensuring that many access the Internet at lower cost. African Internet statistics should, therefore, be included in this section to assess how many African still have to be connected to this service, if African governments aim to reduce illiteracy – assuming that those connected to the Internet will be thoughtful enough to employ this technology to remove themselves from the plight of illiteracy and use this service to learn different kinds of information and escape the illiteracy trap which results in lack of development.

In Africa, 5.5 per cent of Africans (i.e., the whole continent), have Internet access - without a basic telecoms infrastructure the chances of the population making use of the Internet is diminishing (Roycroft and Anantho 2003:62). They further argue that given the average per capita income in sub-Saharan Africa is less than US$1500 per year and the average total price of using a local dial-up Internet is approximately US$68 per month (excluding line rental), Internet access in Africa is a luxury. While Internet service providers (ISPs) are primarily located in capital cities, more than 70 per cent of Africans live in rural areas (Pitt and Levine 2003:3).

Internet use in South Africa is among the highest in Africa, though Makhaya and Roberts (2003:6) maintain that Internet use has spread rapidly within wealthier communities. Jensen (2001b: 143) points out that, by 2000, it was estimated that there were over 1 300 000 ISP subscriber accounts in Africa. Of these, North Africa had 250 000 and South Africa 750 000, with 300 000 in the other countries. In 2000, South Africa was ranked twenty-fifth in Internet national connectivity, with Egypt ranked sixty-eighth (Lesame 2002a: 15).

South African Internet penetration grew by 80 per cent from 1.6 million to 2.8 million users in 2001. However, the South African electronic digital divide is evident by the many that do not have Internet. South Africans with home Internet access are mostly city dwellers with higher incomes. A report released by Nielsen/Net ratings stated that the number of female South African

Web surfers grew between 2000 and 2001, and that women account for 52 per cent of Internet users (McDonogh 2002:54-55).

The main reason for this low access to telecom services is affordability among the poor. The government stated in 2006 and again in early 2007 that they would introduce a new telecom company called Infraco to compete with Telkom with a view to lowering telecoms prices (Hamlyn 2007:21). However, it will require more players than three companies in this market to provide lower consumer prices and satisfy unmet demand for services.

Infraco is a fibre optic communications network that was formerly owned by Transnet and Eskom (which will be a state-owned entity that will set its prices and provide companies network access after transformation implemented at that time (i.e., 2007) was completed) (Hamlyn 2007:21). Because access to ICT in South Africa is low, the Ministry for Communications uses intervention such as telecentres to improve ICT and Internet, especially in rural areas. Additionally, the South African signal distributor, Sentech, provides telecentres with access to broadband wireless Internet. By virtue of Sentech's multimedia license legislated by the Telecoms Amendment Act of 2001 (cf. South African Telecoms Amendment Act No 64 of 2001), and initially using a high-powered radio-based network in the major metropolitan areas of Johannesburg, Midrand, Pretoria, Durban and Cape Town, Sentech offers Internet connectivity to homes, businesses and telecentres. Sentech focuses on ICT technology to bridge the digital divide, with their social investment efforts concentrated in this area.

Sentech also provides wireless connectivity to the Mindset Network or Learning project (a South African educational network that teaches high school curricula through print media and television), to allow the delivery of a broadcast signal from Mindset to transmission partners (Mindset Learning Project 2002). The Activate or Learning Channel (available on Channel 319 on digital satellite or DsTV) content is broadcast by Sentech to 200 schools, promoting more access to education through ICT.

1.6.3 Telecentre development

Telecentres are developed as one of the interventions aimed at addressing the telecom or ICT infrastructure deficiencies delineated in sub-sections 1.6.1 and 1.6.2 of this chapter. This sub-

section describes the legislative framework mandating local telecentre development and explains reasons for the development of that legislation.

South Africa adopted a telecoms universal service and universal access policy in 1996 through the Telecoms Act No 103 (cf. South African Telecoms Act No 103 of 1996). The Act designated the USA to establish telecentres. In particular, an objective of the Act is to promote the universal access and affordable provision of telecom services. Another objective (out of 17) is to make progress with universal provision of telecom services (Republic of South Africa Telecoms Act No 103 1996:10). The USA was set up by Chapter VII of the Act (ibid: 49): "The Agency shall strive to promote the goal of universal service; encourage, facilitate and offer guidance in respect of any scheme to provide universal access or universal service".

A Universal Service Fund (USF) was established from a levy on operator turnover to subsidise network extension and telecentre establishment in "under-serviced" areas occupied by "needy people" (Gillwald 2003a: 14). The USF is administered by the USA. As a consequence, South Africa is promoting telecentre establishment and operation (Latchem and Walker 2001:206). The promotion of telecentres follows the overcoming of apartheid and South Africa's first democratic elections in 1994 and is aimed at improving universal access to telecom services and South Africa's teledensity level.

After 1994, South Africa experienced rapid development of the telecoms sector. There were 63 USA telecentres in South Africa in early 2001 (Makhaya and Roberts 2003:14). These centres were established in South Africa as a direct result of globalisation after 1995, when, then as Deputy President, President Thabo Mbeki attended the then Group of 7 (now G8) developed nations conference on the Information Society (IS) and challenged the rich countries to visit South Africa to consider how ICT could benefit people in LDCs. This challenge led to South Africa hosting the Information Society and Development (ISAD) Conference in May 1996. This conference linked the economically powerful G7 nations with 30 developing countries. South Africa prepared a position paper for the conference, stressing the importance of IS issues for developing countries.

Former Department of Arts, Culture, Science and Technology (DACST, split after 2004 into Department of Arts and Culture and Department of Science and Technology) led the drafting of

the position paper for ISAD, and the then Minister of then Department of Posts, Telecom and Broadcasting (DPTB - Ministry for Communications since 1999), Jay Naidoo, led the conference delegation. IS issues enhanced their profile because the former DPTB included wider information access issues, not only telecoms. This focus shifted the debate from providing universal access to basic telephony to including access to computers and the Internet. The ISAD conference raised the G7's (now G8's) recognition of South Africa, and in particular the telecom sector. Interest of South African government departments in the industry was also increased.

The end of 1996 saw the former DPTB finalise the telecoms legislation with a consensus reached on the White Paper in Telecoms Policy in 1996 (cf. South African White Paper in Telecoms Policy 1996). In November 1996 the Telecoms Act No 103 was passed (cf. Republic of South Africa Telecoms Act No 103 of 1996). This Act allowed the 1997-2002 exclusivity period for Telkom to provide telecom services. In February 1997, South Africa's submission to the World Trade Organisation (WTO)'s Negotiating Group on Basic Telecoms (NGBT) included South Africa's plans to gradually liberalise via the introduction of cellular phone providers, and, in subsequent years, a SNO. In 1997, Telkom was granted its operating license to operate, with exclusivity to May 2002, telecom services and meet universal service obligations (USOs), which included:

(a) installing 2, 69 million new telephone lines of which 1,676 million were to be in previously "under-serviced areas" (those without telephones lines during apartheid times);
(b) providing telecom services to 3, 204 villages while carrying out (a);
(c) establishing 120, 000 payphones; and
(d) providing access to 20,000 'priority customers' (e.g., community centres, clinics and schools).

Failure of Telkom to meet these challenges would lead to the imposition of financial penalties (Makhaya and Roberts 2003:6).

Furthermore, in October 1998 former President Nelson Mandela convened a South African summit at Gallagher Estates, Midrand, to address challenges of job creation and retention, economic growth and development. At this Presidential Job Summit delegates agreed to promote job creation initiatives, particularly those sectors with a high potential for job creation. Since that

declaration the South African ICT sector has undergone change aimed at spreading services to most parts of the country through development projects, including:

(a) establishing telecentres by the USA and other statutory bodies such as the GCIS;
(b) establishing digital villages, by PPPs in townships (semi-urban areas formerly "designated" for black people, located close to city centres). Also, MACIS is a Cisco Networking Academy (Motshweni 2002). Another successful digital village is in Emdeni, South Western Townships or Soweto (Soweto Digital Village 1997). The Emdeni digital village is established and funded by Microsoft South Africa, Hewlett Packard (HP), Africare (a non-government organisation), and the local government (Soweto Digital Village 1997; Microsoft Digital Villages 2003). An objective of digital villages is to make technology accessible to previously disadvantaged communities, resulting in a resource pool of technologically trained persons available for recruitment. Training provided includes personal computer skills, enabling those people trained at the digital villages to market their IT skills through the digital village, the companies funding the village, supporting local businesses as well as telecoms service providers and connecting local communities to the global communication network (Lesame 2003a:11-12). In 1997, the Chairman of Microsoft Bill Gates visited, and officially opened the Emdeni digital village together with former President Mandela (Modise 2001; Wessie 2001);
(c) establishing private sector electronic learning (e-learning) centres. Centres are also funded by foreign donors and government departments. The purpose of e-learning centres is to impart ICT skills and provide mathematics and science education to school students (Lesame 2003a:1). Most of these centres are established within schools;
(d) publishing of the e-Education White Paper developed by the Department of Education in 2004 aimed at "ensuring optimal availability and use of ICTs in education in a manner that will create better access to quality education for all" (Pandor 2004:6). Pandor, former South African Minister of Education, stated in this government gazette that given the magnitude of the problem and in the spirit of Tirisano (SeTswana language for cooperation or building together), public and private sectors need to join hands to ensure that South African children receive high-quality learning and teaching, and that lifelong leaning is enhanced. The White Paper further proposed that e-Education, should be funded in part by the licensing obligations of telecom providers, private sector donations and support from international development assistance agencies. However, the e-

Education White Paper (announced in 2003 but gazetted in 2004), did not address the rural bandwidth problem and while it aimed to address the provision of ICT in schools, it did not mention learning environments such as Adult Basic Education and Training (ABET). Further, VoIP that could potentially provide cheaper rural telecom services to the poor and issues of application of language and ICT content were not addressed. Consequently, in early-2007, the Presidential National Commission on Information Society and Development (PNC on ISAD) issued a tender requesting experts to structure and implementation plan for e-Education in South Africa. Public debate is expected to take place concerning national e-Education implementation including aspects of language, ICT content, affordability and accessibility. This process is in its infancy. Some e-Education projects operated by the PNC on ISAD include the Khanya (in Zulu and Xhosa languages to lighten or brighten) Project which was initiated by the Western Cape Department of Education, Gauteng Online (a project that links local schools to the Internet), and the National Portal Initiative (Thutong). Thutong is a SeTswana language concept meaning "place of learning";

(e) The New Economic Partnership for African Development (NEPAD) proposal establishing the E-schools Demonstration (Demo) Project that links six NEPAD e-schools in the participating African countries (including Tunisia, Kenya and South Africa). The NEPAD e-schools Demo Project aims to provide ICT skills and knowledge to primary and secondary students and enable them to function in the emerging Information Society and Knowledge Economy by providing education health, ICT basic literacy training issue, and provide teacher computer training and aspects of technology regulation (e.g., ICT school policy and the approval of content) (South African Presidential National Commission on Information Society and Development 2007); and

(f) The PNC on ISAD's research report on e-Literacy and ICT skills development proposing interventions including the provision of scholarship and bursary funds for students in ICT-related tertiary qualifications, and that the recipients should have internship commitments to provide skills development and training in rural communities. These recommendations could be adopted and implemented by local universities as they transfer ICT knowledge and skills to their students. In her speech during the opening of the academic year of the UNISA in February 2007, South Africa's Deputy President Phumzile Mlambo-Ngcuka reiterated this point stating that local universities should provide ICT education to students which is "locally-relevant" and that ICT skills taught should result in the solution

of existing national socio-economic problems, including poverty and unemployment. Mlambo-Ngcuka (2007) also stated that ICT education in South Africa should promote local language. South African ICT indicators in 2007 are illustrated in Table 9.

Table 9 illustrates a decrease in the South African teledensity level from 9.97 per cent in 2006 and 9.70inj 2007 (see Tables 5 and 9 respectively) to 9.70 per cent in 2008. Although the teledensity figures are not exactly the same in all the tables because the results were produced by different researchers and organizations in different countries, all the information suggests that the teledensity level was decreasing. Table 9 also indicates that the teledensity level was decreasing with respect to access to the fixed-line network but access to mobile phones increased dramatically from 2000 to 2007. In 2007 81.27 per cent of the South African population had access to mobile phones while 10 per cent had Internet access (7.3 per cent of this group accessing this service at home), 1.6 per cent had access to broadband Internet, 77 per cent had access to traditional radio, 66 per cent had access to traditional television, 15.7 per cent of the population had access to a computer and 81.3 per cent of the South African households had electricity. Generally, Table 9 indicates that access to the ICT mentioned in the tables improved except for access to the fixed-line telephone network which declined per household as well as per 100 population.

Table 9: South African ICT Indicators, 2008

Indicator	2000	2001	2002	2003	2004	2005	2006	2007
% of fixed-lines per 100 inhabitants	11.00	10.73	10.48	10.14	10.05	10.08	9.93	9.70
% of mobile cellular subscribers per 100 inhabitants	12.10	18.57	24.05	29.72	39.19	49.68	67.63	81.27
% of Internet subscribers per 100 inhabitants	1.63	2.09	2.20	6.76	7.65	9.13	9.57	10.00
% of broadband Internet subscribers per 100 inhabitants	0.00	0.00	0.01	0.04	0.09	0.34	0.77	1.63
% of households with a radio	70.68	72.10	79.60	80.60	80.80	78.90	78.46	76.6
% of households with a TV	51.00	52.60	56.30	57.90	59.20	60.00	64.42	65.6
% of households with a fixed-line telephone	23.95	23.88	23.60	22.90	21.60	21.00	18.69	18.6
% of								

households with access to a computer	7.56	8.47	9.55	10.56	11.47	11.91	13.00	15.7
% of households with Internet access at home	2.00	2.20	3.00	3.40	4.20	5.00	5.70	7.3
% of households with electricity	69.00	70.19	75.60	77.90	80.30	80.20	81.30	81.30

Source: Universal Service and Access Agency (2008a:21)

Research and ICT projects conducted and operated by the PNC on ISAD are aimed at teaching locals ICT skills while promoting local language and culture. Universities need to join and provide community-relevant ICT courses which may enable those who have undertaken the courses to plough back to their communities what they were taught in the courses and also solve community problems. The University of Pretoria has recognised this fact and started to run socially-relevant computer classes (cf. Chapter 2).

In reviewing the PNC on ISAD (2007) report on e-literacy and skills development report it should be mentioned that bodies such as the PCN on ISAD could engage universities (and other stakeholders having an interest in e-education) in their research projects in the quest to include all relevant stakeholders in e-education policy formulation and implementation processes so that all relevant stakeholders are able to implement the policy as set out in policy documents. Andrew and Petrov (2003:75) support this view and term this approach to policy-making and implementation as a “systems thinking approach”. Stakeholders that were not initially involved in the formulation of a policy could resist implementing that policy arguing that they were not involved in that policy or that their interests are not represented in that policy. Therefore, inclusion of industry stakeholders in policy-making and policy-implementation processes may generate more debate on

issues of that policy and also may provide an integrated approach to the solution of existing telecom infrastructure-content, and e-education implementation problems.

Benjamin (2003:2) states that by end 2001, 65 former USA telecentres had been established and by 2006, the former USA (2005:8) stated that in addition to the 65 stated by Benjamin, 50 telecentres were established by 2006 and 14 telecentre sites were upgraded. Of these 25 were MPCCs, 16 were tele-containers at community-based telecentres (Universal Service Agency 2005:8). Latest (2008) statistics of these centres are included in Table 10.

Table 10: South African Public and Community Access Points, 2008

Community and Public Telephones	2002	2007
Telkom Public Phones	195, 000	158, 000
Number of Community Service Telephones (CSTs)	31, 000	220, 000
Number of Thusong Service Centres	38	123
Number of Telecentres	72	152
Number of Cyber-laboratories	0	235
Number of Public Information Terminals	0	700
Number of CPOs	3	14

Source: Universal Service and Access Agency (2008a:21)

To achieve the MPCC results illustrated in Table 10, policy changes that promoted telecentre development in the 1990s were brought about by some degree of deregulation and liberalisation of telecom in most African countries including South Africa. In South Africa, the 1996 ISAD conference championed the idea of setting up "multipurpose community centres" (MPCCs). This resonated closely with the initiative of the ITU to establish telecentres in African countries. This and other matters related to the state and the future of telecentres in South Africa will be returned to later in the thesis.

In sum, the three sub-sections above highlighted the need for local telecentres, described the legislative framework mandating telecentre development and provided details of the historical development of the local ICT infrastructure by various national companies, government departments and international ICT policy development and implementation organizations. The development of the ICT infrastructure is important to address national information and education deficiencies and challenges.

1.7 THEORETICAL APPROACHES TO THE STUDY

Theories introduced in this section are discussed and critiqued further in Chapter 3. The purpose of applying these theories in research is to explain how ICT is employed and adapted in developing countries and to understand how ICT is employed for development. Telecentres are a form of technology transfer from urban to rural areas, as much as they are technology transfer from more developed countries (MDCs) to LDCs (Benjamin and Dahms 1999; Harris 2001). The dominant paradigm (DP) (discussed in Chapter 3) is employed to explain how technologies are transferred from MDCs to LDCs in the quest to modernize urban and rural areas. The DP is further discussed in Chapter 3, (Nulens and van Audenhove 1998; Sussman 1999), to establish its relevance in the workings of local telecentres.

Development Support Communication (DSC) theory is thus employed in this thesis to describe how telecentre users can communicate effectively using ICT located in telecentres towards the achievement of the development goals. DSC theory explains how local people use the telecentres and ICT in the telecentres in development projects (Melkote 1991; Obregón and Rivera 2001; Servaes 2001).

Another theoretical approach employed in this study is community informatics (CI). This theory is employed to explain what telecentre users employ ICTs for or the purpose of ICT use. This theory explains how ICT is adopted and employed by technology users, especially those users unfamiliar with the technology (Gurnstein 2000a; Harris 2001). Furthermore, three schools of thought that explain the relationship between ICT and development are discussed, viz., the technophilic, technophobic and intermediary theoretical frameworks. Technophilics believe that telecoms exert a positive influence development, while technophobics regard telecoms as having a negative effect on development and expand the information gap between rich and poor, and the literate and

illiterate. The technophilic view of the role of ICT in society is utopian, while the technophobic view is dystopian. The intermediary school of thought states that while access to ICT might not directly lead equitably to development, this access may be necessary in order for a country to be part of the global economic activity, and that ICT should be employed to develop people by imparting ICT and computer skills (by those in educational institutions and other community institutions such as telecentres), to those who require such skills (cf. Bailur 2008).

The utopian perspective on ICT supports the deployment of ICT in communities and perceives positive developments arising from this deployment. Utopians argue that ICT enhances productivity, improves employment opportunities, and upgrades the quality of work in many occupations. Moreover, ICT offers opportunities for small-scale, independent and decentralised forms of production. Technophiles envision that technology will aid developing countries to "leapfrog" stages of development (Castells 1998; Mansell and Wehn 1998; Naidoo 1998; Nulens and van Audenhove 1999; Matsepe-Casaburri 2002).

Additionally, Bozeman and Rogers (2002:773)'s *churn* model is employed to explain the "use-transformation-value" of information gained by telecentre users and how the latter use that information to develop other persons in their communities. Bozeman and Rogers' model states that information without use is information without value, therefore persons should use information gained from telecentres for community development or to develop other human beings. New uses of information gained from the telecentres in turn enhance the reservoir of knowledge available for further community transformation.

Finally, the new paradigm for capacity development and institutional innovations is employed to advance the argument of the importance of ICT skills training in developing countries, by governments in cooperation with the private sector and international donor agencies. In these processes of ICT training in developing countries, women should from an important part of the training due to the important role they play in local development projects.

1.8 THE AIM OF THE STUDY

Against the historical background of the need for telecentres to provide ICT for education and personal development nationally – discussed in the preceding sections, this is an exploratory and

descriptive study aimed at:

1.8.1. Describing the impact of telecentre ICTs on the *education of telecentre users from the users' perspective*, with specific reference to the particular technology employed for specific educational needs.

In an attempt to achieve this aim, the study seeks to contribute toward the objectives of:

1.8.1.1 Identifying *technology employed and that needed or required by telecentre users to advance their educational goals while visiting the telecentres.*

1.8.1.2 Describing *educational and vocational support offered by telecentres to employed* users e.g., teachers, agricultural workers, librarians and nurses who, in turn, use that support at work.

1.8.1.3 Identifying forms of ICT training *provided by telecentre staff to users and*

1.8.1.4 Investigating *the opinions of telecentre users with regard to the impact of the centres on their education*.

The research question is stated next.

1.9 THE RESEARCH QUESTION

The study's main research question is:

1.9.1 What impact does ICT located in telecentres have on users' formal and non-formal education?

To answer this question and gather information about how telecentres contribute to the education of the telecentre users, the following sub-questions are also addressed:

1.9.1.1 What telecentre ICT does the telecentre user employ to better satisfy his or her educational needs?

1.9.1.2 What are the ICT training needs of telecentre users?

1.9.1.3 What technology at the telecentres is employed for educational purposes?

1.9.1.4 For what educational purposes is telecentre technology employed at the telecentres?

1.9.1.5 What ICT training is provided to telecentre users by the telecentre staff and managers?

1.9.1.6 How do the telecentres support employed users in terms of supporting the work that they do, e.g., teachers?

To answer the research question, the following methodology is employed.

1.10 RESEARCH METHODOLOGY

Triangulation was employed to conduct this research, combining a survey questionnaire and personal interviews with the main purpose of ensuring the validity and reliability of the results. Mouton and Marais (1988:91) define triangulation as the "use of multiple methods of data collection to increase the reliability of observations". The main reason for using triangulation was to gain more information from the respondents to answer the research question in a satisfactory manner and also to increase the reliability of the research results. A descriptive survey was employed to measure ICT impact on user education and document current conditions at the sampled telecentres. Wimmer and Dominick (1997:137) state that surveys are a perfect instrument to measure impact and or describe current situations.

Personal interviews were employed because they allow penetration into subtle social and personal meaning. In this research the interviews were employed to ask the telecentre managers-cum-users about the developmental history of the telecentres and the role of the telecentres in the community. Personal interviews were employed to ask respondents questions and clarify their unclear answers they had answered in the questionnaire. Telecentre managers and ICT trainers (the same persons also acting as assistant telecentre managers and administration assistants) were interviewed in their capacity as developers and operators – because they know more about how the telecentres came to be established and they also know what educational courses are taught at the telecentres. The telecentre managers are also telecentre users.

The pilot study was conducted at Tembisa telecentre MPCC located in the telecentre municipal library. Tembisa is in the province of Gauteng, about 20 kilometres from Tshwane. Field research was conducted in four rural and semi-urban or semi-rural areas in three provinces; Hoxani telecentre in rural Limpopo Province, Tombo telecentre in rural Tombo village in the Eastern

Cape Province, Siyabonga telecentre in the informal settlement or rural town of Orange Farm (situated about 50 kilometres south of Johannesburg), and MACIS, which was already stated in this chapter as located in the telecentre of Mamelodi just outside Tshwane.

Data were examined using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were employed to further analyse and interpret the data. These statistics provided simple summaries of the sample in the form of tables and statistics which calculated values to summarise the data. Statistical techniques employed include the analysis of variance (ANOVA) and the mean and the standard deviation (Coetzee 2007). These statistics measure the reliability of results. The Chi square test was employed to identify existing relationships between variables and trends in the use of ICT. Post hoc tests or multiple comparisons were employed to compare ICT uses at telecentres. More methodology details are dealt with in Chapter 6.

1.11 SUMMARY AND OUTLINE OF CHAPTERS

In this chapter it was argued that the South African teledensity (fixed and mobile), is low compared to other developing countries, especially those of Asia and South America and therefore needs rapid deployment. Further, because of low teledensity, South Africa established a telecoms policy in 1996 aimed at providing telecentres in rural and semi-urban areas with the main purpose of bridging the digital and information divide and providing universal access to telecoms services. Because of their ability and potential to offer shared services, telecentres may ideally offer more affordable services to Africans, who mostly live in rural areas and are economically deprived, unlike fixed-line telephones which are hugely expensive in South Africa. Mobile phones have improved access to telephony in South Africa and assisted towards the bridging of the digital divide.

However, there remains a need to quicken the rollout of fixed-line services so that more people can access telephony and the Internet. More competition in the fixed line market should be promoted in South Africa to assist the lowering of the tariffs, and allow more users to connect to the Telkom, Neotel and Infraco networks. Active interventions and programmes initiated by the state and other stakeholders, which have employed primarily on wiring schools and classrooms, training and providing community access in poorer geographic localities are necessary to broaden technology access and bridge the urban-rural digital divide. Nonetheless, there is also a need to

improve the operational status of the already existing telecentres and other ICT. Given the socio-economic barriers to access ICT, the digital divide remains in South Africa and requires more effective regulation. Mobile phone penetration, however, has groan impressively over the past years and more than 90 per cent of the population had access to mobile telephony in 2009.

Against this background, this study is divided into eight chapters. The first chapter provided an introduction to the thesis and the research methodology. The aim of this study was stated as was the need for the study, background, the research problem, aims, research questions and aspects of the research methodology.

Chapter 2 provides definitions of the main concepts employed to clarify the operationalisation of these concepts.

Chapter 3 provides a discussion of development theory, technology transfer and use models to lay the theoretical foundation for the applied research, and to provide a critique of some aspects of these theories as they apply to the use of ICT in local development projects. This chapter also describes the role of technology in development, with specific reference to the role of telecentres in development.

Chapter 4 summarises the contribution of telecentres in South Africa's socio-economic development with the main purpose of advancing the argument that South Africans should promote the use of ICT and telecentres to spread education nationally in order to reduce high illiteracy.

Chapter 5 summarises the South African telecoms legislation that lays the foundation for telecentre development. The chapter explores how this regulation made it possible for some parts of South Africa to have access to telecoms services which they had no access to prior to 1996. This policy has failed to make these services available and affordable to the digital have-nots. Shortfalls of the telecoms regulatory policy are stated to suggest improvements to such legislative shortcomings.

In Chapter 6 aspects of the research methodology are presented. Motivation for using the survey questionnaire and personal interviews is also provided and the problems experienced during the gathering, analysis and interpretation of the data are also dealt with.

In Chapters 7 and 8 the results of the study, gained from the questionnaire and personal interviews are presented. Chapter 7 presents results obtained from the questionnaires while Chapter 8 presents results gained from the interviews.

Chapter 9 provides a summary of the research, and concludes on the role of telecentres on the education of local users and the contribution of these telecentres to education. Recommendations for future research on local telecentres are formulated and a local telecentre model, based on the telecentres studied is proposed.

CHAPTER 2

KEY CONCEPTS AND CONSTRUCTS

In this chapter, the main concepts and constructs used in the study are explained. The purpose is to clarify the concepts and constructs in terms of their use and application in South Africa and to develop the theoretical basis for the thesis or framework for the study. The concepts and constructs are also defined because the problem formulated in Chapter 1 introduces the necessity for defining all concepts and constructs used to analyse the problem and clearly determine what the variables encompassing the problem are and relationships between these variables explained. This chapter serves the latter purpose and this reason therefore demands that the main concepts and constructs used in this thesis be defined to ensure that the concepts and constructs are understood (by readers of this work) with "common and unambiguous meaning" (see also Bless and Higson-Smith1995:29). Additionally, because different concepts and constructs can have different meanings in different contexts of communication and even in countries, there is a scientific need to define these concepts and constructs to explicate the socio-political situations and contexts in which they are used. Berg (1998: 25) also acknowledges that in social sciences qualitative research, "concepts and constructs need to be conceptualised and operationalised to ensure that everyone is working on the same definition and mental image".

The concepts and constructs discussed are selected because of their relevance to the process of bridging the digital divide, and the promotion of access to ICT for those previously deprived of access, which are some of the main imperatives and infrastructure problems the telecoms policy is aiming to address. Understanding telecoms policy and future implementation thereof necessitates revisiting the concepts and constructs in South Africa as a developing country. Some concepts and constructs discussed in this chapter may be familiar to the informed scholarly reader but South African definitions of some of these concepts and constructs are unique because they are intended to remedy the apartheid regime ills; a regime also unique to South Africa. The definitions also have to be revisited because over the past years there have been changes to some of the definitions and these changes have been necessitated by lack of achievement of goals set by previous definitions such as unmet universal access targets, decreasing teledensity levels and changes in the communications industry that have been brought about by a massive increase in mobile telephone uptake. These concepts and constructs include telecentres, development, digital divide, universal

access, teledensity, universal service and globalisation. Although the history of most of the definitions is traced to developed countries such as the U. S. and Europe, South African definitions are mostly provided.

2.1 ICT

Information and communication technology allows information to pass over distance at fast speed as a result of their digital nature. The South African definition of ICTs is found in the strategy document for the use of ICT in education developed by the Departments of Education (DoE) and of Communications (DoC). This strategy document, published in January 2001 (2001:6), states that:

> ICTs are all forms of electronic communication in both digital and analogue form. Digital electronic devices include computers, CD players, cellular telephony and satellite broadcasting. Analogue devices are largely confined to conventional radio broadcast technology and audio, such as tape recorders. Bandwidth, the volume of data that may flow through a communication channel is constantly increasing. In addition, there are more and more ways of accessing this data. Due to this increased bandwidth and the different forms of connectivity, the various technologies are converging into the broad field of information and communications technology (ICT).

Information is the key to understanding ICT, write Duncombe and Heeks (1999:2) because information is what is captured, processed, stored and disseminated with ICT. Understanding ICT therefore requires understanding information, practices and needs because ICT will store information to fulfil those needs and the information practices engaged in also satisfy those information needs. Duncombe and Heeks further maintain that ICT is not the only "technology" that handles information, but that ICT is based on digital information held as 1s and 0s, and comprises computer hardware, software and networks. Other information-handling technologies include the following:

(a) Intermediate technology – largely based on analogue information held as electro-magnetic waves such as radio, television and telephone;

(b) Literate technology – based on information held as the written word such as books and

newspapers; and

(c) Organic technology – based solely on the human body such as the brain and sound waves (Duncombe and Heeks 1999:2).

In the case of developing countries, where financial resources are not abundant as in developed countries, technology that is widely available to members of civil society is intermediate technology such as radio and television (although still in some rural areas, television is not widely available). Mobile phones are widely available, but fixed-line telephones are only owned and afforded by a few (as media ownership statistics stated in Chapter 1). Technology based on literacy such as books and newspapers are also widely available in South Africa, but judging by the high national illiteracy levels (cf. Chapter 1), it is clear that these technologies are also read by a few million people. It is technology such as this, intermediate and literate, which can assist South Africans reduce the high illiteracy level. Organic technology (which is technology used for the creation and usage of tools, crafts and weapons and is constructed from living organisms and organic compounds) should also be used by South Africans in development projects because South Africans produce various types of crafts which earn them income when sold (Organic Technology – Memory Alpha, the Star Trek Wiki 2009). However, organic technology to work effectively, it has to be supported by social capital or will to change the lives of others for the better. People who do not care (thus have no social capital or desire to assist others better their lives) about how others' lives can be improved and changed for the better cannot develop a nation (cf. Section 2.10 of this chapter on a discussion of social capital and the digital divide). Social capital also involves the capacity of an individual to motivate and drive oneself to achieve self-development. Development starts with self-development and one should begin by developing oneself before aiming to develop a country.

In this study, I focus on digital (mostly intermediate, although the questionnaire does ask respondents about literate) technology is focused on, with the aim of asking telecentre users how they use these technologies and how these technologies have changed their lives for the better, as Herselman (2002:1) states that ICT should "connect people in different places and time zone, be used for knowledge management in order to expand the range of human capabilities". The approach of study is technophilic rather than technophobic and the focus is on community-based telecentres and ICT usage at these centres.

2.2 TELECENTRES

Telecentres are given different names, including telecottages, community technology centres, community communication shops, networked learning centres, multipurpose community centres, digital clubhouses, *cabinas publicas, infocentros, telecentros, espaces numerises, telestugen and community access centres*). Generally and internationally (including South Africa), telecentres have been advocated as a means of providing "a wide range of information and communication services to underdeveloped areas, such as rural areas and townships (a township is a name given to an area in South Africa where mostly black people reside, generally near cities and towns" (Mmusi in Lesame 2005:157). Underdeveloped areas are those with minimal or no telecommunications services. In South Africa there are many such areas. Telecentres are usually established in these areas to provide inhabitants with cheaper and affordable access to and usage of ICT facilities, including the Internet.

Gómez, Hunt and Lamoureux. (1999:2), and Reilly and Gómez (2001:1) define a telecentre as:

> "A physical space that provides public access to ICT for communication purposes, and other aims including educational, personal, social and economic development."

Based on the premise that not everyone in the world has access to a telephone, much less a computer, facsimile service, Internet connection, or relevant information resources, telecentres are designed to provide a combination of ICT services to users at affordable cost. Services range from basic e-mail, telephone, facsimile, Internet or World Wide Web (WWW), word processing, information retrieval, to resources such as tele-medicine, tele-education and distance education. The telecentre concept in South Africa often excludes a phone shop, and sometimes facsimile services, but not computer services. In recent times, some phone shops have started to provide computer services, facsimile and Internet services.

2.3 INFORMATION

An important requirement of ICT and telecentres is information. ICT should contain information relevant for use by local people for community development, and wherever possible, produced and

distributed in local language that community members understand. Technology that could be employed to distribute this information include intermediate and literate. In a country with a dramatic mobile phone uptake, mobile phones could also be used for distributing educational information especially at telecentres. Heeks (2005:1) states four main resources necessary to produce and share information effectively. These are data, economic, social actions and decisions taken by community members geared towards use of development information learned from ICT.

In what he terms "the information chain" Heeks defines data as development ideas required to improve a local community; economic resources including finance or access to funds, technology and technological skill in order to access ICT and data (in ICT); social resources entailing personal motivation and confidence to push oneself to access and use ICT productively and action resources encompassing finance, technology and "soft resources" such as skills and empowerment (Heeks 2005:1). When persons ultimately have access to all these resources, they are able to access ICT and information, assess that information to evaluate the capacity of that information to empower their lives; if the information does not improve their lives in some way, the people do not use that information and in turn find new sets of information. However, if the information gathered was meaningful in one way or another, then the persons use the information fruitfully to improve their and others' lives.

Aspects of Heeks (cf. 2005)'s "information chain", which Heeks developed into an "information model" or a "digital divide bridge" are similar to Tongia (2006)'s "4As Theoretical framework" and offer similar solutions to the problem of the digital divide and information have-nots. Tongia's "4A Theoretical Framework" and "4Cs Theoretical Framework" are discussed later in this chapter (cf. Section 2.10) and offer some practical solutions to how community members can solve problems of lack of access to ICT and information. If persons cannot produce their own information, or act positively and productively on information they obtained from ICT or other persons, then development may not occur.

2.4 PUBLIC-PRIVATE PARTNERSHIPS

As stated in Chapter 1, developed and developing countries have recognized the role of the private sector in assisting governments to establish advanced telecommunications and ICT networks, especially in economically deprived rural areas. A public-private partnership (PPP) definition

embraced by the Canadian Council for PPPs is: “A cooperative venture between the public and private sectors, built on the expertise of each partner, that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards” (The Canadian Council for Public-Private Partnerships 2008:1).

This Canadian PPP definition is similar to that of Britain (cf. Spackman 2002; Becker and Patterson 2005) and that of the ITU InfoDev which encompasses PPP definitions and models of several developed countries (cf. ITU InfoDev 2008). The latter definitions and models emphasise the role of the private sector in designing and building ICT networks and infrastructure structures (including hardware and software), leasing or contracting ICT projects, and managing and operating ICTprojects for the benefit of both the public and private sector at the risk of both. The South African PPP definition slightly differs from the definitions above because it introduces an element of empowering the disempowered who do not necessarily fund the establishment of that ICT project but benefit from its inception and operation. This South African PPP definition states that a PPP is a joint public and private sector development funding project: “which is part and parcel of an empowerment programme with emphasis on community driven development. PPPs provide us with a way forward in realizing the full potential of communities such as Orange Farm” (Motshekga 1999:1).

Motshekga (ibid.) further stated that PPPs have been implemented in South Africa not only in the ICT sector but also in education, health and other sectors to serve public interests or meet public service obligations. According to the ITU InfoDev (2008:1) governments in both developed and developing countries are turning to the private sector for the delivery of infrastructure services because of:

(a) “Recognition that the private sector organizations have superior management skills, understand the market and marketing forces, are motivated and financially efficient, even though they are driven by financial profit and may have a limited tolerance for risk in challenging situations”; and recognition that
(b) “Government has a mission and responsibility to meet social and developmental needs and service objectives which are in the public interest; it has financial resources it can invest in to secure skills and government direction or vision and financial reasons”.

According to Garforth, Phillips and Bhatia-Panthaki (2007:723) the private sector, after shifting fortunes in development theory and practice over the years, is now widely recognized as the key to economic growth. As explained in Chapter 1, there is a growing trend, internationally, to pursue and implement PPPs as ICT and telecommunications services delivery tools and the success of the PPPs in achieving development goals has yet to be assessed by future research in many developing countries.

2.5 TELECOMMUNICATIONS

The definition of telecoms to follow best describes what this technology does: *"the transmission of verbal messages, numeric data and pictures by wire and by the electromagnetic spectrum"* (cf. Barnett, Jacobson, Young and Sun-Miller 1999:43). These authors view telecoms as technology that permits instantaneous communication over distances, as do Thornton, Carrim, Mtshaulana and Reburn (2006: 17) who define telecoms as: "the art and science of communicating over a distance by telephone, telegraph and radio. The transmission, reception and the switching of signals, such as electrical or optical, by wire, fibre, or electromagnetic (i.e., through the air) means".

ICT in telecentres perform this function, and bridge the communication gap and digital divide between the rural people and those who reside in urban areas. Telecentres are designed to reduce this rural-urban gulf, and to inform telecentre users about services such as tele-health.

Barnett et al. (1999:45) also maintain that telecoms (like transportation) can change the proximity of places by improving connection while improving communication between people. The space-adjusting technologies of telecoms are being rolled out in many parts of South Africa, with the use of interdependent communication networks used to reduce rural and urban distinctions. Information technologies are becoming more readily available. This was acknowledged by former President Mbeki (2001b: 5) in his State of the Nation Address in parliament, in which he stated that government would expedite MPCC rollout in rural areas.

For people who have access to ICT, communication with their families, relatives and business partners situated elsewhere is common place. However, for people without ICT access, immediate communication is difficult, impossible or delayed. An advantage of ICT and telecoms technologies is that they provide almost immediate two-way communication. The time-saving, space-adjusting,

two-way communication and immediacy qualities of telecoms technologies make it easy for people to communicate. The technologies also have other uses, e.g., distance education, e-commerce, e-government and organisational networking. In this regard, Chibber (2002: 52) maintains that telecom is "one of the most important and strategic components to provide infrastructure to support economic development, social advancement and educational opportunities".

2.6 FORMAL AND NON-FORMAL EDUCATION

Education is a process through which knowledge is gained. Through learning processes people understand these aspects better after gaining knowledge. Dewey (2001:1) describes education as the processes that: "begin unconsciously at birth, continually shaping the individual's powers, saturating consciousness, forming habits, training ideas and arousing his feelings and emotions. The most formal and technical education in the world cannot safely depart from this general process but can only organise it or differentiate it in some particular direction".

Formal education is the knowledge individuals gain at formal educational institutions, schools and universities. Non-formal or informal education is knowledge that individuals derive outside the classroom. Informal education is commonly called lifelong learning, as people of all ages continue to educate themselves about issues from media, social institutions, friends, religious institutions, labour unions, the Internet and other sources of information. Smith (2001:1-2) provides insight into informal education according to the influential Brazilian educator Paulo Freire. Smith argues that informal education has five characteristics:

> First, a dialogue rather than a curricula form of knowledge. This means then that informal education involves educator sharing ideas with the educatee, instead of depositing ideas to the educatee. Dialogue also involves respect and co-operating the other's ideas. Second, informal education is concerned with praxis - action that is informed and linked to certain values. This process is important and can be seen as enhancing community and building social capital, leading to human development. Third, informal education involves developing consciousness in others, especially those who do not have a voice, and the power to transform. Fourth, informal education promotes learning in the lived experience. It promotes the logic that believes in what you have done and not in what

> you have heard of. Fifth, informal educators often believe that the information divide between learners and educators can be bridged through sharing of information.

Freire's advancements in literacy training laid the groundwork for a large portion of the participatory communication for development research that emerged over the past 20 years (Huesca 2005:1). Of central importance was Freire's insistence on grounding pedagogical exercises in the lived experiences of students, as both a moral imperative and pragmatic necessity. By encouraging students to name their worlds, teachers validated their pupils' humanness while generating words and themes that resonated with everyday struggles. This resonance provided students with the impetus to learn to read and write. Then opening the possibility for an emergent critical consciousness formed the basis of theoretically driven movements – praxis – for social justice. Huesca further states that Servaes's (1989) "multiplicity in one world paradigm" embraces the major premise of Freire's critical pedagogy regarding popular participation in naming the world, but complicates Freire's work, by emphasising that cultures are not monolithic and unified, but contain multiple interpretations and meanings of notions, such as poverty and oppression.

Chitty (2004:45) observes that Freire's methodology for releasing the power of the oppressed has become the foundation of participatory communication, a field whose contributors see it as a reinvention of the Lernerian communication and development. Lerner was interested in shaping national structure, in the management of symbols of modernisation. In the development of his construct, Lerner identified three conditions that had reshaped public communication: technology (growth of mass media), participation (rise of public opinion and spread of media consumption), and globalisation (political activation of the opinions of mankind) (ibid.). Freire's focus, therefore, was on how education can be used as a development tool, both formal education and lifelong learning.

Formal education is different from informal education in that at schools and universities students are expected to demonstrate an understanding of information via tests, assignments and examinations. Governments prescribe curricula which formal education departments and institutions must follow. Lifelong learning is becoming a fundamental source of job security or employability in the digital age. People should not only read textbooks, but also understand how computers operate.

To improve the low South African education levels and IT skill base, former President Mbeki (2002:10) mentions several strategies government intends to employ. These include the use of ICTs for human resource development and education advancement, improvement of access to capital, improvement of maths and science education, and improvement of the economic infrastructure. In 2002, Microsoft donated software to South African schools. This gesture followed a visit by Bill Gates to South Africa to promote IT use in education, maths and science studies in schools.

ICTs are also used for education in new ways, for example, Elmer (1999:1) states that network-based interactive communications are creating new learning experiences that are altering the instructional paradigm and that: “In contrast to the presentation-based approach to conventional instruction (teaching by telling), the emerging paradigm is being shaped by the "learning-through-doing environments made possible by new media”.

Distance education, which is part of learning, refers to the electronic delivery of educational material to receivers who are physically located far from educators. For example, university or college lecturers teach students located in another country via videoconference. Distance education may utilise ICT to reach the learners, including television transmission, radio, tele-conferencing, e-mail, Internet chat rooms and discussion groups or computer conferencing.

As part of the learning process, distance education is an application of the multi-purpose or multi-functional community telecentre (MCT), along with tele-medicine, e-trading and tele-working. Distance learning is helpful to those who, for financial, social, political, geographical and medical reasons, must travel to an educational institution.

2.7 DEVELOPMENT

The operational definition of development used for this study, because of its relevance to developing countries like South Africa, is provided by Servaes (1999:77), and states: “Development is a multi-dimensional process involving major changes in social structures, popular attitudes and a national condition of life from unsatisfactory to satisfactory”.

Multi-sectoral development necessitates the advancement of sectors such as education, health, e-government that will bring government services with the click of a mouse. With regard to the

economic situation, jobs need to be created to reduce high unemployment. ICT is viewed as instrumental in this multi-dimensional development of South Africa, and sectors within the South African economy. Information is necessary for development to occur and ICT allows access and sharing of information. ICT also allows government to communicate with civil society to advance and introduce development projects to the public. For example, in South India, the Government of Kerala state (GOK) initiated micro reforms to attract ICT investment in the ICT sector (Arun, Heeks and Morgan 2004:6). The GOK developed policies that emphasise ICT as an engine for industrial growth and employment. The GOK ICT policy in this domain articulates a three-fold strategy encompassing:

(a) establishment of a vibrant ICT industry;
(b) building a robust ICT infrastructure (e.g., techno parks and telecentres), for production of ICT applications, ICT business development, software development and innovation, among other objectives, and development of ICT in schools for ICT skills capacity building; and
(c) upgrading the quality of human resources. In all these activities, the state has a direct ownership and delivery role.

Most of Kerala's ICT projects have been very successful in education, electronic government and ICT universal access programs. For example, Lesame (2005b:91) states that Kerala ICT projects, including the Fast, Reliable, Instant, Efficient, Network for Disbursement of Services or FRIENDS, were deployed to provide free Internet connections to rural areas. Also, 400 libraries were established in rural areas to increase IT information dissemination centres and make the Internet widely available. FRIENDS is also used by government to provide IT benefits to all people and offers citizens integrated IT services for utility payments for specific services such as electricity and water charges, property tax, professional and building tax (ibid.). South Africa still has to develop examples such as India, in developing an ICT society while also building an ICT-skilled society, because at present most South Africans are illiterate, which burdens the literate and developed citizens as they have to assist others. Development progress will be achieved in South Africa if illiteracy, poverty and unemployment are reduced. Development of other areas, including building a solid ICT infrastructure and development of human ICT skills and capacity, may follow.

ICT supplements mass media such as radio, television and print media for development communication. Servaes (1999) further argues that "satisfactory" in the previous definition means

“materially and spiritually better”. In a developing country, a prime ingredient for development is the dissemination of information, e.g., information about new fertilisers, seeds, public health and education. The process of education is related to information dissemination and ICT disseminates development information to users. ICT and mass media therefore perform the communication and information-transfer function for development purposes. To invest in education is productive because an educated labour force is a source of productivity and development. However, Castells (1998:5) states: “To be educated means nothing if the educated people do not enjoy good health, decent housing, psychological stability, cultural upliftment, and cultural fulfilment.”

In South Africa this is a problem because most educated people’s lives have not been much improved by their education (most still get poor salaries) with some university graduates being unable to find suitable employment. Some working people do not have decent housing or cultural fulfilment. Development means an improvement in these aspects of people’s lives. This is called multi-dimensional development. Development is not necessarily the same for all countries. Jussawalla (1992:3) observes that there is a difference in the meaning of development between developed and developing countries. In MDCs, the provision of telecoms or information infrastructure leads to increased economic activity. However, in LDCs a lack of telecoms and information infrastructure hampers economic development. This situation implies that for developing countries to develop faster, they must develop their telecoms and information technology infrastructures rapidly to “leapfrog” stages of development. Telecentres are part of the telecoms infrastructure aimed at bridging the digital divide between urban and rural areas.

According to Mansell and Wehn (1998:8) development in MDCs and LDCs also does not mean the same thing, and that development has been understood since the Second World War to involve economic growth, increased per capita income, and attainment of a standard of living equivalent to that of industrialised countries. However, developing countries will not in the near future be developed to the extent of the developed countries. This is because there are many basic areas in developing countries that need to be developed, areas that have been in place for many years in the developed world, e.g., housing, health and education. African governments have therefore placed deployment of advanced technology among their priorities. Mansell and Wehn acknowledge that there is no “holy-grail” offering a clear definition of the meaning of development, and that a country must reach its own consensus on the changing meaning of development.

Two other important concepts and constructs that need to be defined for the purposes of this study are universal access and universal service. These concepts and constructs form the basis of South Africa's telecom and ICT policy related to telecentres.

2.8 UNIVERSAL ACCESS

Universal access means the provision of telecom service access to consumers at affordable prices and acceptable walking distance. Acceptable distance depends on the country's context. In South Africa this distance is interpreted as time spent to travel to facilities. According to the ITU (2001:1) and the USAASA (2008a:25), South Africa's target is to offer national access within a 30 minutes walk to a telephone. A more general view is that acceptable distance, e.g., a few metres to a public telephone booth both in urban and rural areas, to a public telephone should be acceptable to most members of a community. A 500 metres distance was suggested during the October 2005 Telecoms Pricing Colloquium. However the 500 metres distance was not finalised and will be finalised after the new definition has been determined by the USAASA which opened up a new process of defining both universal service and access in 2008.

Traditionally, universal access refers to: "Reasonable access to a telephone" (USAASA 2008a:24).

The definitions above formed the basis of universal access definitions discussed in South Africa in public meetings organised by the then USA, and at a colloquium entitled – "Defining Universal Service in South Africa" - in 1999, and also in the 2005 Colloquium. The results of the 1999 discussions were published in the Government Gazette No 20129 of 1999, Notice 1114. This Government Gazette defines universal access and universal service in terms of Section 59 (2) (a) of the South African Telecoms Act No 103 of 1996. According to this Government Gazette (1999:7), universal access refers to: "Everyone in the country having a telephone they can use within a reasonable distance. This can be seen as an intermediary stage to universal service, which refers to people having a private phone at home".

In South Africa in some rural parts of the country people still travel long distances to access a telephone. For example, in the Eastern Cape and in some parts of KwaZulu-Natal there are regions with a teledensity of below five per cent, which is unacceptably low teledensity level. To alleviate this problem Matsepe-Casaburri (2001c: 1) gazetted 27 district councils that qualified as under-

serviced areas and announced that small and medium-sized enterprises (SMMEs) would be licensed to provide telecom services to telecoms-poor areas. Mukoma (2002:50) states that the SMMEs would help to alleviate unemployment. According to Mukoma (ibid.): "Areas identified for the licensing phase include municipalities such as Limpopo Province Capricorn district and Bushbuckridge or Lowveld, and KwaZulu-Natal's Ugi and Zululand districts. Others include the OR Tambo municipality and Amatole district in the Eastern Cape and the Free State's Lejweleputswa and Northern Free State districts".

The licensed companies are termed under-serviced area licenses (USALs) and belong to a category of licences that were introduced through the Amendment of the South African Telecommunications Act No 103 of 1996 (Amended in 2001). USAL licences are earmarked for small or emerging entrepreneurs to enter the burgeoning and lucrative telecom market in the era of convergence. According to the Independent Communications Authority of South Africa (ICASA 2006:2), licensees could provide telecom services, including Voice over Internet Protocol (VoIP), fixed mobile services, public pay phones and long distance calls to be transported through networks of any operators licensed to carry international traffic. In August 2003, ICASA received many applications from SMMEs for licenses. Winning SMME bidders were publicly announced in January 2005. These companies are Ilizwi Telecoms (Pty) Ltd – OR Tambo District, Eastern Cape; Amathole Telecoms (Pty) Ltd, Amathole District, Eastern Cape; Bokone Telecoms (Pty) Ltd, Capricorn District, Limpopo Province; Kingdom Communications, Zululand District, Kwa-Zulu-Natal Province; Thinta Thinta Telecoms, (Pty) Ltd, Ugu District, KwaZulu-Natal Province; KaraboTelecom (Pty) Ltd – Central District, Free State Province and Bokamoso Consortium (Pty) Ltd, Lejweleputswa District, Free State Province. The USALs have to contribute towards achievement of universal service and universal access and bridging the urban-rural digital divide.

The policy of universal service and access in most developing countries, including South Africa, is defined within the context of the countries' social and economic conditions, imperatives and market maturity (Universal Service and Access Agency of South Africa 2008a:19). In 2008, the latter agency, USAASA embarked on a new process of redefining universal service, universal access, needy persons in ICT and under-serviced areas because technological or infrastructure convergence, increased public access to new technology and the surpassing of fixed-line by mobile phone penetration have changed the local telecom landscape to such an extent that the key concepts and constructs defining the industry have to be re-examined (ibid.). The USAASA also states that

universal service and access are evolving concepts and constructs, and also the fact that technology is no longer the same in 2008 as it was in 1996, when the Telecoms Act No 103 was enacted, therefore the concepts and constructs have to be re-defined. Also, the Electronic Communications Act of 2005 which regulates converged technologies necessitates the setting of new universal service and access targets and re-identification of under-serviced areas because mobile phones have brought telephony to many local areas which were previously defined by the 1996 Act as under-serviced.

Convergence and the introduction of new services in the market are challenging traditional universal service policies and the means by which universal services objectives are currently met (ibid). There are many services such as e-mail, VoIP, instant messaging and broadband Internet access that require consideration or inclusion into new universal access and universal access definitions. The USAASA further states that South Africa never completed the initial process of defining universal service and access in the late 1990s and early-2000s, and as a result of that the country never had well-specified definitions of these concepts and constructs but adopted and employed the generic ITU definitions of these policy concepts and constructs.

The main aim of universal access has always been, and will continue to be, to promote the installation of public phones to areas without service, establish telecentres and community ICT centres in libraries and schools, establish call centres in rural areas and low-income areas, especially for social, medical and security reasons (e.g., in crime situations), and provide a basic and initial connection to a network (ibid.). In 2008, the USAASA proposed a new universal access definition which is: "Universal access means that every person, within their area, has reasonable (in terms of distance) and affordable access to publicly available electronic communications network services, electronic communications services and broadcasting services" (USAASA 2008a:24).

Universal access – in future – could include access to all ICT services, according to the USAASA (ibid.), including voice, the Internet and broadcasting services. South African universal access targets are different from those set by other countries because there is a huge urban-rural difference in terms of access to telecom and broadcasting services and new laws aim to reduce this gap. The new universal access definition also proposes that "needy persons" should receive subsidies from the USAASA or government to receive or pay for telecom, ICT and broadcasting services. Needy persons include poor persons from low-income households, the disabled and other groups which

have disadvantages in society, e.g., township and rural dwellers, households, communities and institutions. These groups will be specifically defined when national debate starts, i.e., when the USAASA has received public comments on the proposed new definitions which were expected to reach the agency by September 2008.

Countries set different universal access and service standards. According to the ITU (1998:10) World Telecom Development Report, the Pakistan definition of universal access is a public phone per village and that of the Comoros is a phone in every locality. Zambia's definition is telephone booths in public places such as schools, clinics and libraries countrywide. The Cuban universal access strategy defines the standard for telephone service as availability in all villages and communities of more than 500 inhabitants (Sėror and Fach Arteaga 2000:204). According to these authors in the developed world the definitions of universal service focus on the identity between the individual user and the technology while in the developing world it is defined with respect to collective social units and necessary distance or travel time to reach points of access to such service. The ITU (1998:10) further suggests that universal access is a more realistic goal for many developing countries than universal service, and that a definition of universal access should serve as a national target to implement within five years.

2.9 UNIVERSAL SERVICE

The concept was coined by Theodore Vail in 1909, then Chairman of American Telephone and Telegraphy (AT&T). Vail's intention was to increase AT&T subscribers and provide telecom service to as many United States (US) households as possible. Mueller (1993:353) asserts that Vail's meaning of the universal service concept was a deliberate policy aimed at connecting the nation, starting in big cities and gradually spreading to smaller towns, but never reached households or rural areas. Furthermore, "One System, One Policy, Universal Service" meant a nationally interconnected, centrally coordinated monopoly like Western Union, and its emphasis was on long-distance development, often to the detriment of local and short-haul toll development. South Africa has yet to achieve a nationally interconnected status and when that has been almost achieved, then it can be argued that there is some advancement made towards achieving the national universal service goal of ubiquitous telephone access. Gillwald and Stork (2008:1) state that despite being a continental leader in ICT, many countries are "catching up to SA and overtaking it on a number of key indicators".

"While the South African ICT sector continues to show significant expansion especially with the improved growth in the economy over the last few years, the findings of a household and individual user survey completed by Research ICT Africa suggests that policy outcomes geared at the creation of an equitable information society may be sub-optimal" (Gillwald and Stork 2008:1).

Like other countries fixed-line growth is decreasing in South Africa (cf. Tables 11 and 12), With a decline in the ratio of residential to business lines. This is regardless of the introduction of pay-as-you-go mobile telephony and pre-paid fixed-line telephones. The Research ICT Africa study (ibid.) states that only 18 per cent of households indicated that they had a working fixed-line telephone in their homes. The major stumbling block to the growth of teledensity has been mainly high telecom prices, high interconnection charges and less competition in the fixed-line market (dominated by operator, Telkom). The chairman of the South African Parliament's Communications Portfolio Committee, Khotso Khumalo, announced on the South African Broadcasting Corporation (SABC) Channel 2, Morning Live, in May 2008, that the Department of Communications would license a third fixed-line operator and a fifth mobile phone operator to increase competition in sector. Khumalo (2008) claimed that ICASA should regulate for cheaper prices as increased competition in the sector was failing to bring prices down and added that research conducted by the Department of Communications had indicated that the market was fully saturated, that there was room for introducing other operators. Telkom's domination of this market made the company a natural monopoly which failed to satisfy the public demand for cheap telecom prices but focused on increasing profits and expanding its international market base.

Telkom's monopolistic business model and South Africa's universal service policy implementation have followed the US model, as Mueller (1993: 353) states that concepts and constructs of universal service and natural monopoly became ideological pillars of the developed world's postal, telegraph and telephone monopolies. Mueller further contends that the present meaning of universal service is viewed as a policy goal of sufficient importance to justify rate subsidies, a legal obligation to serve, and other forms of government intervention in the industry and that this is equated with ubiquitous geographic coverage, universal household penetration and proactive government subsidies to achieve these goals. "Ubiquitous telephone access in this sense is an expression of liberal egalitarianism, like universal schooling, literacy or voting rights" (Mueller 1993:353).

The policy of universal service and access in most developing countries, including South Africa, is defined within the context of the countries' social and economic conditions, imperatives and market maturity (Universal Service and Access Agency 2008a:19). The definition of universal service in South Africa originates from the Reconstruction and Development Programme (RDP) base document of 1994, which states that:

> A basic and affordable telephone service should be available to all South Africans who reasonably request it regardless of where they live. A modern and integrated telecoms and information technology system capable of enhancing, cheapening and facilitating education, health care, business information, pubic administration and rural development needs to be developed as rapidly as possible (South African Reconstruction and Development Programme Document 2004:12, 13).

Despite definitions of universal service to mean the pursuance of egalitarianism and provision of services to those in need, South African universal service policy implementation has not advanced to satisfactory levels and prices are not affordable as envisaged in the RDP document and the South African Constitution of 1996. The Constitution passed in 1996 establishes a right to freedom of expression, including "freedom to receive and impart information or ideas" (Universal Service and Access Agency 2008a: 5). The Constitution (1996) has a particular relevance to ICTs as discussed by a reference to the Bill of Rights and it can be argued that access to ICTs, electronic communication services (ECS), electronic communication network services (ECNS) and broadcasting services (BS) is a basic right to all citizens to communicate, which essentially for full participation in society and as a basic element of the right to freedom of expression.

The fact that access to ICT is regarded as the Constitution and the RDP document as a basic right implies that the many areas in South Africa still unconnected, due to Telkom's failure to provide the necessary infrastructure, should be connected. New telecom policy should be developed to ensure that those persons still unconnected to communication networks are indeed connected. This is also due to an inability of the regulator, ICASA, to address this problem by means of imposing punitive and corrective policy measures. In other parts of the country, lack

of access to service has been a result of churn (i.e., disconnections at home as a result of non-payment of monthly line rental and usage charges). In this regard, Schofield and Sithole (2006:19) state that the fixed-line approach did less to fulfil the minimum requirements of its universal service obligations due to issues of affordability and impacts of rate rebalancing policies adopted by Telkom. Also, the latter argue, that the expected growth of mobile penetration exacerbated the problem of disconnections.

The concept and policy of universal service in South Africa are defined in the 1996 Telecoms Act No 103 and were adopted since the promulgation of the Act. Another definition recognised in South Africa is that offered by Moholi (1994:79), which states: "Universal service is a means to enable the individual, community and the nation to attain life sustaining needs, develop the self esteem and make socio-political and economic choices through telecoms".

The former USA's (now USAASA's) responsibility is to ensure that universal service is achieved. ICASA, on the other hand should regulate the industry to ensure more affordable telecom tariffs, however, by end-2007 ICASA had not achieved this goal as tariffs remained high. Universal service analysts (cf. Milne 1998:777) argue that providing a telephone in every household by government is practically impossible as not everyone can afford to pay for a telephone service. Milne argues that countries should strive to achieve universal access rather than pursuing universal service, because: "Achievement of universal service is apparently not commercially viable. Service must be affordable for those for whom it is designed".

In the United States of America (U.S.), universal telecoms (in the case of dial tone), is largely achieved, with 94 percent of households having a telephone service (Compaine and Weinraub 1997:15). The US universal service was achieved in part through the use of cross-subsidies that were made possible under a regulated monopoly scheme that governed the US telephone industry for most of the 20th century. In the US, universal service is also extended beyond Plain Old Telephone Service (POTS), to include the provision of Internet and online services. In Europe, the Organisation for Economic Cooperation and Development (OECD) universal service standard incorporates three concepts and constructs, which, according to Compaine and Weinraub (1997:19), are:

(a) Universal geographical availability - or that telecoms services should be made available, by

service operators, everywhere in OECD countries;

(b) Non-discriminatory access - or that access to communications services should be made available to all that require that service; and

(c) Reasonable costs of affordability - or to the fact that telecoms services should not be too expensive to most society members.

South Africa does not have either universal telecom geographical availability or non-discriminatory access to services. Rural areas do not have access to reliable and efficient telecom services, (cf. Chetty, Blake and McPhie 2006; Langa, Conradie and Roberts 2006). Telecom costs are high in South Africa (cf. Chapter 5). In addition to the US and Europe, many countries have established universal service policy for telecoms, e.g., South Africa, Australia, the United Kingdom (UK), Zambia, Ghana, Chile and India. In the 1990s, G7 countries also made a commitment to promoting universal service, according to Compaine and Weinraub (1997:27).

Basic characteristics of universal service, according to Hudson (1997:82-83), are equity (non-discriminatory access to a telephone) or absence of disparities in telecoms services in terms of price and availability, connectivity or accessibility to a telephone, the availability of a telephone in the entire country, and flexibility which means that government policy should be flexible and accommodate new technologies in their definitions of universal service. In South Africa telecom services are not equitable and many rural areas have no telecom services, as stated previously in this chapter (cf. Love 2005; Gillwald and Stork 2008).

The stages of universal service, according to Milne (1998:776), are:

Stage 1: Network establishment - or that a telecoms operator, like Telkom in South Africa, should establish a countrywide telecoms network. Mobile phone companies Cell C, Vodacom and MTN should also provide services in accordance with license conditions.

Stage 2: Wide geographic reach - or that services of a telecoms operator should reach as many people as possible. Providing telecom services to parts of the country, e.g., urban areas. Telecentres are a means towards this wide geographic reach.

Stage 3: Mass market take-up - this stage has not been reached in South Africa because

services are expensive.

Stage 4: Network completion - or that telecom operators should complete the rollout throughout the country to expand the market.

Stage 5: Service to individuals - or service from telephone operators, both fixed-line and mobile, should be of an international standard. Customers should be satisfied with the quality of telecoms services.

Nations reach these stages of universal service at different times, because universal service definitions and obligations differ. Universal service can mean the availability of public telephones in villages. This definition is unacceptable when people must walk more than two kilometres or drive for an hour or two to get access to basic communication services. In her budget speech in 2002, Minister Matsepe-Casaburri said:

> I personally experienced this digital divide between rural and urban South Africa recently I was attempting to reach my Director General who was attending a family funeral at a village in the Eastern Cape. I was in Pretoria. He had to travel for two hours to the nearest hilltop where he could get a signal. At one point he had to travel for two hours to receive an urgent fax. For many, these conditions have changed, but just as many are still awaiting the change.

Although the (former) Director General Ngcaba, to whom Matsepe-Casaburri refers, was using a mobile phone, in certain rural areas, cellular phone signals are not received as they should. Matsepe-Casaburri has probably experienced this divide on a single day, but many rural South Africans experience the divide.

Noam and Wolfson (1997:113) regard universal service as a universal telecoms goal of public policy to spread telecoms to most of society. Hudson (1997:82) states that as the national telephone network improves the information society grows and services other than the telephone should be added to the universal service definition. Such services include access to the Internet, e-mail and on-line databases.

In terms of Milne's (ibid.:776) stages of universal service, semi-urban parts of South Africa are at Stages 3 and 4. However, many areas in South Africa still await a telecoms service (Stage 1), which means a basic telecoms network still needs to be established. The urban areas of Gauteng Province and the Western Cape have more than 10 telephone lines per 100 persons in most parts. Rural areas with a teledensity of below five percent, such as some in the Eastern Cape, Northern/Limpopo Province and KwaZulu-Natal, need basic network establishment and they are in Stage 1. Benjamin and Dahms (1999:9) share this view and argue that: "The key policy in South Africa now is to encourage network growth into previously uncovered areas. Many of the newer technologies are making it cheaper to provide service in isolated areas. Such new systems are cellular radio and satellite based systems".

As earlier stated in this chapter (and also Chapter 1), churn (disconnections from the mainline network) has occurred due to high tariffs. Love (2005:47) states that declining teledensity and churn have in the South African telecom sector demonstrated that the objective of universal access to telecom services is not being achieved. Love (ibid.), further states that these objectives are those that are centred on the promotion of universal access, affordability, response to customer needs, fair competition within the sector, the stability of the industry, the protection of consumer interests, the promotion of smaller enterprises within the sector and the encouragement of investment and innovation.

Love (ibid.) further critiques the South African telecom policy implementation because major consumer interests are not satisfied. Many telecom consumers, big (business and international) and small (residential), have complained in newspapers and radio programs that Telkom does not provide an acceptable service. There are consumers still waiting for Telkom to either fix faults or provide services that are needed. "Of the 2.8 million lines Telkom installed, about 75 per cent or 2 million (could even be 2.5 million) lines have been disconnected and remain unused. This figure is astronomical" (Love 2005:54).

In addition to churn (disconnection of lines due to line rental and usage non-payment), South Africa's fixed-line teledensity from 1996 to 2004 decreased and continue to decrease as a result of reasons stated above and high inflation which has recently seen interest rates increases and skyrocketing petrol and food prices. This high cost of living has also influenced the decrease in telephone usage, despite the ITU (2006b:22) stating that a survey of South African mobile phone consumption and usage patterns revealed that 52 per cent of the respondents stated that mobile

phones assisted them to save travel costs and 58 per cent of the respondents had their time saved by mobile phone usage. The percentage of households with fixed-line telephones has been declining on an annual basis, and this decline is illustrated in Tables 11 and 12.

Table 11: South Africa's teledensity levels 1996-2004

YEARS 1996-2004	TELEDENSITY
1996	10.3
1997	10.1
1998	10.8
1999	11.8
2000	12.8
2001	11.5
2002	11.4
2003	10.7
2004	10.8

Source: Love (2005:48)

Table 11 indicates that the number of people (per 100 population) with access to fixed-line telephones slightly decreased and increased (1996 to 2000) then decreased again from 2001 to 2003. Telephone access by household has not been better either (see Table 12), decreasing from 27.2 in 1994 to 25.1 in 2002.

Table 12: Percentage of households with a fixed-line in South Africa: 1994 – 2002

YEAR	FIXED-LINE (PER CENT)
1994	27.2
1995	30.1
1996	29.8
1997	29.1
1998	30.5
1999	31
2000	31.7
2001	28.7
2002	25.1

Source: Love (2005:51)

The conclusion drawn from Tables 11 and 12 is that South Africa does not compare well with other middle-income countries which have an average teledensity of 49.8 in 2002 (Love 2005; Padayachie 2005).

Another drawn from Tables 11 and 12 is that South Africa does not compare well with other middle-income countries which have an average teledensity of 49.8 in 2002 (Love 2005; Padayachie 2005) whereas South Africa had an average teledensity of 11.4 per cent in 2002 which is drastically low compared to the other middle income countries.

In addition to lowering teledensity and declining household landline connections, seven small businesses were licensed as under-serviced area licenses (USALs). This reveals that government has not done enough to promote widespread access to telecom services and ownership of telecom companies by small business. In other countries many companies compete for service provision, especially of local telecom services. Initial government plans publicly announced in 2003 that 10 USALs would be licensed but at the end of 2004 only four received operating licenses.

Furthermore, Chetty, Blake and McPhie (2006:14), claim that USALs may not be the answer for deploying telecoms in under-serviced areas because USALs had experienced operational problems "due to the nature of the application process". USAL development has also been adversely

affected by other industrial developments. First, the government determined that value-added network services (VANS) and private telecoms networks to provide their own infrastructure. This meant that USALs no longer rely on obtaining revenue from alternative telecoms infrastructure to VANS and mobile operators in under-serviced areas. Second, pay phones in rural areas have a high call rate per phone since there are not many communication options in these areas. Allowing alternative provision of pay phones reduces an advantage USALs may have to provide such services in rural and remote areas. Third, as the state law states that all schools must receive a 50 per cent discount for Internet access, this removes a potential revenue stream for USALs in remote regions. Finally, while part of the original triad allowed the use of VoIP (Neotel, USALs, Telkom), USALs were financially disadvantaged to the extent that they were unable to use services such as VoIP.

Some of the objectives that have been met by the South African telecom policy include the efficient use of the radio frequency spectrum, the empowerment of the previously economically disempowered groups, by promotion, telecom industry ownership and control, and easier access to telecom services and use of such services by physically disabled individuals (Love 2005:47). The economic empowerment of black groups has been mainly pursued through the purchase of shares during the privatisation of Telkom, the Khulisa offer and the listing of Telkom at the JSE. These processes, however, empowered only individuals who had economic power to buy those shares. South Africa's previous definition for universal service was: "Universal service is making telecoms services, including advanced telecoms services, available throughout South Africa at affordable prices so that they are available to anyone whenever they are needed, regardless of geographical or physical locations, and with due regard to people with special needs" (USAASA 2008a:20).

In view of the still unmet telecom objectives of universal telecom access and service and also because convergence has changed the telecom landscape by offering multimedia instead of just voice or POTS, the USAASA proposed the following new definition for universal service: "A reliable connection, from any part of the country, to a defined minimum set of electronic communications services and broadcasting services, at an affordable rate regardless of geographical location" (USAASA 2008a:23).

The above definition is considered to include three critical aspects that should be achieved by new universal service targets:

(a) Availability. This means that there should be country-wide availability of telecom, electronic and broadcasting services for use by everyone, including in under-serviced areas and by disabled persons;
(b) Accessibility. This factor means that all persons should have reasonable access to electronic, telecom and broadcasting services, with no unfair discrimination in terms of price, service and quality, irrespective of location or other factors; and
(c) Affordability. Electronic, telecom and broadcasting services should be affordable to members of the public, "including low income populations".

It will still be a challenge for the communications industry players, including the ministry, ICASA and service operators, to ensure that the three goals stated above are achieved beyond 2008 and consumers will be expecting telecom prices to drop to affordable levels. In view of the foregoing, telecentres should thus be seen as one of the key measures to assist in the provision of universal access to telecoms services, along with public phone shops by mobile phone companies, MPCCs established by the GCIS and the private sector, public telephones by Telkom, and similar services.

2.10 TELEDENSITY

Teledensity is a measure of national fixed-line telephone (other countries now include mobile phones in their definitions of teledensity) access per hundred inhabitants. Hudson (1997:502) defines teledensity as main telephone lines per 100 people. The ITU (1998:6) regards teledensity as a common yardstick by which telecom penetration is compared. The standard measure for telephone penetration is teledensity or the number of main lines installed by telephone companies per 100 persons. A main telephone line is a connection from a telephone exchange to a subscriber.

South African mobile phone companies have improved South Africa's teledensity, although they also charge prices regarded by analysts as high. Milne (2006:17) asserts that in mobile telephony and software-based service markets, affordability is no longer a concern and the value-added network services (VANS) that these systems permit is endless. Micro-pay is an innovative approach improving affordability of services. Milne (2006:18) provides mobile phone prices for selected developed and developing countries (cf. Table 13). Table 13 demonstrates the disparity even though the mobile phone technology used is similar, and raises the question why some

operators are charging high prices. Telkom South Africa is among these companies. By 2008, mobile phone expenditure per month in African countries was high (Gillwald and Stork 2008:3). The Research ICT Africa study (ibid.) revealed that the average mobile expenditure 12 African countries had increased and the percentages for the expenditure were (in US$), 15.88 in South Africa, 12.52 in Cote d' Ivoire, 11.41 in Namibia, 10.44 in Ghana, 10.41 in Kenya, 10.18 in Botswana, 8.36 in Benin, 7.14 in Cameroon, 6.26 in Mozambique, 5.84 in Burkina Faso, 5.75 in Uganda and 3.81 in Ethiopia. A comparison of the 12 countries' prices indicates that South Africa's prices are the highest per month (cf. Table 13). Also, "International costs are gradually dropping but in South Africa they remain stubbornly high" (van Rensburg 2009:17). Therefore, ICASA (or even the Competition Commission could propose this to ICASA) should drop the tariffs and regulate for cheaper telecoms prices.

This happens in several countries where regulators ensure that they drop the prices of expensive service providers and pay attention to public needs. For example, in 2009, the British Competition Commission ruled big cellphone networks had to reduce their interconnection tariffs to four per cent (about 52 cents) by 2010/11, according to Research ICT Africa (in van Rensburg 2009). Also, in Namibia it was also decided in 2009 that interconnection fees be reduced by 43 per cent, and Namibian telecom regulators further plan to have the tariffs be just 30 cents a minute by 2011, which is very affordable compared to South Africa's current R1, 25 (compared to 24 cents in Cyprus and 38 cents in India, per minute). South Africa has no reason therefore why it should not drop high telecom prices and related costs and follow the examples of the European Union (EU), Namibia and Britain

Table 13: Mobile prices (prices in US$), 2006

Country	Price	Country	Price	Country	Price	Country	Price
Hong Kong	2.19	Turkey	6.59	Korea	14.06	Peru	22.41
India	2.51	Thailand	6.67	Venezuela	14.37	Brazil	23.52
China	3.67	Canada	7.34	South Africa	14.87	Germany	24.05
Indonesia	3.96	Poland	7.45	Sweden	15.63	Netherlands	24.62
Philippines	4.00	Israel	9.25	Czech Republic	16.66	Belgium	24.96
Taiwan	4.96	Argentina	9.96	Australia	18.34	Austria	26.51
Singapore	5.73	Colombia	10.37	United Kingdom	19.08	Japan	28.04
Egypt	5.77	United States of America	11.77	Chile	19.21	France	30.25
Malaysia	5.81	Hungary	13.76	Denmark	19.86	Switzerland	32.07
Russia	6.36	Italy	14.01	Spain	21.45	Mexico	33.17

Source: Milne (2006:18)

Furthermore, Milne (ibid.) suggests that operators do not consider that the prices are too high and point to intense competition and difficulty attracting investment. A fully informed view on this issue requires access to information which only the operators possess, and which they regard as commercially confidential.

2.10.1 The need to transfer technology to and subsidise the telecommunication of disadvantaged groups

South Africa has telecom “needy groups” that have an unmet demand for services. These groups require subsidies because they are unable to afford services or reside in areas without telecom services. Technology and ICT skill should therefore be transferred to these groups in the quest to

widen local telecom reach. Gillwald (2001b:25) states that at a conservative estimate, 39 per cent of all households are unlikely to be able to afford a telephone in the near future, and that without some form of assistance or subsidy, one way of overcoming the most immediate restraint is by subsidising the cost of the service to the receiver as specified by legislation. Ideally, this is what led to the establishment in South Africa of the Universal Service Fund (USF). The USA has to define categories of needy people that qualify for subsidies.

South Africa has attempted to define affordability-related targets for both household-level and publicly accessible telephony (Milne 2006:28). Uncertainty about the legal framework and industrial structure, and continually changing realities on the ground made it difficult to draw definite conclusions. However, the user categories identified in South Africa are:

(a) Group 1: Users that can afford the national levied prices and receive telecom service (no subsidy required);

(b) Group 2: Users that can afford the national levied prices and receive telecom service, but reside in a high price location (operator needs a subsidy);

(c) Group 3: Users that are receiving telecom service but unable to maintain connection or maximise utilisation (users need support). Support could be in the form of financial relief or customised customer premises equipment (CPE);

(d) Group 4: Intra-marginal users currently lacking service and located throughout the country, and are unlikely to afford a telephone in the foreseeable future (users need subsidy); and

(e) Group 5: Potential users that can afford the national levied prices but currently do not receive telephone service (users do not need subsidy).

Various telecom subsidies are in use in many countries which South Africa could introduce to accommodate users unable to afford services. Such methods include the European Union's (EU) pre-payment systems and phased payment of connection fees (Milne 2006:29). The Philippines uses a fixed monthly fee and low monthly fees with a per minute charge. Simpson (2004:233) argues that while it is important to consider issues of economic efficiency in the telecoms sector,

this should neither obscure nor compromise the need to create progressive, socially responsible, universal service reflecting the requirements of 21st century user.

Simpson (2004:237) reiterates that the ability to access telecom services is no more socially important than, for example, ownership of a car. Nonetheless, if indeed telecoms are considered to be socially important as to require a redistribution of income from sections of the population to, then this might be achieved through the government via the general taxation system and specific schemes targeted at particular groups deemed in need of subsidy. Research shows that a "blanket" universal service system can benefit high-income users to low income groups (Simpson 2004:243). Furthermore, Simpson (ibid.) suggests the possibility of using a first mile perspective, where defining and catering for community needs are given priority, unlike last mile perspectives which focus on corporate communication service providers and their requirements. For this to occur, government needs to facilitate a greater participation in the evolution of universal service policy for non-governmental organisations (NGOs), e.g., community and social welfare groups (dealing with issues of the elderly, women and the disabled for instance).

2.11 DIGITAL DIVIDE

The digital divide is often described as the difference between developed and developing countries in terms of telecoms infrastructure and information services. It also refers to the differences in telecoms infrastructures and information services of urban and rural areas in LDCs. MDCs have advanced communication services and their people have adequate access to ICT. Alternatively, most people residing in LDCs have little access to ICT. Choi (2005: 4) defines the digital divide as disparities in access to information and devices across groups. In the latter definition, information devices include telephones (either fixed-line or mobile), personal computers, and the Internet. Groups may vary by context. It can be economic status (rich versus poor or "haves" versus "have-nots"), social class (white versus blue collar), gender (man versus woman), age (young versus old), region (urban versus rural) or sovereign nations (wealthy versus poor economies) (cf. Hargittai 2003; Barzilai-Nahon 2006; Fuchs and Horak 2008; Gutierrez Gamboa 2008).

Describing some aspects of the digital divide, Davison, Vogel, Harris and Jones (2000:1), state that only a tiny percentage of Africans have Internet connectivity, perhaps one in ten outside South Africa. These technology and information differences between rich and poor countries demonstrate

the inequity of the digital divide. Benjamin and Dahms (1999:2), concur with Davison et al. (2000), when they argue that: "In countries of the South and especially in Africa, the vast majority of the population have no access to ICT or training to use them. In poor countries there is also a powerful minority who do have access to ICT and that these elites usually have more interests in common with the elites from other countries than with the rest of the population in their own countries".

2.11.1 Theoretical examination of the digital divide and stages in the digital divide

A theoretical examination of the digital divide traces its origins to the centre-Left social inclusion policy agenda of the 1980s and 1990s to its current status of political "hot topic" (Selwyn 2004:341). In many ways the digital divide can be viewed as a practical embodiment of the wider theme of social inclusion, which was prominent in policy-making throughout centre-Left governments in western countries. In the 1990s, countries such as the UK, France and the Clinton/Gore-era US witnessed a subtle shift towards socially-inclusive policy agenda and the issue of combating social exclusion and establishing an "inclusive society" now forms a bedrock of academic and political discourse in many countries (Selwyn 2004:343). "The information age does not have to be the age of stepped-up inequality, polarisation and social exclusion. But for the moment it is" (Castells 1999: 403).

The ICT inequality Castells refers to above is the digital divide, which results in social polarisation and exclusion because the poor who cannot afford to access and use ICT, are unemployed, uneducated and remain so since they are unemployed, while the rich are upward mobile, have ICT access and further employ ICT for personal advancement and economic prosperity. Van Dijk (2006: 183) terms this phenomenon "the Matthew effect", which was coined by the sociologist Robert Merton in 1968. According to the Gospel of Matthew: "For to everyone who has, more shall be given" (Matt. 25:29, New American Bible). A popular version of this is the rich get richer". Therefore, one of the social and economic consequences of the digital divide is the Matthew effect. Interventions to reduce the divide should be implemented because reducing the divide could assist toward the reduction of social ills, including illiteracy and poverty, which are South Africa's major problems.

Furthermore, the digital divide is widely defined and understood as occurring in the stages

tabulated in Table 14:

Table 14: Stages in the Digital Divide

Stages towards dealing with the digital divide	Infrastructure and ICT usage
Formal or theoretical "access" to ICT and content	Provision of ICT at home, community and work settings
Effective or meaningful access to ICT and content Use of ICT	Provision of ICT at home, community and work; individual access to the provided (by government, private sector or other provider) ICT and meaningful ICT usage
Engagement with ICT and content	The user should exercise control and choice over technology and employ ICT to one's advantage and development. ICT content should be relevant to the user and should, if possible, be in the user's local language for message effectiveness
Outcomes of ICT usage (actual and perceived) Consequences of ICT usage (actual and perceived)	Relevant content leads to positive benefits arising from ICT usage and these benefits range from *production of new content, political, social, consumption, and savings.* If ICT is not relevant to the user, ICT may have a negative or no impact on the user. Users should, therefore, create their own relevant content in the ICT environment instead of consuming existing irrelevant ICT content

Table 14 was adapted from Selwyn (2004: 352)

Table 14 illustrates forms of activity that result from using ICT. These activities are production, political, social, consumption and savings (Selwyn 2004: 343-349). Production activity implies engaging in an economically or socially valued activity, such as paid work, education or training

and caring for a family. Telecentres engage in productive activity, because they employ persons who earn a living, and others offer educational services in the form of computer literacy training. Social, economic and political capital are strategic resources required to reduce the effects of the digital divide by reducing the digital and information gaps between the "information poor" and "information rich", thus reducing "digital exclusion" and promoting "digital inclusion".

In South Africa, more production activity could occur at telecentres, if telecentre managers and users gain access to social and economic capital. Social capital means that individuals should want to use ICT for their own benefit and should further use ICT to uplift themselves. Van Dijk (2006:179) terms social capital "motivational access", which means that people should be motivated to use ICT out of their own volition. Motivation then depends on an individual and each individual should encourage oneself to access and use ICT meaningfully. Motivational access also requires that any social, cultural and psychological fears or inhibitions to access and use ICT be eliminated before accessing and using the ICT.

Economic capital means that finance should be accessible to telecentre managers and users, which can assist these groups to make better use of ICT, because finance provides access to other human and technological resources. Van Dijk (2006: 179) terms this required economic capital "material access" to ICT, and regards it as very crucial since it enables the ICT users to gain skills required to understand and use ICT, namely, strategic, informational, operational and digital skills. These skills involve knowledge required to use computer software and hardware so that one can be employable or operate in the ICT sector and network society where Internet communication is crucial. Motivational and material access, are therefore important requirements for ICT access and skills development. Innovation occurs after ICT users have acquired ICT skills and mastered ICT usage. Finance or economic capital is an important driver of ICT skill acquisition. Finance also provides access to networking facilities and opportunities, which further open other personal development opportunities. Political capital, or government support in different ways including finance, human resources and technology, is also required and necessary to build ICT infrastructure in communities, thus providing "access to ICT".

Political capital provides economic capital and access to ICT, but community members need social capital or take their own initiative to make use of the available ICT to improve their lives and ensure that ICT usage results in positive outcomes such as development of new local ICT content

and community development projects. Digital inclusion therefore depends on oneself, based on interest and affordability of ICT usage.

Social activity means engaging in significant social interaction with family and friends through ICT, and identifying with a cultural group or community. Political activity involves participating in online political discussions, if one has access to the Internet. Previous South African telecentre research (cf. Chapter 4) has not identified much of this outcome as a result of telecentre or ICT usage. Perhaps future ICT studies may shed some light onto some meaningful social activities local telecentre users engage in. Research has also not identified consumption activity as a result of accessing and using local telecentres. Similarly, this could be revealed by future research. The 2008 South Africa ICT access and usage study revealed that mobile is not yet the total solution to low levels of access to ICT (Gillwald and Stork 2008:1). A major area of concern is the low penetration rate for the Internet. While in other African countries those without home Internet use cybercafés to get online, in South Africa this is achieved primarily through work and school (ibid:2).

Savings activity means accumulating savings, pension entitlements or owning property (Selwyn 2004:351). Benjamin (2001a)'s telecentre research identified savings accumulated by local telecentre managers. For example, Benjamin (2001a) stated that Phalala and Mothapo telecentres in Limpopo Province were both "making money, supported in their community". Although minimal, such savings afforded the managers a minimum living wage to reduce poverty but not live in luxury. No pensions or property ownerships have been identified as having resulted from owning or operating a local telecentre (cf. Chapter 4), but emerging small and medium-sized enterprises (SMEs) owners have been identified locally as owning telecom companies such as phone shops and web design companies. Also new BEE millionaires have invested in empowerment stakes in previously state-owned telecom companies (e.g., Telkom). Details of some of these millionaires and figures are stated in Chapters 1 and 5. Therefore, ICT access and usage, locally, has resulted in the reduction of the digital divide although to a limited scale. Economic and educational benefits have also been gained as a result of ICT access and usage, but these have also been minimal.

2.11.2 The digital divide theoretical model

The digital divide existed in the 1970 to 1980s as well, except that at that time it was known as the

telecoms and information gap between the First World (developed countries) and the Third World (developing countries). In the 1970s, the New World Information and Communication Order (NWICO), an initiative of the United Nations Educational, Scientific and Cultural Organisation (UNESCO), attempted to balance inequalities between the flow of technology and information between developed countries (known as the centre) and developing countries (the periphery) by establishing the NWICO. The historical evolution of the NWICO related directly to the concept of free flow of information between countries (Oosthuizen and Qakisa 1996: 120-123). It aimed at promoting information flow from the developing to the developed countries, e.g., promotion of news reporting of more positive news from the developing countries and about the developing countries by global news agencies would be encouraged, as would the idea that developing countries themselves should promote positive reporting about themselves in global media.

The NWICO was established in Algiers, Algeria, in 1973 and can be regarded as having partially succeeded in having the voice of the developing countries represented in global media reporting, although there is still room for improvement, by both the developed and developing countries, together with their news agencies. South Africa has also been making strides in this arena, having expanded its SABC news coverage in the rest of Africa, and also established SABC news offices in different parts of the world, including the US and Europe. In the US, some SABC reporters are based in New York and Washington, while in Europe they are based in Brussels, Belgium and mostly travel through the content to cover African news.

Consequent to the NWICO, the World Summit on the Information Society (WSIS) was developed by the ITU, aimed at finding new ways of addressing the digital divide, beyond 2000. Between the NWICO and WSIS, regional ventures to address Africa's position in the information society were developed in the 1990s, including Africa's Information Society Initiative (AISI), an initiative of the Economic Commission for Africa (ECA). The AISI was founded at the 21st session of the conference of African ministers of social and economic development planning in Addis Ababa in 1995 (Thapisa and Birabwa 1998: 49-52). At that conference, the African leaders took a resolution supporting the adoption and usage of ICT for development by African countries, and the resolution led to the establishment of working groups who would consult with ICT experts in Africa and beyond, with a view to devise strategic plans and strategies aimed at implementing African ICT projects for development. Policies such as liberalisation and privatisation were adopted by African governments, as a result of the ECA's promotion of the policies to member countries. The ECA

also promoted regional cooperation and fund raising for the spread of ICT in Africa. The ECA stated in 1999 that Africa needs better infrastructure to increase demand and lower costs (*Africa Recovery* 1999:17).

Global communication governance is characterised by recurring tensions between the neoliberal imperatives advanced by a powerful Western state-corporate alliance on the one hand and communication rights championed by developing countries and civil society groups on the other (Pickard 2007:119). Although belonging to different periods, the NWICO and WSIS bookend a 30-year ascendance of neoliberal logic in global communications. The "Washington consensus" conception of neoliberalism is characterised by fiscal austerity, the privatisation of state-controlled programs and liberalised markets stripped of all potential impediments – tariffs, subsidies and other protections – to transnational commercial interests of transnational corporations (TNCs). TNCs, while expanding markets through globalisation, promote "digital capitalism", while shirking labour standards, consumer protections and public interest provisions (Pickard 2007: 120-121). These market developments have occurred in South Africa, consequent to the South African telecoms liberalisation policy (cf. Chapter 5).

The NWICO promoted national sovereignty and argued for promoting developing countries' access to mass media, communication technology and information, while also promoting the voice of the South in the global information highway and flow. Furthering goals similar to those of the NWICO and the AISI, WSIS, in Tunis, Tunisia, also aimed at assisting countries to devise strategies attempting to bridge the digital divide. By 2003, the first WSIS summit took place in Geneva, Switzerland, and generated the Declaration of Principles (DoP) and Plan of Action). Lobbying groups pushed the gender-in-ICT agenda or promotion of women's access to ICT and training of women in ICT skills, and development of regional and national ICT strategies aimed at eliminating barriers inhibiting women's access to and usage of ICT (Gurumurthy, Singh, Mundkur and Swamy 2006: 9).

WSIS furthered the neoliberal aim of reducing the digital divide between North and South but debates struggled to provide final financing and implementation solution. However, WSIS succeeded in bringing together governments of the North, South and international agencies to debate issues pertaining to the digital divide and proposing new ICT interventions aimed at reducing the divide, including:

(a) providing women with access to mass media and ICT;
(b) training more women in the mass media and ICT sectors;
(c) developing communications and information networks that benefit women;
(d) promotion of diverse and positive portrayals of women in media and ICT content;
(e) promotion of positive values in media, such as peace, respect and non-discrimination and
(f) promotion of ICT usage for development (ICT4D), also in view of the Millennium Development Goals (MDG) set by the ITU, which include eradication of poverty and illiteracy by 2014 especially in LDCs.

The second phase of the WSIS was aimed at focussing at the digital divide although much attention was paid at the summit to Internet governance issues (Tongia 2006:2). The digital divide relates to connectivity, and not a cause but a symptom of other divides, spanning economic, gender, age, geographic and other divides. The Four A theoretical model for thinking about and addressing the digital divide:

(a) *Awareness*: People should gain knowledge about what ICT can be used for, and should be open-minded about using ICT. In other words, this refers to the "social capital" or "motivational access" discussed earlier in this section, which individuals should possess if they are to employ ICT effectively;
(b) *Availability or accessibility*: This means that ICT should be available to users within reasonable proximity, with appropriate hardware and software that users are able to use. Also, the necessary ICT training should be available at an ICT centre. Telecentre staff should be well-trained to impart ICT skills to telecentre users and should also train themselves periodically in ICT skill as a need arises;
(c) *Ability to use ICT:* This requirement relates to the ability to use ICT, including computer literacy, understanding of computer language, what Van Dijk (2006: 179) terms digital skills to operate computers; and
(d) *Affordability:* This means that persons should spend only a few per cent of one's income on ICT usage (below 10 per cent. In other words, ICT usage should be made affordable by service providers. If ICT usage is expensive, poorer members of society are unable to employ it.

Reducing the digital divide requires that improvements be implemented in processes of ICT provision or delivery. Tongia (2006: 3) proposes Four C Framework which national governments, with assistance of the private sector, could adopt, towards dealing with the digital divide. The Four Cs are computing, connectivity, content and capacity development (or human resources development of ICT skill training):

(a) *Computing*, which refers to the provision of computers to members of society, whether at home, schools, telecentres or libraries
(b) *Connectivity,* which indicates connectivity of people worldwide to telecoms networks to enable them to access ICT services. Mobile phones assist in speeding up connectivity;
(c) *Content,* which refers to relevant and meaningful ICT content for users. It is advisable that ICT content be in local languages, for relevance and effectiveness; and
(d) *Capacity,* which refers to the need for ICT skills training for people employing ICT. Governments and the private sector should play a leading role in this regard because of their access to funding, new technology and technological knowledge or innovation.

To conclude, Lie (2001a: 6) states that the digital divide is real, and that there exists a widening gap between access to ICT in the Northern (developed) countries and access in the Southern (developing) countries. Telecentres are necessary to bridge the infrastructure and information gaps in LDCs. For the digital divide to be bridged, it is also imperative that developing country governments should provide people with access to ICT (Mashile 2001; Sukazi 2001; Nxasana 2001a, 2001b). Some examples of local ICT projects aimed at bridging the rural-urban digital divide are the Department of Communications wireless Internet laboratories (DoC-WILs), cyber-laboratories, post office information centres, also known as public information terminals (PITs), Internet provision to schools (e.g., E-Rate), community digital hubs, satellite broadcasting classes to schools and Thusong Service Centres (cf. Roodt and Conradie 2001; Tlabela 2001; Universal Service Agency Impact Document 2005; Universal Service Agency 2006a; Universal Service and Access Agency 2008a). South Africa, like other African countries, continues to establish ICT access points although there is still some way to go for many persons to access ICT. Examples of these ICT access points are stated in Table 10 (cf. Chapter 1). Other African countries with universal service policies include The Gambia and Botswana.

The Gambia wants phones in all villages of 2,000 people or more, as does Botswana for villages

with at least 500 people (ITU 1998:10). Developed countries are assisting LDCs in the provision of this access through projects like the Digital Opportunity Task Force (DotForce) and NEPAD. DotForce is a World Bank Program, aimed at providing ICT to people in the developing world. NEPAD is an African initiative that has been supported by business and African governments. What is apparent in the above discussion is that parties with access to economic capital or funding, should be actively involved in providing ICT access at affordable costs to those residing in developing countries. ICT centres should be located at close proximity to users, and users should be provided with adequate ICT usage skills by those who have adequate funding and ICT know-how. It is also imperative that ICT content be in languages understood better by users, for message effectiveness and positive impact.

2.12 TECHNOLOGY TRANSFER

Science and technology are widely recognised as important factors in the economic transformation of LDCs. These fields still have to be developed in Africa and most Africans need education and technical training to be more productive. According to Bell and Sadlak (1992:11) technology transfer is: "A process in which knowledge, cost, risk, and benefit are shared among various economic entities in modern human society".

Kim (2003:61) argues that technology transfer and capital investment can provide LDCs with economic growth. An important aspect of technology transfer is local adoption and learning how to use the technology. Learning necessary technical skills is crucial because it determines the success of technology adoption. Mansell and Wehn (1998:60-1) state that when technology transfer does not yield the know-how expected by users, technology fails to spread. Some telecentres still need to establish the working relationships with the private sector.

Bozeman (2000:629) states that technology transfer has many uses including the movement of know-how, technical knowledge or technology from one organisational setting to another. The term has also been used to describe and analyse a wide range of organisational interactions involving technology. Sources of technology have included firms, government agencies, and laboratories, universities, non-profit research organisations, and entire nations. Users include schools, police and fire departments, small business, legislatures, cities, states and nations. In this study, technology is transferred from government agencies such as the GCIS and the USA, to local communities including individuals and groups which own and operate telecentres.

Transfer of ICT skill is undertaken by the agencies upon establishment of the centres and after providing the technology to the relevant parties. ICT skill is transferred, e.g., by the USA to telecentre managers and ICT trainers and they, in turn, teach ICT skills to telecentre users who make use of the telecentres on a daily basis. Although more ICT skills still need to be provided to telecentre users and also the managers themselves, ICT capacity building continues to be a challenge in local telecentres because there remain ICT skills shortages. The former Deputy President, Ms Phumzile Mlambo-Ngcuka has publicly stated that the new government skills-development programme announced in 2006 (Accelerated and Shared Growth Initiative for South Africa, ASGISA), is aimed at ICT capacity building at all levels of government. One of the outcomes of this project was to identify specific ICT skills required in different occupations nationally and training the jobless and less educated to attain these skills. ASGISA also plans to train those already in jobs to improve their performance and productivity (Mlambo-Ngcuka 2007). Universities were urged to participate in ASGISA skills-development projects and assist in imparting ICT skills to community members.

2.13 GLOBALISATION

Scholars mostly view globalisation an economic rather than cultural or social process. Castells (1998), states that globalisation also refers to media, information systems, international institutions and the electronic networking of states. Telecentres, as information systems, are a global concept, which started in Europe and spread to other regions via international funding agencies, non-governmental organisations (NGOs) and local government agencies. The impact of globalisation on countries, ICT and labour markets was mentioned in the digital divide discussion above.

Globalisation has facilitated telecentre development in LDCs, including South Africa because of globalisation of capital (through global funding agencies). Economic globalisation is a process through which economic activities are conducted at an international level. According to Chen (2001:2), economic globalisation is characterised by an increasingly liberal approach to international trade in goods and services, and international capital flows. Hamelink (1994:110) describes economic globalisation as the emergence of global consumers who insist on global services and products supplied by global distributors. Social globalisation means that local events are influenced by international events and social activities. Mass media and telecoms technologies

such as the Internet result in social globalisation, in addition to other international social and business visits abroad, and tourism. Local events are also interpreted (and sometimes adopted) at the global level in a process known as localisation.

Cultural globalisation is a result of communication and information transfer internationally. Both old and new media perform this transfer function. Telecentre users are in a position to experience social and cultural globalisation from using the Internet. Conradie (2001:71-2) states that global impacts on local societies occur directly (e.g., the impact of the international exchange rate on local currency) and indirectly (e.g., impacts mediated by intervening variables such as individual cognition, values, perceptions and attitude). Conradie believes that socio-cultural variables, such as local variables help determine the perceived importance of global forces in an industry, and also contribute to the local impact of (and responses to) globalisation. It follows that socio-cultural characteristics influence attitude toward, the use of telecentres for personal development. Telecentres could be instrumental in the creation of local knowledge, influencing global interpretation of the local, and creating "globalisation from below, which is characterised by the creation of new local knowledge as a result of ICT usage" (Lie 2001b: 22).

The concept of globalisation is relevant for this study in the sense that telecentre development is a direct result of globalisation (see Chapter 1) and in the sense of South Africa having followed the global trends of liberalisation and privatisation in its ICT and telecoms policies. Having started in Scandinavian countries as "social experiments in promoting use of advanced information and communications technology" (Benjamin 2001b:6), telecentres spread to South Africa through influences of global telecoms and global research institutions such as the ITU and the Independent Development Research Centre (IDRC). South Africa joined the ITU in 1995 and has been influenced by technology standardisation and ICT development policy issues of the ITU and the WTO.

Furthermore, what Lie (2001b:17) terms "globalisation as development from below" because development programmes in the past have promoted "globalisation as development from above" (which is supported by the dominant paradigm to development and the modernisation theory of development) is noteworthy. Assumptions of the "globalisation as development from below" approach are similar to the assertions of the New Partnership for African Development (NEPAD) initiative developed by African countries to devise economic and political strategies aimed at

improving Africa's economic status, in cooperation with developed countries (which assist with funding and other support).

NEPAD promotes what Lie (ibid.) terms "grassroots globalisation" (participatory approaches to development). The NEPAD bottom-up approach to development adopts the participatory approach to development for a "change for the betterment" of the lives of ordinary people in the manner desired by those people, e.g., the NEPAD e-schools demonstration (known as the e-schools demo) project initiated in several African schools, including South Africa (cf. South African Presidential National Commission on Information Society and Development 2007). That is, local people decide on a development strategy as a means to improve their lives based on what their problems are and how they propose these problems be solved, using strategic alliances with government, development agencies and parties assisting communities with development projects.

Critics of "globalisation as development from above" argue it is a "linear way of thinking", a "positivistic and behaviouristic way of thinking", the "Western way of thinking" and is an "approach that development is primarily of an economic nature" (Lie 2001b:18). Karim (2004:102) argues that globalisation from above also involves the collaboration between leading states and the main agents of capital formation, and that at the intergovernmental tier, international policy and legislation that governs other forms of transnational communication is shaped. Bodies such as the United Nations, the WTO, the ITU and the World Intellectual Property Organisation (WIPO), operate at this level while transnational corporations also play a major role in promoting globalisation from above.

Conversely, globalisation from below is promoted mainly by organisations that do not have strong links with government and large corporations. Examples of organisations facilitating this kind of globalisation include transnational civil society bodies such as Greenpeace , Amnesty International and the International Committee for the Red Cross (Karim 2004:102). Academics and professional associations, religious organisations and diasporic groups also participate in globalisation from below by developing lateral communications. Although these groups may not directly oppose international governmental activities or transnational corporations, they are nevertheless distinct from them.

Globalisation is often critiqued for negative consequences on developing countries, (cf. Chitty

2004:52); especially that globalisation leads to fragmentation, McDonaldisation and piracy. It is argued that it leads to the disempowerment and reduction in people's ability to define themselves and to construct their frameworks for self-empowerment and localisation. However, counter arguments assert that globalisation has transferred needed technology to developing countries for their benefit.

2.14 THE RECONSTRUCTION AND DEVELOPMENT PROGRAMME AND THE GEAR ECONOMIC STRATEGY

The place of ICTs, therefore, telecentres, in the RDP is discussed in section 2.7 of this chapter, which describes why the RDP and the Constitution regard ICTs as important for South Africa's development and access to ICTs should be provided to members of society. According to the Reconstruction and Development Programme (RDP) White Paper (1994:4), the RDP was an integrated coherent socio-economic policy framework that seeks to mobilise people and the country's resources toward the eradication of apartheid's ripple effects and the building of a democratic, non-racial and non-sexist future. The RDP represented a vision for the fundamental transformation of South Africa. The activities of the RDP were aimed at economic empowerment of citizens and poverty alleviation, especially in rural areas, and areas previously known as "homelands". Principles enunciated in the RDP White Paper, were:

(a) South Africa requires an integrated and sustainable development programme. Therefore, all levels of government should pay attention to implementing social programmes that are affordable, given that the country is committed to fiscal discipline;
(b) The RDP is a people-driven process. Members of communities inform the government, through various mechanisms and media, what they need in their communities and the government plans to provide those services. Participatory communication between government and civil society is the cornerstone of the RDP;
(c) RDP projects should ensure peace and security for all South Africans. This is an important goal enshrined in the country's constitution;
(d) RDP projects should be geared towards nation building or improvement of lives;
(e) Nation-building leads to reconstruction and development. This means building new bridges to transform or develop communities. PPPs, discussed in Chapter 1, contribute to this development by sharing ideas, and financial resources to improve communities; and
(f) People should work toward the democratisation of society. This involves the reduction of

economic deprivation. South Africans have political freedom but most lack economic prosperity because they are uneducated. RDP projects aim to create work for the economically deprived to reduce poverty.

The 1994 RDP document is the key framework for the South African government's activities and provided the overarching context from the development of universal access (Parkinson 2005:17). The RDP referred to ICT as powerful tools for multi-sector development and emphasised the need to strengthen media diversity, including community media, and to encourage the exchange of information between citizens and the government. Within the RDP framework came the Urban Renewal and Integrated Sustainable Rural Development Strategy (ISRDS), which promote people's involvement and initiative in development projects aimed at their communities' development. These development strategies suit community development better than the apartheid way of community development, whereby the apartheid government imposed development on communities and did not involve community members in the planning of projects. Apartheid also limited the development of most communities located in the "homelands" (cf. Horwitz 1997).

Telecentres, as development projects run by government, form part of the ISRDS development strategy, while promoting participatory communication between community members and government agencies responsible for that community development, e.g., the USAASA and GCIS. The process involves communities making written applications for telecentre ownership to the USAASA and, after negotiations between the community and the USAASA, the centres are granted to the communities. Members of those communities then receive initial ICT and management training.

The RDP was funded out of government expenditure on redistributive social spending, and supplemented by foreign aid and joint-financing deals between the government and the private sector (Bucknell, Lee, Skuster and Thornton 2002:1). The RDP was progressive in nature, envisioning a Keynesian economic framework of fiscal expansion-led growth, but was relatively silent on how sustainable economic growth would be achieved (Bucknell et al. 2002:1). Furthermore, the specially set-up RDP ministry lacked political and operational authority to coordinate government departments and ultimately closed. Although the RDP Ministry was closed down, various RDP projects (for example housing development) were distributed to respective government departments which now run the projects.

In 1996, South Africa's gross domestic product (GDP) grew at three per cent and inflation had declined to 8.5 per cent, but there remained a stark income inequality, low investment and savings, and high unemployment (Bucknell et al. 2002:2). The ruling African National Congress (ANC) government faced structural problems including deficit spending, slow economic growth, a growing current account deficit, depreciating currency as well as rising unemployment. There was then an urgent need for the government to devise an economic strategy to deal with these structural problems. Thus the Growth, Employment and Economic Redistribution (GEAR) strategy for fiscal and monetary discipline was developed.

Heintz (2003:1) argued that the GEAR policy was introduced in June 1996 by the Department of Finance (now National Treasury). It proposed a set of medium-term policies aimed at the rapid liberalisation of the South African economy. GEAR is a set of policies including relaxation of exchange controls, trade liberalisation, "regulated" flexibility in labour markets, strict deficit reduction targets, and monetary policy aimed at stabilising the Rand through market interest rates (Heintz 2003:1). Another economic aspect promoted by GEAR is the privatisation of state assets which was negotiated in 1996 through an agreement between the government, business and labour the National Framework Agreement (NFA).

The GEAR document contained ambitious targets for the South African economy, including the generation of a sustainable six per cent growth rate by 2000, the creation of 400, 000 new jobs each year, rapid expansion of investment and more specifically foreign direct investment (FDI) which would in turn develop an economy that would lead to increased job creation (Heintz 2003:2). The logic behind GEAR was that more jobs would assist South Africans to overcome economic and social disparity left by apartheid and alleviate poverty which results in crime. However, Heintz argues that the overall realised growth under GEAR did not change dramatically (2.6 per cent before the introduction of GEAR versus 2.8 per cent after its introduction). In addition, spending on imports dropped significantly in the GEAR period when compared to the entire post-apartheid period and that this could raise demand for domestic goods and improve the national trade balance (ibid.). Slower growth in government expenditures immediately following the 1994 elections do not reflect a policy of fiscal constraint but reflect high levels of spending and a rapid build-up of public debt in the final years of the apartheid regime. In addition, the National Treasury managed to reduce the size of the budget deficit – outperforming the targets outlined in the original GEAR policy.

However, low inflation and declining deficits did not revitalise private investment or enhance fixed capital stock growth (i.e., the rate of accumulation). Net jobs loss occurred between 1999 and 2005 and unemployment remained high (Heintz 2003:4). Such "jobless growth" raises concerns that current economic policy has failed to translate to even modest levels of growth or real social benefits. The GEAR policy has also failed to redistribute income as it initially planned. That is, the more jobs are lost, the greater the increase in poverty.

The largest workers' federation in South Africa, COSATU, criticised the GEAR policy, charging that "job losses have worsened in the past decade and that wealth is still concentrated in a white minority" (Knight 2001:1). COSATU argues that unemployment and underemployment are on the rise, more jobs are shed and that people rely on "survivalist activities to make ends meet". According to COSATU the unemployment rate is 42.5 per cent and South Africa's economic imbalances had not improved in 2006 nor have the jobs promised by GEAR been delivered. Kingdon and Knight (2005:1) state that South Africa's broad definition of unemployment was 38.8 per cent in 2005 and the narrow definition was 26.7 in that same year. Statistics South Africa (2005:1) claimed that in September 2006 the official South African unemployment rate was 25.5 per cent.

South African Chief Economist, Schussler (2008) concurs, and argues that South Africa has made great development leaps since 1994, e.g., building houses for three-and-a-half million people, providing access to electricity and water to millions of South Africans and providing mobile phone access to more than 80 per cent of the population. Speaking on a morning television show, Schussler, however, argued that South Africa's achievements have been mostly material and have not improved the quality of life of many. Furthermore, Schussler argued that South Africa has to reduce inflation, reduce the 25 per cent unemployment rate which "is on the rise" and also reduce the "27 per cent" of people receiving government social grants, which he said was the highest in the world and caused by high unemployment and lack skills to be employable. Schussler further suggested that youth should be developed and empowered with skills so that they are employable.

Telecoms development projects and small business for youth can assist, if introduced at government level, to train youth in telecoms business aspects so that they can actively participate in sector development. Interest rates are high in South Africa and home owners have to increase bond

repayments almost every six months. The South African Reserve Bank Governor, Tito Mboweni has been unapologetic about the situation as labour unions put pressure on him to lower the interest rates and stated that interest rates have not increased by more than the increase in inflation (Hazelhurst 2008:1). Mboweni further said that "things may get worse before they get better". Mboweni argued that "inflation targeting is here to stay" (Isa 2008:1).

Food, electricity and petrol prices are so high that COSATU organised marches in early 2008 to protest against these high prices. Most employed people are struggling to afford food therefore it is unimaginable how unemployed people are surviving. In what newspapers labelled the "anti-foreigner sentiment" and "xenophobic attacks" on foreign nationals in May 2008, unemployed South Africans in squatter camps and townships attacked people from African countries, including Zimbabwe and Mozambique, claiming that the foreign nationals were "stealing their jobs, houses and women" (Bell 2008; Brown 2008; Gerardy 2008). The bottom line is that unemployed South Africans attacked employed foreign nationals.

Why, then, does South Africa persist with the GEAR policy if it does not yield the desired outcomes, asks Mangcu (2005:2). He offers two reasons an economic and a political one. From the economic perspective, the government seems to have misread the causality between foreign investment and domestic growth, and contrary to current economic orthodoxy in South Africa, international evidence shows that it is domestic growth that spurs FDI (Mangcu 2005:2). Multinational companies are attracted to already growing and profitable economies. That South Africa needs national economic growth to create new jobs to improve national savings and domestic investment to create an investment attractive nation. Taking a political view, Mangcu argues that the GEAR policy is backed by the most powerful financial institutions in the world, including the International Monetary Fund (IMF), the World Bank and Wall Street. Therefore, Mangcu regards GEAR as a "high-stakes political issue" that has global ramifications, and that from the outset was insulated from outside pressure groups that might seek more attention to social spending.

The South African government stands by GEAR, despite shortcomings. However, the government has succeeded in lowering the budget deficit and inflation in the past few years. South Africa's Minister of Finance, Trevor Manuel (2006:1) stated that the "GEAR policy was never meant to replace the RDP but rather to reinforce it, no matter what the misguided critics might argue".

Manuel added that the RDP and GEAR have ensured that South Africa's budget and tax policies have played a strongly distributive role, and that "far from contributing to a culture of materialism, both policies have promoted management of public finances with honesty, transparency, stricter corporate governance, social solidarity and shared responsibility".

According to Isa (2006:1), Manuel has lowered the corporate tax rate from 40 per cent to 29 per cent and government has offered an estimated R85 billion worth of personal tax relief since 1995. Furthermore, Isa argues that both Manuel and Mboweni (Reserve Bank Governor), have bolstered market-friendly credentials and boosted their approval rating among investors and the business community. It is apparent, therefore, that South Africa's economic policy has mostly benefited the business community. The official unemployment rate was 20 per cent in 1994, 29, 4 in 2002 and peaked at 39 per cent in 2006. Half the country's black population is defined as living below the international poverty level of US$1 a day (Isa 2006:2). South Africa's biggest challenge remains to reduce this high unemployment level and poverty.

Addressing the skilled labour shortage, and also dealing with the shortcomings of the RDP and GEAR, former President Mbeki, in his 2006 (reiterated in 2008 address) State of the Nation Address, announced that government would supplement GEAR with two skills-development programs termed the Accelerated and Shared Growth Initiative of South Africa (ASGISA) and the Joint Initiative for Priority Skills Transfer (JIPSA). President Mbeki stated that ASGISA was "not intended to cover all elements of a comprehensive development plan but consist of a limited set of interventions that are intended to serve as catalysts to accelerated and shared economic growth" (Wilson 2006:1). Telecentres contribute towards the goals of the RDP and GEAR, although minimally, by creating a few jobs for telecentre managers and their assistants. Telecentres also contribute towards the education of local people by imparting ICT skill to those who visit these centres for ICT training and ICT usage for personal empowerment.

In addition to government attempts to develop ICT and other required skills in the job market, Herbst (2006:21), argues that institutions of higher learning should assist government and the private sector to develop ICT short courses geared at providing employers with the ICT skills. Herbst states that Continuing Education at the University of Pretoria has recognised the need for short courses and embarked on developing courses to assist the creation of employment.
"Short courses and training programmes are effective building blocks for any individual's

professional career path development" (Herbst 2006:21).

Unemployment forecasts in early-2008 contended that: "The unemployment rate would worsen to about 27.2 per cent, as the economy slowed down amid electricity shortages" (Mafu 2008:28). This worsening unemployment situation will affect ASGISA plans to halve unemployment by 2014. What is even more problematic is the argument and econometric model by investment company Dynamic Wealth, which states that unemployment will increase to 27.2 per cent in 2008 due to the economy not growing fast enough to create jobs (ibid.). Dynamic Wealth further predicted that even if the economy were to grow at 6 per cent, the majority of the officially unemployed 25.5 per cent would still be unemployable due to lack of skills, lack of transport to search for jobs and insufficient access to opportunities to acquire or improve skills. A solution to this dilemma, therefore, is more investment in education, skills training especially for youth, and creation of employment which will aid towards crime and poverty reduction as most criminal activities are committed mostly by unemployed robbing the employed to deal with poverty.

Murdoch (cited in Gillingham 2008:16) argues that corporate South Africa cannot afford to simply wait for universities to deliver on skills development, but should invest in its own people of future staff. Murdoch, of Monash South Africa, stated that despite recent findings by the International Investment Council that South Africa's critical skills shortage is a reflection of a general scarcity worldwide, South Africa faces a national shortage of high-level, decision-making skills required to support and sustain economic growth, make strategic decisions and drive business success. Murdoch therefore, proposes that corporate South Africa should assist universities to train personnel to produce to the required skills. Herbst (2006:12 supports Murdoch and argues that business and universities should collaborate in ensuring skills development and providing life-long learning to personnel in order to develop organisational energy which further stimulates positive energy, a winning attitude and people empowerment.

In his State of the Nation Address in 2008, former President Mbeki, again, emphasised the need for his government to accelerate job-creation and implement the "Industrial Policy Action Plan" which would facilitate, among other development projects funding of skills development projects with a special focus on training artisans and releasing R5-billion in incentives (Boyle 2008a:4). Former President Mbeki further maintained that other government communications goals, from 2008 onwards, include accelerating plans for a digital backbone, new international fibre optic

connections and the licensing of the state's proposed Infraco communications company. The Infraco communications company is viewed by government as one of the solutions towards addressing Telkom's high prices by providing more affordable telecom services. Mbeki (2008) emphasised government's commitment to job-creation and skills development and argued that former Finance Minister Trevor Manuel would increase annual allocations towards education and skills development in the 2008 financial year as government viewed education and skills development as the highest priorities. They would contribute towards job creation and poverty eradication. South Africa will also improve "economic diplomacy and international communications" (Mbeki 2008: 4).

Telecentres contribute in the informal education sector mentioned by Herbst (2006:21), by teaching telecentre users limited computer skills and empower users to gain employment in computer-related fields. Telecentres also contribute to economic improvement of telecentre managers via their employment. However, this telecentre contribution is very minimal, considering the huge numbers of uneducated and unemployed people residing in the previously disadvantaged areas where telecentres are located. This situation should be rectified by government with policy directions and infrastructure provision or funding, with assistance from business for additional funding, and the academia for education, capacity building or skills training. Telecentre developing agencies, in turn, need to utilise telecentres constructively for rural and townships development, mainly to reduce illiteracy and prepare individuals for employment. There is also a need to create new local information (local knowledge, e.g. books and other packaged information products, produced in local indigenous languages and marketed) in South Africa and this should be promoted in local languages that local people can relate to (as most information available locally contains foreign programmes and is produced in English which most African people do not speak or read). Issues of employing different languages in the creation of development information and Internet content are gaining importance in discussions of the bridging the global digital divide.

2.15 SUMMARY AND OUTLINE OF CHAPTER 3

This chapter aimed at describing concepts and constructs employed in the South African ICT sector. Telecentres have been defined because they support education and local development projects (cf. Benjamin 2003; Legoabe 2007). Telecentres are a means to bridge the local urban-rural digital and information divides by providing access to telecom facilities and services. The

concepts and constructs defined in this chapter also demonstrate the influence of international telecom, economic globalisation and economic policy institutions such as the World Bank (which promotes privatisation of state assets such as Telkom - adopted by South Africa), the WTO (which promotes telecom liberalisation, universal service and the establishment of an independent telecom regulator – all which were adopted in the 1990s), and the ITU (which promotes telecentre development, among other objectives).

The chapter also sought to illustrate that South Africa's liberalisation telecom and ICT policy has been influenced by global trends and that economic adjustments have to be implemented by the South African government to ensure that GEAR, telecom privatisation, JIPSA and ASGISA benefit South Africans. The chapter identified forms of capital, knowledge and ICT skills required to access and use ICT, because access and use of ICT are crucial towards assisting South Africa to resolve social problems such as illiteracy, social and economic inequality and poverty. People need education to access employment and ICT provides access to education. Education leads to economic empowerment.

The next chapter investigates the importance of technology capacity building for local ICT users, and a capacity building paradigm. Though established in the US, the paradigm is evident in local telecentres where these telecentres provide ICT skills and technical training, and build capacity in computer literacy. Other development theories, discussed in Chapter 3, consider technology transfer from MDCs to LDCs, and urban to rural areas.

Finally, most of the concepts and constructs dealt with in this chapter have contributed towards the empirical analysis of this study in the formulation of questions both in personal interviews with those interviewed to gain the data for this study and also in the questionnaire employed in the research design. The concepts and constructs were also instrumental in the process of data analysis because they provided the researcher with some basis from which she could understand the data and interpret the respondents' answers against the background of how these concepts and constructs apply in and to the South African situation. For example, in the questionnaire, the answers to the questions pertaining to the distance travelled by the telecentre users to reach each telecentre were assessed and analysed against the background of how South Africa defines that distance.

CHAPTER 3
THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN DEVELOPMENT

The aim of this chapter is to examine the role of telecoms in development, with a particular focus on less developed countries (LDCs) such as South Africa. From this context internal and external factors that influence telecoms policy regarding telecentres will be considered in Chapter 5. Another aim of this chapter is to introduce and describe the theoretical frameworks which explain the role of ICT in development. The purpose is to arrive at an understanding of how South Africans can adopt, use and benefit from ICT. Also, and in addition to these frameworks, theories of development communication, especially the new paradigm for capacity development and institutional innovations, are introduced. The purpose is to explain the importance of imparting computer skills to telecentre users in the quest for ICT capacity building. The role of telecentres in development is also explored in greater depth in Chapter 4.

3.1 TELECOMMUNICATIONS AND DEVELOPMENT

Technology possesses the capacity to improve lives if the people concerned to know how best they can use that technology for their development. According to Juma et al. (2001:637): "The conventional view of technology and development is that the former is a product of the latter. In fact, technological capacity is an essential component of development".

Nandi (2002:1) suggests that innovation in communications technology in the West during the past two decades accelerated economic growth by generating new and diffusing existing ideas. Today's empirical literature generally concludes that the overall contribution of ICT to development has been positive and that ICT has been lowering digital poverty (lack of ICT access) (cf. Bourdeau de Fontenay and Beltran 2008). There is over 20 years of accumulated cross-country evidence on the link between telecommunications provision and economic growth (Forestier, Grace and Kenny 2002:623). Some studies state that there is a positive correlation between telecoms and economic growth (cf. Hardy 1980; Saunders, Warford and Wellenius 1994; Madden and Savage 1998; Nandi

2002). Madden and Savage (1998: 174) state that investment in telecommunications infrastructure has the potential to improve national productivity and economic growth. “Economy wide gains occur through the reduction of transport and transaction costs, improved marketing information and the accelerated diffusion of information and knowledge”. Micro-studies of countries including Bangladesh, Botswana and Zimbabwe reveal that there is some evidence that provision of telephony has a dramatic effect on the income and quality of life of the rural poor (ibid.). Historically, telecoms rollout only benefited the wealthy but emerging evidence shows the role of the Internet in poverty relief and improving the quality of life variables including infant mortality and literacy. Although telecoms development has been found to be one of the factors that affect economic growth, its contribution has varied between countries at different stages of development (Shiu and Lam 2008: 4).

Shiu and Lam (2008:1) studied the importance of telecoms development to economic growth in 105 countries. They applied a panel data model to measure the causal relationship between telecoms development and economic growth in different regions and at different income levels for the period 1980 to 2006. Results indicated that there is a bidirectional relationship between telecoms development and economic growth for European countries and those belonging to the higher-income group (ibid.:4). These results are consistent with those of previous studies that argue that the impact of telecoms development on economic growth is greater in countries in which teledensity has reached “critical mass” (meaning 40 per cent per 100 inhabitants). Information flow and exchange (through communication technology) are socially and economically beneficial, and greater “informatization” is an indication of progress (Sawhney and Jayakar 2005:11). Information flow is viewed as something inherently good. Additionally, Xia and Lu (2005: 4, 12) state that narrowing the digital divide to create a harmonious society is becoming a shared belief worldwide because the deployment of telecommunications can stimulate development, while also being an indicator of it. In China, the deployment of telecommunications network in rural areas has contributed to economic and social development (ibid.:12). These latter views suggest that there is a positive impact of ICT on information sharing, rural and social development and economic development.

Furthermore, Karner and Onyegi (in Shiu and Lam 2008: 4) examined the contribution of private telecoms development to economic growth in 14 African countries and 13 countries in Central Eastern Europe (CEE) for the period 1999 to 2005 and found the contribution to be positive but insignificant. Their results indicated that this may be due to relatively low level of telecoms infrastructure in the selected countries, which diminishes the effectiveness of private investment in telecoms (ibid.).

In their study of 105 countries, Shiu and Lam (cf. 2008), found that there is a bidirectional relationship between telecoms development and economic growth for European countries belonging to the high-income group but that there is a unidirectional relationship between telecoms development and economics for low-income countries, which means that these countries first have to attain higher levels of economic development before telecoms can be fully developed and contribute substantially to economic growth and effective national development. Furthermore, Shiu and Lam mention several other studies in general, which indicate that either a bidirectional relationship between telecoms development and economic growth or a unidirectional relationship from the former to the latter. However, there is also a considerable amount of literature which reveals that telecoms development makes a greater contribution to economic development in high-income countries and insignificant or minimal contribution to economic development in lower-income countries. Considering that the South African telecoms sector is not yet advanced, it can be concluded that its contribution to national economic development may not be substantial at this stage, until such time that it is more advanced.

Economic theories also explain the relationship between telecoms and economic development, e.g., the endogenous and exogenous growth theories. The neoclassical exogenous growth theory states that ICT does not have a significant impact on development and economic growth and that it will take time before ICT has a substantial impact on economic growth (Bourdeau de Fontenay and Beltran 2008: 7). The exogenous growth theory also states that the economy's growth rate is constant, a function of the sum of the rate of capital depreciation, the rate of population growth and

other market and population conditions. On the other hand, the endogenous growth theory has a more positive view of the role of ICT in economic development, claiming it is significant, and endorses the influence of knowledge (gained and shared through ICT) on development, economic growth and local institutions.

Knowledge, according to the endogenous growth theory involves innovation and research and development (R&D). Developing countries such as those of Africa are still far from creating their own innovations, while technology R&D is on the increase in these countries. However, Asian countries are among the world leaders in innovation as well as technological R&D. Chibber (2002: 52) states that:

> economists and world leaders have realized and accepted that telecommunication plays an important role for economic and industrial growth in less developed countries. The main reasons for very slow improvement in telecommunications in rural areas, are lack of financial resources, inaccessibility due to poor roads or transportation, unreliable or no power supply and low revenue per line.

The Indian telecoms situation and problems identified by Chibber (ibid.) are similar to those of South Africa and the inhibitors of rural telephony development in India are similar to South Africa's. The assumptions of the exogenous growth theory, which argues that it will take time for technology to have a significant impact on economic development seems to be more applicable to South Africa which has many social and economic problems to deal with while simultaneously attempting to build the ICT infrastructure. South Africa is also battling with and focusing on building basics such as education, creating employment, reducing poverty and developing the economically deprived rural areas.

There is no suggestion that ICT can eliminate inequality or unequal distribution of economic resources across society. Neither does ICT offer a panacea for all development problems. However,

detailed analysis and experience around the world reveals ample evidence that, used in the right way and for the right purposes, ICT can have a dramatic impact on achieving specific social and economic development goals as well as play a key role in broader national development strategies (Bourdeau de Fontenay and Beltran 2008: 17). The real benefits lie not in the provision of technology per se, but rather in its application to create powerful social and economic networks by dramatically improving human communication and exchange of information. ICT can be adopted both selectively and innovatively to directly enhance the welfare of the poor, since interfaces can be designed to reveal little about the individual's social class. In fact, ICT has already assisted the poor and this is illustrated by mobile communications and its significant contribution to personal and economic growth, improved personal communication and the reduction of the digital divide in African and Asian countries (cf. Matsepe-Casaburri 2006s; Barzilai-Nahon 2006; Ki-Moon 2007; Coward 2008; Fuchs and Horak 2008; Xia and Lu 2008).

Recently, many LDCs realised the necessity of ICT in achieving higher growth and economic development. Proper adoption and use of ICT is important and remains a challenge. Properly diffused and used, telecom technology has the potential to improve efficiency and effectiveness to lower public administration costs because it facilitates e-government (Mansell and Wehn 1998:84). ICT also facilitates tele-health and tele-education.

The following illustrate this as far as education is concerned. Many local schools advance the education of their learners through the use of ICT, e.g., Disseminating the Fruits (an IDRC video (2001) provides examples of schools in South Africa, including Sikhululekile, Zimisele, St Albans College and Musi High Schools), the SchoolNet project and the ThinkQuest Africa Partnership. Sikhululekile ("We are Free") High School is located in Temba township, Hammanskraal, in North West Province. Zimisele ("Be Serious or Courageous") High School is situated in KwaThema township, Springs, Gauteng Province. Many schools in South Africa are also linked to SchoolNet South Africa and SchoolNet Africa. The main purpose of SchoolNet is to teach learners IT skills so as to further enhance educational outcomes (SchoolNet South Africa 2001; Riordon 2001).

Ivala (2000) argues that ICT improves the capacity of students to perform better in their studies and promote the use of ICT for distance education, given that ICT constitutes one of the strategies that could bring many Africans closer to educational institutions. According to the video, Musi High School teachers receive ICT training through the Thintana I-learn project. At St Albans College in Pretoria, students have access to education via computers in the classroom and laptops which they can use in the school grounds to create, inter alia, Web sites. ICT skills gained allow email and Internet to be used to communicate with students in the Global Teenager Project (supported by the Dutch Development Fund). SchoolNet's ThinkQuest Africa Partnership is intended for disabled persons and links them internationally to other disabled children.

Local universities such as Western Cape, KwaZulu-Natal, Limpopo, North West and UNISA, provide education to students via ICT but this education is mostly received by students near the cities where the universities are located. UNISA is among the major distance education institutions in the world but still has to expand its reach to rural South Africans, since most of these students have no access to ICT. Tlabela's research (2001) at the HSRC has proven that ICT has advanced the education of historically black universities (HBUs) students' that use wireless Internet laboratories (WILs) established by the Department of Communications (DoC). These labs are generally called DoC WILs. Roodt and Conradie (2001) argue that educational satellite television broadcasts have improved learning outcome and created a learning culture at South African schools. The digital satellite television channel 319, namely Activate, and the South African Broadcasting Corporation (SABC)'s three channels (SABC 1, 2 and 3) broadcast lessons for primary to high school students. These programmes use new media such as mobile phones and e-mail to facilitate interactive communication between the students who phone and send e-mail, and educators through television.

Apart from ICT potential to improve, amongst others, access to education (as the example above indicated), Mansell and Wehn (1998:82) argue that telecom technologies display a potential to support sustainable development and positively contribute to urban and rural development; transport interconnections efficiency and monitoring; health care improvement; enhancement of

learning and capacity building, increasing opportunity for independent living; greater autonomy and improved social integration for disabled people. ICT can also be instruments to enhance disabled persons' independence by providing access to communication, education curricula and informal learning. SchoolNet's ThinkQuest Africa Partnership is an example of such an educational ICT project.

In most LDCs, ICT largely aids individuals residing in cities, because they have access to electricity and jobs, and can afford to own or to share use of ICT, e.g., in telecentres. According to Conradie, Morris and Jacobs (2003), a tele-health project is providing health education for many villages in the rural area of Tsilitwa, in the Eastern Cape province. The Tsilitwa project is an MPCC which provides users with services including desktop publishing, IT skills training and business skills (including technology-enhanced local building methods and baking business opportunities).

Consequently, LDC governments seek to increase their spending on rural ICT rollout by means of financial and technology support from MDCs and the private sector. An NGO runs the Msunduzi Community Network Project, shared between the Greater Edendale Environment Network (GREEN) and the Institute of National Resources (INR) in Pietermaritzburg, in KwaZulu-Natal. Burton (2002:48) considers that GREEN is the pre-eminent NGO in the environmental arena and expands its activities into biodiversity, HIV-Aids prevention, financial management, fund-raising and land care projects.

ICT also assists in the advancement of small local business. Examples include the remote Mokwakwaila telecentre which teaches computer skills and business-related services to users. The Alexandra township (outside Johannesburg) telecentre, or Alexan Kopano MPCC, offers access to Lifeline services, a radio station and satellite clinic, and runs educational campaigns such as teaching locals to pay rates (to eradicate the 1970s and 1980s practice by black people living in townships of deliberately not paying for rates and taxes, as part of their struggle against apartheid). Among the small businesses to benefit from the use of ICT are Ma Neo's Bed and Breakfast in

Langa township outside Cape Town, the Khayelitsha Craft, and the Cape Sonke Route, a group of Cape Town businesswomen who linked themselves to international tourist agencies (IDRC video 2001).

In Ghana, telecentres help to compensate for low penetration of phone lines through public access to telecom facilities, generate profit for owners and contribute to regional development through the provision of telecom access (Falch and Anyimadu 2003:35). The Ghanaian telecentres are also formidable business as some "offer several types of businesses, e.g., the su-su (a type of informal banking system), renting of video cassettes, gift shops, restaurants" and the contribution of the telecentres in economic development "is indeed indisputable" (ibid.). Also, in Hungary and Western Australia, telecentres contribute to economic development in various ways, including assisting communities to meet the challenges of the information society (provide information to users that they use in daily life), and contribute to regional cohesion through the provision of community services such as the issuing of a local newspaper. All these business activities demonstrate the significant role of telecentres in economic development which even technological pessimists cannot deny.

Furthermore, ICT has also improved networking by women who share their ideas, e.g., members of Women's Net and Sangonet. These organisations empower women with ICT skills such as Web site design, fund-raising and extending their communication networks. The organisations also promote women's issues such as the employment of women in senior management positions and women's economic empowerment, attempting to bridge the existing employment gaps between women.

The section above demonstrates the important role of ICT in promoting education, health and business, as the ICT projects discussed explain It is, therefore, crucial that more ICT centres be established, not only to facilitate the development of these sectors (education, health and business) but also to improve communication between local persons, organisations and communities in address issues of national development.

3.2 THEORETICAL FRAMEWORKS REGARDING THE ROLE OF ICT IN DEVELOPMENT

As referred to in Chapter 1, three schools of thought explain the relationship between ICT and development. Technophilics believe that telecoms exert a positive influence in development, while technophobics regard telecommunications as having a negative effect on and contribute to the expansion of the information gap between rich and poor, the literate and illiterate. The technophilic view of the role of ICT in society is utopian, while the technophobic view is dystopian. The third theoretical perspective on the role of ICT in development, an intermediary perspective, states that "while access to ICTs might not directly lead equitably to development, they may be necessary in order to be part of the global economic activity" (Bailur 2008:3).

The utopian perspective on ICT supports the deployment of ICT in communities and perceives positive developments arising from this deployment. It is further argued that in the economy, ICT enhances productivity, improves employment opportunities, and upgrades the quality of work in many occupations. Moreover, ICT offers an opportunity for small-scale, independent and decentralised forms of production. Regarding LDCs, technophiles envision that technology will aid them to `leapfrog' stages of development (Castells 1998; Mansell and Wehn 1998; Naidoo 1998; Nulens and van Audenhove 1999; Matsepe-Casaburri 2002).

The utopian perspective reflects the modernisation view of development (cf. Rosnow 1960), with a positivist view of technology (cf. Hunt 2001; Roman and Colle 2002; Bailur 2008). A utopian perspective argues that telecentres represent "a new symbol of hope for community development" (cf. Bailur 2008), with the ability to bring about "a new social order, one that is surely more prosperous and just" (cf. Hunt 2001:1, 4).

Modern information and telecommunications technology can improve living standards in remote and rural areas by offering important commercial, social and educational benefits (Jussawalla and Lamberton 1982; Share 1997; Madden, Savage and Simpson 1997). Mansell (1999:35) adds that:

> In some parts of the world, information and communication technologies (ICTs) and services are contributing to revolutionary changes in business and everyday life. In other parts of the world, the lives of people have hardly been touched by these innovations. If people in developing countries are unable to acquire the capabilities for using the new ICT applications, they will be increasingly disadvantaged or excluded from participating in the global information society. The social and economic potential of these new technologies for development is enormous, but so too are the risks of exclusion.

This statement supports the view that ICT, if accessible to people in LDCs, conveys more knowledge and information for development purposes to the inhabitants. For Deane and Opoku-Mensah (1997:5), telecoms in the modern global economy offer a new dawn of economic opportunity. For example, shared access to ICT, through cyber-laboratories at schools, telecentres, phone shops and other ICT centres offer users a wealth of information. ICT courses ranging from secretarial to business computer literacy skills enable recipients to gain work and enter into entrepreneurship activity. Telecentre users also use skills gained at telecentres as a foundation for further study at other educational institutions, while others employ the knowledge to impart the skills to others. Bozeman and Rogers (2002:770) term this kind of community development "qualitative change results", and it means new knowledge gained through ICT which creates new uses of that knowledge by instilling value in others.

Byron and Gagliardi's (1998:2) optimistic view is that optimistic profound changes have been brought about by the information society and impact of ICT on economic and socio-cultural development during the latter half of the 20th century. The changes contributed to the emergence of a global society, in which the traditional barriers to communication (i.e., time and space), have been overcome by the creation of simulated virtual worlds. Furthermore, Nulens and van Audenhove (1999:28) argue that the benefits of ICTs are not confined to the West alone, and that the widespread use of ICTs in developing countries will improve the economic and social situation of Third World populations.

For Byron and Gagliardi (1998:2) ICT results in both positive and negative consequences for development. They state:

> The new technologies are seen as having the potential vastly to improve working conditions and the overall quality of life for humankind, making possibly a more leisure-oriented society. On the other hand, others view the implications of ICT for the future of human society with considerable scepticism or pessimism. While they greatly facilitate access to information, they also have the capacity to create an increasingly isolated, artificial existence for individuals becoming ever more dependent on technology rather than direct human contact for the means of communication.

On the other hand, "there is a more critical body of literature regarding telecentres, or ICT pessimists" (Bailur 2008:3). Technophobics like Sussman (1999:12) believe that ICT applications and their transformative nature are greatly exaggerated, and argue that ICT has many negative effects on society. Sussman argues that:

> ICTs may destroy more jobs than they create, widen the gap between the rich and poor, and the huge capital investments required to strengthen national capabilities for using ICT could divert resources from other activities that could have greater development impact.

In South Africa the telecoms parastatal, Telkom, shed more than 28 000 jobs between 1998 and 2003, after a 30 per cent privatisation in 1997. Privatisation was followed by restructuring and listing on the JSE and NYSE (March 2003). Attempting to justify this job loss in a country with an unemployment rate of 26.6 per cent (Stats SA 2006), Telkom's former CEO, Sizwe Nxasana contends that time to meet liberalisation objectives was ending and obliging the company to restructure, consolidate core functions, outsource non-core functions and shed jobs. Nxasana considers that Telkom had to modernise and reduce inefficiency (Ray 2004:16).

> By 2000 there was a common understanding of what was to be done, culminating in the landmark deal with the unions, the signing of the Job Security Retrenchment Framework Agreement (Ray 2004:18).

The agreement aimed to offer IT training and skills development for retrenched workers, rewarding employees for achieving measurable targets, modernising the company and outsourcing non-core business such as cleaning and catering services. Regardless of public opposition to worker retrenchments and rising tariffs, Nxasana changed Telkom from a debt-ridden institution in the late-1980s and early-1990s (Horwitz 1997; Ray 2004), into a billion-Rand profit-making international enterprise. ICT and Telkom's international strategic equity partners (SEPs) have played a major role in that transformation.

Technophobics argue that ICT reinforces historical trends towards socio-economic disparity, inequality in political power and gaps between knowledge elites and the disenfranchised. It is Hamelink's (1997:6) view that on an economic level, the technophobic perspective forecasts a perpetuation of the capitalist mode of production, with further managerial control over the means of production. In most countries, this perspective implies job displacement and deskilling. In politics the expectation is that a pseudo-democracy will emerge as a result of ICT usage that will allow people to participate only in marginal decisions.

Sussman (1999:12) believes that ICT enables governments to exercise surveillance over citizens more effectively and questions the revolutionary changes that are said to be brought about by ICT and digital technology:

> "It is good to argue that ICT brings about a communications revolution. It is always well worth asking who is revolting?"

ICT pessimists are found all over the globe. “Qvortrup (2002), found that 70 per cent of the first wave of Australian telecentres disappeared after two years; Robinson (1998) wrote that after two years, only five of 23 original Mexican telecentres were functional, and Wade (2002), stated that providing IT connectivity and access for development is “like arguing that cheap books can cure illiteracy” (Bailur 2008: 3). The dystopian view of the role of telecentres in development appears to take on the neo-dependency view of development, that the notion of connectivity and access leading to “development” is one manipulated by corporate giants and development agencies to maintain the dependency of developing countries on the West (ibid.: 4).

This dystopian perspective explaining the role of ICT on development is supported by questions of financial, social and political telecentre sustainability (cf. Whyte 1999; Benjamin 2001a; Hudson 2001). Financial sustainability questions whether poor or underdeveloped communities in developing countries can afford continued access to and use of ICT in telecentres. Social sustainability questions community member commitment to continue operating and maintaining telecentres and costs thereof, including human, technological and financial resources (cf. Benjamin 2001a; 2001b).

The intermediary perspective on the role of ICT in development reflects the capability approach in development, where development follows neither a modernisation nor a neo-Marxist model, but is instead about an individual’s capability rather than wealth (cf. Bailur 2008). Practical applications of the intermediary perspective to the ICT role in development include ICT usage in education and health, e.g., in Kerala, India, and also in China’s rural telecentres’ ICT usage, where “telecentres do not fill a fundamental information void, but enhance the livelihoods of those who are already educated and relatively wealthy” (Bailur 2008: 4). A common ingredient of the three theoretical perspectives is that they demand committed community participation, if telecentres are to succeed as development projects and be successfully evaluated as impacting positively on people’s lives.

On balance South Africa’s views regarding the effect of ICT on development are positive, when judged by the content of speeches by key government officials. For example, former President

Mbeki in his 2002 State of the Nation Address to stated that ICT exerts a positive influence on the social and economic development of South Africans. The late former Minister of Communications, Dr Ivy Matsepe-Casaburri, also previously referred to, also argued (2002:1) that in Africa and South Africa, ICT is identified as central to development, as it presents an opportunity to leapfrog decades of development. The speeches and documents compiled by South Africa's presidents (former President Mandela and President Mbeki) and communications ministers (Dr Jordan, Naidoo and Dr Matsepe-Casaburri), have resulted in a fairly comprehensive view of the information society and in a policy of universal access to ICT (van Audenhove 2003:30). Former President Mandela highlighted the role of ICT in development at an ICT Summit in 1998.

South Africa strongly promotes the use of ICT especially in education. At an ICT Summit held at Gallagher Estate in Midrand, in June 2002, major South African ICT stakeholders, including government, academics, labour, civil society and business, discussed ICTs and job-creation. According to Pela (2002:7) the stakeholders at this ICT Summit agreed that:

> "South Africa will embark on an active program to reduce the digital divide between rural and urban communities. ICT must increasingly contribute to economic growth, equity and social integration, job creation and overall development".

Pela (ibid.) adds that the delegates at the summit viewed ICT as being instrumental in South African development because they:

(a) link economic activities, both at home and abroad;
(b) support social integration and interaction;
(c) form the basis for sound decision-making in all fields;
(d) are essential for democracy at all levels;
(e) help give people access to government services; and

(f) underpin the development of the South African culture.

These statements illustrate that major stakeholders in the ICT sector believe in the capacity of ICT to empower people. Stakeholders at the summit also undertook to promote the use of ICT and to create more jobs in the sector. The summit was well-attended by leaders in the ICT sector and representatives of major business and labour organizations. This suggests that South Africans believe that ICT will benefit the country once deployed and used efficiently.

The view taken in this study is that technology is neither good nor bad. Each technology exhibits democratic as well as authoritarian characteristics, and the impact of technologies is mediated by the context in which they operate (Nulens and van Audenhove 1998:6). This requires that people be trained in how best to use technology so that they can know how best it can serve them. In this regard, Bozeman and Rogers (2002:773) have developed the *churn* model, whose core assumption is "use-transformation-value". The model states that information without use is information without value. Scientific knowledge is developed through the transformation of extant knowledge into diverse new uses, uses that may have little or nothing in common with previous applications of knowledge. These new uses, in turn, enhance the reservoir of knowledge available for further transformation (into further uses which, in their turn, provide new potential transformations).

In essence, what Bozeman and Rogers (2002) mean is that knowledge gained by individuals can be used to improve their lives and contribute to the improvement of others' lives if shared. Bozeman and Rogers employ the term "churn model" for this use and transformational process because the notion of "churn" implies no particular direction (e.g., linear), and no amputation of scientific progress. The standard definition of churn, "to stir or shake with continued motion", captures the notion of scientific knowledge acquisition as described by Bozeman and Rogers' churn model.

Furthermore, Bozeman and Rogers (2002:770-775) employ the term "knowledge value communities" to refer to communities under study by researchers, who study such communities with the aim of bringing some positive change and transform the communities through introducing

community development projects. Information gathered from these communities is termed "qualitative change results" and it is these change results that provide new knowledge.

A practical application of this model is visible in how local knowledge is produced at telecentres and also in how the telecentre users in turn make use of information they gather from the Internet and other ICT at telecentres. This knowledge will assist define the telecentres' role in development. The knowledge will also allow the researcher, the telecentre managers and the USAASA, to create new forms of knowledge, courses for telecentres and telecentre managers, or any other form of new knowledge aimed at further empowering or developing those who employ telecentres.

The churn model of scientific value, with its attendant focus on the knowledge value creation, provides a fundamentally different foundation for understanding knowledge creation, that requires that attention be paid to the social forces affecting knowledge creation, and downplaying the economic incentives and, perforce, market-based valuation of knowledge (Bozeman and Rogers 2002:790).The churn model, therefore, promotes the creation of knowledge for no economic or financial gain but for developing others and imparting the gained knowledge. This consequently contributes to a less illiterate society. However, the model recognises that market factors such as pricing are potentially significant in the creation and sharing of knowledge.

It can also be hypothesized that users also make use of this information for self and community development. Chapters 7 and 8 establish what telecentre users gain from the telecentres and what they employ that new knowledge for.

To conclude this section: Three frameworks or points of view explain the effect ICT may have on development: positive, negative and necessary for a country's global inclusiveness and competitiveness. For Castells (1998:4) the role of ICT in stimulating development is, also two-fold:

> It allows countries to leapfrog stages of economic growth by modernizing their production systems and increasing their

> competitiveness faster than in the past. The most crucial example is that of the Asian Pacific economies, particularly the case of Hong Kong, Taiwan, Singapore, Malaysia and South Korea, which use ICT for social and economic development.

For those economies that are unable to adapt to new technological systems, their retardation becomes cumulative (Castells ibid.). Also, their ability to move into the information age depends on the capacity of the society to be educated, and to assimilate and process complex information, which starts with the education system, running from the primary school to the university level. It also relates to the overall process of cultural development, including the level of functional literacy, the content of the media, and the diffusion of information within the population as a whole. Castells observes that regions and firms concentrate on the most advanced production and that management systems are increasingly attracting talent from around the world, while leaving aside a significant fraction of their own population whose educational level and cultural skills do not fit the requirements of the new production system.

LDCs should also be prepared to welcome knowledge workers from around the world, in their quest to transform themselves into knowledge societies. At this point, it is appropriate to discuss theories of development, which further explain the relationship between ICT, knowledge and development.

3.3 THEORIES OF DEVELOPMENT COMMUNICATION

As referred to in Chapter 1, the modernisation theory or dominant paradigm of development, and the theoretical approach of Development Support Communication (DSC) or Another Development (AD) are deployed as part of the theoretical basis for this study. These theories offer views about how development goals can be pursued and achieved. These theories have been selected for this thesis owing to their practical relevance to South Africa's development objectives, such as bridging the digital divide.

3.3.1 The dominant paradigm

The modernisation theory is the dominant paradigm of the 1940s and 1960s. It argues for the transfer of knowledge and technology from MDCs to LDCs. According to Nulens and van Audenhove (1998:3):

> The dominant paradigm tends to take an idealistic and technophilic stance towards the relationship between society and ICTs. In the technophilic view ICTs are viewed as having positive effects on society including an increase in jobs, an expansion of diversity and pluralism, a harmonization of society, an increase in efficiency in private and public sectors.

The dominant paradigm also supports a dependence on technology for the purpose of development. Some LDCs cannot afford technology, and still need affordable media like radio and television, and oral media like theatre, to advance development projects. Dependence on MDCs is also encouraged by the dominant paradigm since LDCs have to be aware of new technological developments to pursue their goals. New technology is not always affordable to poor nations. Dependence on MDCs is also encouraged by the dominant paradigm since LDCs are obliged to import new technology from MDCs, technology that LDCs may not even afford to buy, considering their other development needs such as poverty alleviation, health, basic and adult education. DSC has been viewed as offering LDCs two-way and cheaper communication means to advance their development goals.

Barnett et al. (1996:21) point out that inadequacies in modernisation theory lead to an alternative elaborated by scholars primarily from Latin America, working for the United Nations Economic Commission for Latin America (ECLA), who reached the conclusion that: "The global economy cannot be conceived as a system of equal trading partners because the superior military, economic,

and political power of the centre (MDCs) imposes conditions of unequal exchange on the periphery *(LDCs)"*(Barnett et al.1996:21).

They further state that the core-periphery division of labour in the capitalist world-economy leads to unequal exchange relations in favour of the core. This critique supports the views which argue that the dominant paradigm promotes technology-driven development that favours rich nations. As a result of its unrealistic stance toward the role of ICT in development, the dominant paradigm has been criticised by theorists who view technology as exerting positive as well as negative influence on people and development. Sussman (1999:13) believes that while it is good that a society should be led by scientists and technocrats who create ICT for purposes of development, it is as good that humanists should work with technocrats in the discovery of knowledge for human development.

Although the modernisation theory has had critics, the theory is said to have "passed" as a dominant paradigm in studies of development communication (Jacobson 1993:214). One of the main critiques of the modernisation theory is its emphasis on the objectives; scientific approach to conducting research. Critics feel such an approach is detached and does not generate a full understanding of the individuals under research. These critics argue that research, like knowledge, is value-laden, and that therefore, social science is a ruse unless it is devoted to social change rather than to the accumulation of objective scientific knowledge (ibid.).

> "The myth of the objectivity of social science research
> has been so sufficiently exposed in recent years that
> a long discussion is unnecessary" (Jacobson 1993:218).

A recurrent criticism of modernisation work is the tendency to underestimate the effective knowledge contained in traditional understandings and practice (Jacobson 1993:215-216). Conversely, participatory research places traditional indigenous and local knowledge in a position of primary importance and argues that only through sensitivity to cultural and political factors, as seen by local peoples themselves, can research hope to understand a community and needs to assist

when asked. Participatory research contrasts sharply with modern era practices in which university-trained researchers would act as expert consultants, more or less, telling local communities what they needed to do to achieve local development goals, and then gathering data to test communication theories (Jacobson 1993:215).

The central aim of participatory research is to foster self-reliance in local people by helping them conduct their learning and research (ibid.). This fostering of self-development and self-reliance is what Melkote (2006:116) regards as one of the advantages of participatory communication strategies. It promotes "empowerment" as an alternative to social change, rather than "the earlier overly top-down and prescriptive" development strategies employed by many scholars and practitioners over the past few decades.

Another critique of the modernisation theory, although this theory has guided intellectual thinking and scholarly research in the field of socio-economic development for decades, is the assumption that "modernisation of developing countries was dependent on changing the character of inhabitants to resemble more closely the attitudinal and value characteristics in Western Europe and North America" (Melkote 2006:113).

Further, it is not possible at present, in a developing country with many rural and uneducated people to radically transform traditional life, because most rural people do not understand aspects of modern life (because they have no education, are poor, and cannot afford modernity and aspects thereof). Others in this group prefer rural life and have no desire to adopt modernity and its high-cost technology, with its intrusive nature regarding individual privacy. Hence most of these rural people prefer to engage in rural development projects such as those involving farming and agriculture. Other rural people prefer country life rather than the hustle and bustle of the city and the intrusiveness of information technology which compromises personal privacy and individual autonomy.

Although this emphasis on multiplicity accentuates the role of communication for participatory

development, it falls short of distinguishing that multiple meanings are made in communication (Huesca 2005:1). Such a distinction necessitates exploring how participants comprehend, construct, and negotiate the diverse, complementary, and contradictory elements of their everyday lives – how they theorise relationships of the world. The value of participatory media is not in being instruments of transmission (as the dominant paradigm proposed) but of communication, i.e., for exchanging views and involving community members at local level (The Communication Initiative – Participatory theories and approaches 2003: 4).

As observed earlier, telecentres are instruments that can assist in bridging the digital divide. However, to be effective they require PPP funding to provide affordable telecoms services. PPPs assist local governments in issues of governance, health care campaigns and education, as the digital divide model proposes. Local municipalities should therefore fund telecentre managers (e.g., pay their salaries) for the sustainability of the telecentre, as is done in Western Australia (WA).

Another theory that promotes communication between researchers and communities under this research is the new paradigm for capacity development, which also suggests institutions should be creative enough to introduce new solutions and training programs aimed at local community development. This paradigm is discussed in the next sub-section.

3.3.2 The new paradigm for capacity development and institutional innovations

According to Fukuda-Parr, Lopes and Malik (2002:19), technology transfer analysts discovered, in the 1980s and 1990s, that the technical assistance is inadequate to build capacity in IT skills. What is needed more than technical assistance, is technical cooperation, based on partnerships between donor (MDC) and recipient (LDC) to help local people use ICT to create local knowledge. According to the paradigm for capacity development and institutional innovations, the asymmetrical relationship of the donor imposing ideas on LDCs is eliminated by technical cooperation. In addition, technology transferred from MDCs functions in LDCs when inhabitants

understand the technology and use it effectively for development goals. Developed by Fukuda-Parr, Lopes and Malik, this paradigm for capacity building and institutional innovation is aimed at solving old development problems, and its assumptions are based on the need for IT training for the purpose of creating new knowledge creation. The capacity building and institutional innovation paradigm is opposed to the assertion of the dominant paradigm that, what works globally may work locally. Fukuda-Parr et al. (ibid.) remark that this new paradigm promotes the motto: "scan globally, reinvent locally".

The capacity building and institutional innovation paradigm also promotes the trying out of new methods - such as "networks that make the best use of new types of learning and trying innovations that address asymmetry in donor-recipient relationships, such as pooling technical co-operation funds and developing forums for discussion among southern nations" (Fukuda-Parr, Lopes and Malik: ibid.). The development route adopted by Microsoft South Africa, working with the government and development agencies such as the USAASA, in establishing computer laboratories, telecentres and digital villages in parts of South Africa follows the assertions of this paradigm. Microsoft also embarked on developing software for local languages in the quest of promoting ICT use. Microsoft South Africa imparts ICT skills in users of telecentres and digital villages, making sure that not only do people gain access to ICT but also skills training.

3.3.3 Development Support Communication (DSC) or Another Development (AD)

Several theorists propose DSC as an approach to development communication. According to Obregón and Rivera (2001:101) the 1970s brought forth the emergence of this alternative paradigm, known as the pluralist perspective. In a nutshell, advocates of DSC recognised the failure of previous development models and embraced new approaches to development. Some of these approaches are:

(a) development should be needs-oriented;
(b) development should be endogenous;

(c) development should promote participation at all levels;

(d) development should promote equal access; and

(e) development should promote society's self-reliance; development should take into consideration local culture, values and norms (Obregón and Rivera 2001:101).

Within the DSC approach, the role of communication is described as that of development support communication, which supports community development. Emphasis is placed on two-way interactive and participatory communication between developers and those developed, as a response to the top-down, one-way communication, proposed by the dominant, expert-driven project design, with the others being developed. DSC is *people-centred* since it supports the idea that concerned parties with development should contribute their ideas while those being developed must have a say in the projects aimed at their development. For Servaes (2001:5) participatory communication is not new and has been practised and promoted for many decades: "It has received considerable attention in industrialised countries in adult education, community development and development communication, and has achieved increasing visibility internationally in sociology and anthropology".

According to Servaes (ibid.), DSC favours many approaches based on the context of the basic felt needs and empowerment of the most oppressed sectors of society. Early 2001 saw the birth of the New Partnership for Africa's Development (NEPAD), a development initiative begun by President Mbeki and supported by African leaders such as former Nigerian President Obasanjo. NEPAD is aimed at African leaders, investigating ways for African people to "extricate themselves and the continent from the malaise of underdevelopment and exclusion in a globalising world" (*Vodaworld Magazine* 2004:38). NEPAD uses the DSC approach of including development strategies from African countries to improve the region's economic outlook with ICTs being identified as a major driver of NEPAD processes and activities.

Oelofse and Fabricius (2002:5) indicate that NEPAD targets African states characterised by "bad" governments, to alter government strategies by encouraging principles of good governance and

ending conflict. Communities exhibit the desire and need to develop over a long period. This developmental approach encourages developers to create their own development strategies even though they may also employ those stemming from the West. Melkote (1991:62) argues that the pluralistic nature of DSC implies that communities set their own priorities and standards which may be unique to their situations. Melkote (ibid.) adds: "This approach focuses on human and economic concerns and places greater emphasis on basic needs of people and participation of beneficiaries in development programmes set up for their benefit".

According to Lie (2001b) DSC is concerned with local interpretations and cultural construction that is (partly) based on these interpretations. DSC, as communication regarding localisation, is concerned with action and local people running development projects aimed at their own situation.

> "As an active concept it refers to supporting the voice of the local, national and regional, in order to counter-balance the global communication flow and to positively favour the right to culture from the inside out. This dimension has now been generally termed globalisation from below" (Lie 2001b:22).

Telecentres are development projects staffed by at least one or two people, (telecentre managers), who are dedicated to the success of the centre. This person should be skilled in matters such as computer literacy, data retrieval, business management and community development. In the DSC literature, such a person is termed a DSC professional performing a facilitating communicator role; the presence of such a facilitator is vital for development programmes (Agunga 1997; Conradie 1998). In South Africa, facilitators are generally telecentre managers who are trained by the USAASA in technical and management skills.

Telecentre managers and ICT trainers perform roles of development communicators because they link community members with development agencies such as the USAASA, the GCIS, and other government departments. Swart (2004:121) refers to the development communicator as the

individual who plays a more strategic role in the development process, interacts with the members of the community face-to-face in dialogue and spends more time in the community. Also the development communicator facilitates two-way information flow between himself or herself and the members of the community under development – as advocated by a participatory approach to development.

In Australia, telecentre staff are paid by local government (cf. Sabien 2003) in order to make sure that the staff stays and develops the telecentre, and that volunteers are managed properly and do not leave. South Africa needs to introduce this development in telecentre management schemes because managers and their assistants need income to survive. This could also prevent many local telecentre managers from leaving the telecentres or just abandoning the projects, as has happened in the past.

DSC is suitable for this study owing to its participatory nature given that telecentres involve two-way communication between stakeholders who decide how these centres should operate. These stakeholders are the telecentre owners, the managers and users, the USAASA and telecoms service providers like Telkom, Sentech and Vodacom. Two-way communication between the developers and those being developed can result in positive results. It should therefore be emphasised that development projects using two-way communication methods could assist rural South African development. Community members could also be creative and suggest ways of how they can use technology for their own development, based on what they might afford to purchase in terms of technology and information services. According to Anderson, Van Crowder, Dion and Truelove (1999:5): "An approach that incorporates the unique characteristic(s) of ICT with participatory communication and learning strategies can help to guide the contribution that telecentres can make to agricultural and rural development".

Anderson et al. (ibid.) also state that in the absence of such an approach, the rush to wire rural areas may result in development short circuits. DSC emphasises alternative and popular

communication strategies. It stresses the use of low-cost satellite communication, video, and computer networking for local level communication of a participatory nature.

Partisan as it is in nature, participatory research has been criticised as "representing an idealism that is misleading, because it can lead to action that is not based on an accurate analysis of existing social and historical contradictions" (Jacobson 1993:217). What can be regarded as the contribution of participatory research in social sciences research is that this approach accepts that research is not a value-free process and that local knowledge is important to be included in research results rather than the depending on knowledge from experts only. This study also recognises that knowledge gained from local telecentre users is important information that should be gathered and added to what is regarded as local knowledge in issues of development.

> One problem in participatory models is that is not clear that communities needed to be involved for certain results to be achieved. In some cases such as epidemics and other public health crises, quick top-down solutions could achieve positive results. Participation communication ignores that expediency may also positively contribute to development. Belaboring through grassroots decision-making process are slower than centralised decisions, and thus not advisable in cases that require prompt resolutions. Participation might be a good long-term strategy but has shortcomings when applied to short-term and urgent issues (The Communication Initiative – Participatory Theories and Approaches 2003:5).

Another critique that can be made of participatory approaches to communication is their heavy emphasis on face-to-face interaction and downplaying of the role of mass media in community development. Mass media, such as radio, have been proven to disseminate development information quite efficiently and sufficiently so a best strategy could be one that integrates the use of oral communication and cheap mass media in diffusing development communication messages. This strategy for developing countries, therefore, should promote some aspects of the

modernisation theory (which supported mass media usage for diffusion of ideas and spreading of development communication messages) and some aspects of participatory communication theories which support oral communication to advance development projects at local level.

> "Participation at local level can also promote division,
> confusion, and disruption that do little to solve problems"
> (The Communication Initiative – Participatory Theories
> and Approaches 2003:6).

In summary, development messages could be announced on radio and thereafter development support communicators, e.g., telecentre managers could reinforce such radio messages by interacting with members of communities and educating these community members about such projects. Mass media also assist in eliminating or reducing conflicts that erupt between community members when development projects are being run.

3.3.4 Community Informatics

Harris (1999:74), a proponent of informatics, writes that telecentre studies will be dominant in the CI field, because, as community resources, telecentres offer opportunities for that development that is predicated on improved access to information for whole communities. He continues that: "The study of Community Informatics (CI) is emerging in part in response to the challenge of achieving economic and social development for communities through the use of ICT. CI pays attention to physical communities and implementation of technologies and applications, which enhance and promote their objectives" (Harris 1999:74).

Where successfully and properly implemented, telecentres assist communities to achieve many social development objectives. Acacia research on telecentres in Africa has shown that telecentres have developed many people in Mozambique, Senegal, South Africa and Uganda. Acacia's telecentre video, *Disseminating the Fruits*, also provides insight into how South African women

use ICT in business, and how ICT empowers schools, communities and facilitates rural development. In Asia (Harris 2001) and Latin America and the Caribbean (Hunt 2001), many successful telecentre stories have been documented and are available on the Internet. Other examples of successful telecentres are those connected to the Western Australia Telecentre Network.

Gurnstein (2000b:2) states that CI begins with ICT, as providing resources and tools that communities and their members can use for local economic, cultural and civic development, and community health and environmental initiatives. CI also includes the ICT and the "user" (and the "uses"), and as is concerned with community processes, user access, and technology usability as it is with systems analysis and hardware and software design. One can, for example, argue that in this study CI is employed in the questionnaire to address and question telecentre users about their use of hardware and software at telecentres, about how they access the technology at the centres, as well as about telecentre usability – what they use the ICT for, how, which service providers they used while at the centres and at what costs, and also about the impact of the ICT on their education. These questions therefore locate this study within the CI field.

Fundamental to the advancement or improvement of personal education or social and economic development through ICT usage, is access to the ICT. Gurnstein (2000b:3), identifies an "ICT Access Rainbow" with discrete levels, which creates the required environment in which access to ICT can be provided or even achieved. These levels are:

a) governance and policy;
b) literacy and social facilitation;
c) service providers;
d) content and services;
e) software tools; and
f) devices and carriage facilities, which include "technical" aspects at a telecentre such as connections to networks such as the Internet and computers, "economic" aspects such as

the costs of using ICT at telecentres, and "social" aspects such as cultural, educational or literacy, and social barriers limiting the use of ICT.

In this study, elements of the "ICT Access Rainbow" that have been employed during the research methodology (in questionnaire construction, asking users about what services they were using the service providers selling those services, the content they used on computers, e.g., what information they employ computers for and what types of software they use). Questions in the questionnaire also addressed issues of literacy and social facilitation by asking users how telecentres improve their formal and non-formal education, and also whether the telecentres linked them to other communities or to the rest of the world, e.g., through the Internet and e-mail. Data analysis in Chapters 7 and 8 reveals answers to these questions. The economic impact of telecentres on users is also described in Chapter 7, which investigates how users employ ICT for business, government services and also communication to obtain study-related information. Therefore Gurnstein's ICT Access Rainbow has been instrumental in guiding in the processes of data gathering and analysis in this study.

The CI theory supports the purposes of this study even though it does not provide an explanation of how problems should or could be resolved in the case where there are functional problems or deficiencies in some elements of the "ICT Access Rainbow". This is one of the shortcomings of the theory when translated into practice. Failure on the part of any element of the "ICT Access Rainbow" to perform their responsibility and mandate (e.g., service providers), could result in the failure of the other parts of the rainbow to perform their own responsibilities or achieve their objectives. Each element of the access rainbow should perform its own function efficiently for the benefit of the other elements. A systems thinking approach could be the best practice that could sustain the ICT access rainbow and ensure that ICT is delivered efficiently to communities and achieves its purpose in those communities.

3.4 SUMMARY AND OUTLINE OF CHAPTER 4

This chapter introduced frameworks and theories that emphasise the role of ICT and telecentres in development. Its purpose was to provide a theoretical background to the research question of the study, namely, what telecentre impact does ICT located in telecentres have on users' formal and non-formal education, and to, together with the following chapters, form the theoretical foundation of the empirical analysis of the study.

The dominant paradigm discussed in this chapter emphasised that technology and knowledge are transferred from developed to developing countries for the purpose of imparting knowledge and ICT skills inhabitants. Critique of the dominant paradigm suggested that while technology and knowledge are transferred from developed to developing countries, it is important that two-way communication is promoted between those who develop others and also those being developed. The reason is that two-way communication yields better results in development communication rather than in top-down one-way communication. It is therefore imperative that aspects relevant for developing countries be adopted and implemented from both development paradigms, depending on local community communication needs.

It is concluded that assertions advanced by the intermediary theoretical framework explaining the role of ICT in development and the new paradigm for capacity building are critical for adoption by developing countries which promote ICT skills development, community advancement and e-education. According to this paradigm, educational institutions should engage in the creation of new knowledge for the purposes of educating community members and for the creation of knowledge value societies. Telecentres and universities should be part of these institutions which contribute to the improvement of literacy levels in underserved and poverty-stricken rural areas of South Africa. Chapter 4 pays more attention to how telecentres can contribute to this development goal. The point of departure is international cases of successful telecentres from which South Africa could draw lessons in the quest to use such centres for communication and development.

CHAPTER 4

THE ROLE OF TELECENTRES IN DEVELOPMENT: AN INTERNATIONAL EXPERIENCE

4.1 INTRODUCTION

Research on telecentres is conducted worldwide. The first part of this chapter deals with previous research in South Africa and selected countries, including the United States of America (US), England, Canada, Australia, Denmark, Sweden, the Asia-Pacific and South America, as well as Scandinavia. The second part focuses on some telecentres and research conducted on specific telecentres in Bangladesh, Canada, Uganda, India, Australia and selected African countries. The foundation of the role of telecentres in development is summarised by Madden, Savage and Simpson (1997:273), as the provision of access to information, thereby helping countries to meet universal service obligations (USOs). Barriers to accessing ICT also restrict the ability of regional populations to generate income streams via enterprise and education. In South Africa in particular, because of the huge rural-urban digital divide, it is imperative that access to ICT be accelerated. The last part of this chapter addressed this issue by explaining how telecentres assist towards bridging the digital divide.

4.2 TELECENTRES IN MORE DEVELOPED COUNTRIES

4.2.1 Scandinavian telecentres

Telecentres were first established in Scandinavia in the early-1980s and called telecottages. Scandinavian telecentres provided the basic model for many telecentres around the world. Telecottages offered telephony, facsimile, photocopying, distance education, telework and jobs. Scandinavian models have been adapted by Canada and Australia, whose telecentre research is detailed below. The Australian experience is a success as most telecentres are well funded by the state through local government, which sustains them (Sabien 2003; Western Australian Local Government 2001).

4.2.2 Australian telecentres

South African telecentre management and operation could learn valuable lessons from the Australian telecentre experience, which serves both urban and rural areas satisfactorily. Madden, Savage and Simpson (1997:272-288) conducted research on telecentres in rural areas of Western Australia (WA). They maintain that these telecentres are used successfully for development there especially in agriculture, tourism and fishing. Telecentre users have access to Technical and Further Education (TAFE), advanced computer courses, a wide range of software, interactive media and database software. WA telecentres provide IT services and training in order to support rural communities, local businesses and distance education (Sabien 2003:8).

According to Sabien (ibid.), through the Telecentre Support Branch (TSB), these telecentres are provided with financial assistance and development support by the WA government. Additionally, Sabien states that such telecentres are "non-profit" community managed facilities, and that they emphasise the provision of local access to Internet-enabled computers, two-way video-conferencing, photocopiers, faxes, information on a range of government services and a satellite teaching service.

An important lesson is that state funding leads to success. It is clear from Sabien's information that people located near telecentres in these rural areas feel that the centres are useful. South African telecentres likewise need ongoing government funding and telecentre managers should be paid. They incur telecentre development expenses, including maintenance of equipment, transport from rural areas to nearby towns to purchase equipment, stationery and other items necessary for the operation of the centre, and fulfilling computer-training requirements. Another idea that could be adopted by South African telecentres is to develop mobile rural telecentres for areas that need these services more urgently. Australian telecentres are called Modular Interactive Telecoms Environments (MITEs), are mobile and provide access to communication services where they are stationed. MITEs are transportable, pre-wired buildings for communities who are further than 500 kilometres from Perth in WA and lacking necessary telecom services (ibid.).

Similar issues of development and sustainability are identified in British research.

4.2.3 British telecentres

British telecentres were established in the 1980s. Murray and Cornford (1998) conducted a telecottages survey in the UK, the results of which highlighted new trends in the development of the MCT model. Their research established that twice as many centres there were making a profit than was the case in 1994 (when they first surveyed 150 UK and Irish telecentres), but that the number of loss-making centres remained about the same. Murray and Cornford (1998) conclude that there has been an increased emphasis on training as a major activity for centres and that the provision of Internet-related services has also become an important focus. They also contend that there has been a slight increase in the proportion of centres providing subcontracted work for local teleworkers.

4.3 UNITED NATIONS AND ITU-ESTABLISHED TELECENTRES

The ITU Development Bureau in Telecoms (BDT) developed a global telecentre development programme, the Integrated Rural Development Programme (IRDP), to demonstrate the sustainability of MCTs. According to Ernberg (1998) the ITU/BDT telecentre pilot projects are located in Africa (Benin, Mali, Mozambique, Tanzania and Uganda); Asia-Pacific (Bhutan, India, Maldives and Vietnam); the Americas (Honduras, Haiti and Suriname) and Europe (Romania).

The United Nations Development Programme (UNDP) is also assisting countries, including Egypt to establish telecentres (UNDP 2001). The UNDP also supported the South African former Universal Service Agency (now Universal Service and Access Agency of South Africa/USAASA) in funding (along with other donors) the establishment of telecentres. Other telecentre funders include the International Development Research Centre (IDRC). According to Shore (1997) the IDRC has been instrumental in establishing successful telecentres in the communities of Iqualuit, Iglulik and Cambridge Bay in Canada. Inuit Communications Systems in Canada built pilot community telecentres, which provide free access to northern-based arts and

cultural exchanges, distance education, aboriginal communication, health and social services and economic development.

4.4 TELECENTRES IN LATIN AMERICA AND THE CARIBBEAN

Latin America and the Caribbean possess successful telecentres that play a crucial role in development, from education to health and tele-working.

4.4.1 Telecentres in Mexico

According to Robinson (1999:1) the Mexican telecentre project encompasses computers and the Internet. Robinson states that most of the Mexican telecentres are not functioning, mainly because of lack of support (financial and technical) from the state. Their difficulties are regarded as a passing phase, which will be overcome. *Telecentro* (telecentres in Mexico) are established not only to provide a source of low-cost communication through the use of evolving digital technology but, more importantly, to serve as a catalyst for constructing a digital database of information to be used by local officials and citizens for public matters (ibid.).

4.4.2 Telecentres in Peru, Chile and Paraguay

The Peruvian Scientific Network established telecentres to provide access to computers and the Internet. The Peru telecentres use a *franchise* model, like India and Senegal. However, the telecentres of Peru operate at different levels:

(a) *mother infocentres* are operated in major cities and usually provide around 50 computers. There are about 25 mother infocentres in Peru;

(b) *telecentre franchises* in smaller towns usually possess about 20 computers each. The Peruvian Scientific Network (PSN) offers equipment, training, and support, while a local owner runs the business. There were about 300 such telecentres in Peru in 1999 (Latin American Telecentre Network 2001); and

(c) *Monocabinas* that offer a computer, printer, phone and modem to serve rural areas. There were approximately 250 in Peru in 1999. The PSN gathers information pertaining to health, education and development.

Telecentres in this region are intended to foster socio-economic and rural development, especially in Peru, Chile and Paraguay. Research on the telecentres in this region has been conducted by Proenza, Bastidas-Buch and Montero (2001) who identified the following types of telecentres in Latin America and the Caribbean:

(a) *commercial* telecentres in Peru (*cabinas públicas* or cyber cafès) are established by the private sector to increase Internet access. Commercial telecentres in this region possess limited capacity and benefit low-income populations. Proenza, Bastidas-Buch and Montero (2001) propose that government should make a concerted effort to develop telecentres with an ability to provide Internet services;
(b) *franchise* telecentres in Peru are regarded as more successful when run by the private sector. It is recommended that franchises be promoted in openly competitive markets;
(c) *university* telecentres in Peru foster research activity and offer supplementary educational services, promote social outreach and develop connectivity;
(d) s*chool* telecentres are common in South America. These telecentres are for the benefit of students and are usually located near laboratories and libraries. School telecentres charge fees for services to maintain sustainability. Having the school and the community share user-costs bolsters sustainability. School children benefit from the information and computer usage gained from telecentre technology; and
(e) *NGO telecentres* are also located in Chile, Peru and Brazil. Proenza, Bastidas-Buch and Montero (2001) identify these telecentres as successful because:

1. their sponsors are open and willing to discuss finances;
2. they promote modern, inexpensive information and communications technology consistent with payment ability of, and potential benefit to target clients;
3. their mandate is documented and clearly identifies the direction and sustainability of operations;

4. all clients, no matter how poor they are, pay for services rendered;
5. they maintain a decentralised administrative structure, attuned to patrons' needs;
6. *municipal* telecentres found in Chile, Panama, Paraguay and Peru provide access to computers and the Internet designed to support efforts to decentralise and strengthen local government, and promote local development and civic participation; and
7. MPCCs in the region, established together with the ITU, are intended to deal with the developmental challenges of rural environments.

Proenza, Bastidas-Buch and Montero (2001) conclude that to be successful in economic and social development, telecentre initiatives should:

(a) target low-income populations;
(b) remain strongly committed to self-sustainability and adopt business models consistent with that commitment; and
(c) be run by committed persons willing to contribute capital and time, address community needs, and become knowledgeable about the initiative's technical and financial requirements.

In addition, state funding is regarded as important for telecentres survival. Merit-based state funding systems proposed include telecoms development and community investment funds. These funding schemes yielded positive results in that region and are recommended for use by other telecentre-promoting governments.

4.5 ASIAN TELECENTRES

4.5.1 Indian telecentres

In addition to the basic services, Indian telecentres also provide Internet access and a focus on business. Many telecentres are privately owned, with the network providing Internet connections and information services, some of which are run by university-linked and funded agencies and

NGOs (Harris 1999, 2001). Another focus of Indian telecentres falls on telecommuting jobs in writing, translating, technical computer aspects and data entry fields. Most Indian telecentres employ 50 persons, which is relatively large when compared to South African telecentres (with one to three people).

4.5.2 Bangladesh telecentres

Bangladesh Grameen Bank is a micro-lender providing small loans to support 2.1 million micro businesses, especially those operated by women entrepreneurs in disadvantaged areas (Benjamin 2001b:8). The Grameen Phone principle is one of creating small business to provide telecoms services via cell phone services as public phones (ibid.). Payphones have a stopwatch and a calculator. It is estimated that in 2001 there were 500 Grameen village phones in Bangladesh (Akhbar 2001; Benjamin 2001b). Telecentres also operate in the Philippines, China and Vietnam.

4.6 TELECENTRES IN OTHER AFRICAN COUNTRIES

In Africa, telecentres operate in Mali, Senegal, Mozambique, Zambia, Egypt, Tanzania, Tunisia, Uganda and Benin. Research conducted on centres in Uganda, Tanzania, Senegal, Tunisia, Mozambique and Zambia is considered in the following section (the most reliable source on this, is the Internet). Stories concerning these indicators are useful for South African telecentre administrators and managers to contribute to improved performance and sustainability of local telecentres.

South Africa has supported telecentre development in Africa, with former South African Minister of Communications, Jay Naidoo, undertaking an African Connection Rally in 1999 from Cape to Cairo, visiting telecentres and providing support for these projects (African Connection Project 1998; Naidoo 1999). The African Union (AU) supports telecentre development as a vehicle to enhance the African telecoms infrastructure.

In Senegal there are no public phones, however, private telecentre franchises exist. According to Sagna (2000:1) there were approximately 7 000 telecentre “prives” in Senegal in 2000. In

Senegal, Sonatel (the PTO), has no public phones, but installed 10 000 public telephone shops (telecentres) operated by local entrepreneurs. To encourage prive establishment Sonatel offers a substantial discount on tariffs and supplies advice for telecentres wishing to add services, such as fax and Internet access. Senegal has set milestones for African countries through prives (cf. Benjamin 2001b; Jensen 2000; Jensen 2004).

Sagna (2000:1) conducted research on ICT in Senegal on behalf of the United Nations Research Institute for Social Development (UNRISD), and states that in response to the need for general public telephone access, private telecentres quickly replaced telephone booths, which, because of their relatively high installation cost and frequent damage, were scarce. In addition to private telecentres, cyber cafes and Internet access points are found in Senegal. Télécom-Plus telecentres (with little access to computers and printers) also exist. Sagna (2000:45) identified the following uses for Internet access points in Senegal:

(a) communication between parents and children studying abroad;
(b) information facility for information on study abroad;
(c) contact point for local NGOs and partners;
(d) research on business opportunities; and
(e) online documentation for professional purposes.

Clearly, Senegal is an African country with an effective strategy for providing universal access to ICT to civil society. Not only do telecentres function succesfully, but other commercial ICT projects also operate well, e.g., cyber cafes. Owing to expanded competition between providers of facilities, access to prives remains affordable. Most Senegalese prives open from 7 a.m. to midnight (ibid.).

Only a few telecentres are established in the towns and rural areas of Tanzania. Research is available on the Sengerema telecentre. This multipurpose community telecentre has a project management committee (PMC) comprising representatives from national institutions, international donor organisations (Christian Reformed World Relief Council or CRWRC and the Evangelican Lutheran Church of Tanzania/ELCT in Mwanza Region) and local observers. The

local steering committee (LSC) consists of representatives from local organisations and institutions, and private enterprise. Dahms (2001:8) states that the Sengerema telecentre has a manager and the PMC and that the telecentre employed five people. Furthermore, 117 people had been trained in the computer courses offered by this telecentre free of charge.

In Tunis, Tunisia, the Agence Tunisienne d'Internet (ATI), which is the government authority maintaining the Internet backbone in Tunisia, carried out a national tender for 100 telecentres (PubliNets). More information on Tunisian telecentres is available on the Tunisian National Telecentre Web Site. In Egypt, Sharkeya Governorate Technology Access Community Centres (Sharkeya Governorata Technology Access Community Centres 2001) have been established. According to Jensen (2000) the UNDP is collaborating with the Sharkeya Governorate, and the Sharkeya Chamber of Commerce, amongst local funders, set up three TACCs in the governorate.

Hassanin (2003:6-9), writes that in Egypt, the Ministry of Telecoms and Information (MCIT) announced, in 1999, the National Communications and Information Technology Plan (NCITP), which has the promotion of ICT use as a goal. According to Hassanin (2003:9), civil society organisations (CSOs) in Egypt promote the objectives of the NCITP, work for the dissemination of ICT and are mostly active in community development, e.g., computer training, establishing computer laboratories and ICT training in schools, libraries and youth clubs. ICT, argues Hassanin (ibid.), becomes a development tool because access to ICT leads to personal improvement which leads to employability and economic development.

Hassanin (2003:7, 15) further states that the Ministry of Education (MOE) in Egypt established 300 technology clubs and installed 27 technology development centres for computer training in universities, schools and public libraries, Internet access and distance education. South Africa has made similar ICT interventions at educational institutions and community organisations, e.g., the Department of Communications' Wireless Internet Laboratories (DoC WILs), at Historically Black Universities (HBUs), cyber laboratories at schools, and Public Information Terminals at community libraries. Furthermore, according to Swinton (2003:23) South Africa has 73 community telecentres and 30 school cyberlabs which have been established in underserved areas and which provide e-education, e-health and e-business opportunities. "The ultimate aim of these

centres is to give and improve the skills, information and links that the community needs to develop a sustainable infrastructure" (Swinton 2003:24).

The objectives of the Egyptian NCITP are similar to those of the South African legislation on e-Education (cf. Chapter 1), in South Africa organisations that pursue e-Education goals include schools, libraries, the GCIS and its Thusong community centres as well as the USAASA which establishes and manages telecentres. South Africa established 900 MPCCs, called Thusong Service Centres (cf. Legoabe 2007). The challenge of South Africa is to establish more of the centres, involve more CBOs and communities in the establishment and management of the centres and better train telecentre managers (cf. Benjamin 2003; Hulbert 2006), and ensure that the centres are economically sustainable by rewarding telecentre managers (cf. Sabien 2003).

Both South Africa and Egypt (among other African countries) should hasten ICT rollout to improve literacy rates, which in the case of Egypt, is 65 per cent (Hassanin 2003:8). More South African telecentre developments are discussed later in this chapter. Mali is an African country which has increased ICT access. According to Willeme (2004:1) the International Institute for Communication Development (IICD) has established 703 telecentres in Mali. The MCT in Timbuktu, Mali operates in a wing of the local hospital. Volunteers install PCs and set up the network, and provide the local community with training in PC use and Internet applications such as e-mail and the World Wide Web. A Web site was created for the Timbuktu MCT hosted on a server in Bamako. This MCT was the first to be established by the ITU-UNDP-World Health Organisation (WHO)-IDRC and UNESCO development project in Africa.

The Food and Agriculture Organisation (FAO) used the Timbuktu MCT as a local base for development work, which cost US$ 1 million to link the Rural Community Radio and the FAO World Agriculture Information Centre (ITU Development Sector Mali Case Study 2001). According to Willeme (2004:1) the International Institute for Communication Development (IICD) had established 703 telecentres in Mali, projects run in association with the Ministry of the Home Department (MATCL). The Timbuktu telecentre is equipped with computers and offers typing, copying, telephone, fax and Internet services. The centre is run by technical staff and overseen by a committee which includes the mayor, business people, artisans, librarians, health workers, women's organisations and other community members. The steering committee

sets prices, offers discounts for children and women. An emphasis of the telecentre is to provide training to artisans to develop Web pages to sell handicrafts. Telecentres have proven to be particularly useful to tour operators organising visits to centres as Timbuktu. The collection in the local museum and the manuscripts in Centre Ahmed Baba Library were digitised (ITU Mali Case Study 2001).

The Nakaseke telecentre is a successfully operated Uganda telecentre which represents a joint project between international donors (UNDP, ITU, IDRC) and local funders (including the local PTO, libraries, and the government). Some Ugandan telecentres are established through the African Connection Project. Telecentre models in Uganda comprise:

(a) the MCT, such as the Nakaseke Telecentre, a pilot project funded by donors; and
(b) Starcom calling centres, a private sector investment to establish a network of payphones (ibid.).

Under this model, Uganda has several funding strategies:

(a) public funding by government or state organisations for the purpose of telecentre development and maintenance. The ITU, UNESCO and the IDRC, contribute to 75 per cent of the Nakaseke Telecentre's budget;
(b) private funding common in the funding of telecentres in the developed countries; and
(c) contracts phase funding where the private sector finances telecentres to offer specific public services for a specified period. This process differs from public funding in that public funding constitutes state funding for all telecentre services and activities over a long period.

Services provided by the Nakaseke Telecentre include telephone, facsimile and photocopier services. The telecentre aims to introduce ICT and library services. The centre also offers secretarial services and intends to have e-mail and Internet services. However, the telephone lines at the telecentre is not of a high enough quality to allow Internet service. On the other hand, the Starcom calling centre consists of a container on top of a very small aperture terminal (VSAT)

dish with a satellite connection (cf. Dahms 2001). In general, though, Ugandan telecentres struggle to survive with decreased government support. Despite these difficulties the telecentres continue to support distance education, primary education, continuing education for health staff and voluntary health workers, computer training for teachers, tele-health (working with Nakaseke and Mulago hospitals) and broadcasting.

According to the International Institute for Communication and Development (IICD 2006:1) there are 60 telecentres in Uganda that aid in the implementation of education, good governance and health services. Partners that establish Ugandan telecentres include the Ministry of Tourism, Trade and Industry (MITT), the Ministry of Health, the Ministry of Local Governance, a training partner TechnoBrain, the Ugandan Institute for Communication Technology and the Ugandan Communications Commission (UCC).

The IICD also operates telecentres in Zambia. The Chipata Chamber of Commerce (CoC) in Zambia launched a telecentre in Chipata as part of the African Connection Rally in 1998 (African Connection Project 1998). This telecentre targets the local business community, and represents a joint venture between the Lusaka-based ISP ZamNet, which provides the leased line link to the telecentre, and Shula Habeenzu. The Twigwilizane Women's Foundation Community Telecentre (TWFCT) tackles social challenges such as the HIV and Aids stigma, prostitution, nepotism, racism and chauvinism, amongst others (cf. Tigwilizane Women's Foundation Community Telecentre [Sa]). The TWFCT also partnered with the Chipata Council and the Zambia police to train police officers at minimal cost in computing skills. Additionally, the Tigwilizane Women's Foundation (TWF), through the TWFCT, tackles social challenges, using ICT, to achieve the MDGs.

Despite the African telecentre developments discussed above, ICT development in Africa remains slow. Boloka (2004:31) argues that the reasons for this and the waning interest of global media and ICT players in the South African market, in particular, are that:

(a) globalisation negatively impacted on the development of small ICT companies which are unable to withstand acute economic pressure while consolidation continues to elude the

industry. Globalisation embodies the "big is better syndrome" which only benefits conglomerates through mergers and acquisitions and not small ICT companies which need to be developed in Africa. African governments have also failed to advance successful establishments of small and medium-sized enterprises (SMMEs) in the ICT sector;

(b) markets built on ideological inclination or traditions are susceptible to economic pressures, and therefore likely to crash in the face of globalisation. This is important in view of BEE, which has not only shaped the post-apartheid media, but continues to influence policy governing the media industry as well. Globalisation does not distinguish between BEE and non-black economic empowerment; and

(c) although the globalisation-shaped transformation process in South African media industry has helped create and enhance a competitive media environment, access and diversity, it has shed many non-performing firms and annihilated small media, creating an environment in which only conglomerates thrive. This situation is apparent in the South African telecom industry where only Telkom and the mobile phone operators are thriving, while the new Neotel and SMMEs such as the under-serviced area licenses (USALs) are surviving (in the case of the USALs).

The section above discussed international telecentre case studies and research results produced by international telecentre studies. South African telecentre research and policy makers could consider the problems imposed by globalisation on the South African telecoms and media sector identified in the previous section when formulating future policy on universal service and access, and telecentre development to ensure that failed (locally and in other countries) telecentre development strategies are not repeated.

The next section examines research conducted by local researchers on South African telecentres and provides recommendations from the studies' researchers towards the improvement of the performance and delivery of these telecentres.

4.7 RESEARCH ON SOUTH AFRICAN TELECENTRES

There were 194 Department of Communications (DoC) and Universal Service Agency (USA) cyberlabs, telecentres and community digital hubs in South Africa by February 2006 (Universal Service Agency 2006a:1). The last recorded figures of these ICT centres are listed in Table 10 (cf. Chapter 1). Studies conducted on local telecentre development include the following:

(a) The National Information and Telecoms Forum (NITF) study of MPCCs, was conducted by Karaki and Benjamin in 1996 and was partly funded by the IDRC. The study intended to assess the state of South African MPCCs. Questionnaires were sent to 8,000 organisations, but only 441 were returned by 235 MPCCs and 206 non-MPCCs (cf. Karaki and Benjamin 1996; NITF MPCC Research 1996). According to this study the numbers of MPCCs in South Africa, by province, are: 54 in the Eastern Cape, 52 in Gauteng, 46 in KwaZulu Natal, 30 in the Western Cape, 23 in the Northern Province (now Limpopo Province), nine in Mpumalanga, eight in the Free State, seven in North West and six in the Northern Cape. The study focused on four MPCCs as case studies: Legae la Kitso in Atteridgeville (a township near Pretoria), Kwa-Mashu Community Resource Centre (Kwa-Mashu, near Durban), MACIS and Alexsan Resources Centre in Alexandra (township outside Johannesburg). All centres are located in urban areas.

The NITF study focussed on the characteristics of the MPCCs, the results identified as *sustainability, ownership, linkages, services* and *finances*. The *conclusions* of this research suggested that MPCCs play a major role in their community, offering a range of services, and also in development, especially in areas far from government delivery. According to the report most of these centres experienced funding shortage and relied on donor finance, though many had developed independent funding methods. In addition, the Eastern Cape and KwaZulu-Natal telecentres are well organised. Particular organisations supported certain centres, e.g., the Diakonia Church in KwaZulu-Natal and the Social Change Assistance Trust in the Eastern Cape. Rural MPCCs were more likely to offer a wider range of services than those in the urban areas. Advice Centres in rural areas

offered training and small business support - often because the centres represented the principle development resource of the community (ibid.).

The methodological limitations of the NITF study, according to Karaki and Benjamin (1996) are:

1. the list of MPCCs did not contain all South African MPCCs;
2. to contact the MPCCs required that the centres be in communication with someone (or on some database), and therefore the researchers did not reach the most isolated centres;
3. many MPCCs did not receive the questionnaire and many of those who received them did not return it;
4. their research was biased toward well-connected MPCCs which did return the questionnaires;
5. only five per cent of questionnaires were returned (441). Further, only four MPCCs were analysed and these were urban; and
6. the research did not focus on the educational effects of ICT on their users but mentioned ways in which the MPCCs helped the MPCC users socially and economically.

(b) The Jensen, James and Edwards (1997) telecentre study evaluated the suggested locations of the telecentres before they were established, and identified the funding and structural need. Sites visited included Makuleke, Botlokwa, Apel and Mohodi in Limpopo Province; the Legkraal Career Association and Winterveldt Post Office in the North West Province; the Ndevana Development Forum, Siyahluma Business Entity and Hlwahlwazi Adult Literacy Committee in the Eastern Cape Province; Turntable Trust in Bulwer, KwaZulu-Natal Province and the MACIS in Mamelodi, Pretoria. This IDRC-supported research identified possible difficulty which proposed telecentres might face, including financing operational and staff payment matters, a lack of electricity and accommodation, infrastructure and building-related problems, limited business management skills and other technical problems involving LANs and WANs. It nevertheless became apparent that South African telecentres provide telecom services to millions of people who previously had no access.

(c) The USA preliminary evaluation of South African telecentres was also undertaken to assess established centres and develop better management systems for future telecentres, (Khumalo 1998:1). Telecentres in this study included Ga-Seleka in Northern Province (Limpopo Province), Ndevana in the Eastern Cape Province, Thaba Nchu in the Free State, Pescodia in the Northern Cape, Bamshele in KwaZulu Natal, and Winterveldt in North West. The results suggested that telecentres were "reasonably accessible" to users; the "equipment worked most of the time"; "operator competence was lacking"; "most ISPs do not have local points of presence (POPs) and access is relatively expensive"; "software installed in most computers is inappropriate and of poor quality" (Khumalo 1998:2).

Some recommendations include:

1. developing a management system for the USA and organisation of a telecentre. This study argued that a management system would assist the USA to monitor use of equipment, advise on expansion of telecentres where necessary and provide a true reflection of telecentre income or expenditure;
2. expanding on and communicating the responsibility of the USA concerning telecentre organisation (e.g., clarity on ownership, level of support from the USA and handling of complaints);
3. providing telecentres with clear guidelines on tariffs and pricing policies; and
4. adopting a "modular approach in relation to equipment and services"

(Khumalo 1998:4).

The USA claimed to have implemented the recommendations of these studies. According to Memela (2005) the USA established the Telecentre Association of South Africa (TASA) to identify telecentre problems, facilitate solutions of those problems and assist the agency in the co-ordination of ICT training programs for telecentre managers. Some telecentres experienced operational problems since 1999. For instance, the Ndevana telecentre closed temporarily in 1999

owing to financial and telephone technology issues (Cekiso 2000). The USA rescued the telecentre and paid the telephone debt.

Khumalo (1998:4) recommended that PPPs develop telecentres, with government agencies such as the USA establishing the telecentres, and private companies assisting in further development and financing and IT training of managers and users. The economic benefits furnished by telecentres to communities included providing managers with small salaries and telecentre users with computer literacy.

(d) The Human Sciences Research Council (HSRC) study of South African telecentres was conducted in 1997-98 (cf. Conradie 1998). This research formed part of the Communication for Technological Advancement (COMTECSA) research programme, and the HSRC collaborated with external partners and organisations such as universities, technikons and the Council for Scientific and Industrial Research (CSIR). Conradie mentions four case studies which were analysed: Siyabuswa Education Improvement and Development (SEIDET) telecentre in Siyabuswa (remote Mpumalanga Province); the Hammanskraal phone shop (North West Province); the Brits Publicity Association (small town 50 kilometres west of Pretoria); and the Micha-Kgasi educational telecentre (near the remote Kgabalatsane village in North West Province). The SEIDET telecentre provides educational support in the fields of science, mathematics and English.

Conradie's report (1998:109-110) offers a framework for the present study because it mentions lessons learned in international telecentre development, including:

1. the development and entrepreneurial activities at rural telecentres tend to operate according to the principles of Integrated Regional Development (IRD). This approach involves an investment in developing the knowledge, skills and entrepreneurial abilities of the local population, and requires considerable predevelopment activity. It is similar to what the USA offers South African telecentres (human resources development - HRD, financial management training or entrepreneurial skills and IT skills);

2. when planning to establish telecentres, consideration should for example be given to the level of demand for services; the involvement of other organisations in the running of the telecentre; socio-cultural aspects which may affect the utilisation of the telecentre (such as communication gaps associated with gender); and a participatory needs assessment to assist in identifying the information and training requirements of the local population. According to the 1996 Telecoms Act of South Africa, the USA (now USAA) is obliged to perform these tasks to aid telecentres to develop; and
3. telecentres require local pioneer scouts (telecentre managers). This point is supported by USA research which indicated that telecentres need managers trained in financial control and human resources management to succeed.

(e) Benjamin, Stavrou, Burton and McCarthy (2000:26-27), conducted the Telecentre 2000 study and mentioned that:

1. telecentres are managed better when the owners have a financial involvement;
2. there is a latent demand for telephony;
3. simple business models are employed;
4. there is a great demand for computer courses and other services like health and education to be provided by telecentres;
5. it is hard to keep computers and other electronic equipment working in rural areas, as telecentre managers have to travel to urban areas for expert assistance; and
6. as a national system, the USA found it hard to provide centres that are effective at local level, i.e., top-down planning is unlikely to achieve bottom-up development.

A summary of the Community ICT projects established in South Africa by the end of 2001 illustrated in Figure 1 shows that:

(a) In 30 (46 per cent) of the telecentres were computers and phones operating.
(b) Twelve (18 per cent) of the telecentres possessed computers but no operating phones.
(c) Two (3 per cent) of the telecentres had phones but no functioning computers.
(d) Twenty-one (33 per cent) of the telecentres were not operating.

(e) Five (8 per cent) of the centres used the Internet.

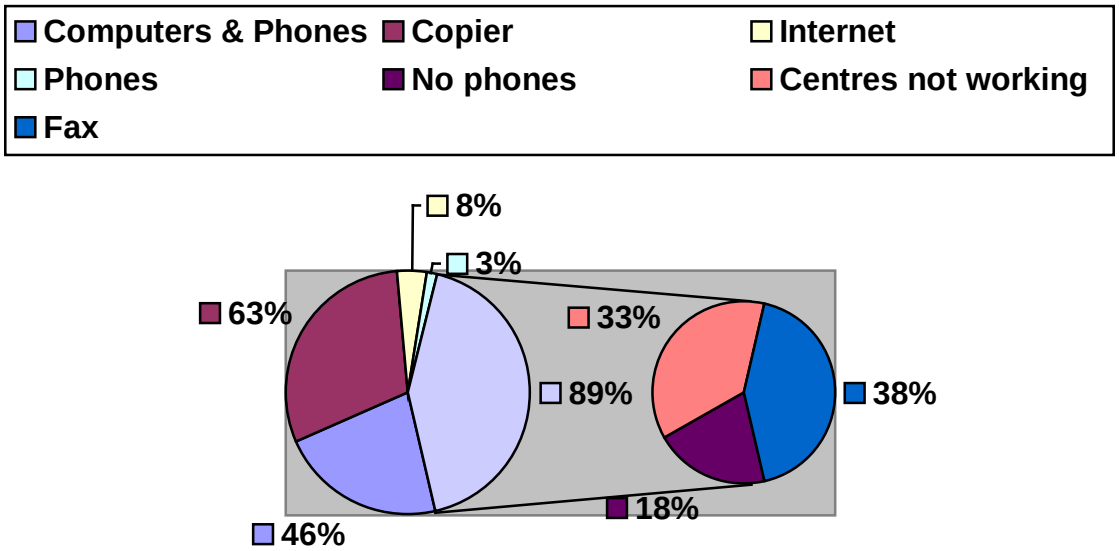

Figure 1: USA Telecentre Survey Results at the end of 2001

Source: Benjamin (2001a:4)

Benjamin's (2001a) study also analysed the state of the telecentres but not the impact of the functioning telecentres on their users' education. While useful, this study does not offer solutions to the specific problems experienced by the telecentres which were not operating. Benjamin's (2001a) research suggests that local telecentres, in order to succeed should:

a) be well-managed;
b) develop new services, e.g., act as a post office, sell stationery, run newsletters, provide tourist information services, and so on;
c) establish external linkages for information sharing and problem-solving; and
d) network with telecentres, funding organisations and institutions from government and the private sector. Several telecentre managers from the Northern Province (now Limpopo Province) are already sharing ideas through networking.

e) The GCIS study was aimed at assessing GCIS-established MPCCs nationally that were successful. GCIS MPCCs are located in rural areas and offer government services such as health, welfare, home affairs and housing. MPCCs also offer telecentre-type services and are equipped with the necessary ICT. Twenty GCIS MPCCs were in full operation by 1999, with 900 established MPCCs in 2006 (cf. Legoabe 2007). These telecentres contribute to community development and the reconstruction and development of South Africa. For example, the Makhuva community telecentre provides education and health information and saves community members time travelling to nearby cities (Makhuva MPCC 2001).

Besides telecentres and MPCCs, South Africa also has Vodacom, MTN and Cell C phone shops (estimated to be more than 3,800 in 2000) to fulfil licence Community Service Obligations (CSOs), Internet cafés, information centres, and centres of excellence or digital laboratories in HBUs.

(f) The Northern Province (Limpopo Province) telecentre community research study was conducted by the Vodacom Link Centre in Johannesburg. According to Benjamin (2001a:12) the centre conducted research on six such telecentres. The research was funded by the IDRC and conducted by people residing in the communities where the telecentres are located under the guidance of Link Centre researchers. The study ran from February to October 2000. The instruments employed included household survey, user questionnaire, group discussion, organisational interview and participatory rural appraisal techniques. The project assisted researchers in learning about telecentres and establishing local control of the centre. Lessons learnt motivate other telecentres to function better, as the Link Centre's newsletter is sent to telecentres.

The results of the telecentre community research (ibid.) indicated a number of contrasts between Northern Province centres:

1. Phalala and Mothapo were both "making money, supported in their community";

2. Botlokwa telecentre experienced tension with local organisations that felt that the centre was not run well;
3. Mankweng telecentre was operating despite competition from telephone and computer service companies. Mankweng experienced a burglary and loss of computers and other equipment; and
4. Thakgalane had not received their equipment (usually telecentres received equipment from the former USA), and lacked a working phone and training support. Weak management and poor skills led to cessation of operations at Makuleke MPCC.

Among the conclusions drawn from this experience are:

- telecentres must be fully equipped by the former USA (USAASA) to operate properly;
- vandalism and theft indicate that property should be secured;
- telecentres with local support succeed (see Conradie 1998);
- the USA must support telecentres by providing equipment, technical training, funding and financial management training;
- telecentres are designed to be a government subsidised universal access facilities for the rural poor, who are not able to afford to pay some telecentre bills; and
- community members could participate in research to solve local ICT problems.

(g) The Kutu Mphahlele and Maepa (2003) telecentre study was conducted in Limpopo Province indicated that access to ICT is regarded by the South African government as important in enhancing the quality of life in rural communities. They perceive a need for telecentres in Limpopo, but maintain that for telecentres to succeed, the following factors are important:

1. determine the need for their existence in the proposed locations;
2. their role in the community should be made clear, e.g., if the centre is a profit-making entity, the community should be educated that members will have to pay for services;

3. an appropriate site and premises. Some telecentres have to pay rent. The USA should assist telecentres in finding appropriate locations;
4. ensure community support and ownership of the centres which is crucial for telecentre sustainability;
5. secure centre equipment (Lesame 2002b; Mathebe 2001; USA 2002);
6. managers should possess sound managerial skills. In the USA telecentre audit (2002) most managers interviewed stated that they needed skills such as financial management, marketing management and technical training;
7. a strong management committee is needed. The onus is on telecentre managers to ensure that the centre operates efficiently, which requires the services of more than one person; and
8. the attraction of more customers by the promotion and expansion of services beyond basic communications.

(h) The 2001-2002 USA telecentre audit identified telecentres as:

1. Mini telecentres (three of 47 telecentres researched);
2. Standard telecentres (16 of 47), mostly established by youth and women's organisations;
3. MPCCs (23 of 47); and
4. Pilot telecentres (three of 47).

Recommendations made by the USA telecentre audit (2002) are:

1) Telkom's telephone charges are too high and should be reduced as they impact on affordability and profit. Phone shops located near the telecentres offer similar services, sometimes at cheaper rates. Telecentres could also use services of other telecom service providers, e.g., Neotel and cellular services providers.
2) Security should be tightened. For example, Mamelodi telecentre (located in Gauteng Province) ceased operation as it was burgled several times since 1999, as did Siyakhana telecentre in Ntselamanzi rural village near Alice and Machibini telecentre

in rural Lady Frere (both telecentres in the Eastern Cape Province), Mpukunyoni telecentre in KwaZulu-Natal Province, and Newtown telecentre at Postmasburg in the Northern Cape Province (USA telecentre audit 2002).

3) The USA, NGOs and other development agencies should assist telecentre development by providing technical support and training to managers. This would assist to sustain these centres.
4) Telecentre managers should be provided with business management skills such as financial and marketing management.
5) Telecentres should not be established in very economically deprived areas. For example, Northern Cape telecentres suffer from a lack of income and development. Boitekong telecentre, outside Rustenburg in North West Province, also experience this problem. Clearly, socio-econometric factors (e.g., culture, education and income) influence the success of a telecentre.
6) The education of telecentre managers and volunteers should be enhanced. It is the responsibility of each manager volunteering to sharpen the business skills and generally improve their education.
7) Telecentre managers should join the South African Telecentre Association (SATA), established in 2003, to enable managers to share experiences and improve management practices (Memela 2005). According to Memela SATA will aid the relationship between telecentre managers with the USA.
8) Electricity should be made available in areas where telecentres are established. The telecentre in the Matatiele rural area in the Eastern Cape Province does not have electricity (USA telecentre audit 2002).
9) Telecentre managers should pay their electricity and telephone bills to avoid service termination. The Ndevana telecentre near Berlin, Eastern Cape Province and the Bhamshele telecentre in KwaZulu-Natal Province had Telkom lines cut owing to non-payment.
10) Telecentres should be provided with better technology. Digital technology and wireless networks work better for telecentres, especially in rural areas where it takes time to repair damaged equipment.

11) Government support (financially with regard to information and capacity building) is crucial to telecentre success. Telecentres experiencing difficulty have been assisted by government and the CSIR.

12) Private sector support is necessary to sustain telecentres. In this regard, Microsoft South Africa has assisted telecentres in hardware, software and IT-training, e.g., the Mamelodi telecentre.

(i) The Hulbert (2006) telecentre study was conducted at six ICT centres established by Technikon South Africa in selected areas of Southern Africa. Hulbert (2006:148-154) concludes that for ICT centres to succeed in this region:

1. donors' requirements should be satisfied;
2. community interests should identified prior to establishment to ensure that the community needs a centre and that the centre will satisfy community communication needs;
3. donors should form local partnerships with local organisations for the success of the centres; and
4. IT and managerial skills should be transferred to centre managers before and after centre establishment to ensure the financial and operational sustainability of that centre.

Furthermore, Hulbert (2006:159) proposes a telecentre model aimed at:

I. involvement by the community during telecentre development which discourages a "top-down" approach to telecentre development and technology transfer;
II. satisfaction of community needs through telecentre activities;
III. consideration environmental factors that affect the development before establishing the centre, e.g., security, availability of electricity and the local economic situation;
IV. provision of technology and training to staff; and
V. implementation of activities, operations, and constant evaluation of operations with a view to administering corrective measures when needed.

To summarise, the problems of the South Africans are evident, and include challenges such as vandalism and economic sustainability. Solutions vary by telecentre, but it is clear that all telecentres should have secure building, management training and introduce services to attract new clientele. There should also be more cooperation and communication between members of TASA, USAASA, and other funders and stakeholders which have and interest in supporting the telecentres. Stakeholders should also highlight the value of community education. Educational institutions have a role to play in teaching people about the importance of telecentres in local development. Chapter 8 also highlights the value of education in telecentre development.

4.8 KEYS TO SOUTH AFRICAN TELECENTRE SUCCESS

The main recommendations from the preceding research projects for telecentre development, management and sustainability are:

(a) managers should plan telecentre activities and develop strategic plans. This is particularly important with not-for-profit CBOs that rely on a revolving cycle of volunteers;
(b) stakeholders should be well-managed. In Australia, telecentre volunteers are remunerated (Sabien 2003);
(c) telecentre services should be inexpensive. A survey of telecentres and Vodacom phone shops in Pretoria townships (Atteridgeville and Mamelodi) showed that the telecentres charged 80 cents per call unit, while most of the Vodacom phone shops charged 50 cents per call unit. To be sustainable, telecentres should price services competitively. New services should be provided to attract clients;
(d) local government should establish telecentre support units (TSUs) to focus on telecentre development and the remuneration of staff;
(e) managers should record their activity and engage in bookkeeping;
(f) telecentres should maintain relevance to their community and provide needed services. For example, some communities state they need telephones and basic computer skills to obtain employment in urban areas, i.e., Tombo MPCC;

(g) local telecentre ownership is necessary, e.g., the Worcester telecentre in the Western Cape Province was closed in 2001 because of conflict mismanagement (USA telecentre audit 2002); and
(h) there is a need for a balanced approach to community development.

If a telecentre is established, that community should be developed in all the necessary areas, among them include being provided with better roads, electricity, sanitation, schools and clinics. This implies a systems and well-rounded approach to development.

4.9 SUMMARY AND OUTLINE OF CHAPTER 5

This chapter showed that telecentres are a global concept to aid in the development of people. From the literature reviewed in this chapter, it is evident that a number of types of telecentres exist:

(a) telecentre pilot projects installed and operated by international development agencies (such as the IDRC, UNDP and UNESCO) with local partners and NGOs; and
(b) national telecentre rollout programmes as part of government policy to address national USOs. The USAASA telecentre program is of this type.

This chapter also referred to financial, human resources and other operational problems experienced by South African telecentres and elaborated on proposed solutions to these problems for the future development of the telecentres. A systems approach to telecentre development and sustaining has been proposed. Government departments should ensure that they co-operate with other elements of the "ICT Access Rainbow" in the processes of telecentre development in order to ensure that centres succeed. Economic theories have been discussed as well and they explain that ICT may not be a solution to development problems, but it certainly can be employed to assist nations achieve development goals if used efficiently in strategic development projects. The role of ICT in business and empowerment of small business owners has been apparent in this chapter, which can induce many would-be business persons to use ICT in activities aimed at business development. The theories of development discussed in this chapter have also been

criticised as far as their relevance to the development of the South African rural areas are concerned.

This chapter demonstrated that telecentres experience development problems in all countries across the globe, and that there are similar types of telecentres in different countries. The challenge is to ensure that problems experience by telecentres are dealt with by those operating the telecentres and new strategies of running the centres successfully be developed. The chapter also showed that telecentres, across the globe, offer educational, health and other facilities to users, and therefore contribute to formal and non-formal education of users in many countries. South African researchers, therefore, have to define this educational impact on local users and record this information which is readily available in other countries. This study will contribute to this goal and fill this information vacuum.

Chapter 5 is a discussion and critique of the South African telecoms policy, which laid the groundwork for telecentre development. The chapter traces the regulatory framework from the late-1980s to 2009, and provides a critical analysis of policy developments, while capturing the latest infrastructure and technology developments, telecom company ownership structural adjustments, new service provisions arising from competition and the convergence push. The chapter also proposes regulatory challenges and regulatory alternatives which could improve some areas of policy implementation regarding telecentres and bridging the digital divide.

CHAPTER 5
TELECOMMUNICATIONS REFORMS IN SOUTH AFRICA - AN ANALYTIC FRAMEWORK

5.1 INTRODUCTION

This chapter discusses and analyses South African telecom policy from the late-1980s to 2008. These policy changes can be interpreted as government attempts to provide universal access to telecom services to ensure public access to ICT, promote the democratisation of society and flow of information. The telecom policy has also attempted to address the slow growth of the fixed-line telecom market by introducing mobile phone services and legislated for Internet provision at public access points. However, policies discussed in this chapter have failed to meet the high demand for affordable fixed-line telecom services but have succeeded to generate the rapid growth of the mobile phone market. Internationally, important components of telecom reform include privatisation of the state-owned monopoly, introduction of competition and creation of an independent regulatory body (Sánchez 2002:44). These components also form the core of South African telecom reforms. This chapter evaluates whether these policy developments amongst others, have improved access to national telecom services towards the democratisation of society.

This chapter also provides a critical analysis of the telecom policy which was brought about the regulatory environment that established telecentres. Although this policy was instrumental in bringing telecentres to South Africa, it did not create an environment for the centres to expand speedily and operate efficiently. However, the purpose of the regulatory policy was not to ensure that telecentres contribute to telecentre users' education but rather to create an enabling regulatory environment for telecentres to be established country-wide on an equitable basis.

The chapter discusses telecom reforms introduced in four phases. In the late-1980s and early-1990s, an interplay of forces led to the liberalisation of the telecom industry. Stage One (late-1980s to1993 and pre-democracy period). During this period the old South African Posts and Telecoms (SAPT) provided postal and telecom services. The SAPT law was abolished in 1991. In

September 1993, competition was introduced into the monopoly telecom market with the licensing of two cellular operators, Vodacom and Mobile Telephone Networks (MTN). Two regulators were established before the 1994 democratic elections, one for telecoms (former South African Telecoms Regulatory Authority or SATRA) and another for broadcasting (the former Independent Broadcasting Authority or IBA). Stage One policy developments were pushed by global changes in telecom regulation, which had an impact on local policy. Domestic forces also influenced local telecom policy formulation, e.g., political changes and demand from political parties that the telecom sector be restructured.

Stage Two (1994 to 1996), was characterised by democratic and consultative processes (consultation by government with stakeholders including business, civil society, academia and labour unions). This led to the Telecom Act of 1996. Stage Three (1997 to 2000) involved more liberalisation of the sector, privatisation of a 30 per cent stake in the public parastatal Telkom and changes in telecom policy to accommodate convergence and develop an ICASA Act (which merged IBA and SATRA). Foreign influences included globalisation, global changes in telecom regulation (e.g., the World Bank's promotion of the privatisation of state-owned telecom enterprises or SOTEs which influenced South Africa's management of public-owned enterprises) and South Africa joining the World Trade Organisation (WTO) in 1995.

Domestic influences also pushed telecom policy changes and these included political pressure to have new telecom laws and bridge the rural-urban telecom services and information divides. These local developments led South Africa to adopt the WTO telecom policy because membership commits countries to implement the policy and create telecom environments which promote liberalisation and universal service to telecom services. The WTO also stipulates for the establishment of an independent regulators, fair allocation of scarce resources such as the spectrum and making broadcasting and telecom licensing criteria publicly available (Drake and Noam 1997; Tuthill 1997; Henderson, Gentle and Ball 2005).

South Africa made commitments contained in the WTO Reference Paper, which forms parts of South Africa's Schedule of Specific Commitments to adhere to certain to basic regulatory principles, including universal service and regulation of the sector in a transparent, non-

discriminatory and competitively neutral manner (Universal Service and Access Agency of South Africa 2008:6).

Stage Four (2001-2006) involved more changes to the South African Telecom Act No 103 of 1996 aimed at further liberalising the sector, which included an introduction of two more cellular operators and the Second National operator or Neotel), and the issuing of under-serviced area licenses (USALs) to small companies to provide telecom services in previously disadvantaged and rural areas. In the following sections, these stages are discussed chronologically. First, a brief definition and discussion of policy and its goals is provided.

5.2 MEANING AND GOALS OF POLICY

There are different views on what policy means. Social or political scholars view policy as public directions set by government as a means of fulfilling its constitutional responsibilities in respect of a particular area of public and private activity. Scholars view policy as government and public consideration of how to structure and regulate certain activities so that they can contribute to the public good (Straubhaar and LaRose 1995:90). Additionally, Swanepoel (2002:360) states that policy constitutes sets of national or desired goals, which can also be employed as evaluation criteria of other proposals (and in this instance policy and national ICT development). Swanepoel contends that policy can be enshrined in national documents such as the constitution and this is true of the 1996 South African Telecoms Act because most goals of this Act are enshrined in the constitution. For example, the idea of universal service or equitable provision of ICT services is based on the principle of equality before the law, in terms of provision of telecom services in all areas, regardless of whether the area is urban or rural or whether the persons are poor or rich.

Furthermore, Braman (1998b: 12) argues that policy can be viewed as a general principle that underlies the making of law and regulations. She formulated five different types of state attitude towards industry intervention:

(a) Strategic sector intervention: State primacy in directing and providing incentives for industry development;

(b) Facilitation: The state provides structural conditions to encourage private sector responsibility for infrastructure and resource provision;

(c) Consensus building: The state attempts to integrate activities of the public and private sector through mutually beneficial collaborations. Most South African ICT laws have been born out of discussions and consensus building between stakeholders such as labour, government, business, civil society and other interested parties such as the academia;

(d) Supervision or mediation: A lesser interventionist role for the state involving only supervision of market delivery of infrastructure and resources; and

(e) A non-interventionist role: Complete reliance upon the market.

The role of government as expressed above is central to policy development. Neo-liberals are, however, increasingly advocating a reduction in government direction in policy-making and the removal of the administrative state. In some quarters, such as privatised state entities, government activity has decreased but it is hardly possible that the role of government could disappear completely. The South African telecom industry has been characterised by an interventionist state (Communications Ministry), even in the presence of an independent regulator and this has been criticised by industry observers (cf. Gillwald 2005; Horwitz and Currie 2007; South African National Assembly, *Report of the ad hoc Committee on the Review of Chapter 9 and Associated Institutions* 2007). The latter report, chaired by former Minister of Education, Prof Kader Asmal, further proposed to government that the Communications Ministry should no longer interfere with the regulator, ICASA, as this undermined ICASA's authority and mandate.

Boeringer (1996:6) stresses that policy should reflect the interests of the major participants in the policy arena (e.g., equipment manufacturers, service providers, regulators, users), and describes the major issues over which they contend, including the industry structure, pricing and the extent of regulation and stake-holding or shareholding. One could argue that, in a democratic system national policies should respect diverse interests in order to limit conflict amongst decision-

making groups and sustain mutual cooperation instead, if one will benefit from the policy. South Africa's first attempts at telecom privatisation in 1990 (pre-democratic government) were opposed by labour and the African National Congress (ANC).

However, the South African Telecoms Act formulated in 1996 is upheld by key role players in the telecoms industry because it was formulated democratically, with all key stakeholders participating actively in the policy-formulation process. If one accepts that policy formulation should reflect the interests of diverse groups then it becomes important that policy formulation should be managed with sensitivity and telecoms policies should integrate the social, political, economic and legal dynamics.

In private companies, in contrast to public institutions, policies are expressed as strategies and sometimes as codes of practice, corporate policy or self-regulatory measures of regulation. Telecoms policy is more often expressed in the form of laws embedded in legal frameworks or principles or codes of practice in state organisations, international and national institutions.

5.3 THEORIES OF TELECOMMUNICATIONS REGULATION

Theoretical telecom approaches and power-relations theories enable the understanding of the interplay of conflicting interests during decision making processes when formulating policy in institutions such as the national assembly and national regulatory authorities (NRAs). Picot and Wernick (2007: 663) state that the theory of telecom regulation distinguishes between three approaches: public-interest theory, capture theory and economic theory. Public-interest theory is based on normative theory, and is viewed as a response to public demand for the correction of market failure and for the prevention of discriminatory practices. Public interest indicates wide representation of the opinions and interests in a policy. Public interest should reflect the customer or consumer interest, and ensure that the equality of citizenship is central in policy, and also that policy pursues the human values of universality of telecoms service provision, access to ICT, diversity and equity in telecom service provision, independence of the regulator and regulator and service operator accountability. South Africa's 1996's telecom policy entrenched the pursuance of these values, which promoted equal access to telecom services or universal service to these

services, whether one resides in an urban or rural area.

Historically, arising from the U.S. telecoms policy theory, the capture theory states that regulation is either provided in response to the industry's demand for regulation or regulatory agencies come to be controlled by the regulated industry over time. In other words, regulatory policy is "captured" by the industry. Capture theory highlights the susceptibility of government institutions to corporate influence (Socikwa 2007: 45). Capture theory also provides a critique of the corporatist theory of telecoms policy formulation. The corporatist theory is based on the premise that "corporatism is a collaborative decision-making arrangement including government, business and labour" (Boeringer 1996:5). Corporatists embrace the idea that power and authority in the policy-making formulation process are vested in particular groups, more especially business and government, and that ultimately, business and labour become part of the extended state. Additionally, Braman (1998b: 8) claims that the extent to which government agencies are affected by "capture theory", depends, among other factors, on the type of nation state, area of policy-making and the maturity of industries and agencies involved.

Economic theory can be interpreted as an enhancement of the capture theory on account of its ability to describe the causes that give rise to regulation and puts forth a set of assumptions and general predictions about which industries would be regulated and what form of regulation would result as a logical implication of these assumptions (Picot and Wernick 2007:663). The economic theory also describes the goals of business in influencing the state and industry regulation, viz., direct financial subsidy, control over entry by new competitors, control over substitutes and complementary products, and fixed prices.

These theories of regulation have been criticised for several reasons (ibid.): Public-interest and capture theory both provide insufficient theoretical underpinning, which could explain the mechanisms that give rise to regulation; all three of the theories suffer from certain inconsistencies with respect to empirical regularities. Nevertheless, for two reasons it seems necessary to keep them in mind while observing the regulation of technology such as broadband. First, juxtaposing the two perspectives represented by public interest and capture or economic theory brings to light the area of conflict that characterises governmental activities in regulation.

Second, capture or economic theory and public-interest theory offer two different views on governmental activities: simplified public-interest theory assumes that the government (as the representative of the public) plays an active role by deliberately influencing markets for public welfare, while capture and economic theory are based on the assumption that politics plays a more passive role, reacting to external effects (e.g., the exertion of influences from related companies). This is related to two perspectives on the broadband market: government as an "enabler" versus government as the "rule maker" in emerging markets, corresponding to the public good and the competition-based perspective.

Assumptions of the public-interest theory and the capture or economic theories are prominent in processes of formulating South African telecoms policy, because the democratic processes of formulating the 1996 Telecoms Act were based on serving public interest, pursuance of universal service and universal access goals and satisfying public demand for telecom services (cf. Ali 2003; Horwitz 1997; Horwitz and Currie 2007). Focus on the promotion of more industry competition, driven by globalisation and technology convergence, took precedence in the policy from the late-1990s onwards and the ECA of 2005 is a manifestation of electronic communications regulation in South Africa. The development of this Act was driven by the impact of convergence on the market.

In the final analysis, policy should reflect the interests of the major participants in the ICT sector, e.g., government, civil society, equipment manufacturers, service providers, regulators and users or telecom consumers. Policy should reflect public interest or consumer interest. In private companies, in contrast to public institutions, policies are expressed as strategies and sometimes as codes of practice or corporate policy. Telecom policies are, however, more often expressed in the form of laws embedded in legal frameworks or principles or codes of practice in state organisations or international institutions. In the local context, telecom policies developed in the 1990s were formulated in a more democratic way (including views from different stakeholders) than those beyond 2001, which were mostly formulated by putting the interests of government and business.

5.4 STAGE ONE: LATE-1980s TO 1993 - PRE-DEMOCRACY

Demonopolisation of telecom networks and services in South Africa began in the late-1980s. According to Ngcaba (1996:1) technological developments during the early-1980s created conditions for the re-evaluation of the way in which the former Department of Posts and Telecoms (now Department of Communications) was operating. Consequently, the then Ministry for Posts and Telecoms appointed Dr Wim de Villiers in 1986 to make recommendations concerning the strategy, policy, control structure and organisation of posts and telecoms in the country. The outcome of the De Villiers study was the establishment of the state operator Telkom SA Limited and the South African Post Office Limited in October 1991.

Telecom companies moved from being fully state-owned to being commercial entities mainly listed in stock exchanges, whether they were local or global. South Africa followed this global trend, through the Post Office Amendment Act of 1991, which provided for the separation of the posts and telecom services (Pongwana 2001:13), to create two *corporatised* companies or *commercial* entities, namely Telkom South Africa Limited (Telkom SA Ltd to provide telecom services), and the South African Post Office (SAPO to provide postal and savings bank services). This is the most significant development in South African telecom and postal services, in the pre-1994 or pre-democracy period.

According to Ngcaba (1996:1), the Department of Posts and Telecoms commissioned Coopers and Lybrand in October 1991 to undertake an analysis of the policy options for restructuring South African telecom services sector. Horwitz (1997:66) asserted that parastatal reform of South Africa paralleled the dynamics in other countries and was, motivated by the poor performance of state-owned enterprises, public sector debt and the lustre of the free market. Horwitz further maintained that parastatal reform in South Africa was more complicated than the neo-liberal economic policy presented, and was a move towards commercialisation and later privatisation of state-owned enterprises. Privatising the parastatals could accomplish several goals consistent with reforming apartheid: “It might address real operational and managerial problems in parastatals, bring money into government, mollify government critics *and* maintain white control over the

parastatals through private shareholding." Coopers and Lybrand, in 1992, revealed that telecom service provision, by SAPT, was provided along racial lines (Horwitz 1997:64). Data for 1989 showed telephone penetration per 100 black people at 2, 4 compared to 25 for white people. To implement changes to the unbalanced provision of telecoms services, a telecoms regulatory body was established to ensure that telecom services were provided throughout the country on a non-racial basis (Ngcaba 1996:4).

The South African Telecoms White Paper (1996) established a framework consistent with international practice by separating the regulatory, operational and policy-making functions. The regulatory regime created by the Telecoms Act No 103 of 1996, embodies the policy objectives set forth in the Green and White Telecoms Policy Papers in a concrete and enduring form. Former Minister for Telecoms and Broadcasting Jay Naidoo (1997:7) stated that the regulatory framework would smooth the transition from a market currently dependent on a monopoly provider of essential telecom services to one in which there is robust competition among service providers. Ten years later, in 2007, robust competition exists only in the mobile phone market and not the fixed-line market where Telkom remains dominant.

5.5 STAGE TWO (1994 to 1996) – THE DEMOCRATIC PROCESS THAT LED TO THE 1996 TELECOMS ACT

The post-apartheid period (post-1994) is a period of managed liberalisation of the telecom industry. Govender (2001:52) opines that the previous telecoms regulatory model involved the government owning and operating the network, while also assuming policy maker and regulator roles. This model was common among developing countries before the 1990s. However, in the 1990s countries opted for open liberalised markets. During apartheid, Telkom (headed by a Postmaster General or PMG) used to be an operator and regulator. There were neither competitors for Telkom nor official telecoms policy. The industry remained highly centralised and closed to foreign investment. Telkom had a monopoly providing fixed-line services that remain (in 2007), because although Neotel commenced operation in 2006, it has failed to penetrate the market.

After South Africa's first democratic political negotiations, known as the Congress for a

Democratic South Africa (CODESA), the Postmaster General was replaced by the Director General (DG), for the new Ministry of Communications. The new Ministry established the South African Telecoms White Paper in 1996. The White Paper established a framework consistent with international practice by separating the regulatory (function of ICASA), operational (Telkom and mobile service providers' function) and policy-making (government) functions. The regulatory regime created by the Telecoms Act No 103 of 1996, embodies the policy objectives set forth in the Green and White Papers in Telecoms Policy in concrete form.

Key objectives of the 1996 Act include, *inter alia*, the creation of a telecoms regulator (former SATRA), the USAASA, the USF and the telecoms Human Resources Development (HRD) fund. According to the Act, these institutions are individually and collectively responsible for the promotion of universal service and affordable telecom services, the promotion of telecom services that are responsive to the needs of users and consumers, and the promotion of competition within the industry. In this competitive environment, USF funds should target end-users to facilitate affordability and indirectly encourage further network rollout, including telecentre rollout.

5.6 STAGE THREE (1997 TO 2000): FURTHER LIBERALISATION, PRIVATISATION OF TELKOM AND THE ICASA ACT

Telkom was partially privatised in 1997 when 30 per cent of the company was sold to local empowerment group (Black Economic Empowerment or BEE company), Thintana Communications, a subsidiary of SBC Communications of the United States of America or US (18 per cent), and Malaysia Telekom Berhad (12 per cent). The South African government owned 70 per cent of Telkom in 1997. The initial public offering (IPO) of Telkom SA on the Johannesburg Stock Exchange (JSE) and New York Stock Exchange (NYSE) was finalised in March 2003, with former Minister for Public Enterprises, Jeff Radebe announcing the listing in 2001 that was delayed until March 2003. Owners of Telkom (from 2005 onwards) are stated in Chapter 1 of this thesis.

The South African government adopted an IPO route for Telkom to stimulate economic growth, promote BEE and create a large shareholder base to empower historically disadvantaged South

Africans. Through this process thousands of new investors, including *stokvels* (local savings groups in black townships), participated in share trading (Lesame 2003a:9). This activity encouraged longer-term wealth creation. Telkom's IPO assisted the national budget's social delivery objectives by reducing government debt financing costs (Radebe 2001, 2002). This process released funds for social investment programmes such as building of tarred roads, schools and water projects.

Additionally it was believed that a successful Telkom IPO on the stock exchange had the potential to improve South Africa's rating and investment outlook overseas, and financial liquidity, and attract foreign direct investment (FDI) to create local employment opportunities (Radebe 2001; 2002). Another reason for the listing of Telkom was to increase South African global economic competitiveness.

The merging of SATRA and the IBA in 2000 was a result of globalisation and convergence of technologies. The ICASA Act No 13 of 2000 merged IBA and SATRA to establish ICASA. According to Section 4 of the ICASA Act, the functions of the Authority are:

(a) to perform the duties imposed on the former authorities under the underlying statutes;
(b) exercise the powers conferred the former authorities by the underlying statutes; and
(c) subject to Section 231 of the Constitution, the Authority is to act in a manner consistent with the obligations of the Republic under any applicable international agreement.

The Authority, i.e., ICASA, is subject to the Public Finance Management Act No 1 of 1999 (Lesame 2000:34). The ICASA Act provides deterrents, including imprisonment, to prevent a conflict of interest on the part of councillors. ICASA's functions include:

(a) A monitoring function: Monitoring and inspecting the industry to ensure that licensees comply with regulations as well as the terms and conditions of their licenses. Ensuring that licensees use their allocated frequency spectrum without interfering with other services;
(b) A regulation and policy-making function: All regulations and policies enforced by ICASA arise after a process of public consultation of civil society by government, to ensure that

policies are sustainable and applicable to the needs of the market and the public. The legitimacy of policies makes it easier for ICASA to enforce them; and

(c) An adjudication function: ICASA's primary function is to hear telecom complaints and resolve them. Some complaints are brought by licensees against the other, and others by the members of the public against service providers. ICASA determines the procedure for resolution and adjudication of complaints and industry disputes. If ICASA fails to enforce a particular ruling on a party, then ICASA can take the party to court. Should ICASA fail to win a case, ICASA can take the matter to an Appeals Court. The law enables the public to complain about broadcasters to ICASA. Such complaints are investigated before, if necessary, being referred to an independent committee established by ICASA, known as the Broadcasting Monitoring and Complaints Committee (BMCC) (cf. ICASA Act . No 13 of 2000).

Minister Matsepe-Casaburri (2001c:1-16) issued telecoms policy directions, which legislated for the introduction of:

(a) the SNO in which a 30 per cent stake was reserved for government's Esi-Tel and Transtel respectively and a 19 per cent BEE stake; this company, Neotel, started operating in 2006;
(b) awarding an international multimedia license to Sentech (the national signal distributor – and this happened in 2005);
(c) at least one competitor to Telkom and the SNO;
(d) number portability and carrier pre-selection, to foster competition; and
(e) stimulation of small and medium micro enterprises (SMMEs) involvement in the telecom industry. They have operating licenses to provide services to increase teledensity in areas with under five per cent penetration. In August 2003, the regulator received many applications from SMMEs for licences. Winning SMME bidders were publicly announced in January 2005 and these companies are known as the Under-Serviced Area Licenses (USALs). Licensed USALs were Ilizwe Telecoms, Amathole Telecoms Services, Bokone Telecoms, Kingdom Communications, Thinta Thinta

Telecoms, Karabo Telecoms and Bokamoso Consortium (Esselaar, Gillwald and Stork 2006; ICASA 2006).

USALs belong to a category of licences that were introduced through the Amendment of the South African Telecoms Act No 103 of 1996 (Amended in 2001). USALs are telecoms licensees that provide telecom service in areas with a tele-density of less than five per cent. Minister for Communications, Matsepe-Casaburri declared 27 areas under-services in telecoms in 2001. USAL licences are earmarked for small or emerging entrepreneurs to enter the burgeoning and lucrative telecom market in the era of convergence. According to ICASA (2006:2), licensees could provide telecom services, including voice over Internet Protocol (VoIP), fixed mobile services, public pay phones and long distance calls to be transported through networks of any operators licensed to carry international traffic.

5.7 STAGE FOUR (2001 to 2008): MORE LIBERALISATION, CHANGES TO THE 1996 ACT, INTRODUCTION OF NEOTEL, THE THIRD AND FOURTH MOBILE PHONE OPERATORS, THE ICT CHARTER, THE ICASA AMENDMENT ACT AND THE ELECTRONIC COMMUNICATIONS ACT

A third cellular service provider, Cell C, was licensed and started operations in November 2001 (Powell 2001; Msomi and Sigonyela 2001). Virgin Mobile, owned by British mogul Richard Branson entered this market in 2006. These two mobile phone companies entered the market as a result of the Telecoms Amendment Act of 2001, which introduced more competition in this market. Amendments to the 1996 Telecoms Act began at a colloquium on February 2001 in Midrand, where a new policy framework for the South African ICT industry was discussed. The ICT colloquium was aimed at strengthening regulations for telecom, providing investor confidence, computing and convergence. New policy supported the 1996 Telecoms Act in providing laws regarding the convergence of technology. Describing South Africa's ICT policy at this colloquium, the late former Minister Matsepe-Casaburri (2001d), said that her government recognised that the ICT sector is at the epicentre of growth and development of the country and a "New Economy". A New Economy lowered input costs, raised efficiency and skills. Matsepe-Casaburri added that her government also recognised the need to understand globalisation and its

impact, and that her government would strongly embark on a path of "managed liberalisation, encouragement of domestic and foreign direct investment, priority of human resource development, encouragement of formation of public-private partnerships, policy and regulatory certainty, the establishment of a solid ICT industry and the promotion of the African Renaissance".

Former Director-General of Communications in South Africa, Dr Ngcaba, stated at the 2001 telecoms colloquium that the new regulations were aimed at achieving:

(a) promotion of universal and affordable provision of ICT services;
(b) promotion of the provision of a wide range of ICT services in the interest of economic growth and development;
(c) making progress towards the universal provision of telecom services;
(d) encouraging investment and innovation;
(e) encouraging the development of a competitive and effective ICT manufacturing and supply sector;
(f) promoting the development of ICT services that are responsive to the needs of consumers;
(g) encouraging ownership and control of ICT services by historically disadvantaged groups
(h). protecting the interests of telecom consumers - ICASA performs this function though not satisfactory because most consumers complain of high Telkom charges (see the beginning of this chapter and also in Chapter 1); and
(i) promotion of the empowerment and advancement of women and small, medium and micro-enterprises (SMMEs) in the ICT industry (Ngcaba 2001:2).

Ngcaba (2001:10) claimed that these sector objectives would be integrated with national RDP objectives (i.e., meeting basic needs such as water, housing, sanitation and electricity), developing human resources, democratising state and society, improving the quality of life and reducing poverty and with the GEAR plan (cf. Chapter 2). GEAR is South Africa's economic policy whose goals are budget reform to strengthen redistribution of expenditure, faster fiscal deficit reduction, a competitive and stable currency, monetary consistency to limit inflation, appropriate flexibility in labour markets, funding of skills training commensurate with needs, expansion of trade and

investment, implementation of stable and co-ordinated policy, tariff reduction to complement industrial restructuring, tax incentives for new competitive investment and labour absorption, accelerating the restructuring of state assets to optimise investment resources and expanding infrastructure investments to address service deficiencies and backlogs.

The Telecoms Amendment Act (No. 64 of 2001) was intended to pave the way for South Africa's movement to an information and knowledge-based society. It sought to promote Internet provision in schools, among other objectives, and to improve the definition of universal access in the country to include the provision of advanced technology to those who desire such technology and can afford their ownership and usage. Most of the stipulations of the 2001 Act continue to be implemented within the sector, by the telecom service providers, in terms of making sure that universal service goals in the country are realised, although the processes of implementing the Act's objectives are proving to be slow.

The 2001 Telecoms policy introduced a hybrid model for telecoms regulation (Govender 2001:52). This model proposed that government should own a 70 per cent stake and 50 per cent of Vodacom (the cellular operator). While part of its interest in Telkom was privatised, government's infrastructure interest was strengthened by an envisaged stake in the SNO, held through ESI~TEL and Transtel.

In terms of the 2001 regulations, Neotel (SNO), would compete in the local access, national long-distance and international long-distance markets, offering a full range of voice and data services. South Africa still has a great demand for telecom and ICT services, and it is foreseen that Neotel will have to satisfy this unmet demand (and eliminate bottlenecks) in terms of universal service and universal access. ICASA, as well, has a responsibility to ensure that operators deliver services where required. In turn, government should improve ICASA's human and financial resources to enable duties to be performed effectively, efficiently and in a timely manner. In this regard, former ICASA Chairman Langa argued that ICASA needs more funds and personnel to perform its functions satisfactorily (Langa 2001:1).

Makhaya and Roberts (2003:12) argue that although ICASA's independence was established by legislation, there are operational constraints on that independence. But, experience suggests that an effective regime depends on regulatory powers and resources which enable it to establish a strong reputation, and not on its *de jure* independence from government (ibid.). ICASA, therefore, seems to be battling to establish a reputation as an independent and financially stable regulator, even since its SATRA and IBA days (cf. Lesame 2000; Msomi and Sigonyela 2001; Gillwald 2005).

Gedye (2007a:1) was more specific asserting that in January 2007, ICASA experienced a "mass exodus" (14 senior officials resigned) of staff as a result of, among other reasons, lack of leadership as Chief Executive Officer (CEO) Mashile was not performing his duties. Gedye also cited corruption at the regulator's offices (e.g., councilors exerting pressure on management during tender processes and forcing certain consultants on departments and that travel policies were continually being flouted by ICASA officials), under-funding by government which resulted in the regulator's under-performance and that councilors have intervened on behalf of staff with whom they have familiar relationships to protect them from disciplinary action. In response, ICASA CEO Mashile said that the accusations were unfounded (ibid.).

According to the 2001 telecom policy regulations, foreign ownership in the SNO or Neotel would not be limited, but up to 30 per cent ownership of Neotel would be for BEE shareholders. Furthermore, Neotel would use or piggyback on Telkom's network infrastructure for the initial two years of operations until it had developed its own network. Operators were allowed to apply for the 1 800 MHz spectrum and third-generation (3G) mobile licences. Sentech provides international carrier's carrier and multimedia telecom services as a result of these regulations. This means that Sentech provides telecoms services to carriers or operators including Telkom.

With regard to the proposed carrier of carrier license for the international telephony gateway, Sentech could provide a link for several telecom operators including Telkom, with direct connection to the end-user. This means that a consumer can obtain an international telephone from Telkom or Neotel, who in turn will access the line from Sentech at a fee.

The other piece of legislation developed in the South African ICT sector is the ICT Charter. The draft charter for ICT was released in February 2004 to increase black ownership and management of the ICT industry to 30 per cent by 2010. This will be a milestone in a process expected to change the face of ICT ownership in South Africa, which was white-owned for decades. The ICT Charter was finalised in June 2005.

Another policy development was the Electronic Communications and Transactions Act (ECTA) of 2002. The main purpose of this policy is to regulate electronic communications (business and personal), and ensure that online users have electronic privacy (e-privacy) on cyberspace. Some of the issues addressed by the ECTA include electronic signatures, digital signatures, encryption, domain names and cryptography. An electronic signature is a generic technology neutral term that refers to the universality of all the methods by which one can "sign" an electronic record (Lesame 2001:65).

South Africa has cyber inspectors as a result of the ECTA of 2002. The government appointed cyber inspectors to scrutinize Web sites, and to monitor hackers, cyber-fraudsters and cyber-forgers. The ECTA's objective is to create legal certainty around transactions and communications that are conducted electronically (cf. Lesame 2001:65). It seeks to make such transactions legally binding, and to give legal recognition to data messages, electronic signatures and electronic evidence. It also contains the first statutory provisions under South African law on cyber crime and introduces statutory criminal offences relating to computer information systems (ibid.).

The ECTA is a result of public discussions on the South African Green Paper on Electronic Commerce. Cogburn (2003:144) argues that this Green Paper made constant reference to the need to harmonise South Africa's emerging national e-commerce regime with the growing global consensus and in line with extant commitments to the WTO. In addition, South Africa's e-commerce policy approach is based on eight key principles:

(a) quality of life;
(b) international benchmarking;

(c) consultative process;
(d) flexibility;
(e) technology neutrality;
(f) supporting private sector lead and technology-based solutions and initiatives;
(g) establishing and supporting public-private partnerships; and
(h) supporting SMMEs (e.g., USALs).

A brief assessment of the pursuance and implementation of this e-commerce approach by South Africa (government and the private sector), indicates that some of the principles that are visible, to a certain extent, in the implementation of the telecom policy, are international benchmarking, consultative processes (but not in all the processes, policy changes and privatisation transactions), policy flexibility, technological neutrality and support of some ICT in education projects by the private sector and PPP investments in the sector (e.g., the E-Schools Education Demonstration Project, known as the Demo Project which involves provision of ICT education in African schools in a few African countries including South Africa and Kenya). Those e-commerce principles that are not readily visible in current telecom developments include quality of life, consultative processes (have not occurred in some policy developments and implantation, e.g., the recent privatisation of Telkom to the PIC and Elephant Communications surprised even labour and empowered an elite few without consultations with civic society and the public who owned Telkom) and policy flexibility or inflexibility (e.g., South Africa's liberalisation policy has stunted the sector's growth because it does not allow more companies to compete in the service provision in order to hasten the bridging of the huge digital divide).

According to the Government Gazette No 25806 on Electronic Communications Regulation (2003:11), the purpose of this legislation (ultimately the Electronic Communications Act of 2005), is to promote and facilitate the convergence of telecoms, broadcasting and broadcasting signal distribution, promote the universal provision of communication services and connectivity. With television offering interactive services on mobile phones and some radio broadcasters already using live audio stream on the Internet, enabling broadcast beyond allocated geographical areas, the national Department of Communications (DoC) decided to introduce the Convergence Bill. According to Sowaga (2005:7), the convergence laws aim to promote convergence in

broadcasting, broadcasting signal distribution and telecom sectors to provide a legal framework for convergence.

The ECTA of 2002 was amended and expanded, and after public deliberations and debates on the amendments, a new Act developed, viz., the Electronic Communications Act No 36 of 2005. An aim of the Act is to tighten loopholes in Internet banking legislation and also those concerning Internet crime and child pornography (cf. Lesame 2001; Sowaga 2005). During the processes of developing the Act, President Mbeki rejected the initial Amendment Bill because the Bill gave the Communications Minister, Dr Matsepe-Casaburri the power to appoint ICASA councillors. This function used to be in the hands of the members of Parliament, who after parliamentary deliberations, made recommendations to the Communications Minister about new councillors and capacities of those individuals (Gedye 2007b:2).

The proposed ICASA Bill suggested an independent panel of five or more appointed by the Communications Minister would nominate one and a half the number of candidates required, from which the Minister would select the councillors (Gedye 2007b:2). The Freedom of Expression Institute (FEI) also welcomed President Mbeki's rejection of the ICASA Bill stating that the Bill would have been unconstitutional and violated ICASA's independence by not selecting the councilors fairly and objectively through parliament (*Mail & Guardian Online* Mbeki bounces ICASA Bill 2006:2). The Bill was subsequently changed, and the solution to the Bill's problem was that National Assembly would submit candidates to the Communications Minister, and that National Assembly could also invite technical experts to assist in the process if necessary. The Bill was subsequently passed into the ICASA Act at end-2005.

The Electronic Communications Act (ECA), enacted in 2005, promotes competition in the telecom market and mergers between telecom, computing and broadcasting markets as companies integrate services and offer bundled services, e.g. pay TV, broadband and integrated Internet services. For example, Neotel and Dimension Data division Internet Solutions (IS) jointly secured a two-year, R192 million contract to supply bandwidth and network services to South African universities and research institutions (McLeod 2007:37). Furthermore, the ECA facilitates competition in the telecom sector and is breaking down

monopolies, decreasing vertical integration in the sector while advancing horizontal integration. For example, Telkom's fixed-line business is slowly shrinking as Telkom faces up to its dying business model in the era of convergence as new operators enter the market to provide integrated services. Neotel has entered the market and is offering fixed-mobile services. MTN and Vodacom are proving to be formidable competitors to Telkom in data service Provision and entering the fixed-line phone market. These companies have already gained customers from Telkom as Telkom's number of fixed-lines continue to decrease (cf. Chapter 2). Furthermore, MTN and Vodacom are making inroads in offering consumer broadband, a sub-sector previously dominated by Telkom.

Until 2006, MTN and Vodacom had been reliant on Telkom to supply them with the cable links that connect their base stations (McLeod 2007:38). In 2007, both MTN and Vodacom rolled out fibre-optic cables nationally to cater for the high demand for broadband on their cellular networks, from customers using the networks to access 3G data, to high-speed users including Internet users and businesses (ibid.).

Other smaller operators have entered the market and these include:

- IS, which offers corporate Internet, data and voice services;
- Verizon Business, which competes with IS in offering corporate Internet, data and voice services;
- Vox Telecom, which offers corporate and consumer voice, Internet services and leased-cost routing. Vox and other emerging telecom operators are inventing innovative ways of taking voice revenue from Telkom, using VoIP and least-cost routing systems. In addition, Vox Telecom has introduced an ambitious plan to pay consumers for receiving phone calls and this result in Telkom losing even more customers and earning less profit ;
- Altech, a cellular service provider through Altech Autopage Cellular and
- MWeb, which offers retail consumer-focused Internet services. Altech, IS and MWeb are running test WiMax networks with the intention of challenging and replacing Telkom's last mile copper cables that connect individual consumers and businesses to Telkom's telephone exchanges. The purpose is to bypass Telkom's networks, gain some of Telkom's customers

and ultimately contribute to lowering the cost of telecom services to the consumer (McLeod 2007:37, 38).

Additionally, the ECA promotes competition because it:

- ensures that licensees have no special privileges over one another, creating a level playing field;
- removes any monopoly elements from old licenses;
- opens the market to companies that are not traditional telecom operators, e.g.,
- creates a horizontal rather than a vertical industry structure where operators are not tied to specific technology and this allows for convergence;
- allows service-based competitors to build their own infrastructure, subject to the conversion of their licenses and the awarding of radio frequency spectrum. This promotes industry competition at infrastructure level; and
- forces operators to interconnect voice calls with one another according to a price formula to be set out by ICASA (ibid.). These regulations could lead to a decrease in voice tariffs.

5.8 FURTHER CRITIQUE OF SOUTH AFRICAN TELECOM POLICY FORMULATION AND IMPLEMENTATION

South Africa's policy formulation in the mid-1990s was consultative and followed democratic processes. During the Green and White Paper formulation stakeholders were publicly invited to telecoms policy debates, conferences and colloquia and telecom policy formulating processes were generally regarded as "democratic". In this regard, Horwitz (1997:68-72), described how South Africa's new telecom policy formulation was "in the spirit of stakeholder consultation that had become the hallmark of the forums, with all these forums following democratic processes of making policy decisions". At that stage, the goals of the telecom policy were stated by government representatives as aimed at achieving or spreading universal service goals. However, since universal service goals were not attained in 2006/7 (cf. Chapter 2), it can be argued that the policy implementation processes have been geared towards telecom corporatism rather than democratisation of society through widespread availability and accessibility of telecom services.

5.8.1 Corporatist versus democratic theory of telecom policy formulation and implementation

According to Boeringer (1996:5), "corporatism" is a collaborative decision-making arrangement including government, business and labour. Corporatists embrace the idea that power and authority in the policy-making formulation process are vested in particular groups, especially business and government and that ultimately labour and business become part of the extended state. Taking this theory into consideration, both the privatisation of Telkom in 1997 and the selling of the Telkom stake to the PIC, and subsequently to Elephant Communications were corporatist in nature and execution. However, in the PIC and Elephant case only the government and business were involved in deliberations, with labour excluded. This explained labour unions' critique of these privatisation processes (cf. Chapter 1). Civil society and political parties also did not participate or approve the privatisation, hence their strong adverse reaction (cf. Chapter 1). The privatisations were, therefore, undemocratic. In this regard, Hills (1993:26) states that:

> "The profits from such privatisation allow debt-ridden governments to pay off interest to the industrialised nations. Yet privatisation has the immediate impact of directing attention to the largest consumers. Privatisation of state responsibilities simply allows a policy of favouring the rich to operate unseen. It denies citizenship in favour of consumerism".

The PIC and Elephant Communications privatisations favoured elites with political backgrounds and the business transactions were undemocratic because they benefited a few individuals instead of many. For these privatisation processes to have been democratic, more industry stakeholders or parties with vested interests in the telecom sector could have been involved, in order to make sure that these privatisation transactions benefited more South Africans and that the transactions' goals were aimed at serving the universal service interests and social obligations which still have to be met or achieved in the country. The proposed sale (in 2007) of Vodacom shares to some individuals (formerly members of parliament, ICASA executives, Telkom executive employees

and mobile phone company executives now employed in the private sector) also demonstrates the corporatist and self-serving nature of the business deals in this sector which do not favour democratic ideals legislated by the "democratic" universal service and universal access telecom policy. Horwitz and Currie (2007: 445) criticise these forms of privatisation, as having opened up "opportunities for rent-seeking under the ideological aegis of Black Economic Empowerment" in the quest to create a black bourgeoisie.

The democratic theory of telecom policy formulation maintains that policy-making should include many stakeholders in the telecom sector, including telecom consumers, labour, government, bodies representing telecom consumers, or members of civil society, church organisations and non-governmental organisations, academia and many other groups which have vested interests in the telecom sector (Boeringer 1996:3). South Africa followed the democratic route during the formulation of the 1996 Telecoms Act, because the Telecom Green Paper and White Paper formulation processes were widely publicised in local media and all stakeholders were invited by government to propose policy changes and/or suggestions which were later incorporated into the 1996 Act.

These democratic processes did not occur during the privatisation processes. Therefore, South Africa's telecom policy formulation processes changed after the privatisation of Telkom in 1997 from the democratic nature towards corporatism. Possible reasons for this change is the impact of global telecoms policies on South African telecom policy (e.g., the WTO, ISAD and the World Bank), and the pursuit of private interests. Perhaps government policy creates a balance between how much private interest should be advanced in this sector vis-à-vis serving public interest. During the process of privatising the 30 per cent stake of Telkom in 1997, the South African labour movement, COSATU, initially opposed the process arguing that the privatisation would empower the already rich and neglect the poor. This has subsequently happened (e.g., in the case of Telkom selling a stake to the PIC and Elephant Communications). COSATU was also concerned about loss of jobs at Telkom.

Corporatism in the South African telecoms policy implementation should be legislated so that universal service goals are pursued. Corporatism mostly empowers the few while ignoring the

interests of low-cost customers who cannot afford to purchase shares. Government could, however, implement corporatism strategically to develop new telecom policies aimed at spreading telecom services. It could also be done by establishing SMMEs for black women who are still the most disadvantaged in society in terms of access to work and financial resources. Furthermore, corporatism, as demonstrated by other countries' telecom policies and privatisation transactions (e.g., Singapore and Malaysia) is mostly driven by business interests (and not universal service goals) which inform government policy in a particular sector. According to Chwee-huat (1993:13), Singapore Telecom adopted a "proactive corporate strategy" to "attract foreign investors" and augment "international visibility".

Singapore, as a small island and modern city of a population of about three million people (ibid.:12), can afford to follow the corporatist approach to telecom formulation in the sense that the country does not have enormous historical telecom imbalances between urban and rural areas such as South Africa (with a population of 47 million people, 60 per cent of which are poor and live in remote rural areas most of which are *still* without telecom services. Hence South Africa has to advance telecom policies aimed at solving the huge digital divide problem rather than the economic empowerment of the few. Hills (1993:24), states that when privatisation occurs, the target areas of the telecom sector are long-distance communications, international communications, overlays of digital networks for business users and cellular mobile radio for urban areas. Hills also states that "rural telecoms, arguably of the most direct benefit to these countries are not mentioned". This situation is apparent in the South African telecoms market. Until now, business, urban areas and conglomerates have benefited from the current policy of managed liberalisation and privatisation.

Rural areas have benefited little from telephones (private and public), with many being disconnected or not working, and established USALs struggle to operate. Telkom has so far ignored rural area demands for better technology to serve rural areas, so as to provide a modern and efficient telecom infrastructure. Instead of being networked by Telkom as its license instructs, rural areas have been networked by mobile phone companies, and most people in rural areas own mobile phones operated by Vodacom and MTN. Third and fourth mobile operators, Cell C and Virgin Mobile have not yet widely spread their services in or penetrated the rural market.

According to Hills (1993:23), to promote the entry of competition into a monopoly market (liberalise that market) increases freedom and choice for the population at large. Hills further argues that everyone is a consumer yet no mention is made of the hierarchy implicit within the idea of consumer. When liberalisation involves only the freedom for large new competitors to enter the market to compete for the business of large users of telecoms, it is a restricted version of freedom, and if the result of increased freedom for the large and the rich is a restriction on the freedom of the poor and disadvantaged, then the very process of liberalisation can be seen as part of that process by which a state denies rights to all citizens in the interests of the property rights of a certain section of business (Hills 1993:23). Therefore, South Africa's liberalisation can be regarded as undemocratic and not, so far, pursuing universal service objectives.

On Sunday (March 18, 2007), the South African Broadcasting Corporation (SABC), Channel SABC1 television programme, *Asikhulume* (Zulu for Let's Talk) program, formerly hosted by Xolani Gwala, discussed the topic, "Is South Africa succeeding in bridging the digital divide or not?" Industry leaders, telecoms regulators and company CEOs discussed the issue. The audience sends emails and short messages systems (SMSs) to the program with comments, queries, complaints and suggestions to policy changes. The public also phoned in to the program and talked to guests and Xolani Gwala. The conclusions of the public voting, and also the public comments in the telephone calls, e-mails and SMSs, pointed out that South Africa was failing to bridge this divide and that the government should set new regulatory measures to address the issue. Eighty-six per cent of all those who participated in the discussion voted "No", fourteen per cent stated "Yes". South Africa is not bridging the digital divide.

Few rural residents participated in the program. A reason for small rural participation could be that rural inhabitants do not have phones, email, and mobile phones to access. The program also established that South Africa was succeeding in the installing of computers in schools, but still needed to advance and upgrade computer training at all the schools and train teachers in computer literacy. Access to fixed-line telephones was seen as a problem not being considered by Telkom, but access to mobile phones was viewed as increasing, both in urban and rural areas.

Telkom followed a similar route to Singapore and Malaysia by first commercialising the entity in 1991 and privatising the company in 1997, and again in 2003 for the benefit of a few BEE powerhouses and former parliamentarians, and Khulisa shareholders (who bought Telkom shares during the 2003 listing of Telkom at the Johannesburg Stock Exchange – cf. Chapter 1). Newmarch (2007:2) criticised high salaries and bonuses received by chief executive officers (CEOs) and business leaders in the telecom market, stating the case of MTN with a turnover of R29-billion, 0.47 per cent after-tax profit spent on five executive directors and Chief Executive (CE) Phuthuma Nhleko who received R23-million. Former Telkom CEO Nxasana received R15, 42 million. Telkom had spent 1.97 per cent of the after-tax profit remunerating five executive directors and reported R37-billion in turnover. Chwee-huat (1993:8) furthermore states that the global telecom industry is characterised by rapid growth in demand for telecom products and services; that liberalisation in many countries has created competition resulting in greater customer awareness through intensive marketing and competitive pricing and that technology advancement has brought down prices.

In South Africa, the telecoms sector has not experienced these developments (i.e., resulted in improved customer awareness through intensive marketing and competitive pricing, technological advancement which has brought down prices) (ibid.). Therefore, it can be concluded, therefore, that in South Africa, although there has been rapid growth and demand for some telecom services (e.g., mobile phones) there is also a decline in fixed-line telephones because Telkom has disconnected many customers due to non-payment and ability of customers to afford high tariffs (cf. Gillwald 2005; Hodge 2005a). Esselaar, Gillwald and Stork (2006:3) state that globally, the increase in competition has driven down prices, grown subscriber bases and diversified the range of services. In South Africa, although the subscriber base has grown (but subsequently decreased) and services diversified, the prices have increased.

Cogburn (2003:136) provides insight into the restructuring that has occurred in the South African telecom sector and why corporatism took root. Cogburn argues that the historical processes of globalisation and an information age continue to unfold, and, as the demands of global electronic commerce expand, the international telecoms regime is facing pressure to transform. A range of social, political, economic, cultural and technological factors are challenging this regime seen as

the Global Information Infrastructure/Global Information Society (GII or GIS).

Two distinct possibilities explain the GIS. A possibility is that a broad regime could emerge representing a plethora of diverse societal stakeholders exploiting the applications and service of the Information Society (ibid.). A second possibility, is a more likely explanation of South African telecom industry developments, is that corporate-oriented interests may dominate the emergent regime formation process and skew development away from broad societal perspectives, to a more narrow regime focused on global electronic commerce. It is, indeed, true that South Africa's telecom sector has taken this route and the changes have adversely impacted on universal service and democratisation of society. The impact of the GIS could be what influenced South Africa to develop the ICT Charter in 2005 which promotes business developments in this sector and the pursuance of BEE.

In addition, the influence of the "Brussels Principles", which influenced the 1996 South African "ISAD Principles" (cf. Chapter 1), could also have impacted on South Africa's corporatist route in telecoms. The "ISAD Principles" include:

- the importance of the role of the private sector in stimulating dynamic competition and attracting the private sector to invest in the infrastructure and applications for the Information Society;
- using a strategic policy approach to stimulate the development of an Information Society, with an appropriate legal and regulatory framework;
- working to stimulate the creation of content that is relevant to and reflective of many of the world's cultures and languages; and
- the idea of using the potential of an Information Society to stimulate employment creation (Cogburn 2003:139).

South African telecoms could be said to be working towards the achievement of these principles. Most are readily visible in processes that develop the market. They still need to be implemented in practical ICT projects which will generate new jobs and develop local languages in ICT usage.

It is, however, also apparent (judging from how the sector has developed , e.g., privatisation) that the South African government realised that government alone would not be able to develop the local telecom sector and therefore developed policy which ensure that government would collaborate with the private sector.

5.8.2 Managed liberalisation has not promoted economically viable competition

There is little competition in the South African telecoms industry despite legislation promoting competition. Telkom's competitor, Neotel is operating but not much is said about company achievements and industry penetration. The strategic investor in Neotel is Tata (Esselaar, Gillwald and Stork 2006:28). Neotel comprises:

(a) state-owned enterprises Eskom and Transtel (31 per cent);
(b) Nexus Connection (19 per cent);
(c) Tata Group (25 per cent); and
(d) Two Consortium [Umkhonto WeSizwe Military Veterans Association (MKMVA), and Telecom Namibia] (12.5 per cent)
(e) Communitel (12.5 per cent) (Neotel 2009)

The telecom policy of managed liberalisation has been criticised as stifling competition. Critics argue that more competition would reduce telecom prices and satisfy existing telecom demand for services, especially in rural areas. In this regard, the *Mail & Guardian* wrote:

> South Africans are still paying through the nose for telecoms and broadband services, while Matsepe-Casaburri sticks to her guns, touting managed liberalisation as the answer to our woes. While most stakeholders and commentators see increased competition as the answer to exorbitant telecoms costs, Matsepe-Casaburri has stuck to the government line that competition needs to be introduced gradually and tied in with delivery to under-serviced areas (Mail & Guardian Report Card: Cabinet A to F December 2006 to January 2007: 9).

Little surprise then, argues the *Mail & Guardian* (ibid.) that the Minister (former) was running neck and neck with Telkom for the hotly contested "33.6 Kbps Modem Award" presented by consumer activists MyADSL to the organisation or individual who posed the biggest obstacle to development in the broadband arena over 2006 and 2007. To promote competition in the industry and deliver services to underserved and unserved areas, there have been calls, for the past few years, by industry analysts, for decisive action to promote competition between more if not many companies in the industry to satisfy public demand for affordable services.

> "There have been calls for the unbundling of Telkom's local loop and the regulation of bottlenecks, including the interconnection regime and Telkom's monopoly of landing rights of the SAT-3 undersea marine cable. Yet the Minister has targeted ICASA, the communications authority, and its independence" (Mail & Guardian Report Card: Cabinet A to F December 2006 to January 2007: 9).

South Africa may have initiatives in the form of the Electronic Communications Act (ECA) of 2005 and Neotel. Nevertheless, there remain many impediments to vigorous competition (e.g., laws that dictate that few companies should provide services especially in the local loop which is most underserved especially in rural areas) and price reductions (e.g., prices further increased for four consecutive years). The Department of Communications could, therefore, develop telecom tariff schemes to force price drops. Further, the elimination of more companies to compete in the provision of telecom services would eliminate bottlenecks and satisfy consumer demand for affordable telecom services, especially for the "low-cost consumer" (cf. Grilli 2004; Milne 2006). Competition for telecoms markets will also promote growth and economic development.

Gillwald (2005:470) states that South African telecom liberalisation policy failures include co-jurisdiction between the government and the regulator. That is, government should refrain from interfering in ICASA's regulation of the sector. Gillwald also argues that ICASA's institutional incapacity is viewed as lacking the expertise to fulfill the vital regulatory function in the democratic process and flawed appointments of ICASA staff and councilors. This has impacted negatively on ICASA's effectiveness and image in the industry. ICASA's deficiencies further

include skills shortages (there are also skills shortages in the Ministry and a lack of capacity in DoC to forward-looking policy), lack of policy-developing and regulatory skills and expertise. Regulation is required to empower ICASA in human and capital resources.

As for promotion of local competition, Chetty, Blake and McPhie (2006:14) suggest that there should be more companies licensed to offer wireless communication services to benefit ailing USALs. They argue that USALs have to compete with MTN and Vodacom, who due to universal service obligations have already attained a large market and widespread coverage of remote areas. Also, USALs are for small businesses only. It is expensive for small business to set up operations in remote areas, as they do not have access capital whilst the traditional telephony infrastructure is costly (Chetty, Blake and McPhie 2006:14). Wireless last mile solutions could be combined with VoIP to lower the entrance costs for USALs.

> "The policy vacuum in the department is the obstacle. If any sector needs a 21st century minister, communications does" (Mail & Guardian Report Card: Cabinet A to F December 2006 to January 2007:9).

With the quotation above, the *Mail & Guardian* (ibid.), further graded former (and the late) Minister Matsepe-Casaburri with an E for her performance in 2006, and asked her to resign, to make way for a new, progressive "21st century minister for communications". South Africa could follow, for example, the US example in spreading affordable telecom services nationally.

U.S. telecoms competition, especially in the local loop, resulted in expanded universal access to telecom services by members of the public, mostly in the rural areas. According to Hudson (2003:2-3), the Education rate (E-rate) assisted the US to provide telecom services and spread services at affordable prices and offer much-needed discounts to the poor. Hudson states that the Federal Communications Commission (FCC) sets overall policy for the E-rate program, which is administered by a non-profit entity, the Universal Services Administrative Company (USAC). South Africa could also establish more bodies to advance the universal service cause. New agencies would be non-profit entities and work co-operatively with local municipalities and the USAA towards the pursuance of the goals of universal service and universal access as stated in

the South African telecom legislation.

In the U.S., support for telecom services and Internet access is provided to schools in wealthy districts. These schools are eligible for a 20 per cent discount and most impoverished districts are eligible for a discount (80-90 per cent) regardless of location (i.e., both inner cities and rural areas). In South Africa the E-rate for selected schools is a discount of 50 per cent. Another initiative South African policy makers could adopt from the US is the provision of local telephone service franchises by 25 local exchange carriers or LECs that range from multiple companies to community co-operatives and small "mom and pop" phone companies (Hudson 2003:9). In South Africa, Telkom should offer a satisfactory rural service and unbundle the local loop. For such changes to occur, new legislation is necessary and this legislation should also empower the present USALs. Consequently, Minister Matsepe-Casaburri (2007:1) announced in May 2007 that Telkom would be given time until 2011 to unbundle the local loop and that 80 per cent of that unbundling process should be completed by 2011 (Olivier 2007:1).

Another lesson from the US experience is the provision of larger telecom discounts to low-income and the elderly who need the services for emergency reasons but cannot afford the price of access or usage. In South Africa, schools are allowed a 50 per cent discount on the E-rate program, but this discount is too low and has not resulted in many schools accessing the Internet. This service could be made free to schools in the poorest areas, such as the Eastern Cape, Northern Cape, Free State and Limpopo Provinces. South African telecom policy lacks discounts for the elderly, the disabled and other needy persons. Discounts should be provided to such consumer groups (Hudson 2003; Holt and Jamison 2006).

For example, Turner (2006:8) documents that the US implements "low income user" telecom subsidy programs including Lifeline, Link Up and Toll Limitation Service. Lifeline support reduces eligible consumers' monthly charges for basic telephony. Link Up reduces the price of initiating a new telephone service, i.e., a reduced connection charge for low-income customers. Toll Limitation Service allows eligible consumers to subscribe to toll blocking or control free. The US Low Income Fund that receives approximately 12 per cent of universal service fund disbursements in 2005 benefits rural health care centres, schools and libraries (Turner 2006:8).

Also, the High Cost Fund (HCF), which received 59 per cent of the USF disbursements is implemented in the U.S. Its purpose is to ensure that rural consumers have telephony access and pay rates for telecom services that are reasonably comparable to those in urban areas (Turner 2006:7). Competitive pricing also does not exist in the South African telecom market dominated by Telkom, which levies high tariffs and the mobile interconnection fees. Mzolo (2005:1) asserts that while the Organisation for Economic Cooperation and Development (OECD) welcomed Telkom's announcement to reduce tariffs as a "good sign", the organisation's fixed-line proposed tariffs remain high by international standards.

Telkom had filed its tariff reductions with the regulator – ICASA – to effect an overall tariff reduction of three per cent. South Africa's largest labour union, COSATU, acknowledged the reductions but said they were "small" and that Telkom "was still milking the locals" (Mzolo 2005:1). COSATU called for the "renationalisation of Telkom" to "provide efficient and affordable service for everyone in the country".

Between 1996 and 2003, Telkom's local call prices increased by an average of 27 per cent per year, resulting in the price of a three-minute local call being five times more expensive in 2003 than in 1996. Line rental charges increased by 66 per cent between 1996 and 2003 (Gillwald 2005; Love 2005). Melody (2003a:15) adds that as a result of Telkom's price increases, South Africa is among the few countries, where progress in network development continues to decline with every price increase.

Hodge (2005a; 2005b) claims that the tariff increases that followed Telkom's initial privatisation in 1997 have stifled access to both basic services and the Internet. Further, in 2001, the average total price of using a local dialup Internet account for 20 hours a month in Africa was about US$68 (Jensen 2001b:143). This was about R748, 00 in South African currency, the Rand, (monthly usage fees, telephone line rental). Internet Service Provider (ISP) subscription charges varied greatly in 2001 – between US$10 (about R110 in the South African currency) and US$100 (about R1 100) a month, reflecting the different levels of maturity of the markets, the varying tariff policies of the telecoms operators, the different regulations on private wireless data services

of various African countries and on access to international telecom bandwidth. The Internet costs were still high in 2006/7 (cf. Chapter 1).

South Africa's mobile high phone prices are due to interconnection charges (Van Rensburg 2007:8). Van Rensburg argues that these interconnection prices have risen from 27 cents to R1, 27 in 2007. In addition, Van Rensburg questions why a local landline phone call costs 59 cents a minute while a mobile phone call costs R2, 50. Van Rensburg further suggests that ICASA should intervene to enforce lower interconnection charges as in the UK where interconnection costs were lowered by the regulator or the Office of Communications or (OFCOM, formerly OFTEL). This action facilitated lower prices and strengthened competition.

South African telecom privatisation has hampered network expansion. Also, the post-privatisation experience is one of increased consumer prices. These two effects are the opposite of what happened in other developing countries. A study of 30 Latin American and African countries from 1984 to 1997 conducted by Wallsten (Garcia-Murrillo and Kuerbis 2005:8), determined that competitive markets (presence of mobile sector firms unassociated with the incumbent) is positively linked to increased teledensity, connection capacity, and a decrease in local call prices. In addition, when moderated by the presence of an independent regulator, privatisation reforms were also positively correlated with the telecom indicators referred to.

However, most of these positive impacts have not occurred in South Africa. Horwitz and Currie (2007:445) argue that the regulator has been sabotaged by government, in part due to the consequences of the haste to privatise, in part because the ANC leadership has been loath to trust democratic structures outside of its immediate control.

5.8.3 Universal telecommunication access not achieved

Critics argue that fixed-line subscription has been decreasing in South Africa in the past few years. This decline is attributed to high telecom tariffs (cf. Love 2005; Hodge 2005b; Gillwald 2005; Horwitz and Currie 2007). Declining fixed-line teledensity and increased churn demonstrate that the universal access objective is not likely to be realized (Love 2005:47). Unmet

objectives have also impacted negatively on affordability, response to customer needs, fair competition, industry stability, protection of consumer interests, promotion of smaller enterprises, and encouragement of investment and innovation. Anecdotal evidence is found in the plethora of complaints contained in newspaper articles and radio programs (e.g., on 702 Talk Radio), especially regarding a lack of service delivery in rural areas and slow fixing of faults. Telkom's lines in 10 years (1996 to 2006), 3.919 to 4.708 million lines for a population of between 44 and 47 million people, represent penetration rate of just 10 per cent (and falling) (Horwitz and Currie 2007:447).

> "Of the 2.8 million lines Telkom installed, about 75 per cent
> or 2 million (could even be 2.5 million) lines have been disconnected
> and remain unused. This figure is astronomical" (Love 2005:54).

In addition, the seven USALs previously mentioned were also licensed to provide services. Chetty, Blake and McPhie (2006:14), claim that USALs may not be the answer for deploying telecom services in under-serviced areas. This means that in 2006 no USAL was operational due to the delayed application process. USALs' operations have been adversely affected by industry stipulations including:

(a) government determinations allow VANS and private telecom networks to provide their own infrastructure. This determination means that USALs cannot rely on revenue from providing access to telecoms infrastructure to VANS and mobile operators in under-serviced areas;
(b) pay phones in rural areas have a high calling rate per phone. Allowing private provision of pay phones reduces any advantage USALs may have had in providing these services (Chetty, Blake and McPhie 2006:14);
(c) state law requiring that states schools must receive a 50 per cent discount for Internet access removes a potential revenue stream for USALs; and
(d) USALs were part of the original triad allowed to use VoIP (SNO, USALs, Telkom). This advantage, however, was removed.

Some of the objectives that have been partly met by the South African telecom policy include the

efficient use of the radio frequency spectrum, empowerment of some previously economically disempowered groups, promotion of the telecom industry ownership and control by previously disadvantaged groups, and easier access to telecom services by physically disabled individuals (Love 2005:47). The economic empowerment of the black groups has mainly pursued through share purchase during the privatisation of Telkom, the Khulisa offer and the listing of Telkom at the Johannesburg Stock Exchange (JSE). These processes, however, empowered only individuals with economic power.

Matshikiza (2001:1), a Communications Workers' Union (CWU) spokesman, stated at the time of Telkom's privatisation that the government was trying to "fool people into believing that the privatisation of Telkom was to their advantage although the reality was that the underlying reason behind Telkom's 2001 retrenchments was the initial public offering (IPO) through the JSE to capitalists". Matshikiza (2001:2) further criticised the IPO emphasizing that the costs of the commercialisation and privatisation of Telkom far outweigh any illusionary benefits of a discounted offer with the vast majority of the population earning under R5 000 a month, share purchase was not feasible in the counted Khulisa offer (the Khulisa offer sold each Telkom share at R28 per share to enable the poor to buy some shares). At that time, the former Minister of Public Enterprises Jeff Radebe had stated that historically disadvantaged individuals and *stokvels* (i.e., black people's savings groups in the townships), would receive preference to purchase shares in terms of the Khulisa offer because "by its very nature it is intended to target low-income earners" (*Business Day Business Report* 2003:1).

In reality, commercialisation and privatisation have increased the cost of living for working people (Matshikiza 2001:2). Since partial privatisation and full commercialisation, Telkom escalated tariffs for services used by households, namely, basic rental and local calls. Conversely, South African mobile phone companies improved teledensity better than Telkom although they are also charging high prices. Milne (2006:17) asserts that in the mobile and software-based service market affordability is not a concern, and that value-added services permit innovative payment approaches, thus improving affordability of services. This may be one reason for the fast increase in the mobile sector, which low-income consumers experience to be more affordable than fixed-line. Due to the affordability factor mobile phones have substituted fixed-line phones

in the low-income market but complimented fixed-lines in more affluent markets.

5.8.4 Telkom is stifling local economic development and global competitiveness

Because of the high tariffs Telkom is accused of reducing South Africa's economic activity or "putting brakes on the economy" and stifling telecom competition (cf. Melody 2003b; Padayachie 2005) . The Department of Communications (DoC) failed to remedy the situation with the former Deputy Minister for Communications Padayachie (2005:2), contending that the high telecoms tariffs adversely affected governments' "thrust to create more jobs and reduce unemployment". Tariffs were also been criticised by former President Mbeki who, on more than one occasion, urged ICASA and Telkom to reduce tariffs as they adversely impacted on investment (*The Namibian* 2005:1). Telkom fails the poor, criticised News24.com (2004:2).

Telkom's charges are too high with Anderson/MoneyWeb (2005:1) stating that local calls were 200 per cent more expensive (of 15 countries surveyed), than the average and international bandwidth cost (nearly 400 per cent more than the sample average). Milne (2006:18) further argues that operators reject claims that their prices are too high, pointing to intense competition, difficulties attracting investment and so on. Telkom retaliated, asserting that its business strategy was aimed at cost cutting and expansion into international markets (News24.com 2004:1). Telkom, although granted a five-year period of exclusivity to expand the network, has used its monopoly power to thwart competition and raise prices so high that these high prices have damaged the economy (Horwitz and Currie 2007: 445).

5.8.5 Few sources to fund for telecommunications infrastructure development

South African "needy groups" have an unmet demand for telecom services. Given the limited success of telecentres, and that at a conservative estimate 39 per cent of households are unable to afford a telephone, a means to overcome this restraint is by subsidising the price of the service to the subscriber (Gillwald 2001:25). However, this 39 per cent was a 2001 estimate and in 2008, the figure was probably higher because of the rapid rise in cost of living between 2006 and 2008, the more people having lost jobs, food being excessively expensive, interest rates having increased three to four times between 2007 and 2008, and life being generally difficult for many,

also as a result of the international credit crunch. Ideally, this was the concern of the USF, however, this fund has not served needy people.

Possible subsidy schemes that might be introduced alleviate the burdens or accommodate low-income users. Such methods include:

(a) pre-payment systems and phased payment of connection fees as used in Europe and implemented by the European Union; and
(b) fixed monthly fee and low monthly fees with per minute charge as used in the Philippines (Milne 2006:29);

A "blanket" universal service system can benefit high-income users rather than those on low incomes (Simpson 2004:236). Simpson suggests a first mile perspective, where defining and catering for user and community needs given priority, unlike last mile perspectives which focus on corporate communications service providers and their requirements. For this to happen, government needs to facilitate greater participation in the evolution of universal service policy for various non-governmental organisations (NGOs), e.g., community and social welfare groups (dealing with issues of the elderly, women and the disabled for instance).

Strover (2000:151) criticises universal service policy for failing to appreciate first-mile issues and argues that how connectivity looks, feels and behaves from the subscriber's perspective is important as universal service should represent the sum of capabilities that extend users into the networked nation, rather than just a "last-mile" collection of vendor-related concerns and constraints.

For Talyarkhan (2005:1) the "first mile" success factors are:

(a) building on existing knowledge systems;
(b) creating appropriate materials;
(c) using appropriate technology to reach communities;
(d) working with infomediaries;

(e) building capacity of infomediaries and target groups;
(f) facilitating local content creation;
(g) making local knowledge visible;
(h) minimising social exclusion; and
(i) strengthening social capital.

Last mile represents a supply-side driven concept and is a top-down, national, corporate, technical and engineering perspective on telecoms infrastructure deployment (Lowenberg 2005:1). First mile is based on a demand-side driven understanding and describes geographic orientation for telecoms infrastructure and services deployment. However, this undertaking is in conflict with a democratic, social and economic perspective that focuses on the difference these systems and services make in the quality of people's lives. According to Lowenberg, first mile solutions seem to be the best for South African areas without telecom services because they consider local needs and demands and are therefore aimed at solving local ICT problems.

South Africa has few funding alternatives to supplement the USF. Accordingly, there is a need to develop alternative funding schemes to broaden universal service and access programs. Local governments in South Africa should assist the national government in telecom infrastructure development and service delivery. For example, in the US, many states have implemented initiatives to extend the information infrastructure to underserved areas (Hudson 2003:7). In particular, the Appalachian Regional Commission (ARC) provided funding of over US$18 million for 118 projects between 1995 and 2001 in its 13-state region for telecom projects. Each project involved a minimum of two sectors from a community (or region) as end users, including government, health, education, business or community interests.

Further, in 2001 Michigan launched the Link Michigan initiative to upgrade the state's telecoms infrastructure, by aggregating state-wide telecom purchases to create a high-speed backbone, implementing taxing and permitting reforms, increasing access to information about existing infrastructure, and providing funds for regional telecom planning of last mile solutions (Hudson 2003:7). These initiations demonstrate an opportunity for South Africa's nine provinces to engage in the national telecom debate and develop telecom infrastructure, especially as some provinces

have returned unspent funds to national treasury. At the same time, South Africa demonstrates an inability to harness the potential of ICTs and that telecentres serve an impossibly large proportion of the population, e.g., in Gauteng Province, 13 telecentres potentially serve over 2.5 million people within a five kilometre radius (Esselaar, Gillwald and Stork 2006:7, 45).

Other examples from developing countries include national governments initiating methods to raise funds for universal service or access programs, include in Peru, a Development Fund for telecom infrastructure development and sustainability (cf. Garcia-Murillo and Kuerbis 2005). Sri Lanka granted international licenses to more than 30 new competitors to enter. A condition of these licensees was that they were to make a contribution to local operators and a local development fund (Henderson, Gentle and Ball 2005:216). Furthermore, options to provide for the continued affordability of local services (e.g., low user and subsidised schemes) were considered as part of tariff-rebalancing programme. In contrast, Telkom failed to administer low-user tariff schemes when they administered tariff-rebalancing.

Increases in local-call charges – despite more modest increases in monthly rental fees which appear to remain too high as a fixed price to consumers – are viewed as a key factor, together with mobile substitution, as being responsible for the 600, 000 customers migrating from Telkom's network between March 2000 and September 2002 (Gillwald 2005).

To manage this process of tariff rebalancing by Telkom, while safeguarding other public interests, ICASA applied a price cap model. Initially, Telkom's prices were capped via a directive from the Minister of Communications at the time of gazetting of the Telkom license in 1997. The cap allowed a 20 per cent increase (Gillwald 2005:474), across a basket of services annually for three years. With the lapse of this Ministerial determination in 2000, ICASA conducted a review and prescribed regulations for a new cap. But that process was delayed at the Ministry, allowing Telkom in 2001 to circumvent the authority of the regulator and file a significant increase for 2002. By the time ICASA's price cap regulations for Telkom were approved in November 2002, Telkom had prepared overall price increase for 2003 of 9.5 per cent, and 12.5 per cent for basic local services. A stand-off between the regulator and Telkom ensued, which resulted in an agreement allowing the planned tariff increases to proceed on condition that any 2004 increases

were minimal (Melody 2003b; Gillwald 2005).

By the price cap model, Telkom is allowed to increase prices to cover expected inflation on costs of providing fixed-line services, but the increase must be adjusted downward to cover any anticipated improvement in productivity (Melody 2003b; Gillwald 2005). In the rate review by ICASA that was delayed by the Ministry, the regulator proposed a price cap of the consumer price index (12.5 per cent) – X (1.5 per cent). Melody (2003b:28) argued that proper application of the price cap model – with a more realistic inflation-accurate productivity improvement factor reflecting Telkom's actual performance, would have resulted in a local-call tariff reduction for Telkom, not a price increase.

5.8.6 Telkom's anti-competitive behaviour: The case of ISP and VANS operators

Telkom is accused of charging ISPs and VANS excessive tariffs for data transmission and use of bandwidth (Goldstuck 2002; Lesame 2002a; Gillwald 2005; Horwitz and Currie 2007). Gillwald (2005:9), further states that the high price of Telkom's basic fixed-line services is accompanied by the high facility-leasing and interconnection tariffs required from VANS providers. Access regulation is characterised by unsuccessful attempts to compel Telkom to provide VANS and mobile phone operators access to facilities, i.e., bandwidth and international data gateway at reasonable wholesale prices.

ICASA's inability to ensure "cost-based" access to Telkom's facilities by competitors in data markets, has stifled innovation and had an inflationary effect on costs borne by business and individuals (Gillwald 2005:478). The Competition Commission ruled that Telkom's behaviour is anti-competitive towards VANS operators and brought the case to the Tribunal, which, if it concurs with the Commission has greater authority to penalise Telkom for such anti-competitive behaviour. Furthermore, Horwitz and Currie (2007:447) argue that Telkom's ongoing utilisation of its monopoly over the backbone network and invocation of its legal exclusivity in order to inhibit the growth of competitive VANS and ISPs, and the relative inability of ICASA to combat either Telkom's predatory designs over upstream and downstream competitive offerings or deal successfully with Telkom's litigiousness.

Access regulation is another context in which Telkom has abused market power and not provided fair interconnection fees (cf. Love 2005; Gillwald 2005; Van Rensburg 2007). According to Gillwald (2005:481) enforcing retail and access regulatory measures effectively requires the means through which the regulator can correct asymmetry in access to cost information. A regulatory tool to enforce the incumbent towards transparency of its costs is the requirement to provide charts of accounts and cost accounting manuals. However, while this requirement allows for accounting separation between competitive and non-competitive components of the incumbent's operations to be determined, it does not remove incentives for the incumbent to restrict competition by rival firms. Thus, even where incumbent cost information is available, the reliability of the information is uncertain.

In this regard, Milne (2006:18) proposed that a fully informed view on this issue requires access to information which only operators possess. However, Garcia-Murillo and MacInnes (2003:670) state that the regulated have more information and are more knowledgeable about the industry than government officials, and that regulators have to make an extra effort to avoid being influenced by carriers who can take advantage of their information limitations.

5.8.7 Failure of the telecommunication legislation to serve women's interests

South African telecom policy has not satisfactorily advanced women's interests. Women, despite their historical economic disempowerment have not been specifically empowered, except for being included as "previously disadvantaged groups". Women could be economically empowered through development projects such as the Grameen Phone project implemented in Bangladesh (cf. Benjamin 2001b).

Interventions such as the Grameen Phone provide capital to start businesses, and also the necessary business skills and support required to sustain and develop small business. In South Africa, potential financiers of projects could be major banks and development banks such as the Development Bank of South Africa. Beyond South Africa, potential financiers include the African Development Bank, the New Partnership for Africa's Development, the United Nations

Development Programme and the World Bank.

The African Information Society-Gender Working Group (AIS–GWG) identified a number of features in which ICT policies could redress the historical invisibility of women (Gillwald 2001b:1-5). These should include the integration of gender into ICT policy to improve the quality of life of all citizens, rather than ignoring segments of the population. ICT policy should also be integrated with other policy areas (e.g., social policy and economic policy) to ensure that efforts toward sustainable development are co-coordinated and cohesive. Policy should be flexible, enabling and feasible enough to achieve transformation goals and should ensure emphasis on development of effective technology and infrastructure, and serve the needs of women to reduce entrenched gender disparities. South African has yet to formulate specific development projects in the ICT sector aimed at women empowerment. Telecentres assist in women empowerment as some telecentre managers are women.

However, regulations for electronic communications, broadcasting and postal sectors to meet the needs of people with disabilities have been formulated (South African Government Gazette No 29986 2007:5). As a "previously disadvantaged group", people with disabilities include individuals who are limited in one or more functional activities, including hearing, communicating, moving, learning or other intellectual or emotional activities. The regulations in the latter government gazette seek to prescribe the code of conduct to accommodate people with disabilities to be adhered to by all license categories licensed in terms of Chapter 3 of the ECA as well as the Postal Services Act No 124 of 1998. The purpose of these regulations is to promote the provision of ICT services to persons with disabilities and also ensure that they secure employment in the broadcasting, film and telecom or ICT industries.

5.9 IMPACT OF CONVERGENCE ON THE SOUTH AFRICAN COMMUNICATIONS INDUSTRY: REGULATORY CONVERGENCE, OLIGOPOLISATION AND BLUE OCEAN STRATEGIES

Several reasons have brought market structure and service provision changes to the South African telecom or ICT industry. One reason is digital convergence. Convergence is one of

the buzzwords of the new media explosion – the idea that the digital delivery of media comes together; television, online video delivery, Internet communications and telecommunications combined in one mobile phone-type delivery (Lister, Dovey, Giddings, Grant and Kelly (2005: 214). Convergence is employed to describe ways in which previously discreet media forms and processes are drawn together and combined through digital technologies (ibid.:385). The word "digital" is used to capture two essential aspects:

(a) all the information is now being processed as a binary code; and
(b) digital technology is associated with the emergence of new online economy in contrast to old off-line economy (Choi 2005:4).

5.9.1 Functional convergence

Functional convergence is mostly visible in *network level technology convergence* which involves the merger of transport technologies, or technology that transmits data or information, such as circuit-switched voice networks and packet-switched data networks. It involves a situation in which services are delivered over their traditionally package. For example, fixed-line telephone services and pay TV access offered as a single, cut-price package. According to Kim (2005:5) digital convergence has led, amongst other industry changes, substitution between telecom services, where mobile is substituting landline because mobile has the capacity to offer more services than landline and also offer the consumer convenience. The substitution between telecom services is followed by the convergence between telecom services and broadcasting services, e.g., availability of news (and soccer matches in the not-so-distant future - 2010) on mobile phones.

Digital convergence creates new opportunities for upstarts and challenges for technology companies and service providers. Convergence involves the power of the digital media to combine voice, video, data, text and money in new applications, devices and markets (Kim 2005:4). The age of digital convergence in which the computer, the telephone and the television are no longer distinct products with separate functions is upon us. Whether at home, at the office, or in the classroom, we increasingly communicate, learn, and enjoy entertainment using video-on-

demand, interactive television, the Internet, personal digital assistants and more.

Lehman-Wilzig and Cohen-Avigdor (2004:710), place convergence within the defensive resistance stage, offering three possible interactions, namely:

(a) functional equivalence, which means that the older medium (e.g., newspaper) is supplanted by the new one (e.g., online newspaper);
(b) functional differentiation, which indicates that the two media (old and new) find a way to coexist; and
(c) functional multiplicity, which means that both media merge into one multi-functional unit.

Functional differentiation involves separate services, usually delivered over one transmission pathway, which are accessed by the customer through a single user interface. For example, when you access voice telephony and the Internet (wireless application protocol or WAP) using your mobile phone. Functional multiplicity implies the offering of "triple-play" or "quadruple play" services, a situation where one telecom or ICT company offers three or more services to consumers in one basket. Convergence of markets also demonstrates functional multiplicity, because it involves the development of services to such an extent that they become substitutable for other services as far as both suppliers and consumers are concerned. Also referred to as *market convergence*, this term refers to the phenomena of horizontal and vertical concentration, mergers and acquisitions (M&A).

With telecom liberalisation, which South Africa adopted through enacting the 1996 Telecoms Act and the 2001 Telecoms Amendment Act, the increase in competition and decrease in profit margins pushes companies to expand into related high-growth industries such as broadcasting, entertainment like movies and computer games. In such competitive situations or markets, the free market gives dominance to the strongest companies who continue to dominate smaller companies and sometimes drive competitors out of the markets. For example, in South Africa, dominant companies such as Telkom provide fixed-line services, Telkom owns 50 per cent of dominant mobile telephone service provider Vodacom, and has entered the entertainment and

news broadcasting pay TV market through subsidiary, Telkom Media. Because Telkom also provides broadband Internet service, it is therefore offering "The Fantastic Four" and having engaged in horizontal integration for decades, is now flexing its muscles in vertical integration. Sociologist Robert Merton's "Matthew effect", which means that "the rich get richer" (Van Dijk 2006:183), applies to Telkom because this monopoly company is becoming oligopolistic as a result of vertical integration. Companies offering triple and quadruple services or bundled services are on the increase in the quest to enter new markets and offer multimedia services to the consumer. Triple services are telephony, broadcasting and Internet services.

Horizontal integration means business concentration on the same level in the production chain (e.g., services including information and communication, such as telephones, Internet, broadcasting) whereas vertical integration refers to concentration at different levels in the production chain (e.g., services including information and communication, network construction and maintenance, information transportation and management) (Van Dijk 2006:82). Some criteria that allow companies to engage in vertical integration are that these companies make extraordinarily capital-intensive investments, have high turnovers and profits, and have extremely high research and development costs. For example, although Telkom had a poor fixed-line business performance in 2006/7 with fixed line revenue plunging 46.6 per cent to R2,6 billion and fixed-line operating profit falling 19,4 per cent to R4,3 billion, fixed-line volumes falling sharply by 9.6 per cent and local call volumes tumbling down 22,3 per cent, the company nevertheless increased the margin on its earnings before interest, taxes, depreciation and amortisation (Ebitda) to almost 45 per cent, a level that management stated was unsustainable and the expectation was an Ebitda margin of 37 per cent for the 2008 financial year (Financial Mail 2007:36).

Telkom's trust fund or financial wherewithal was also demonstrated when the company applied to the regulator, ICASA, for a pay TV license. Telkom provided two letters from its bankers; one bank (Absa) confirmed that the company has "short-term banking facilities" of R9.1 billion while the other bank (Standard) upped this figure with a R4 billion confirmation (De Wet 2007:57). Starting Telkom's entertainment company, IC Entertainment, cost R7 billion, but Telkom had far more financial reserves than necessary.

5.9.2 Convergence and impact on the communications market structure and service provision

Convergence or combination of technology occurs at the levels of production and distribution (Lister et al. 2005:214). First, at the production level, for example, newspapers, music, and television once had very different physical production bases but could all now be substantively produced using the same networked multimedia computer (ibid.: 385). From a technological perspective, South Africa has seen, in the past two years, convergence of telecommunication and broadcasting at a full-scale national level, which has resulted in Telkom creating a subsidiary broadcasting and entertainment company, Telkom Media, to offer pay TV services. Telkom Media, is, therefore, a result of Telkom's "Blue Ocean Strategy", because Telkom's fixed-line market is saturated and Telkom no longer has new customers in that part of business but instead losing clients to mobile phone and VoIP operators. This means that South Africa's fixed-line market is a "Red Ocean", in which "the market has reached a saturation point" (Lee 2005: 8), and competition is unyielding. However, competition in the local fixed-line industry is not firm or taut, but stifled by Telkom's monopolistic tendencies, anti-competitive behaviour towards VANS, abuse of market power and high prices which have also cost Telkom clients and not created externalities for Telkom (cf. Melody 2003a, 2003b; Gillwald 2005, Love 2005). Therefore, Telkom adopted a "Blue Ocean" strategy, entering new communications avenues by creating new markets and a new company, Telkom Media to offer other competitive broadcasting and entertainment services in the quest to earn new profits and extend market dominance.

The mobile phone companies are engaging in blue ocean strategies because the South African mobile phone industry is also reaching a saturation point as this market has reached a "Red Ocean" because the mobile phone market was already saturated by end-2007 and competition is stiff as millions own and use mobile phones. Technological convergence has also pushed Vodacom and MTN to invest in multimedia offerings. Vodacom is also moving toward offering wire-line services. African mobile phone giant MTN, after leader Vodacom, is the second-biggest cell phone operator in South Africa with 14.8 million subscribers and a 36 per cent market share (Naidu 2008:1). As part of its blue ocean strategy, MTN expanded its mobile phone market to 21 African countries and the Middle East. Beyond South Africa, MTN started operations in 1994

and now offers mobile services to countries including Zambia, Ghana and Iran (Boyle 2008b:7). MTN owns 49 per cent of the highly successful Irancell operation and is looking at expanding its market to China and India. Additionally, to improve its triple-play service offerings, MTN plans to concentrate on offering mobile, fixed, data services in the future as these are integrated and doubled its capital spending to R30 billion in 2008.

Furthermore, the ECA can be viewed as facilitating competition in the telecom sector and breaking down the Telkom monopoly, decreasing vertical integration in the sector while advancing horizontal integration. For example, Telkom's fixed-line business is slowly shrinking as Telkom faces up to its dying business model in the era of convergence as new operators enter the market to provide integrated services. Second National Operator (SNO), Neotel, has entered the market and is offering fixed-mobile services. Mobile phone operators MTN and Vodacom are building fixed-line networks and therefore entering this market because Telkom has failed to satisfy consumer demand, although new Telkom CEO, Reuben September (Financial Mail 2007: 36-37), claimed that the company has "not taken our eye off the ball", and that the company was still investing in customer service and infrastructure and network expansion in its quest to deal with competition and decline in profitability. MTN and Vodacom are proving to be formidable competitors to Telkom in data service provision. The two companies have already stolen customers from Telkom as Telkom's number of fixed-lines continue to decrease.

Until 2006, MTN and Vodacom had been reliant on Telkom to supply them with the cable links that connect their base stations (McLeod 2007:38). In 2007, both MTN and Vodacom rolled out fibre-optic cables nationally to cater for the high demand for broadband on their cellular networks, from customers using the networks to access third generation (3G) data, to high-speed users including Internet users and businesses. Therefore, the mobile phone companies have created new markets and offer new services to earn additional profits by entering a blue ocean. The purpose of this consolidation is to deal with fierce competition, earn more profit and expand the markets beyond South African borders. These competitive developments imply that convergence has several implications not only on industry competition but also on market structure, market power assessment (e.g., vertical integration), continued regulation or re-regulation and on other aspects of the telecom or ICT industry.

Second, at the level of distribution previously discrete networks are absorbed into the single process of online networks – news, music, entertainment can all be accessed through the Internet. For example, Potgieter (2008:86) states that the PlayStation 2 is not only a games console, but also a CD player, DVD player and Internet connector. Mobile phones are an ideal example, in that they provide multiple services including digital cameras, camcorders, text messaging (SMS), multiple-message and video messaging (MMS) voice recorders, calendars, torches, watches, and other devices useful in daily life, at home, work and play.

Third, convergence has resulted in media ownership being increasingly concentrated through mergers of corporations that would previously have operated in different sectors, e.g., Telkom's growing vertical integration. The value chain of the communications industry has been changed as several distinct value chains in this industry are linked with each other and the established value chain is increasingly being deconstructed, with entry of powerful new players and radical restructuring of the industry (Kim 2005:5). Rapid technological developments and increasing market turbulences have added new dimensions to an already complex scenario and M&A have increased in the communications market as companies merge to increase their profits, enter new and interesting markets to expand business and offer consumers multimedia services (ibid.). Horizontal and vertical integration, and oligopolisation, are on the increase as rich companies become richer.

Vertical integration has been more often observed in the digital convergence envorinment. The different degrees of vertical specialisation and vertical integration in the communications industry result in the different payoff of integrations as opposed to the genera economic theories (Kim 2005: 8). Digital convergence leads to structural changes in the information industries including publishing, broadcasting, film, cable, telephony, software and data processing and the Internet in the era of convergence. For example, Microsoft has also dominated the personal computer (PC) market and its extension into the Internet by dominating software provision. Recently, Microsoft has been bidding for Yahoo in order to dominate service provision online. Rushe and Waples (2008:9) found that Microsoft has made a US$44.6 billion hostile bid for Yahoo because Microsoft plans to dominate the Internet in competition with companies such as Google. Google

dominates online advertisements, Yahoo leads in display advertising online and Microsoft's Windows software is the world's dominant operating system. Kim also established that fixed-line telephony service is at the centre of merger trends.

In the 1990s there was an enormous wave of M&A which dramatically re-configure the market structure of global telecom (Warf 2003:321). In Europe and the U.S., telecom firms have steadily consolidated into a shrinking pool of providers, rapidly oligopolising the industry, and the reasons behind this process include globalisation, deregulation, the convergence of technologies, the search for economies of scale and scope, and U.S. corporate tax (competition) laws. It also points to the impacts of this oligopolisation on consumer prices, labour, equity of access to telecom services, and the political and cultural repercussions of increasingly concentrated ownership.

Oligopolisation in telecoms is not new (Warf 2003: 323). The merger of Bell Telephone and U.S. Telegraph in 1900 produced the American Telephone and Telegraph Company (AT&T), which established itself as the giant in a rapidly expanding industry by the 1920s. For almost a century, as a publicly-regulated utility, AT&T enjoyed a monopoly over the domestic market, a status guaranteed by the 1933 Telecoms Act, with exclusive control over the production, installation, maintenance and service of telephones. Deregulation, in the 1980s, saw the dissolution of AT&T in 1984. M&A have been prevalent in South African communications since 2003, and result from convergence, company "Blue Ocean" strategy and triple play. Triple play is also termed multi-play or quadruple play (Tardiff 2006).

Multi-play is a marketing term describing the provision of different telecom services, such as broadband Internet access, television, telephone as well as mobile phone service by organisations that traditionally only offered one or two of these services. A quadruple play service combines the triple play service of broadband Internet access, television and telephone with wireless service provisions. This service set is sometimes referred to as "The Fantastic Four" (ibid.). M&A are the most direct methods firms employ to enter a market (Kim 2005:7). In the U.S. communications industry, Kim (2005:19-20) identified four mergers clusters, viz.:

(a) wireless and broadcasting mergers;

(b) fixed-line telephone and satellite cluster; and
(c) fixed-line telephony, broadcasting and satellite cluster.

Convergence has had a similar impact on the South African telecom industry as in the U.S. and has resulted in mergers and oligopolisation. Mergers have occurred in the pay TV industry where the newly licensed companies comprise mergers between companies. For example, pay TV service provider Multichoice has had cooperation with mobile phone service provider Vodacom to offer services over their networks.

Also, new pay TV company On Digital Media (ODM), comprises a consortium between Modern Times Group, an international television broadcaster with interests in pay TV, radio and television production, and local partners such as the investment holding company First National Media Investment Holdings (FNMIH) (Pty), Ltd, and a broad-based economic empowerment women's group which owns 30 per cent of ODM (Da Silva 2007:1). FNMIH constitutes the second largest ODM shareholder with a 25.87 per cent joint venture between COSATU's investment arm, Kopano ke Matla, and the Industrial Development Corporation (IDC) take up a third largest stake in ODM with a 21.13 per cent stake. With an 80 per cent black empowerment shareholding, ODM is a truly South African-owned company. ODM will compete with Multichoice, Telkom Media (66 per cent owned by Telkom), Walking on Water (WOW) and E-Sat in the pay TV market, ending Multichoice domination of this sector.

New legislation in the form of the ECA is another factor that has further promoted converging markets, M&A, creating new companies which offer consumers integrated services while earning millions in profit. The enactment of the ECA has improved competition and allowed provision of multimedia services. The millions earned contribute to the creation of private oligopolies whose service provision rests on providing multimedia services to the consumer through converged media. The ECA was enacted in 2005 and its purpose is to promote competition in the telecom market and mergers between telecom, computing and broadcasting markets as companies integrate services and offer bundled services, e.g., pay TV, broadband and integrated Internet services. For example, SNO Neotel and Dimension Data division Internet Solutions (IS) jointly secured a two-year, R192 million contract to supply bandwidth and network services to South

African universities and research institutions (McLeod 2007:37).

Fourth, digital convergence has also resulted in regulatory convergence (Lesame 2000; South African National Assembly, *Report of the ad hoc Committee on the Review of Chapter 9 and Associated Institutions* 2007). The merger of the former broadcasting regulator, the Independent Broadcasting Authority (IBA) with the former telecom regular, the South African Telecoms Regulatory Authority (SATRA), in 2000, was pushed by globalisation and functional convergence of technology employed in the two sectors. Technological convergence thus makes it possible for users to access multimedia services such as tele-shopping (e.g., one may view and buy products on the Internet or do shopping via a telephone); tele-banking (e.g., one may find one's banking details or information on the Internet and may do further banking over the telephone); tele-medicine (e.g., electronic computerised patient records can now be accessed by all health-care centres). This convergence between various networks and companies, poses regulatory challenges for regulators about how these converging markets should be regulated, hence the idea of a single regulator seems more practical to oversee the whole communications industry. The rationale for the merger of SATRA and the IBA into a single entity is ostensibly found in the increasing convergence of the broadcasting, telecom and information technology sectors, as well as in the efficiency and cost benefits (South African National Assembly, *Report of the ad hoc Committee on the Review of Chapter 9 and Associated Institutions* 2007:189).

The South African telecom market structure is designed around the vertically integrated incumbent operator and it induces the inherently anti-competitive imperative that demands a \ resource-intensive regulatory response (Gillwald 2005:469). The regulator has often not had the statutory powers, and seldom the capacity, to circumscribe the behaviour of the incumbent so that it does not impact negatively on new entrants. Without effective regulation, the assumed benefits of liberalisation – including more affordable access through improved management of the incumbent and more efficient allocation of resources in the market through competition – do not materialise.

However, neither the enabling legislation, nor ICASA's internal structure in which the divisions for broadcasting and telecom continued to operate quite separately from each other, reflected

these technological advancements It was only in 2005, with the enactment of the ECA, that the underlying legislation pertaining to broadcasting and telecom was repealed to effect convergence of these sectors. Digitalisation has seen the traditionally separate broadcasting and telecom sectors converging, with the result that the old service and technology-specific legislation no longer met the requirements of markets that had subsequently merged (ibid.). The promulgation of the ECA (2005) allowed new companies that offer integrated services to emerge and consolidate their services to create new markets, e.g., mobile broadcasting and pay TV.

The rapid convergence taking place between broadcasting, content and communication technology, services and markets requires an urgent review of existing regulatory frameworks (Kim 2005: 4-5). The central question is nor how to regulate convergence, but how regulation should (and must) change in the face of convergence. Regulators have concerns whether their structure and policy direction fit the changing market (Kim 2005:9). Additionally, Frieden (2005:1) is of the opinion that converging technologies and markets pose major challenges to incumbent telecom companies and NRAs. ICASA has the same challenges, and has often issued regulations late, e.g., pricing policy, further allowing Telkom to continue abusing the market.

Fifth, digital convergence has also led to the emergence of new telecom companies enabled by competition laws (McLeod 2007:38-40). The ECA also promotes competition because it:

(a) ensures that licensees have no special privileges over one another, creating a level playing field;
(b) removes any monopoly elements from old licenses;
(c) opens the market to companies that are not traditional telecom operators;
(d) creates a horizontal rather than a vertical industry structure where operators are not tied to specific technologies and this allows for convergence;
(e) allows service-based competitors to build their own infrastructure, subject to the conversion of their licenses and the awarding of radio frequency spectrum. This promotes industry competition at infrastructure level; and
(f) forces operators to interconnect voice calls with one another according to a price formula to be set out by ICASA. These regulations could lead to a decrease in voice tariffs.

5.9.3 The social and political impact of globalisation, deregulation and convergence on the telecoms sector

In the U.S., the amalgamation of firms in telecoms has raised a few concerns among consumers, competitors, watchdog groups and government regulators about the consequences of increasing concentration of ownership in this industry (Warf 2003:337). These concerns exist in the local telecom market as well, and are:

(a) Across the planet, deregulation, privatisation, and new communication technologies have generated a worldwide market for media services in which a few giants have established powerful distribution and production networks, and that such firms, by virtue of their large market shares, often act in collusion;

(b) Large firms may reduce competition, driving smaller ones out of business. In the theory of oligopoly, firms with large shares of the market can act as price-setters rather than competitive price-takers;

(c) M&A activity may lead to higher prices for consumers, but also higher stock prices and dividends for the providers;

(d) Further, mergers may lead to declining service quality and network reliability as providers discriminate between high profit business and relatively low profit residential customers;

(e) Another concern about M&A activity is labour markets, because although telecoms is a relatively capital-intensive industry – its employment impacts are felt overwhelmingly through its forward rather than backward linkages – the consolidation of corporate providers has often been accompanied by announcements of layoffs and employee retrenchments. After AOL's purchase of Time Warner, for example, two thousand people lose their jobs; and

(f) Equity issues are also shaped by M&A activity: deregulation has encouraged telecoms to be provided increasingly on a "pay per" basis, a context in which firms engage in network "cherry-picking" of the most profitable customers and effectively abandon others, such as rural regions, as well as poor and disenfranchised customers, thus paying lip service to the bridging of the digital divide. This development enhances the divisions between the information "haves" and "have-nots". Regulatory mechanisms have to be put in place to

manage or control the behaviour of telecom multinationals as well as national monopolies to deal with the digital divide.

In the South African telecom sector, deregulation of the industry has not led to much industry competition (except for Neotel's market entry and mobile phone competition), but has promoted oligopolisation and introduced new markets such as pay TV. There is still minimal competition in the industry despite the ECA legislation promoting competition. Neotel still has to make business strides in terms achievements and industry penetration. Privatisation has mostly benefited rich companies and BEE stakes have mostly favoured a few politically connected black people (Brown 2004; South African Press Association/SAPA et al. 2004; Horwitz and Currie 2007; Piliso 2007; Chonco 2008, Rumney 2008). Members of some labour unions have benefited in BEE transactions and also other blacks already owning big business, e.g., the BEE consortium which has led a bid for a R7.5 billion Vodacom stake comprises of Bulelani Ngcuka, Deputy President of South Africa Phumzile Mlambo Ngcuka's husband, Nkenke Kekana, former Parliament Communications Committee Chairman and ex-Telkom executive employee, former Eskom Chairman and businessman Reuel Khoza and businesswoman Anna Mokgokong (Naidu 2008; Rumney 2008). COSATU has also objected to the sale of stakes at Telkom to benefit a few (Brown 2004:1).

Rumney (2008:3) argues that being politically connected seems to be an important aspect in securing BEE deals. However, BEE should not merely about the deracialisation of business, but also about the fundamental altering of organisations, and that BEE beneficiaries should not lose sight of how the BEE policy came about and of how important it is to transform business for the benefit of many (Chonco 2008:2). BEE deals have clearly benefited the rich and politically connected, as this was the case with one of the broadest-based early BEE deals, that of the transfer of 35 per cent of Johnnic Holdings to the National Empowerment Consortium, which was headed by Cyril Ramaphosa, who has gone on to become one of South Africa's millionaires, thanks to a string of subsequent BEE deals. Horwitz and Currie (2007:447) have criticised telecom liberalisation in South Africa, arguing that this policy has created a black bourgeoisie, failed the masses and trumped by privatisation since there is not industry competition while Telkom is still enjoying monopoly fruit. Rent-seeking and empowerment of a few prompted parliament to pass

the Broad-based Black Economic Empowerment Act in 2004 with the aim of spreading privatisation benefits to more than a few. This Act also aims to increase small and medium-sized enterprises (SMEs) in the industry.

Summing up developments in the industry over the democratic dispensation, Gillwald (2005:469) has argued that the telecom policy has good intentions but policy implementation processes and regulator inefficiencies to manage market abuse and anti-competitive behaviour by Telkom has let the industry and consumers down while also stifling innovation. If technology prices are high, most consumers will not be able to afford it, and therefore, may be unable to communicate. The onus lies with NRAs to regulate for fair competition, service provision and also to ensure that the consumer has enough choice in services provided but is not abused by high prices. Research and development in the industry is also lacking, thus stifling local innovation but relying on new technology from overseas.

5.10 SUMMARY AND OUTLINE OF CHAPTER 6

This chapter summarised South Africa's telecoms policy developments from the late-1980s to 2008 in four stages. Stage One summarised the developments between the late-1980s to 1993. Stage Two discussed telecom policy developments from 1994 to 1996. Stage Three discussed policy developments from 1997 to 2000 and Stage Four summarised the developments from 2001 to 2008. The analysis of the South African telecoms policy developments, and implementation of that policy concludes that the developments result from a combination of foreign push, e.g., globalisation and global telecom changes, the GII, the "Brussels Principles", and also domestic influences, e.g., pressure from political parties, business, labour unions and other stakeholders within South African government to establish a new telecom policy framework aimed at providing solutions to the low teledensity, accelerate business in the ICT sector and bridge the huge urban-rural digital divide.

The chapter also criticised the implementation of policy by government and agencies such as ICASA and the USAASA, suggesting policy alternatives towards pricing aimed at ensuring that telecom services are affordable and therefore, contributing to the democratisation of society and

encouraging investment. High tariffs and market distortions are criticised in this chapter, more especially Telkom's treatment of USALs, VANS and ISPs.

The national telecom business community, telecom operators (especially USALs and the USA), have a social obligation to improve rural access to telecom services. Government also has that social obligation which should be fulfilled through Telkom (since government still has a major stake at Telkom). Government policies and regulatory agencies should play a major role towards the goal of providing access but at present these groups are not doing that. The chapter provided some recommendations as well about how these government agencies could be empowered and how the agencies themselves could perform better and heed public critique and recommendations when offered by industry observers and telecom consumer groups. ICT infrastructure development is crucial for southern African development (James 2001:32).

Also, what is necessary in the South African (and Africa in general) is "action-oriented research" and "pilot studies" to "deepen the technological base and allow feedback into the policy formulation and amendment process" (James 2001:33). A prerequisite for entry into the information age is infrastructure development and foreign investment is a crucial necessary to ensure that the infrastructure is developed (Nulens, Hafkin, van Audenhove and Cammaerts 2001:328). Additionally, Lesame (2005a:10) is of the opinion that national governments should work hand in glove with foreign investors, and create favourable ICT policies to attract the investors, to develop local ICT infrastructure and combine the expertise of foreign investors and local knowledge and understanding of the local market by government.

The discussion above of South African telecom policy and its implementation by government and its agencies, demonstrated that there remains a need to establish more telecentres near homes because there are still too few telecentres and that few serves many people. Telecentres reduce the cost of telecom because as shared community entities, users pay less for telecom services at telecentres. In view of the still expensive incumbent operator prices, telecom policy should promote speedy establishment of more telecentres, as this chapter has demonstrated that present policy still has not expanded telecom services to those who need them most. To their credit, government seems to be striving towards opening up the telecoms market even further by opening

up the local loop, which is viewed as one of the business alternatives to reduce the high prices in the long run because it promotes competition.

This chapter has also showed that communications industry mergers are on the increase, with rich companies becoming richer as oligopolisation flexes its muscles, and that telecom companies play a crucial role in these mergers in the quest to provide multimedia services to consumers at competitive prices.

Chapter 6 critically discusses the methodology employed in this study. Chapters 1 to 5 provided the history of how telecentres came to be established in South Africa. International telecentre developments were also discussed in these chapters, because these developments had an impact, as a result of globalisation and South African membership of global telecom policy formulating organisations such as the ITU and the WTO, on local telecentre development and operation. This historical background was necessary to lay the foundation on which the impact of telecentre ICT on user education can be assessed. Chapter 6 explains how this impact was assessed.

CHAPTER 6
RESEARCH METHODOLOGY

6.1 INTRODUCTION

This chapter describes the methodology used to conduct an empirical investigation of the influence of telecentres on the education of the centre users and explains the selection and sampling of the telecentres. It outlines procedures followed in methodological sampling, construction and administering of the survey questionnaire and personal interviews. Motivation for the use of triangulation and the specific research methods employed is provided. ICT impact is analysed in this study at individual and community development levels. These levels of analysis call for different tools, with the questionnaire analysing the ICT impact on the individual development while the personal interview questioned respondents on both individual and community development as a result of ICT usage.

Research processes followed include identifying the research population, sampling, procedures followed to conduct personal interviews and drafting and administering the questionnaire, data capturing, coding and analysis and ethical considerations. These belong both to the qualitative and quantitative research frameworks (Mouton 2001:143-180; Babbie and Mouton 2001:74). The chapter also explains the quantitative aspects of the methodology and how the survey questionnaire was conducted. Qualitative aspects of the research and how personal interviews were conducted are explained. Limitations of the research design and ethical considerations conclude the chapter. First, the aim of the study and the research questions are restated

6.2 THE AIM OF THE STUDY AND THE RESEARCH QUESTION

6.2.1 The aim of the study

This is an exploratory and descriptive study aimed at:

6.2.1.1 Describing the impact of telecentre ICTs on the *education of telecentre users from the users' perspective*, with specific reference to the particular technology employed for specific educational needs.

In an attempt to achieve this aim, the study seeks to contribute toward the following objectives:

(a) Identify *technology employed and that needed or required by telecentre users to advance their educational goals while visiting the telecentres*;
(b) Describe *educational and vocational support offered by telecentres to employed users* e.g., teachers, agricultural workers, librarians and nurses who, in turn, use that support at work;
(c) Identify *forms of ICT training provided by telecentre staff to users*; and
(d) Investigate the *opinions of telecentre users with regard to the impact of the centres on their education*; and
(e) Describe how the rural and urban telecentres differ in terms of the users' access to these telecentres (distance travelled to reach the telecentres) and usage access (technology available and used at the telecentres, prices paid to travel to the telecentres and also to use the ICT at the centres).

6.2.2 The research question

What impact do ICTs located in telecentres have on users' formal and non-formal education?

To answer this question and gather information about how telecentres contribute to the education of the telecentre users, the following sub-questions are addressed:

(a) Which ICTs do the telecentre users employ to satisfy their educational needs?
(b) What are the ICT training needs of telecentre users?
(c) What technology at the telecentres is used for educational purposes?
(d) For which educational purposes is telecentre technology used at the telecentres?

(e) What ICT training is provided to telecentre users by the telecentre staff and managers?
(f) What are the attitudes and opinions of the users concerning how the telecentres contribute or do not contribute to their education?
(g) How do the telecentres support working users e.g., teachers, nurses, and others, with technology and other resources?.
(h) What distances do the rural and urban telemeter users travel to use the telecentres and what prices do the users pay to travel to the telecentres and also to use the ICT inside the telecentres?

These sub-questions are addressed in Sections B and C of the survey questionnaire; sub-questions (a), (c) and (d) are asked in Questions 13, 14, 15, 16 and 19 of the questionnaire. Sub-question (b) is addressed in Questions 17 and 20 of the questionnaire. Sub-question (e) is asked by Questions 13, 15, 16, 19, 20, 21, 22, 23, 24, 25, 26 and 27 of the questionnaire. Sub-questions (f) and (g) were mostly addressed by interview questions. The questionnaire also addressed user demographic details and telecentre information in Section A and telecentre access, pricing and usage issues (cf. sub-section 6.3.1 of this chapter). Some questions of the questionnaire (e.g., in Section B, 8, 9, 10, 11, 12 and 18) also addressed telecentre access, pricing and usage issues, and so did the interviews.

The methodology employed to achieve these aims and answer these questions is discussed in the following sections.

6.3 SELECTION OF TELECENTRES

Four telecentres were selected for the research and one for the pilot study. Non-probability purposive sampling was employed to select all five telecentres. In purposive sampling, the respondents "are subjectively selected by the researcher, who attempts to obtain a sample that appears representative of the population" (Nachmias and Nachmias 1987:186). The telecentres were selected for the following reasons:

(a) Two of the telecentres are in rural areas (Tombo and Hoxani telecentres). These rural areas are provinces deprived of telecom services (cf. Chapters 1

and 2 of this thesis). The author selected the telecentres to determine access to and use of ICT in rural areas with little or no telecom services;

(b) Two telecentres are in urban locations (Siyabonga and MACIS). These centres can also be regarded as semi-urban because townships are sometimes referred to as semi-urban because they are situated outside cities and some townships do not have adequate infrastructure, including sanitation, electricity and telecommunications, to be categorized as urban. Siyabonga and MACIS telecentres are located in South Africa's richest province, Gauteng or "place of gold", which also has the highest teledensity and widest access to ICT services. A comparison of rural-urban access to telecentre ICT is therefore sought, to draw conclusions about how South Africa is achieving the goal of universal access and how the digital divide between rural and urban areas is being addressed by government. Analysis of information concerning universal access goals also shed light into whether telecommunication service providers have met their USOs. Question 7, in Section A of the questionnaire, identifies the names of each telecentre researched (and therefore, whether the telecentre is urban or rural). Universal access and digital divide issues are addressed in Section B of the questionnaire and are specifically addressed by Questions 8, 9, 10, 11, 12 and 18. These issues were also addressed in the interviews, with other aspects of the interviews and some answers provided in sub-section 6.3.1 of this chapter and also in Chapter 8; and

(c) It is the opinion of the researcher that the selected telecentres have more daily users than the other telecentres which this researcher visited before. Sampling these telecentres would therefore provide more respondents and speed up data collection. The author visited more than 10 telecentres in 2004 in the Eastern Cape and Limpopo Provinces, as a way of laying some groundwork for this field research and discovered, in most of those telecentres that there were not many users who came into a centre per day. The researcher also made enquiries to the USAA as to which telecentres were better operating than others nationally and she was informed that the four telecentres were operating "better" than others (Mahao, 2004; Memela 2005; Nzuza 2005). Mahao informed this researcher that if one wanted to obtain adequate information about telecentres, one could use these four centres as they always had users employing them and that the centres were some of the few operating "better

than others". Therefore the four sampled here were operating better than others on a daily basis and one can obtain information from users at the centres.

6.3.1 Background of sampled telecentres

Information provided in this section addresses issues asked in Section B of the questionnaire. Other issues reported in this sub-section were asked during the interviews because this researcher was not very familiar with the areas under study and asked the interviewees more area background questions in order to understand each rural and urban area much better before investigating the role of the telecentres in developing each area. The researcher, therefore, decided to include the information detailing the history of each area in this section of the chapter, before actually explaining how the information from these areas was gathered.

Also, more interview questions asked interviewees about how individuals and the areas were developed by the telecentres, how the telecentre impacted on users' education and also the impact of the telecentres on community development. The researcher thought it necessary to ask about the history of the rural and urban areas first before delving deeper into issues of telecentre and community development, and the results of this scrutiny are included in this section below. The sub-headings (a) to (f), below, are themes that arose from respondents' answers and also themes that the researcher considered appropriate against the background provided in Chapter 1, and also information she gathered from the interviewees. Other sub-headings are areas the researcher was interested in which she asked interviewees questions about, e.g., the role of PPPs in the establishment of each telecentre, which was stated below as affiliations and strategic alliances responsible for telecentre establishment and maintenance.

The section below provides information about the telecentres selected:

(a) Location and context (which led to the telecentre development);
(b) History and development;
(c) Accommodation;

(d) Functions;

(e) Affiliations and strategic alliances and

(f) Running costs, funding mechanisms employed and funding challenges encountered by managers and their assistants.

6.3.1.1 Siyabonga telecentre

Siyabonga is situated in Orange Farm informal settlement or semi-urban area. Siyabonga is a Zulu word which literally means "we are thankful". This name suggests that the people who named this telecentre were thankful for getting it. Siyabonga telecentre was selected or sampled for this research because of its vibrant activity (many people make use of the telecentre on a daily basis).

(a) Location and context

Orange Farm is situated between the township of Sebokeng and the suburb of Ennerdale 40 kilometres south of Johannesburg, and 65 kilometres from Tshwane (formerly Pretoria), on the road from Johannesburg to the towns of Vanderbijlpark and Potchefstroom. Orange Farm has urban and rural characteristics and so is semi-urban or semi-rural socio-demographically because it constitutes large urban houses (see Figure 2), modern businesses, and small shacks (see Figure 3) with cattle and donkeys roaming around some streets. It is a fast growing area. Figures 2, 4 and 5 were taken by this author at Siyabonga telecentre in 2005 when she visited to conduct the personal interviews for this study and to administer the survey questionnaires.

Figure 2: Some modern houses in Orange Farm informal settlement near Siyabonga telecentre

Source of photograph: Lesame (2005b)

Figure 3: A shack house in Orange Farm not far from Siyabonga telecentre

Source: Thale (2002:3)

Some inhabitants of Orange Farm are urbanised and others exhibit rural interests and lifestyles because they plant food in their gardens and keep cattle, chickens, donkeys and goats in the same yards. However, these farming activities are usually prevalent in rural areas, but can be seen happening in the urban township of Orange Farm,

which may suggest that local people try and find means of sustaining themselves as the cost of living is high, including the cost of food. What is also apparent from looking at Orange Farm is that most people live in shacks (hence the area is commonly called an informal settlement), with inhabitants regarded as poor.

Although the farming activities and shacks contribute to the rural nature of Orange Farm, tarred roads, new and well-built schools, clinics, telephones and electricity and make Orange Farm urban. Therefore, this township is semi-urban in appearance. During the personal interview this author conducted with the ICT trainer at Siyabonga telecentre in 2005, Reginald Msimango, he stated that: "There are more unemployed people in Orange Farm than there are employed, although I do not know the numbers".

The quotation explains why there are farming activities at the township because unemployed people perform farming activities in order to feed their families. Some of the infrastructure missing in informal settlements comprises proper housing and sanitation facilities. Some parts of Orange Farm have sanitation facilities, others don't (the shack areas). According to Thale (2002:1), although most Orange Farm residents live in shacks, are unskilled and possess no visible means of subsistence, the settlement receives substantial development funding from government and its inhabitants are among the most civic-minded in South Africa, "taking pride in their environment and endowed with a strong sense of place, social bonding and a strong will to survive" (Thale 2002:2).

The middle and upper-class homes seem to have been newly constructed. Many different kinds of businesses exist next to Siyabonga telecentre, e.g., telecommunications phone shops in containers and garages, Sizanani ("help each other") Development Society, Heaven Funeral Parlour, Zico Hair Salon, a meat market, Phokeng Furniture, doctors' rooms, a busy taxi rank, and schools. A few Vodacom and Cell C public phone shops can also be observed as one travels through the settlement but these are not near the telecentre. Most of the people using the businesses around the telecentre are clients of the telecentre because most make telephone calls at the telecentre and some of them make use of the centre's computers (Mathe 2005; Msimango 2005).

A few kilometres from Siyabonga telecentre, is the Orange Farm ICT Hub which was established by the Economic Development Unit of the City of Johannesburg Metro, in partnership with the Council for Scientific and Industrial Research (CSIR)'s Information Society Technologies Centre (ISTC). According to Mogaki (2004:1), the Orange Farm ICT Hub was opened in November 2004 by Johannesburg Mayor Amos Masondo, who stated at the time that the objectives of the ICT Hub were to offer more ICT training to Orange Farm residents (to augment the telecentre ICT classes owing to a high demand for computer literacy and skills in the area), and to link small businesses in proximity to the hub to the Internet and other national businesses using wireless technology. The ICT Hub is, however, located far from the telecentre so the two centres are not in competition.

(b) History of Siyabonga telecentre and the role of public-private partnerships

According to the telecentre manager (Makoro 2005), Siyabonga telecentre was established in 1999 by the former Universal Service Agency (USA). Makoro had applied to the USA for the telecentre as part of expanding her business interests and the agency granted her the telecentre.

In a personal interview, Makoro (2005) stated that the telecentre was opened by the former premier of Gauteng Province, Advocate Mathole Motshekga, in 1999. At the time, she said that the ICT would contribute toward teaching Orange Farmers ICT skills so that they could find jobs to alleviate their poverty. Motshekga (1999:1) added that the telecentre was "a public-private-partnership (PPP) which is part and parcel of an empowerment programme with emphasis on community driven development. Public-private partnerships provide us with a way forward in realising the full potential of communities such as Orange Farm".

Motshekga further congratulated the partners who had started the telecentre – British Petroleum (BP) South Africa, Safmarine, the former USA (now USAASA) and Siyakhula ("we are growing") Trust - on their dedication to socio-economic empowerment and upliftment activities and developing entrepreneurial skills at Orange Farm. Motshekga also stated that it was important for the former USA (as it

was known at the time) to continue establishing PPPs with the private sector in order to provide further MPCCs to communities for the purposes of ICT skill training and community development.

(c) Telecentre accommodation

Siyabonga telecentre is located in a building with a few rooms, one of which was the restaurant owned by Makoro and the other room was a sewing room where women attended some sewing and baking classes. According to Makoro (2005), her own vision was that she and her colleagues would teach local people business skills and computer skills (after they had gained some practical business skills) to empower them so that they could establish their businesses or further the knowledge gained from the telecentre at educational institutions of higher learning. In the same building there was a tuck shop which sold mobile phone airtime and food. Another room in the building was the MTN phone shop belonging to the telecentre owners and on the roof of the building was a Sentech satellite dish for Internet access. The telecentre building is illustrated in Figure 4, which is also a photograph taken by this author during one of her visits to the centre.

Figure 4: Siyabonga telecentre

Source of photograph in Figure 4: Lesame (2005b)

(d) Functions of the telecentre

Like many other former USA-established telecentres, Siyabonga telecentre started out by only offering access to telecommunication equipment and services to local people, e.g., telephones, facsimile, photocopying and computer services including the Internet. It has since developed other services according to need and financial capacity, and these services have been introduced by the manager Mrs Makoro and her husband (who manages a building construction business and teaches computer literacy at the telecentre), and the computer trainer Reggie Msimango. Msimango conducts the computer classes assisted by Bheki Mathe. The other functions of this telecentre and ICT services that it offers the community are summarised in Table 9. Figure 5 shows the computer training function of the telecentre as it was taken by this researcher after administering some questionnaires with these telecentre users at the telecentre.

Figure 5: A computer training class in session at Siyabonga telecentre

Source of photograph in Figure 5: Lesame (2005b)

In addition to the work conducted at the centre (cf. Figures 5) this telecentre was the only centre examined that was developing a Web site, demonstrating the advanced computer literacy of the ICT trainers.

The telecentre mostly offers computer literacy programs, identified later in this chapter and in Chapter 7 (in Table 15), with costs of the computer programs and other services offered.

(e) Affiliations and strategic alliances

According to Makoro (2005), the telecentre was established as part of a women's development project aimed at teaching catering, sewing and computer skills for small business management. Makoro was instrumental in starting the development project (as chairperson of the local women's group and a businesswoman running businesses attached to the telecentre). During the opening of the telecentre, Advocate Motshekga (1999:1) commented that the telecentre would provide the nucleus for future development in Orange Farm and stimulate economic and social development in the area. Motshekga (1999:1) also encouraged the residents of Orange Farm to pay for the services offered by the telecentre so that "they could be sustainable and assist the local authority in maintaining the area".

(f) Costs and funding

The telecentre is funded through fees paid by telecentres users for the computer courses delivered and for other services rendered. At the time the author conducted the personal interview with the telecentre staff, the staff were expecting twelve more computers from the former USA which would be installed in their new building. This building was expected to be finished by end-2005. More information on the costs and funding mechanisms employed by the telecentre staff is stated in Chapter 7.

Although the telecentre personnel claimed that they would be glad to make more profit from the revenue generated by the computer classes and other services, they also stated that they were glad to receive the income that they were receiving. Msimango (2005) stated that they had "nothing" before working at the telecentre so

they could not complain but should be “happy” with the small income that they were receiving. Msimango was confident that their profit would improve when their new building was open because they would be able to offer more computer services with more computers, which he thought would bring more computer trainees to visit the centre for computer literacy classes.

At the time of the interview (2005), the telecentre was the only usable public phone entity and computer centre in the area so there was no concern about competition. However, with the fast development of Orange Farm, the telecentre would be better advised to develop new services such as postal services and courier services because there were signs of growing competition, such as new phone shops and people installing phones in their homes. New services introduced could increase the telecentre’s financial viability and contribute to its economic sustainability.

6.3.2.2 Tombo telecentre

The Tombo MPCC is located in the O.R. Tambo District Municipality near the village of Port St Johns in the Eastern Cape Province.

(a) Location and context

An interview conducted by this researcher in 2004 with the erstwhile telecentre manager, Lusapho Njenge who revealed that the telecentre was launched in 1999 by the late Minister of Public Works, Stella Sigcau, and that the centre was the first of three pilot ventures aimed at testing the government MPCC concept facilitated by the Government Communication and Information Service (GCIS). The centre drew attention and people came there to access telecommunication and information services from as far as Umtata and that one of the aims of the telecentre was to provide government services to local communities. The telecentre was established by the USA in collaboration with the GCIS (Njenge 2004).

Tombo village houses (including rondavels) are scattered through the countryside with an estimated population of about 30 000 people (Smauza 2005). Many smaller

villages surround Tombo and some people from these villages employ Tombo MPCC, especially for government services. The telecentre is located inside the municipal building, next to a clinic. The names of nearby schools – which sometimes make use of the telecentres' services - are Mtweni Senior and Junior Secondary School/s (JSS/s) Jokwana, Vulindlela (Open the Way), Tekwini, Nyikimeni, Zanemvula (Bring the Luck/Rain), Hlamvana, Cwebeni, Magombeni, Bizana, Buzongwana and ITombo JSS (Smauza 2005).

According to Smauza (2005), some students residing in Tombo studied at institutions of higher learning by correspondence, and some of these students posted and received their mail at the telecentre. Smauza mentioned the University of South Africa (UNISA) and the former Rand Afrikaans University (RAU) now the University of Johannesburg, after merging with other universities in Johannesburg in 2004/5.

Tombo is known to be a progressive village, according to the respondents (Njenge 2004; Smauza 2005) because most modern developments in the villages around Port St. Johns are initiated at Tombo (e.g., the use of computers). There have also been television programmes broadcast on the South African Broadcasting Corporation (SABC 1) channel about Tombo and the development projects taking place in the village, such as irrigation schemes and forestry projects with technical and human resources assistance and knowledge from government agencies and groups such as Working for Water (WFW). One could identify a few businesses in the village, e.g., a couple of shops, a liquor store next to a meat market and two Vodacom phone shops which were not near the telecentre. A clinic is located next to the telecentre which is in a municipal building.

(b) Telecentre accommodation

The telecentre is located in an office at the Tombo/Port St Johns municipal building. According to Smauza (2005), the Port St Johns Municipality assisted the telecentre to sustain itself, e.g., the municipality settles the centre's electricity bill and the centre did not pay the municipality rent. In addition, the Tombo Development Centre (TDC) manages and controls the finances of the telecentre (including Smauza's salary). Also, the former USA provided the telecentre with technology (and continues to do so when

required), and Smauza and other telecentre staff (such as manager Njenge), are required to report to the agency monthly regarding centre performance (Smauza 2005).

(c) The role of public-private partnerships in the establishment of the Tombo telecentre

Partners assisting the telecentre include the Department of Health, the Port St Johns Local Municipality, and an Arts and Culture Centre. Njenge (2004) indicated that the Department of Home Affairs visited the telecentre to offer their services e.g., facilitate applications for birth certificates and identity documents. The Department of Social Welfare visited the telecentre to process applications for social and other grants. A number of successful partnerships with community based groups and non-governmental organisations exist at the Tombo MPCC, a partnership with the Umtata Child Abuse Resource Centre (UCARC), a project aimed at curbing women and child abuse, training in business and bookkeeping skills provided by the Tombo Entrepreneurship Development Centre, as well as assistance provided in registering small businesses.

(d) Functions of the telecentre

Like Siyabonga telecentre, Tombo telecentre initially offered only access to telecommunications equipment, e.g., telephones, computers, Internet and facsimile services. The telecentre since developed service offerings based upon needs and financial capacity (Smauza (2005). These services include MTN public phones and a post office. The mail was delivered daily, a service most South African villages do not have. New services that the centre planned to introduce, according to Smauza, included an overnight courier service to major cities, a post-banking system and selling of stationery for students to save travel costs.

In another interview Smauza (2004) established that the telecentre offered Basic Computer Literacy training courses acquired from tertiary institutions, Metro Training College funded by the CSIR, the University of Fort Hare (UFH-ICDL) and Port Elizabeth (PE) Technikon, studying Computer Networking (LAN). The Tombo

telecentre is located in two rooms, one office and the other a large computer laboratory where computer classes are held. The laboratory contains 21 computers. The ICDL course and a Cisco Computer Networking course are taught at this telecentre, every Monday to Thursday with computer practice on Saturday, as with MACIS, from 16h00 to 18h00. These computer courses, including E-Citizen, Cisco Computer Networking, International Computer Driving License (ICDL) and Basic Computing, indicate an element of growth and innovation on the part of the telecentre. In 2003 the centre offered no computer courses, while its computers were unused, according to Chetty (2005:28). Chetty further states that factors which had hampered usage of the computers, at that time, included a lack of training services and no provision of relevant content. However, this situation changed and later in 2005, the above-mentioned computer courses were offered by the telecentre (Smauza 2005).

(e) Costs and funds of ICT training and services offered

The main computer courses offered by the telecentre are referred to in sub-section (d) above. The courses were offered in cooperation with Cisco Systems, the ICDL Foundation and the University of Fort Hare in the Eastern Cape Province (Smauza 2004). Costs of using the ICT facilities at this telecentre are stated in Addendum C.

(f) Affiliations and strategic alliances

Additional stakeholders who supported the centre are the Tombo Entrepreneurial Development Centre (TEDC) staff, the University of Fort Hare (UFH East London campus), and the ICDL Foundation, which provided the telecentre with computer training courses (Njenge 2004; Smauza 2005).

> "A lot of local pre-schools, and government departments such as Home Affairs and Social Development, and supermarkets also use the telecentre services and make marketing materials and copies at the centre. The community also utilizes the post office established by the telecentre two years previously (Smauza 2004 Interview by author).

6.3.1.3 Mamelodi Communication and Information Services (MACIS) telecentre

The MACIS centre is located in Makhubela Street, Mamelodi West, in the Mamelodi township in the Tshwane municipality.

(a) Location and context

This telecentre is located next to a taxi rank and opposite a residential hostel. A couple of blocks from the telecentre is a shopping complex and the Solomon Mahlangu Freedom Park is next to the municipal building in which the telecentre is located.

(b) History of the MACIS telecentre and the role of public-private partnerships in this development

An interview with the telecentre manager, Lucas Maako (2004), revealed that the telecentre was established in 1999 by Nebo Legoabe who now works for the GCIS, and Esme Modisane, who initiated the telecentre. Modisane had had an interest in computers and desired to advance local IT skills and provide the community with access to communication services. Modisane migrated to the city and left Maako to operate the telecentre. The centre is sponsored by the USAASA (then USA), which also assisted (and still did by end-2007) the telecentre manager with technical assistance, together with the CSIR. According to Maako (2004), the CSIR sponsored the telecentre with computers after the centre was burgled by vandals in 1999 and 2000. However, security measures were tightened (Maako 2004 *Interview with author*). Since then, the centre received replacement computers from the CSIR and thereafter improved its security. The municipality also stationed security guards at the main gate to assess vehicles.

(c) Telecentre accommodation

The MACIS centre is housed inside the Mamelodi municipal building, with local government and municipal offices. This telecentre is in Mini Munitoria Room B30.

(d) Functions of the telecentre

There were eight working computers at the time of this author's visits and five computers gathering dust in the room but not functioning. The MACIS centre also offered fax facilities. Telephone services were not offered because these services are abundant in the township. Mostly the centre offered (and still did by end-2007) computer literacy courses. These courses are listed in Table 15. Although the Internet is available at this telecentre, it is not employed by the members of the public but used by staff (cf. Chapter 8).

(e) ICT training and other services offered: Costs and funding

People visited this telecentre to attend computer classes and learn computer skill. Specific computer training courses are listed in Table 15.

(f) Affiliations and strategic alliances

Additional centre stakeholders are the International ICDL institution which made the ICDL course available to the centre and the University of Witwatersrand (Wits) which offered the Information Literacy (Info-Lit) course at the centre and accredited the course.

6.3.1.4. Hoxani telecentre

(a) Location and context

Bushbuckridge is a small town situated on the north-eastern border of South Africa. It is surrounded by many rural villages, of which Shangaan-speaking Hoxani is one. According to Polzer (2004:6), the population of Bushbuckridge consists of Shangaan and Sotho-speaking people. Some of the Shangaan people of Bushbuckridge hail from Mozambique. The Hoxani village MPCC is located in Limpopo Province, but just outside Mpumalanga Province border. It is located about five to eight kilometres from the Kruger National Park. Hoxani village is also near the town of Hazyview, another few kilometres from Bushbuckridge. Limpopo Province is situated below the Zimbabwe border.

(b) History of Hoxani telecentre and the role of public-private partnerships

The telecentre was developed because, according to the former Minister of Public Works in South Africa, Jeff Radebe, the South African Department of Public Works, through its Community Based Public Works Programme (CBPWP), championed the Reconstruction and Development Programme (RDP) of Limpopo Province by implementing poverty-alleviation projects and building ICT networks in that province (Radebe 1999:5). An interview (by this researcher) with telecentre manager, Elsie Ndlovu, in 2005, revealed that this centre was established by the Department of Education in Limpopo Province for teacher development and that computers (hardware and software) and audio-visual technology used by the telecentre were sponsored by the entertainment conglomerate and first pay TV operator, Multichoice.

(c) Accommodation

The telecentre is located in two computer laboratories which are located at the Hoxani Teacher Training College and is mostly used by trainee and qualified teachers who work at nearby Limpopo and Mpumalanga schools (Ndlovu 2005).

(d) Functions of the telecentre

The telecentre was intended to empower teachers by imparting Outcomes-Based Education (OBE) skills. These teachers also increased their knowledge of the subjects that they teach in Limpopo schools. Hoxani telecentre, therefore, contributed (and still performed this function by the end of 2007), to the formal education of school educators in Limpopo Province, because Further Education and Training (FET) is part of the formal education system, which in South Africa is categorised according to three levels: General Education and Training (GET), FET and Higher Education (HE) (South African Department of Education 2005:1). The GET band comprises of the Reception Year of Grade R (last year of pre-school) and students to Grade 9, as well as Adult Basic Education and Training (ABET) qualifications. The FET band comprises education and training from NQF levels 2 to 4 (equivalent to Grades 10 to 12 in schools), and the N1 to N6 in colleges. The HE band consists of degrees, diplomas and certificates to postdoctoral degrees.

The Hoxani MPCC manager, Elsie Ndlovu was a former teacher, advisor and capacity builder, who, at the time of the interview was employed by the DoE to provide the teachers (cf. Figure 6) with OBE skills (Ndlovu 2005 *Interview with author*).

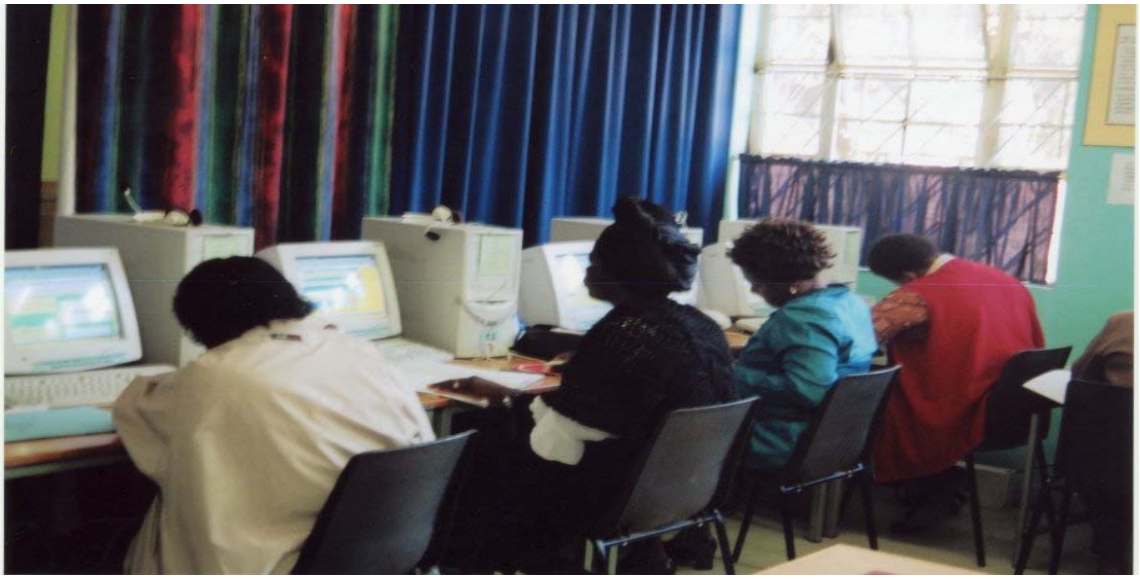

Figure 6: Telecentre users (in this case teachers) learning IT and OBE skills at Hoxani telecentre

Source of photograph in Figure 6: Lesame (2005b)

(e) ICT training and other services offered: Costs and funding

The ICT training offered is listed in Table 15, while costs incurred by the users are in mentioned in Chapter 8. Teachers were taught desktop publishing skills at the telecentre and assisted Ndlovu and her staff in producing a newsletter which the telecentre distributed to schools that support the centre (cf. Figure 7).

Vol. 1, No. 1 Hoxani SHOMA News January 2005

Hoxani Shoma News

An Empowerment Newsletter

Introducing Shoma Centres – An OBE Resource for Educators.

Editor-in-chief: Elsie Ndlovu

Editors' Desk

What is SHOMA?

SHOMA is a Sotho word meaning, "work". The SHOMA project is a Multi-Choice Africa venture, in conjunction with the Department of Education. The mission of this project is for Multi-Choice Africa to help the department increase the implementation of OBE in schools.

Hoxani SHOMA Centre

At Hoxani Shoma Centre, we are dedicated to equipping teachers with practical OBE knowledge that they can use in their classrooms. We function, along with numerous other Shoma Centres around the country, to use technology (e.g. computers and videos) to achieve the purpose of empowering educators to function in OBE.

Why OBE?

We are all familiar by now with the term OBE (Outcomes-Based Education). Not all of us, however, really understand the practical application and impact of OBE in the classroom. The Shoma programmes re-introduce OBE in an interactive way that helps educators to actually use OBE in the classroom.

Shoma candidates in the Video Centre, Watching a video clip introducing the day's topic and receiving guidance by Ms. Elsie Ndlovu

1

Figure 7: A newsletter produced by teachers at Hoxani telecentre

Source: Ndlovu (2005 *Interview with author*). *Hoxani Shoma News: An Empowerment Newsletter*, January (2005:1).

(f) Affiliations and strategic alliances

The telecentre is supported mainly by the DoE and entertainment company *Multichoice* (which provided technology). The DoE provided financial support, and human resources,

and paid the salaries of telecentre staff. Other government departments which support this telecentre are referred to above in sub-sections (b) and (c).

Table 15: IT and related services available at the telecentres

ICT/Services	Siyabonga	Tombo	MACIS	Hoxani
Computers (PCs)	10	21	8	24
Internet	Yes	Yes (staff) No (general public)	Yes	No
Telephones	6 MTN lines	3 Mobile Telephone Network or MTN (mobile phone operator) public phone lines and Telkom (incumbent fixed-line operator) office line	Telkom office line	None
Television	No	No	Yes	Yes
VCR	No	No	Yes	Yes
Facsimile	Yes	Yes	Yes	Yes
Photocopier	Yes	Yes	Yes	Yes
Scanner	Yes	Yes	Yes	No
Satellite dish - Sentech	Yes	Yes	No	No
Printer	Yes	Yes	Yes	Yes
Post Office or private mail				

post boxes	No	Yes	No	No
Computer courses				
Info-Lit	Yes	No	Yes	No
ICDL	No	Yes	Yes	No
Basic Computing	Yes	Yes	Yes	Yes
Software Applications	Yes	No	No	No
Modern Applications	Yes	No	No	No
Secretarial and Office Administration	Yes	No	No	No
Business Administration	Yes	No	No	No
E-Citizen	No	Yes	No	No
Cisco-Computer Networking	No	Yes	No	No
OBE and General Education and Training (GET) courses	No	No	No	Yes
Government information (GI)services Public Information Terminal (PIT)	No	Yes	No	Yes (GI), No (PIT).

6.4 RESEARCH DESIGN

This section motivates why triangulation was employed as a research design and how it was

executed. Triangulation was employed and was used to obtain different views on the topic under study and also to enhance the reliability of the study. Neuman (2000:124), defines triangulation as the use of both qualitative and quantitative research methods to "better look at something from several angles than to look at it in only one way" or that it is "cross examination". Qualitative means that the raw data exist in a non-numerical form (e.g., reports and conversations) (Du Plooy 2002:33); quantitative means that the raw data exist in a numerical form (e.g., observers' or judges' ratings) (Rosnow and Rosenthal 1996:74). Neuman (2006:8) states that qualitative design entails the collection of data in the form of words, pictures and objects. Qualitative data are presented in Chapter 8 and quantitative data are presented in Chapter 7.

Following Baker (1999:256) triangulation was utilised employed to increase the validity of the study's results. In other words, triangulation assisted this researcher to gather evidence from multiple sources to address and answer the research question from different points of view. Triangulation is the strategy of casting out broadly for diverse evidence to more effectively focus on the study at hand. Triangulation is based on the notion that more confidence is gained in a study's result if different methods lead to the same or similar conclusions. Triangulation has a variety of definitions all which have the same underlying meaning, "you must know two points to get to a third" and came from sailors as well as "nautical, construction and surveying professions" that measured distances (Neuman 2000:124). Each research method has its strengths and weaknesses, so by employing triangulation value is added to the research because the strengths of one research method may support the weaknesses of another research method (Babbie 2001:113).

Another advantage of triangulation for this study is that it allowed the researcher to collect data from multiple sources.

> "When triangulation made its way into qualitative research it carried it sold meaning – verification of the facts – but picked up another. It came to mean that many sources of information were better in a study than a single sources because multiple sources lead to a fuller understanding of the phenomena you were studying. Others expanded its use to include using multiple subjects, multiple researchers,

> different theoretical approaches in addition to different data-collecting techniques" (Bodgan and Knopp Biklen 2003:107).

Furthermore, the use of multiple methods allowed the researcher to understand the topic from more than one viewpoint because different sources provided a deeper understanding and knowledge of telecentres and how communities employ them from a user perspective.

> "The examination of problems using diverse paradigms and research methods establishes a firm foundation of knowledge" (Petter and Gallivan 2004:1).

Two types of triangulation were employed in this study, namely methods triangulation and data sources triangulation (Neuman 2000:124-125). With regards to the triangulation of methods, the survey questionnaire was used as a quantitative method and personal interviews to collect qualitative data. With regard to the triangulation of sources, information is obtained from telecentre users and managers, as well as centre administrative assistants (who are the same persons as ICT trainers and assistant telecentre managers). "The use of mixed methods is not aimed at validation (of results) but at deepening and widening understanding of issues studied. Furthermore, triangulation can cut across the qualitative and quantitative divide (Olsen 2004:4).

Therefore, the research design of combining personal interviews and the survey questionnaire contributed to the achievement of a multi-dimensional view of the impact of telecentres in user development and also verification of data from the sources, for increased confidence in research findings. Although the questionnaire contained some open-ended questions (yielding qualitative data), it was mainly employed in this study as a quantitative method.

6.4.1 Personal interviews

(a) Nature of personal interviews

The personal interviews conducted were semi-structured and flexible because although

the researcher asked the respondents prepared questions from a schedule (cf. Addendum A), other follow-up questions were not prepared. Follow-up questions, aimed at clarifying vague answers and seeking more information, were also asked.

> Design in qualitative interviews is iterative. That means that each time you repeat the basic process of gathering information, analysing it, winnowing it and testing it, you come to a closer, clear and convincing model of the phenomenon you are studying. The continuous nature of qualitative interviewing means that the questioning is redesigned throughout the project (Babbie 1998:290).

The quotation above explains the repetitive nature in which the interview questions were constructed, re-examined when necessary or rearranged. The quotation also explains how this researcher structured the interview questions in such a way that they included questions which required specific and detailed information about the telecentres (e.g., on telecentre development and impact of telecentres on education), which can facilitate comparison of respondent reactions. In this case, the researcher had to ask more telecentre-specific and precise questions to the respondents and these questions were fixed and scheduled.

The semi-structured part of the interviews explains that other questions were not prepared, but arose from respondent responses. According to Bless and Higston-Smith (1995:105), where non-scheduled questions have to be asked, the interviewer is free to formulate questions as judged appropriate for the given situation. In this way, respondents are not confronted with already stated definitions or possible answers, but are free to choose their own definitions to describe a situation or to express their particular views and answers to problems.

Questions pertaining to daily telecentre operations were posed to managers, while those concerning the influence of the telecentres on users and communities were posed to managers and users. Probing questions can lead to new questions based on answers obtained from earlier questions. Questions differed by telecentre because of location. The majority of interviews were conducted when this researcher visited the telecentres. Two follow-up telephone interviews were conducted with the then

manager of Tombo telecentre (Smauza) because the researcher could not travel to Tombo due to financial difficulties.

(b) Sampling procedure and respondent details

A non-probability sampling technique, convenience or availability sampling, was employed to select the respondents as the subjects were available when the researcher visited. Convenience sampling involves the selection of respondents that are available (Nachmias and Nachmias 1987:185). Available samples can be helpful in collecting exploratory information and may produce useful data (Wimmer and Dominick 1997:63). It is not the intention of this researcher to generalise the findings of the study to all South African telecentres, but only to draw conclusions about the selected telecentres. However, the study's results should indicate what respondents view the ICT influence to be on telecentre users residing in similar areas. The main criterion used to select individuals as part of the purposive sample was their presence at the telecentre at the time of the researcher's visit.

Respondents were telecentre managers, ICT trainers and other users.

(c) Conducting the personal interviews

Interviews were conducted before and after the process of questionnaire administration.

The following interviewing procedures were adhered to (Babbie 1995:265-67; Nachmias and Nachmias 1987:242):

(a) the researcher's dress sense was neat, clean, and informal to put the respondents at ease and increase rapport between herself and the respondents;
(b) the researcher identified herself to the respondents and informed the respondents that she works at UNISA in Tshwane and that she was conducting research to gain a doctoral degree;

(c) the respondents were informed about the purpose of the research and asked to participate in the study anonymously. Most interviewees did not provide their names but some of the older persons did;
(d) the respondents were informed that they were chosen because of their use of the telecentre;
(e) the researcher explained to the respondents why this study was conducted;
(f) a relationship of confidence and understanding was created between the researcher and respondents with a friendly and reassuring resolve. The researcher explained to the respondents that research on their communities provided information about them;
(g) during the interviews the questions were read to the respondents and probing questions were asked when it was necessary in between the prepared questions; and
(h) responses were written down. When it was not possible to write down or transcribe all the responses the researcher depended on memory. However, the researcher tried to write down most of what the interviewees said at the time. Quotations from the interviewees and photographs taken during the interviews were also employed as they represent a qualitative raw data source that capture aspects of an interview.

The interviews lasted between 40 minutes and an hour. Most interviews occurred in the telecentres' computer training rooms. Interviews not conducted in computer training rooms were those with the Siyabonga telecentre manager, which took place at the restaurant next to the telecentre, that of the Hoxani MPCC telecentre manageress, which took place in the television room next to the computer room and the interviews of the Tombo manager and assistant manager which took place outside (in the municipal grounds) and inside the telecentre office respectively. The interviews were conducted during the week and no official interviews were conducted during weekends, although some questionnaires were administered on some Saturday mornings at MACIS telecentre.

(d) Why personal interviews were used for data collection

The researcher employed interviews as they uncover information about the value and contribution of telecentres in communities development. Personal interviews are "superior for gaining extensive information, verified by extended discussion and probing in problem areas" (Guy, Edgley, Arafat and Allen 1987: 245).

(e) Interview schedule

The list of questions asked to the respondents (telecentre managers and other centre administrators or ICT trainers) at each telecentre is included as Addendum A. Other users were asked similar questions except that the questions addressed to them only focused on telecentre usage and not on development. Follow-up questions were not included in Addendum A because they differed per interview (depending on the answer received). Also, questions asked telecentre managers, as included in Addendum A, were slightly different from each other because the areas asked about were also different in outlook and development status. The managers' answers were also different because the telecentres did not develop in the same way.

However, the questions were not very different in their main content and meaning as they focused on how the telecentre developed a community, although some questions were phrased differently. This depended on who was being asked the questions (some managers spoke on their own when describing the history of the telecentre and its role in community development and with this kind of outspoken or extrovert manager, most questions were answered before the researcher even asked them. In these instances, the researcher had to quickly construct new questions that would explore other telecentre aspects, which she saw at a telecentre at that time, which could have some form of impact on individual and community development). For example, Siyabonga telecentre manageress, Ms Patricia Makoro, and her assistant, Mr Reginald Msimango, described the telecentre history, telecentre development and community building issues and other important telecentres factors in two to three questions. That is, they provided long and detailed answers to one question which influenced the following question content and structure) as they spoke about the telecentre without stopping, which answered many of the researcher's prepared questions, so this

researcher had to formulate new questions resulting from their answers and the telecentre environment. Data gathered by means of personal interviews mostly provided answers to questions pertaining to the role of ICT in personal and community development, the history of the telecentres (this information was gathered from the telecentre managers only), strategic partnerships (PPPs) supporting the telecentres and specific details about what the ICT trainers taught at the telecentres.

(f) Respondent information

A total of 47 personal interviews were conducted between April 2004 and November 2005 (respondent details and interview dates are listed in Table 10). The managers' names are also identified with the names of telecentre users who mentioned their names. Telecentre users were asked questions similar to those asked to telecentre managers, although the users were not questioned about how the telecentre operated and what services the centre offered.

Information about the personal interviews and the dates on which the interviews were conducted are listed in Table 16:

Table 16: Interview and Respondent Details

Interview	Telecentre	Date	Respondent (gender)	Respondent occupation
1	Tombo MPCC	20 April 2004	Mr Njenge, Ms Smauza and two users (female and male)	Telecentre Manager, Telecentre Administrator and the users were students
2	Siyabonga	02 February 2005	Mrs Makoro and Mr Msimango	Telecentre Manager and Assistant Telecentre Manager and Computer Trainer
3	Siyabonga	16 March 2005	Mr Msimango and Mr Mathe and two	Computer Trainer and Assistant

			users (male and female)	Telecentre Manager Assistant Computer Trainer, users were students
4	Siyabonga	20 May 2005	Mr Msimango and two users (female and male)	Telecentre Assistant Manager and students
5	Hoxani MPCC	05 March 2005	User (male)	Clerk
6	Hoxani MPCC	31 May 2005	Users (two females and one male). Ms Ndlovu and Mrs Grobler	Students, Telecentre Manageress and Assistant Telecentre Manager
7	Hoxani MPCC	05 March 2005	User (male)	Teacher
8	Hoxani MPCC	05 March 2005	User (male)	Worker at college
9	Hoxani MPCC	05 March 2005	User (female)	Teacher
10	Hoxani MPCC	31 May 2005	User (female).	Teacher
11	Hoxani MPCC	31 May 2005	User (female)	Teacher
12	Hoxani MPCC	31 May 2005	User (female)	Teacher
13	MACIS	27 June 2005	Mr Maako and two users (female)	Telecentre Manager, students
14	MACIS	28 July 2005	Mr Maako and one user (male)	Telecentre Manager and municipal security guard and photographer
15	MACIS	11 August 2005	Mr Maako and a user (female).	Telecentre Manager and student who is also a gospel musician or artist and a preacher

16	MACIS	28 August 2005	Two users (female)	Students
17	Tombo MPCC	15 November 2005	Ms Smauza	Telecentre Administrator
18	Tombo MPCC	22 November 2005	User (male)	School Principal/Teacher
19	Tombo MPCC	22 November 2005	User (male)	Teacher
20	Tombo MPCC	22 November 2005	User (female)	High school student
21	Tombo MPCC	22 November 2005	User (female)	High school student
22	Tombo MPCC	30 November 2005	Ms Rholo	Assistant Telecentre Administrator
23	Tombo MPCC	22 November 2005	User (female)	Municipal secretary
24	Siyabonga	16 March 2005	User (female)	Journalist and web developer
25	Siyabonga	17 March 2005	User (female)	High school student
26	Siyabonga	04 April 2005	User (female)	Student (post-matric/diploma)
27	Siyabonga	06 April 2005	User (female)	Self-employed (Sewing business)
28	Siyabonga	28 June 2006	User (female)	Student
29	Siyabonga	20 July 2005	User (male)	Self-employed businessman
30	Siyabonga	20 July 2005	User (male)	Self-employed businessman
Total			**47 interviews**	

(h) Analysis of data from interviews

Qualitative or non-numerical data analysis is non-statistical in nature and involves interpretation of field notes (Bailey 1994:518). In this study, data from the personal interviews were analysed using open and axial coding (Neuman 2006:461- 464). The methods encompass the following analytic processes:

(a) Open coding – during this process the researcher read the field notes from the personal interviews (written while conducting an interview), for the purpose of looking for critical data, central people, themes, key events and key ideas that were important to answer the research question. This process entailed reading through all the field notes carefully with the purpose of getting a sense of the themes entailed in the field notes. From interview information, this researcher identified and coded the main themes as guidelines to analyse the data; and
(b) Axial coding – during this phase the focus was on coded themes rather than on the data. The main purpose was to assess whether there would be any new themes to review and examine the initial codes and order the themes into a coherent structure.

The major themes also constituted most of the headings used in Chapter 8 which presents the qualitative data.

6.4.2 The survey questionnaire

A questionnaire survey was used to collect information about the role of telecentres in the education of users. Reasons which apply to why the survey questionnaire was employed are:

(a) the questionnaire allowed the gathering of data from a fairly large population (Wimmer and Dominick 1997:137). In this study 200 respondents participated;
(b) the survey was cost-effective; and
(c) a self-administered survey is widely recognised as a useful and appropriate method to investigate behaviour, attitudes and opinions. In this study the purpose was to investigate user behaviour and usage patterns, attitudes and opinions about services offered by the telecentres as well as user's opinions of telecentre impact on their education;

(d) the questionnaire enabled this researcher to ask also open-ended questions about the topic under study which provide different, valuable answers to questions, and, according to Bless and Higston-Smith (1995:122), open-ended questions relieve the anxiety of respondents of giving "false" answers since they express themselves freely and are able to answer the questions in their own words; and

(e) the questionnaire was instrumental in collecting respondent demographic information and also telecentre user perceptions and feelings about the telecentre impact on user education. The questionnaire aimed at addressing all the sub-questions of the research question (cf. sub-section 6.2.2).

Therefore, it was decided that the questionnaire was amongst the best methods to gather data towards achieving the research aim.

(b) Questionnaire design

A cover letter was used to inform the respondents about the purpose of the study and to request them to participate. The letter also identified the researcher, affiliation and assured the respondents that anonymity was guaranteed.

Both closed-ended and open-ended questions were asked. Closed-ended questions were used to obtain information about the respondents' demographic variables, the name of the telecentre, the distance traveled by the respondents to reach the centres, transport costs to reach the telecentre, the respondents' frequency of respondents' visits to the telecentre and also the amount of time the respondents spent at the telecentre per visit. The closed-ended questions were informative in answering questions about the impact on the telecentres on user education. Open-ended questions were used to obtain information about the ICT services used by the respondents and the impact of the ICT on user education. The open-ended questions were also posed to fulfill the aims of the study. Open-ended questions also specified what education users received at telecentres, named the service providers used, answered questions pertaining to the issues of universal access to services and also user views of the telecentres as contributing to their personal and community development. In the last section of the questionnaire respondents were asked about issues of community development and their communication with the global community using the Internet.

Open-ended questions were used because:

(a) they do not lead the research participant by suggesting specific answers;
(b) their approach is exploratory, allowing the researcher to find out whether the respondent has anything to say; and
(c) they invite the research participant to answer in her or his own language or words (Rosnow and Rosenthal 1996:95).

Therefore, these questions allowed the respondents freedom in answering questions and an opportunity to provide in-depth answers. The responses to the open questions are included in Chapters 7 and 8. The closed-ended questions were used to ensure that respondents replied accurately to the dimensions of interest rather than producing large proportions or irrelevant or uncodable answers (Rosnow and Rosenthal 1996:95). The closed-ended questions were specifically asked in such a way as to answer the research questions and achieve the aim of the study (cf. Section 6.2).

The following procedures were adhered in designing the questionnaire (Ary, Jacobs and Razavieh 2002: 398-400; Babbie 1995:146; Baker 1994:177-178; Bailey 1994: 132-135; Neumann 2006:292):

(a) The questions were asked in logical order, e.g., questions about the demographic variables of the respondents (closed-ended questions) were asked at the beginning and questions about the role of the centres in users' education and community development were asked last.
(b) The questionnaire was designed not to bore or tire respondents easily. However, some respondents indicated that the questionnaire was "too long". The questionnaire was 19 pages long, and the length was reduced during the process of questionnaire construction. Respondents, who complained about the length of the questionnaire, suggested that they did not answer the last questions satisfactorily due to tiredness. However, although the length of the questionnaire was tiresome to some respondents, the longer questionnaire did add value to the study because more questions provided more information. Social scientists state that a questionnaire must be short and precise (Ary, Jacobs and Razavieh 2002:400; Neumann 2006:292). The long questionnaire was, therefore, one limitation of the research methodology.

(c) While compiling Question 7, the researcher had included most (not all) of the telecentres she had visited prior to embarking on the field research, before deciding on which ones she would finally conduct research on. The purpose of these visits, in 2004 and 2005, was to know where each telecentre was located, how much it would cost to travel to each telecentre and also know each village and township, including the socio-cultural development aspects of each area (e.g., issues of language and openness of local people and willingness of telecentre managers to assist one in the research). So, the telecentres included in the questionnaire were visited by the researcher and included with the hindsight that the research would be conducted on each one. However, during the sampling processes, it was evident that the researcher should sample only four centres. She (the researcher) decided to select the four finally selected, and by that time it was late to change the questionnaire to include only the sampled four because it had been the initial intention to conduct research on all the centres listed in the questionnaire.

The other issues which also affected the final sampling and selection of the final four centres researched were costs of traveling to each centre and the willingness of the telecentre managers to assist the researcher with requesting the respondents to answer the questionnaires, and also the preparedness of the telecentre managers to generally assist the researcher to conduct the field research. Therefore, for convenience's sake, the researcher therefore chose centres with managers that were more open-minded and positively inclined towards the process of research itself. In some of the initially visited telecentres some managers were not interested in assisting the researcher and some could not be found on the mobile phone numbers they had provided the researcher for future contact, so she ultimately did not select those simply because one would not obtain any data from uncooperative people.

The other factor which induced the researcher to select the final four selected was the fact that many users entered each of these telecentres every day and this researcher then thought that she would approach more respondents at the centres to ask the research questions. Only one to five people came to the centres not selected and in some of the centres no one came while the researcher visited. This sometimes influenced the manager to close the centre and go back home to perform some household or other duties. So the functionality or operationability of a centre also

influenced which telecentres of those listed in Addendum A were selected. Also the availability of a research assistant and a language translator (where required, e. g., Hoxani MPCC) in each telecentre were practical considerations to ensure that the research processes would run smoothly;

(d) In Question 7 of the questionnaire, Hoxani telecentre is written as Bushbuckridge telecentre – because the research assistant, the late Mr Benedict Mnisi had informed this researcher that it is called by that name. The researcher did not know the Bushbuckridge area at all before conducting this study and was introduced to it by the late Mr Mnisi whom she met at UNISA as one of the Department of Communication Science Honours students. However, during the process of questionnaire administration, the telecentre manager, Ms Elsie Ndlovu, informed Mr Mnisi and this researcher that the telecentre was better known as the Hoxani MPCC, named after the village where it is located. The telecentre (and thus Hoxani village) is located about a five minutes drive from the town of Bushbuckridge. So there was no mistake in naming the telecentre Bushbuckridge in Addendum A and naming it Hoxani MPCC in Chapters 7 onwards is because the researcher wrote explanations and names that were told to her at different times of the study by the research assistant and the telecentre manageress. After all, Bushbuckridge is a town for the village of Hoxani so these two places are more or less the same place or area. Additionally, the late Mr Mnisi was not aware that the telecentre was widely known as Hoxani MPCC, he had known the name of Bushbuckridge telecentre. He also may not have known this latter detail as he lived in Tembisa township on a daily basis, in Gauteng Province, far away from Bushbuckridge and attending university (UNISA). In sum, this researcher finally settled on the name provided by the telecentre manageress, Ms Ndlovu, as she thought that the manageress know the area and the telecentre better than anyone else, hence the adoption of the name Hoxani in the latter chapters of this thesis while writing the sections on data analysis and conclusions.

(c) Pilot study

Purposes of a pilot study include testing for clear understanding of questions, overcoming question ambiguity and bias (Kink 1995:41; Rubin and Rubin 1995:57). A pilot study was conducted to establish whether the questions would be well-understood by the respondents,

and was conducted from June to early-July 2004, at the Tembisa MPCC. Tembisa forms part of the Greater Municipality of Ekurhuleni (Nhleko 2004). This municipality pays Nhleko's basic salary because he is a librarian and the telecentre is located inside the municipal library. The researcher was assisted by the late Mr Mnisi in administering the pilot study. Twenty respondents answered the questionnaire, 16 of which were males and four females. Minor changes were implemented in the questionnaire after the pilot study was completed. These changes involved the rephrasing of some words to make the questions simpler and one question was deleted as it proved to be a repetition of an earlier question.

(d) Target and accessible population and units of analysis

The target population included all telecentre users. The accessible population was users at the selected telecentres. Units of analysis were individual users.

(e) Sampling procedure employed

The final realised sample for the questionnaire was 200 respondents, selected from the accessible population of telecentre users. A non-probability sampling technique, convenience or availability sampling, was employed to select the respondents from the accessible population because these respondents were readily available at the telecentres when the researcher visited the centres. Available samples are instrumental for collecting exploratory information and may produce useful data but the samples are problematic because they contain unknown quantities of error (Wimmer and Dominick 1997:63). In this study, this sampling technique was employed because there were not many users who visited the centres in a day, and this left the researcher no option but to ask those users available at a centre, at that particular day and time, to answer the questionnaires.

The available sample, however, did not ensure the external validity of the study. Convenience samples by their very nature do not guarantee external validity (Wimmer and Dominick 1997:63). However, it was not the intention to generalise the findings of the study to all South African telecentres. Nevertheless, research results could indicate what respondents view the ICT influence to be on telecentre users residing in areas similar (in socio-economic characteristics) to those focused on in this research.

The respondents included telecentre managers, ICT trainers and trainees, and other telecentre users. This researcher regarded the telecentre managers and ICT trainers, as well as the individuals using the telecentres, as knowledgeable about telecentre activities.

(f) Administration of questionnaires

The survey was conducted with the assistance of a research assistant, five telecentre managers and three assistant telecentre managers. The survey took place between April 2004 and November 2005. A total of 200 questionnaires were administered in the four telecentres. Forty-nine respondents completed the questionnaire at Hoxani MPCC, 52 respondents answered the questionnaire at Siyabonga telecentre, 49 persons answered the questionnaire at Tombo MPCC and 50 persons answered the questionnaire at the MACIS centre.

The questionnaire was self-administered (or group administered in cases where the researcher was assisted by a research assistant), so that the researcher could clarify to the respondents those questions that the respondents considered unclear or vague. The instructions for answering the questions in the questionnaire were clear and precise, and there were no questions from the respondents about this part of the questionnaire, except for questions at Hoxani telecentre which were addressed by the research assistant, the late Mr Mnisi.

The researcher gave the questionnaires to the respondents who were present at the telecentres at a particular time. Respondents were requested to answer all the questions and when each respondent gave the questionnaire back to the researcher, the latter checked if all the questionnaires had been fully completed. In cases where some respondents had not answered the questionnaire fully, the researcher asked the respondents to reconsider and answer the unanswered questions in which case some respondents obliged while others stated that they had no further answers to provide. In the latter cases, the questionnaires had a poor response rate which the researcher could not avoid. The administered questionnaire is attached as Addendum B at the end of the thesis.

(i) Siyabonga

Here the ICT trainer, Reginald Msimango assisted with the administration of the

questionnaires. The questionnaires were given to the users after each computer class ended at 12 noon. The researcher did not travel to Siyabonga telecentre every day but only on selected days between April 2004 and November 2005. Sometimes the researcher could not find new users on a daily basis and had to wait for new students to register at the telecentre after a three-month course was over in order to have new respondents. The visits were arranged with Msimango by telephone.

Although the questionnaire was administered in English, in this telecentre there was a need to explain some questions and issues in the questionnaire in local languages because of the questions some respondents asked and because some of the users here did not have a good command of English (unlike the Tombo and Hoxani telecentre users). As in the pilot study, some respondents did not answer the questions fully. Some respondents informed the researcher that they had nothing more to add (in which case the researcher had to let them leave the computer room).

Most of the respondents answered the questionnaires in 30 minutes to an hour. Some asked questions in Zulu and Sotho where they did not understand English. Some respondents had to rush off "somewhere" after classes. In such cases the researcher gave them the questionnaires to answer at home and bring them back the following day. Even though some of these respondents had to answer the questionnaires "overnight", some of those questionnaires remained mostly unanswered.

Each computer class contained five to eight computer trainees at a time. Accordingly, the researcher had to return to the telecentre several times to find new users to administer the 50 questionnaires required per telecentre. Except for some respondents who did not answer the questions fully, most respondents were cooperative and responded to the best of their knowledge. Msimango was remunerated for assisting and Makoro did not want the remuneration and regarded her assistance as part of community building.

(ii) MACIS

Questionnaire administration ran smoothly at MACIS, except for a two-week break when the centre manager's mother passed away. Maako, the telecentre manager and ICT trainer assisted the researcher by initially asking the respondents to answer the questionnaires fully.

Most respondents cooperated. The questionnaires were answered after the computer classes, during the week and on Saturdays. It took from April 2004 to November 2005 to finish administering the questionnaires because, like at Siyabonga, the researcher had to wait for new computer trainees to register.

Some respondents were unwilling to answer the questionnaire because they claimed they were "late" for other engagements and had to be persuaded to stay for a few minutes. Some respondents left when they did not answer all questions in a satisfactory manner. In such cases there was little that the researcher could do to ensure that each and every question was answered by each respondent.

However, most respondents displayed some enthusiasm in answering the questionnaire. Some respondents experienced difficulties with English and provided answers that were not comprehensible. This problem was also experienced at Siyabonga telecentre. Other respondents had only just begun their computer classes and did not have much to say because they had not yet learned much from the telecentre at the time of filling out the questionnaire. This problem was experienced only at Siyabonga and MACIS. Maako was remunerated for assisting.

(iii) Tombo telecentre

At this telecentre questionnaires were given to students who visited the centre often (Smauza 2005). Respondents completed the questionnaire, and asked about universities in Johannesburg and Tshwane or Pretoria Most respondents were making telephone calls, other respondents were computer users who arrived for computer literacy classes. The telecentre administrator, Smauza, and her assistant Nomvelo Rholo, assisted with the process of questionnaire administration and asked respondents to cooperate.

According to Smauza (2005), most computer trainees worked during the day, with classes were held in the evenings. Other questionnaires were left with Smauza to administer and post to the researcher in Tshwane when completed. A few questionnaires were posted to Smauza after she had requested them. Smauza was remunerated for assisting. Rholo was not remunerated because she did not perform much work and she felt she did not have to be remunerated.

(iv) Hoxani MPCC

Questionnaires at Hoxani MPCC were administered between February and May 2005. Permission to undertake the research was granted by the telecentre manager Elsie Ndlovu. Ndlovu, her assistant Rose Grobler and research assistant Benedict Mnisi assisted this researcher in questionnaire administration. There were many teachers at the telecentres during this period as teachers attended OBE training (the OBE classes were large). It was common for at least 20 teachers to attend a class or computer laboratory.

No problems occurred during the process of questionnaire administration at Hoxani MPCC, which may be attributed to the fact that the respondents at this MPCC were high school educators and, therefore literate individuals who also understood English well. The questionnaires were administered in two computer laboratories, each with about 10 to 12 computers. Ndlovu and this researcher administered questionnaires in a computer laboratory and Grobler and Mnisi administered the other questionnaires in another computer laboratory. When respondents posed questions Mnisi responded in the local language as the researcher did not know the language. Mostly concerns were raised about Questions 21 and 25. The questions were rephrased in Addendum A and made clearer to the reader.

After administering the questionnaires, personal interviews were conducted. The personal interviews were not conducted haphazardly, but the scientific procedures stated in Section 6.4 above were again followed while planning and executing the interviews at this telecentre. Like Makoro, Ndlovu preferred not to be remunerated for her assistance. Mnisi was remunerated for assisting.

6.5 DATA CAPTURING, CODING AND ANALYSIS

The data were electronically formatted using the Statistical Package for the Social Sciences (SPSS) for Windows version 14.0, in computing descriptive or non-parametric statistics, i.e., frequencies and inferential statistics (e.g., analysis of variance) (Lesaoana 2006; Netswera 2006; Coetzee 2007). Descriptive statistics provided information about the sample's demographic variables in the form of frequency tables. Chi-square statistics were then calculated to identify relationships between variables (Ary, Jacobs and Razavieh 2002:413; Coetzee 2007). The Chi-square test is one of the most widely used tests for statistical

significance in the social sciences when variables under study are nominal or ordinal in measurement (Baker 1999:411). The Chi-square test is therefore a non-parametric test which does not require an interval or ratio level of measurement and is used with nominal or ordinal level data that are not distributed normally (Rubin and Babbie 2005:624-625).

The Chi-square test is a test of independence but does not measure the strength of the relationship between the variables. Instead, it measures whether there is a significant relationship at all, whether the variation differs from chance. Chance is a rival hypothesis and that rival hypothesis is the null hypothesis (Rubin and Babbie 2005:603). The null hypothesis postulates that the relationship being statistically tested is explained by chance – that is – it does not really exist in a population or in a theoretical sense – even though it may seem to be related in the particular findings.

Descriptive statistics, e.g., the mean, standard deviation, analysis of variance (ANOVA) and post hoc tests were employed to describe the sample data and compare telecentre results (Coetzee 2007). Occasionally, researchers compute statistical tests with a combination of categorical (nominal) and interval variables – ANOVA is such a technique (Bailey 1994:407). The mean is an average compound by summing the values of several observations and dividing by the number of observations (Rubin and Babbie 2005:751). If you have a grade point average of 4.0 based on 10 courses and you get F in this course, then your new grade point is 3.6. The standard deviation was employed to provide and indication of variability between the telecentres. The standard deviation (SD) means the standard error of a sampling distribution (Rubin and Babbie 2005:757). The SD is a descriptive statistic that portrays the dispersion of values around the mean (ibid.). In simple terms, the SD represents the value of the difference between respondents in relation to how they answered a particular question. A smaller SD value indicates that there was little difference between respondents about how they answered a question. A bigger SD value indicates that there were more differences in respondent answers concerning a question.

Moving back to the data analysis techniques employed, after the completion of the statistical tests, non-precoded responses were post coded into numeric values for possible statistical analysis (Babbie 1995: 369). This analysis was conducted using Microsoft Excel and the percentages were manually calculated.

6.6 ETHICAL ISSUES

Ethical research issues considered in this study included ensuring respondent privacy or voluntary participation before they answered the questionnaire, respondent anonymity and confidentiality of interviewee details. Bless and Higston-Smith (1995: 102-103) state that privacy or voluntary participation, anonymity and confidentiality are important research ethical considerations. Permission to conduct the research in all the telecentres was requested by the researcher by telephone (and in the case of Hoxani MPCC was requested by the research assistant, the late Benedict Mnisi in 2005) and granted by the managers. Discussions involving the dates and times of interview meetings were also arranged with the telecentre managers by telephone. To gain trust, questionnaire respondents were assured anonymity regarding their identity in the covering letter. The respondents were informed that they could withdraw from the research if they so desired and that they were free not to participate in the research if they did not want to.

6.7 RELIABILITY AND VALIDITY

Reliability means, quality or truthfulness, credibility or believability of the findings and conclusions or research findings (Bornman, Van der Walt and Hanekom 2006:24). Perfect reliability or validity therefore remains an ideal but that does not mean that researchers should refrain from constantly striving toward the highest possible levels of reliability. In this study, the following steps were taken in order to ensure the reliability of the research results:

(a) The reliability of the questionnaire survey was enhanced by the pilot testing of the questionnaire and proper attention given to question formulation;
(b) The reliability and validity of the findings were enhanced by employing triangulation;
(c) The reliability was lowered by the fact that not all the respondents completed all the questions (in the questionnaire); and
(d) Both the reliability and the external validity of the findings were decreased by the fact that non-random samples were employed.

Constructs used to measure ICT impact (the questionnaire and interviews) measured what they were supposed to measure, and in that way construct validity was ensured. Face and

content validity were enhanced by making use of research experts (supervisor/s and other Communication Science research professor/s) to evaluate the questionnaire. The results cannot be generalised to other telecentres as a result of the non-probability sampling techniques employed to select the telecentres and respondents. In social sciences research, an available sample is chosen with the knowledge that it is not representative of the general population (Wimmer and Dominick 1997:63), so the availability nature of the sample is a methodological limitation of this study. Studying limited contexts and sample sizes does not guarantee generalisations (Botes 1995: 5; Mouton 2001: 56). The study has low external validity. Even though the validity of the answers could not be guaranteed, the interviewees' answers were informative, meaningful and instrumental toward answering the research question.

6.8 CRITICAL EVALUATION OF THE RESEARCH METHODOLOGY

This study has a few limitations. The primary factor has been time. The qualitative data collection yielded some data but there was insufficient time for interviewing more respondents. The data from the questionnaires was analysed with the assistance of experienced statisticians (Lesaoana 2006; Netswera 2006; Coetzee 2007; Netswera 2007).

A strength of this study is the use of triangulation which allowed the researcher to collect different views and opinions about the role of telecentres in development from the interviewees and the respondents to the questionnaire, which is one of the advantages of employing open questions in research as mentioned in an earlier sub-section while motivating the use of a survey questionnaire.

Another limitation of this study is that a random sampling design was not employed for the questionnaire survey. Consequently, the external validity of this study might be low and the results cannot be generalised to all South African telecentres. Therefore, the second limiting factor in this study is generalisability.

The fact that some respondents did not answer some open questions in the questionnaire can be regarded as having had a negative outcome on the number of responses received in answering those questions (e.g., Questions 20, 21, 23 and 25, cf. Addendum B). The few responses to these questions could be attributed to the long questionnaire as these questions

were toward the end of the questionnaire and it is possible that the respondents felt response saturated. According to Bless and Higston-Smith (1995:116) an interview or self-administered questionnaire should never be of such a length that respondents are saturated to the point of refusing to collaborate and that if this happens, the respondents will use any means to end the exercise thus making the quality of their answers very dubious. Although some respondents answered the stated open questions, most respondents left the questions unanswered and this resulted in loss of valuable data. Lack of knowledge about telecentres could also be attributed to the unanswered questions but whatever the respondents' reasons were, data was lost and this affected the study's results negatively.

6.9 SUMMARY AND OUTLINE OF CHAPTERS 7 AND 8

This chapter encapsulated and critically analysed the research procedures and methods employed in this study. The chapter also distinguished between quantitative and qualitative research approaches employed in the study and stated the specific research steps undertaken to collect and analyse data.

The nature of data gathered by each methodology employed in this field research assisted the researcher to gain insight into how the telecentres sampled for the research improve the formal and non-formal education of telecentre users.

Chapter 7 presents quantitative data and Chapter 8 provides qualitative data.

CHAPTER 7
QUANTITATIVE DATA ANALYSIS

7.1 INTRODUCTION

This chapter presents data gained from the questionnaire survey. User demographic characteristics are stated in the following section while the third part of the chapter provides information about user access to the telecentres, forms of transport employed and cost of travelling to the telecentres. The next section provides information about communication technology and services offered by the technology at the centres. The fifth section, preceding the conclusion of the chapter, details technological impact on user education from the user's perspective.

7.2 USER DEMOGRAPHIC CHARACTERISTICS

This section provides and analyses the demographic details of the users, including gender, age, marital status, highest educational qualifications, occupation and monthly income.

7.2.1 Gender

At three telecentres, Hoxani, Mamelodi or MACIS and Tombo MPCCs, there were more male respondents than female (see Table 17). At Siyabonga telecentre, there was the same number of female and male respondents (26 females and 26 males, i.e., 52 respondents). The fact that there were more males in the three telecentres could be attributed to the fact that there were not many women at the telecentres during the morning sessions. However, there were a few pockets of women in afternoon sessions of questionnaire administration, however this researcher did not administer many afternoon sessions as in most instances she had to travel back to Pretoria (from the areas where the telecentres are located).

Another reason for fewer female respondents could be that fewer women are still using telecentres to acquire ICT skills training. If this assumption is true, there is a

need to encourage women, through ICT educational and information campaigns, and media, to make more use of telecentres to reduce high levels of illiteracy and gain basic computer literacy skills.

Table 17 shows the gender distribution for the four telecentres.

Table 17: Respondent profile by gender

Gender	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Female	18	36	23	46	26	50	20	41.67	87	43.5
Male	32	64	27	54	26	50	28	58.33	113	56.5
Total	**50**	**100**	**50**	**100**	**52**	**100**	**48**	**100**	**200**	**100.0**

Altogether, 113 males (56.5 per cent of the sample) and 87 females (43.5 per cent of the sampled population), answered the questionnaire. This finding could indicate that there should be ICT training programmes aimed at imparting technology skills specifically to women as Table 18 illustrates that women participated less in the telecentres.

Table 18: Chi-square Test: Telecentre User Profile by Gender

Chi-Square Test			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	2.231(a)	3	.526
Valid Cases	200		
a. 0 cells (.0%) have an expected count of less than 5. The minimum expected cell count is 20.88			

As the sample Asymp. Sig. (2-sided) p-value of .526 is not less than .05, there were no significant differences in gender profiles between the four telecentres. Thus when the findings are shown to be statistically significant, the null hypothesis is rejected because the probability that it is true – that the results were caused by chance – is less than the level of significance. Since the observed significance (.526) is more than 0, 05, the null hypothesis that there are no significant differences between the gender groups of the four telecentres cannot be rejected at 95 per cent confidence interval.

7.2.2 Age

The largest single proportion of teenagers (aged 16 to 19 years) were at the urban Siyabonga telecentre (23.1 per cent of the Siyabonga respondents). There were even more persons of younger age groups at Siyabonga telecentre, with 18 users in the age group of 20 to 24 years and 14 users in the age group of 25 to 29 years old. There were less perons of older age groups at Siyabonga centre, three users in the 30 to 35 age group (5.8 per cent) and five per cent in the 36 to 55 age group. At urban MACIS centre there were more persons of younger age groups than persons of older age groups; six users were teenagers (age group 16 to 19), 16 persons were aged between 20 and 24 years, 13 users were aged between 25 and 29 years, eight users were aged between 30 and 35 years and six users were in the 36 to 55 age category. At rural Hoxani MPCC there were more persons of the older age groups than those of younger age groups; there was one teenager (2.1 per cent of the Hoxani group), six users (12.8 per cent) were in 20 to 24 age group, three users (6.4 per cent) were in the 25 to 29

age category, nine persons were in the 30-35 age group and 28 users were between 36 and 55 years old. At the rural Tombo MPCC most users were between ages 20 and 29, with 16 users (33.3 per cent) aged between 20 and 24 years, and 15 persons (31.3 per cent between the ages of 25 and 29). There were only four teenagers (aged between 16 and 19 years, 8.3 per cent of the Tombo group) at this centre and 13 "old" users, eight (16.7 per cent) in the 30-35 age group and five (10.4 per cent) categorised within the age group 36 to 55. Therefore the age trend is that there were more persons of older age groups (30 years and above) at the rural Hoxani MPCC, more persons of younger age groups (aged between 20 and 29) at rural Tombo MPCC and urban MACIS and Siyabonga centres – with even more perons of younger age groups at Siyabonga centre because there were more teenagers (23.1 per centre aged between 16 and 19 years) in that centre more than the other centres. The respondents' profile by age at the four centres is summarised in Table 19.

Table 19: Telecentre User Profile by Age

Age (years)	**Hoxani (Rural)**		**MACIS (Urban)**		**Siyabonga (Urban)**		**Tombo (Rural)**		**Total**	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
16-19	1	2.1	6	12.2	12	23.1	4	8.3	23	11.7
20-24	6	12.8	16	32.7	18	34.6	16	33.3	56	28.6
25-29	3	6.4	13	26.5	14	26.9	15	31.3	45	23.0
30-35	9	19.1	8	16.3	3	5.8	8	16.7	28	14.3
36-55	28	59.6	6	12.1	5	9.6	5	10.4	44	22.4
Total	**47**	**100.0**	**49**	**100.0**	**52**	**100.0**	**48**	**100.0**	**196**	**100.0**

The mean age for the Hoxani telecentre was 37.6 years, for MACIS centre 26.7 years, for Siyabonga telecentre 25.4 years and for Tombo MPCC 27.5 years. The oldest respondent was a 52-year old user from Tombo MPCC.

Table 20: Chi-Square Test: Telecentre User Profile by Age

Chi-Square Test			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	64.804(a)	12	.000
Valid Cases	196		
a. 0 cells (.0%) have an expected count of less than 5. The minimum expected cell count is 5.52			

As the Asymp. Sig. (2-sided) sample value is .000 for the Pearson chi-square, the centres differed statistically significantly with regard to age. There were 23 teenagers, representing 11.7 per cent of the total sample. The differences between the telecentres are that there was one teenager (age group 16 to 19 years) at Hoxani MPCC (comprising 2.1 per cent of the Hoxani group); six (12.2 per cent of the group) at MACIS centre, 12 teenagers (23.1 per cent of the Siyabonga respondents) at Siyabonga MPCC and only four teenagers (8.3 per cent) at Tombo MPCC.

There were more respondents in the highest age category (between 30 and 55 years) at the rural Hoxani MPCC, with nine respondents at that centre (19.1 per cent of the Hoxani centre users) aged between 30 and 35 years, and 28 persons (59.6 per cent) aged between 36 and 55 years. On the contrary, at the three other telecentres, there were more respondents in the lower age category (i.e., 30 years and younger; although these persons are old since over 18 years, and therefore adult.

In the 36 to 55 age group, there was a total of 44 respondents, representing 22.4 per cent of the total sample. Furthermore, there were fewer (than at Hoxani MPCC) respondents aged between 36 and 55 years at MACIS centre (six persons or 12.1 per cent of the MACIS respondents), Siyabonga centre (five persons or 9.6 per cent of the

Siyabonga respondents) and Tombo MPCC (five persons or 10.4 per cent of the Tombo respondents). Additionally, respondents aged between 20 and 24 years were few at Hoxani MPCC (six persons or 12.8 per cent of the total sample) but were more at the other three telecentres: MACIS (16 respondents or 32.7 per cent), Siyabonga has 18 respondents in this age group or 34.6 per cent of the respondents at that centre and there were 16 respondents at Tombo MPCC in that age group, which comprises 33.3 per cent of the Tombo centre respondents.

Many respondents were in the 20 to 24 age category – 56 persons or 28.6 per cent of the total sample. The next age group with the highest respondents was the 25-29 category; with 45 persons, comprising 23.0 per cent of the total sample. Respondents between 25 and 29 years of age were fewer at Hoxani MPCC (three persons comprising 6.4 per cent of the Hoxani group) and more at the three other telecentres: 13 respondents at MACIS centre (26.5 per cent of the MACIS respondents), 14 persons at Siyabonga MPCC (26.9 per cent of respondents at that centre) and 15 individuals at Tombo MPCC (31.3 per cent of the Tombo centre respondents).

In the 30 to 35 years group, there were fewer respondents at Siyabonga MPCC (three persons comprising 5.8 per cent of the respondents at that centre) than at the other three telecentres: there were nine respondents (19.1 per cent of the Hoxani centre respondents) in that age group at Hoxani MPCC, eight respondents (16.3 per cent of the centre respondents) at MACIS centre, and another eight persons at Tombo MPCC (16.7 per cent of the centre respondents).

Tables 19 and 20, reveal that the main age differences between the respondents of these telecentres is that there were more respondents in the 30 to 55 years old age category at Hoxani MPCC and that there were more respondents in the younger age categories (16 to 19 years) at the other three telecentres – MACIS, Tombo and Siyabonga.

To summarise, the following conclusions can be drawn from the significant Chi-square test:

(a) There were less users in the lower age category (16 to 19 years of age) than from the other age categories;

(b) There were less users in the younger age category (16 to 19 years of age) at lthe rural telecentres of Hoxani and Tombo than at the urban telecentres of MACIS and Siyabonga; and

(c) There were more persons in the highest age category (36 to 55 years) at rural Hoxani MPCC than at the other telecentres.

7.2.3 Marital status

Table 21: Telecentre User Profile by Marital Status

Status	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Single or living alone	25	50.0	40	80.0	47	90.4	33	68.8	145	72.5
Married or living with partner	25	50.0	10	20.0	5	9.6	15	31.3	55	27.5
Total %	**50**	**100.0**	**50**	**100.0**	**52**	**100.0**	**48**	**100.0**	**200**	**100.0**

Table 21 shows that most respondents were single (72.5 per cent of the total sample of 200). Most single respondents were from the MACIS, Siyabonga and Tombo telecentres. This finding supports the result that most respondents were young as most young persons are unmarried. With regard to the Hoxani MPCC, 50 per cent of the respondents were single and 50 per cent married (including those living with a partner even though not legally married, i.e., cohabiting). At the MACIS centre, 80 per cent of the respondents were non-married or living alone and 20 per cent married (including those cohabiting). At Siyabonga MPCC 90.4 per cent of the respondents

were non-married or living alone while 9.6 per cent were married or living with a partner.

At the Tombo MPCC 68.8 per cent of the respondents were living alone or single and 31.3 per cent married or living with a partner. Therefore, most single respondents were at the urban Siyabonga and MACIS telecentres, and at the rural Tombo MPCC. At the rural Hoxani MPCC there were an equal number of single and married respondents (each 50 per cent of the group sampled in that telecentre). The finding that more single respondents were at MACIS, Siyabonga and Tombo MPCCs could be attributed to an earlier finding that most users at these centres were in the lower age categories and usually young people are single. Alternatively, equal (50 per cent of respondents) numbers of single and married users at Hoxani MPCC is also understandable because the findings on age established that most users at this centre were "older". Therefore it is normal for older persons to be either single or married (or co-habiting).

Table 22: Chi-Square Test: Telecentre User Profile by Marital Status

Chi-Square Test			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	22.788(a)	3	.000
Likelihood Ratio	23.367	3	.000
Linear-by-Linear Association	4.053	1	.044
Valid Cases	200		
a. 0 cells (.0%) have an expected count of less than 5. The minimum expected cell count is 13.20.			

As the Asymp. Sig. (2-sided) is .000, there is a statistically significant difference between the telecentres regarding the marital status of respondents. This significant difference has already been explained (cf. Table 21 explanation above). Therefore the findings in Table 22 reinforce those of Table 21 in the sense that there were:

(a) more single people than married and co-habitating persons in the sample; and

(b) few single people and more married and co-habitating persons at Hoxani.

7.2.4 Educational qualifications

Table 23: Telecentre User Profile by Highest Educational Qualification

	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Grade 11	1	2.0	3	6.0	13	25.0	1	2.1	18	9.0
Grade 12	8	16.3	21	42.0	19	36.5	8	16.7	56	28.1
Certificate or Diploma Course	18	36.7	21	42.0	16	30.8	27	56.3	86	43.2
Degree	22	44.9	5	10.0	4	7.7	12	25.0	43	21.5
Total	**49**	**100.0**	**50**	**100.0**	**52**	**100.0**	**48**	**100.0**	**200**	**100.0**

From Table 23, the majority of users with low educational qualifications were from the urban Siyabonga telecentre (25 per cent completed Grade 11 and 36.5 per cent studied Grade 12 which is the end of high school). The most educated users were at the rural Hoxani telecentre where most of users were high school teachers with better educational qualifications (44.9 per cent obtained a certificate or diploma course and 36.7 per cent had a university degree). There were fewer respondents with low educational qualifications at Hoxani MPCC – one person (two per cent of the Hoxani respondents) passed Grade 11 and eight persons (16.3 per cent of the total sample) obtained Grade 12. There were better educated users at Tombo MPCC with 25 per cent having a university degree. However, the largest single proportion of users (86 persons or 43.2 per cent of the total sample), from the four centres, had completed certificate courses or diplomas (21 persons or 42 per cent of the respondents at MACIS, 16 persons or 30.8 per cent of the sample at Siyabonga MPCC and 27 respondents or 56.3 per cent of the respondents at Tombo MPCC), and 19.6 per cent had university degrees. Furthermore, at the rural Tombo MPCC fewer respondents

had lower educational qualifications as 2.1 per cent passed Grade 11 and 16.7 per cent obtained Grade 12. Most respondents at this centre had higher educational qualifications (81.3 per cent, 56.3 per cent of that group having obtained a certificate or diploma course and 25.0 per cent having a university degree).

A similar, lower user educational level exists in the MACIS telecentre as at Siyabonga telecentre three respondents (6.0 per cent of the MACIS respondents) passed Grade 11 at MACIS centre, 21 respondents (42.0 per cent of the MACIS centre respondents) obtained Grade 12, another 21 users (42.0 per cent of the group) obtained diplomas and only five respondents (10 per cent of the group) had obtained a university degree. Most users at Hoxani and Tombo MPCCs have higher educational qualifications represented by 44,9 per cent and 25, 0 per cent respectively had degrees. A conclusion that can be drawn from these findings is that most respondents from the rural telecentres had higher educational qualification when compared to most respondents from the urban centres.

Table 24: Chi-Square Test: Telecentre User Profile by Educational Status

Chi-Square Tests			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	47.737(a)	9	.000
Valid Cases	199		
a. Four cells (25.0%) have an expected count of less than 5. The minimum expected cell count is 4.34			

As the sample Asymp. Sig. (2-sided) is .000, there is a statistically significant difference between the telecentres regarding the educational status of the respondents. These differences were explained under Table 23. The main difference between the centres is that highly educated users were at the rural telecentres, Tombo and Hoxani, and less educated users were at the urban centres, MACIS and Siyabonga. The findings on educational qualifications can be summarised as:

(a) More respondents had degrees at Hoxani telecentre than at any of the other telecentres;

(b) More respondents had degrees at Tombo telecentre than at MACIS and Siyabonga; and

(c) More respondents had lower educational qualifications (Grade 11 and 12) at Siyabonga than at any of the other telecentres.

7.2.5 Employment Status and Occupation

Table 25: Telecentre User Profile by Employment Status and Occupation

		Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
Employment Status and Occupation		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
	Student	3	6.0	22	44.0	21	40.4	17	35.4	63	31.5
	Unemployed	5	10.0	15	30.0	15	28.8	3	6.3	38	19.0
	Teacher	32	64.0	2	3.8	2	3.8	13	27.1	47	23.5
	Clerical staff[1]	7	14.0	4	8.0	3	5.8	3	6.3	17	8.5
	Sales and Marketing	0	0.0	2	4.0	6	11.5	6	12.5	14	7.0
	Other[2]	3	6.0	7	14.0	5	9.6	6	12.5	21	10.5
Total		**50**	**100.0**	**50**	**100.0**	**52**	**100.0**	**48**	**100.0**	**200**	**100.0**

According to the Chi-square (p<0,001) test reported in Table 24 there are significant differences between the telecentres regarding user occupations and employment status. These differences include the following:

[1] This group included hospital and municipal staff, e.g., secretaries and clerks, a telecentre administrator, a garage financial manager or cash register manager, etc.

[2] Other persons in this group include self-employed persons or business owners, cleaners, a photographer, nurse, security guard, pastor who was also a musician recording music CDs at the MACIS telecentre.

(a) The greatest single proportion of users at rural Tombo MPCC (35.4 per cent), urban MACIS centre (44.0 per cent) and urban Siyabonga centre (40.4 per cent) were students (31.5 per cent of the sample). There were, however, very few students at Hoxani MPCC – only three users who comprised six per cent of the centre respondents;

(b) more unemployed users were from the urban telecentres, MACIS (30 per cent) and Siyabonga (28.8 per cent). There were fewer unemployed users at the rural Hoxani MPCC (10 per cent) and the rural Tombo MPCC (6.3 per cent);

(c) the majority of the rural telecentre users were teachers, Hoxani MPCC (64 per cent) and Tombo MPCC (27.1 per cent). There were only two teachers at the urban teachers each (3.8 per cent both at MACIS and Siyabonga MPCCs);

(d) there were no respondents working in sales or marketing jobs at the rural Hoxani MPCC, two users (4.0 per cent) at urban MACIS centre working in marketing jobs, and six users both at Siyabonga (11.5 per cent) and Tombo MPCC (12.5 per cent of the Tombo respondents) at urban Siyabonga and rural Tombo MPCCs working in marketing-related occupations. It could be argued, in this case, that Tombo MPCC has a similar characteristic as an urban telecentre because marketing and sales occupations are prevalent in urban areas;

(e) administrative or clerical staff were fewer in all four centres, 14 per cent at Hoxani, eight per cent at MACIS, 5.8 per cent at Siyabonga and 6.3 per cent at Tombo MPCC; and

(f) regarding the "other" occupational category – many users occupied low-paying jobs such as cleaners (e.g., at a municipality, school or hospital); many individuals in this occupational category were from MACIS (14.0 per cent) and Tombo MPCC (12.5 per cent.

Table 26: Chi-Square Test: Telecentre User Profile by Occupation

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	93.926(a)	15	.000
Valid Cases	200		
a. Eight cells (33.3%) have an expected count of less than 5. The minimum expected cell count is 3.36			

As the sample Asymp. Sig. (2-sided) is .000, the telecentres have statistically significant differences regarding the occupation of respondents. These telecentre users occupational differences are discussed in the above points (a) to (f).

The differences between the telecentres with regard to occupation can be summarised as indicating:

(a) less student respondents and more teachers and clerical staff at Hoxani MPCC than at the other telecentres;

(b) more unemployed respondents at the two urban telecentres (MACIS and Siyabonga) than at the rural telecentres (Hoxani and Tombo); and

(c) more respondents in sales and marketing at urban Siyabonga and rural Tombo.

7.2.6 Monthly income

Table 27: Telecentre User Profile by Monthly Income

Monthly Income	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Don't want to divulge	4	8.0	32	64.0	30	57.7	9	18.8	75	37.5
R0-R399	4	8.0	6	12.0	8	15.4	12	25.0	30	15.0
R400-R999	1	2.0	4	8.0	6	11.5	1	2.1	12	6.0
R1000-R3999	8	16.0	6	12.0	4	7.7	13	27.1	31	15.5
R4000 and over	33	66.0	2	4.0	4	7.7	13	27.1	52	26.0
Total	**50**	**100.0**	**50**	**100.0**	**52**	**100.0**	**48**	**100.0**	**200**	**100.0**

Seventy-five individuals (37.5 per cent of the sample) did not want to divulge their monthly income. Many of these users were from the urban telecentres, 64 per cent from MACIS and 57.7 per cent of the group from Siyabonga. Eight per cent of those who did not want to divulge their monthly income were at Hoxani MPCC and 18.8 per cent of them were at Tombo MPCC.

The percentages in the lower income groups (R0-R399, R400-R999) were also low at Hoxani, MACIS and Siyabonga MPCCs (eight, 12 and 15.4 per cent respectively), but slightly higher at Tombo MPCC (25 per cent) – in the R0-R399 income bracket. Percentages for the R400-R999 income bracket were lowest at Hoxani MPCC (two per cent), Tombo MPCC (12.1 per cent of Tombo centre respondents) and MACIS (eight per cent), but a little higher at Siyabonga MPCC (11.5 per cent). The percentages increased slightly in the R1000-R3999 income bracket and at the rural Tombo MPCC, there were 13 persons (27.1 per cent) earned salaries in that income bracket (i.e., 27.1 per cent), 16 per cent of Hoxani MPCC users, 12 per cent of

MACIS users and 7.7 per cent of Siyabonga MPCC users earned amounts in this income category. There were also 13 persons (27.1 per cent) at the Tombo centre earning R4000 and over. Also at the Hoxani MPCC, 66.0 per cent of respondents (i.e., 33 individuals) earned R4000 and over, while at MACIS there were only two persons (four per cent) earning income in this category. Those users with low monthly salaries had low educational qualifications and jobs that did not provide high remuneration. Higher earners were at the rural telecentres which is understandable because these were the people with the higher education, as earlier revealed in this section.

The Chi-square test of the user monthly salary showed that statistically significant differences existed between monthly salaries from the four telecentres (p<0, 001). The chi-square test depicting user profile by monthly income is stated in Table 28.

Table 28: Chi-Square test: Telecentre User Profile by Monthly Income

Chi-Square Test			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	95.217(a)	12	.000
Likelihood Ratio	97.672	12	.000
Linear-by-Linear Association	3.652	1	.056
Valid Cases	200		
a. Four cells (20.0%) have an expected count of less than 5. The minimum expected cell count is 2.88			

As the sample Asymp. Sig. (2-sided) is .000 Pearson Chi-square, which is less than 0.05, i.e., the level of significance - there are statistically significant differences between the telecentres regarding the monthly income of respondents. Respondents at the rural Hoxani MPCC earned higher monthly income than those at the rural Tombo MPCC and the urban MACIS and Siyabonga MPCCs. Furthermore, respondents from the latter urban centres earned low income in comparison to other centres.

The differences between respondents monthly income at the telecentres can be summarised as:

(a) There were more respondents in the sample who did not divulge their income, 37.5 per cent of the sample; reasons for the respondents not stating their income are unknown;
(b) Less users were in the income category of R400 – R999 (6.0 per cent);
(c) There were more users in the R0 – R399 income category in rural Tombo MPCC; and
(d) More of the telecentre users in Hoxani telecentre fell in the high income category (followed by the other rural telecentre of Tombo) than was the case for the other telecentres, and in this income category there were very few respondents from the urban telecentres, Siyabonga and MACIS.

7. 3 USER TELECENTRE ACCESS, TRANSPORT AND COST

This section discusses issues of universal access to telecentres, transport employed by users to travel to the telecentres and cost of getting to the telecentres.

Table 29 provides information about the distances travelled by the users from their homes to the building where the telecentres are located.

7.3.1 Distance from user's residence

Table 29: Distance to telecentre (kilometres)

Distance to telecentre	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Less than 1 km	8	16.0	12	25.0	14	26.9	19	39.6	53	26.8
1 to 4 km	6	12.0	24	50.0	29	55.8	17	35.4	76	38.4
5 to 10 km	10	20.0	5	10.4	6	11.5	8	16.7	29	14.6
10 km or more	26	52.0	7	14.6	3	5.8	4	8.3	40	20.2
Total	**50**	**100.0**	**50**	**100.0**	**52**	**100.0**	**48**	**100.0**	**198**	**100.0**

Table 29 indicates that there were less Hoxani telecentre users who travelled short distances (e.g., 16.0 per cent travelled less than a kilometre, and 12.0 per cent travelled one to four kilometres), and more who travelled more kilometres. Altogether 20 per cent travelled five to 10 kilometres and 52 per cent travelled 10 kilometres and more to reach the centres. This is in stark contrast to the situation in the other telecentres (MACIS, Siyabonga and Tombo) where more users travelled shorter distances to reach the telecentres. For example, 25.0 per cent of MACIS respondents travelled less than a kilometre to reach the centre, 26.9 percent of Siyabonga centre respondents travelled the same distance and 39.6 per cent of Tombo MPCC respondents travelled that distance to reach the centre. More Tombo residents travelled the shortest distance (less than a kilometre) to reach the centre compared to the urban telecentres (25 per cent of MACIS centre users and 26.9 per cent of Siyabonga centre users).

Again, in contrast to the 12.0 per cent of the Hoxani MPCC respondents travelling one to four kilometres to reach the centre, 50.0 per cent of the MACIS centre and 55.8 per cent of Siyabonga MPCC respondents, as well as 35.4 per cent of Tombo MPCC

respondents travelled the same distance. In this regard, the Tombo MPCC again is more similar to the two urban centres that it is to the other rural Hoxani MPCC, hence it is regarded as being *semi-urban* because travelling shorter distances to access telecommunication services is prevalent in urban areas. Tombo MPCC respondents travelled shorter distances (e.g., 8.3 per cent travelled 10 kilometres and more) than Hoxani MPCC respondents who travelled longer distances (e.g., 52 per cent travelled 10 kilometres and more) to reach the telecentre. Distances travelled by respondents to reach the urban telecentres are similar. Most MACIS centre respondents (50 per cent) and Siyabonga centre respondents (55.8 per cent) travelled one to four kilometres to reach the centre, whereas few MACIS centre respondents (14.6 per cent) and 5.8 per cent of Siyabonga centre respondents travelled 10 kilometres and more to reach the centre.

There were similarities between the telecentres regarding that respondents travelling five to 10 kilometres were almost equal, 20 per cent of Hoxani centre respondents, 10.4 per cent of MACIS centre respondents, 11.5 per cent of Siyabonga centre respondents and 16.7 of Tombo MPCC respondents. The rural centre respondents were more in that distance category than the urban centre respondents.

Table 30: Chi-Square test: Distance from home to telecentre

Chi-Square Test			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	56.653(a)	9	.000
Likelihood Ratio	54.851	9	.000
Linear-by-Linear Association	23.106	1	.000
Valid Cases	198		

Table 30 shows that there are significant differences between the telecentres in terms of average distance travelled by users (Asymp. Sig. 2-sided - is .000, which is less than 0.05, the level of significance). The differences have been explained above – in the explanation of Table 30 and are therefore can be summarised as:

(a) The majority of respondents travelled between one and four kilometres to get to the telecentre;

(b) More persons at Tombo travelled less than one kilometre than was the case for the other telecentres; and

(c) More persons at Hoxani travelled ten kilometres or more to get to the telecentre than was the case for the other telecentres.

7.3.2 Mode of transport used to get to telecentre

Table 31: Transport mode

Mode	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Walk	7	14.0	27	54.0	28	53.5	30	62.5	92	46.0
Car	20	40.0	1	2.0	5	9.6	11	22.9	37	18.5
Public transport[3]	23	46.0	22	44.0	19	36.5	7	14.6	71	35.5
Total	**50**	**100.0**	**50**	**100.0**	**52**	**100.0**	**48**	**100.0**	**200**	**100.0**

The greatest single proportion of rural Hoxani centre respondents (46 per cent) travelled by public transport whereas the majority of respondents at the other centres walked to the centres (54 per cent at urban MACIS, 53.4 per cent at urban Siyabonga and 62.5 per cent at rural Tombo). Altogether 44 per cent of the respondents at MACIS centre, Siyabonga centre (36.5 per cent) and Tombo MPCC (14.6 per cent), made use of public transport to reach the centre. Fourteen per cent of the Hoxani MPCC respondents walked to get to the centre. Also, more Hoxani MPCC respondents (40 per cent) travelled by car to reach the centre but few respondents at

[3] Bus, taxi or train

the other centres employed cars to reach the centres (two per cent at urban MACIS, 9.6 per cent at urban Siyabonga and 22.9 per cent at semi-urban or semi-rural Tombo centre).

Table 32: Chi-Square test: Mode of Transport Used to Reach Telecentre

Chi-Square Test			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	46.441(a)	6	.000
Likelihood Ratio	53.781	6	.000
Linear-by-Linear Association	16.366	1	.000
Valid Cases	200		
a. 0 cells (.0%) have an expected count of less than 5. The minimum expected cell count is 8.88			

As the sample Asymp. Sig. (2-sided) is .000, less than the 0.05 the level of significance, the telecentres significantly differed regarding the mode of transport used by the respondents to reach telecentres. At the MACIS, Siyabonga and Tombo MPCCs, most users (54.0, 53.8 and 62.5 per cent respectively) walked to the centres as previously discussed. At the Hoxani MPCC 40.0 per cent of the respondents used cars and 46 per cent employed public transport to travel to the telecentres. In the other telecentres – the MACIS (one person or 2.0 per cent) and Siyabonga, five persons or 9.6 per cent used private cars to reach the centres.

A conclusion that can be drawn regarding the distances travelled to reach the centres is that the majority of the urban, MACIS and Siyabonga, and semi-urban or semi-rural telecentre Tombo, walked to get to the centres while most rural Hoxani centre users employed public transport and private cars to travel to the telecentres. Distances travelled by the Tombo MPCC users are similar to those travelled by the urban centre users than users of the rural Hoxani centre – another quality that differentiates Tombo from Hoxani MPCC and this quality also characterises the Tombo centre as semi-rural rather than purely rural.

7.3.3 Cost of getting to the telecentre today

Table 33: Transport Costs

Cost	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Less than R2,00	3	6.1	25	49.0	25	49.0	31	64.6	84	42.6
R2,00 to R5,00	3	6.1	10	20.4	9	17.6	5	10.4	27	13.7
R5,01 to R10,00	7	14.3	11	22.4	11	21.6	4	8.3	33	16.8
Over R10	36	73.5	3	6.1	6	11.8	8	16.7	53	26.9
Total %	**49**	**100.0**	**49**	**100.0**	**51**	**100.0**	**48**	**100.0**	**197**	**100.0**

It was relatively inexpensive (R2, 00 and less) to visit a telecentre for most users at MACIS centre (51.0 per cent), Siyabonga centre (49.0 per cent) and Tombo MPCC (64.0 per cent), but for most users at the Hoxani MPCC (73.5 per cent), it was relatively expensive to reach the telecentre. Less Hoxani MPCC respondents paid less to travel to the centre, 6.1 per cent of them paid less than R2, 00 and also between R2, 00 and R5, 00. There were not big differences between the telecentres regarding the number of respondents who paid between R5, 01 and R10, 00 to reach the centres; 14.3 per cent of the Hoxani MPCC respondents, 22.4 per cent of MACIS centre respondents, 21.6 per cent of Siyabonga centre respondents and 8.3 per cent of Tombo respondents.

There were few respondents who paid more than R10, 00 to travel to the telecentres, at MACIS, Siyabonga and Tombo MPCCs, which is in stark contrast to the Hoxani centre group (73.5 per cent) which paid that amount. In sum, it was relatively expensive (paid more than R10, 00 per telecentre visit) for the rural Hoxani MPCC respondents to travel to that centre but relatively cheaper for the respondents in the urban (MACIS and Siyabonga) and semi-rural (Tombo) centres to travel to the

centres. The “rural” Tombo MPCC is again similar to the urban centres in this regard and differs significantly from the other rural centre, Hoxani – hence, in the final analysis, it is categorised as semi-urban.

Table 34: Chi-Square test: Cost of Getting to the Telecentre Today

Chi-Square Test			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	84.095(a)	9	.000
Likelihood Ratio	85.023	9	.000
Linear-by-Linear Association	30.649	1	.000
Valid Cases	197		
a. 0 cells (.0%) have an expected count of less than 5. The minimum expected cell count is 6.58			

As the sample Asymp. Sig. (2-sided) is .000 is less than the .05 level of significance, the telecentres differ regarding the cost of travelling to the telecentres on the day each respondent answered the questionnaire. These differences in the previous discussion and therefore not repeated in this explanation.

7.3.4 Visit frequency and duration

Table 35: Visit frequency

Frequency of respondents' visits to telecentre	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Almost every day	3	6.1	25	49.0	25	49.0	31	64.6	84	42.6
Once or more per week	3	6.1	10	20.4	9	17.6	5	10.4	27	13.7
Occasionally	7	14.3	11	22.4	11	21.6	4	8.3	33	16.8
Once or more in two weeks	36	73.5	3	6.1	6	11.8	8	16.7	53	26.9
Total %	**49**	**100.0**	**49**	**100.0**	**51**	**100.0**	**48**	**100.0**	**197**	**100.0**

Table 35 indicates that most users (84 persons or 42.6 per cent of the total sample), visited the telecentre almost daily. Of the 84, more (3 persons or 6.1 per cent) were from the rural Hoxani MPCC, 25 persons (49.0 per cent), were from the urban Siyabonga telecentre, 31 persons (64.6 per cent) were from the rural Tombo MPCC and 25 persons (49.0 per cent) were from the urban MACIS centre. Twenty-seven users (13.7 per cent of the total sample) visited the telecentres once or more per week. In this latter group, 10 persons (20.4 per cent) were at MACIS centre, five persons (10.4 per cent) were at Tombo MPCC, nine persons (17.6 per cent) were at Siyabonga and three persons (16.8 per cent) were from Hoxani MPCC.

Twenty users (10 per cent of the total sample) visited the telecentre occasionally. In this latter group, 11 persons or 21.6 per cent were at Siyabonga MPCC, four persons or 8.3 per cent, were at Tombo MPCC, 11 persons or 22.4 per cent, were at MACIS

centre and seven persons or 14.3 per cent answered the questionnaire at Hoxani MPCC.

Fifty-three respondents (26.9 per cent of the total sample) visited the telecentre once or more in two weeks. In this latter group, eight persons (16.7 per cent) were at Tombo MPCC, 36 persons (73.5 per cent) were at Hoxani, six persons (11.8 per cent) were at Siyabonga MPCC and three respondents (6.1 per cent) were at MACIS telecentre.

Table 36: Chi-Square Test: Visit Frequency

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	41.454[a]	9	.000
Likelihood Ratio	42.349	9	.000
Linear-by-Linear Association	.429	1	.513
N of Valid Cases	200		

a. Five cells (31.3%) have expected count less than 5. The minimum expected count is 4.56.

Table 36 indicates that, as the Asymp. Sig. (2-sided) is .000, there are statistically significant differences between the telecentres regarding the frequency of visiting the telecentres and the most conspicuous differences are:

(a) Less respondents visited the telecentre on a daily basis at Hoxani than at the other telecentres; and
(b) More respondents of Hoxani visited the telecentres once or more in two weeks than at the other telecentres.

Table 37: Visit Duration

Duration of time spent at telecentre	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Less than one hour	0	0	4	8.0	14	26.9	19	40.4	37	18.6
One to two hours	17	34.0	23	46.0	12	23.1	17	36.2	69	34.7
Three to four hours	30	60.0	17	34.0	21	40.4	7	14.9	75	37.7
Five hours and more	3	6.0	6	12.0	5	9.6	4	8.5	18	9.0
Total %	**49**	**100.0**	**49**	**100.0**	**51**	**100.0**	**48**	**100.0**	**199**	**100.0**

The greatest single proportion users (75 persons or 37.7 per cent of the total sample), spent three to four hours at the telecentre per visit. Of these 75 persons, most were at Hoxani MPCC (30 persons of 60.0 per cent), 21 people (40.4 per cent) were at Siyabonga MPCC, 17 persons (34.0 per cent) were at MACIS and seven users or 14.9 per cent were at Tombo MPCC. Sixty-nine users (34.7 per cent of the sample) spent one to two hours at the telecentres and of these 23 (46.0 per cent) were at MACIS, 17 users (34.0 per cent) were at Hoxani MPCC and Tombo MPCC (36.2 per cent) each and 12 users (23.1 per cent) were at Siyabonga MPCC.

Thirty-seven users (18.6 per cent of the total sample) spent less than one hour at three telecentres per visit (there was no one in this category at Hoxani MPCC). Many of the 37 users, 19 people or 40.0 per cent were at Tombo MPCC while 14 users (26.9 per cent) were at Siyabonga centre and fours users (8.0 per cent) were at MACIS centre. There were fewer users (18 or 9.0 per cent of the total sample) who spent five hours and more at a telecentre per visit. In this last group, six persons (12.0 per cent) were at

MACIS centre, five people (9.6 per cent) were at Siyabonga centre, four others (8.5 per cent) were at Tombo MPCC and three (6.0 per cent) were at Hoxani MPCC.

Table 38: Chi-Square Test: Visit duration

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	44.601[a]	9	.000
Likelihood Ratio	52.489	9	.000
Linear-by-Linear Association	19.827	1	.000
N of Valid Cases	199		

a. Four cells (25.0%) have expected count less than 5. The minimum expected count is 4.25.

As the sample Asymp. Sig. (2-sided) is .000, there are statistically significant differences between the telecentres regarding the time users spent at each telecentre per visit and these differences are.

(a) More respondents at Tombo spent less than an hour at the telecentre than at the other centres;
(b) More respondents at Hoxani spent three to four hours at the telecentre than at the other telecentres; and
(c) More respondents spent three to four hours at Siyabonga than at MACIS and Tombo MPCCs.

7.4 COMMUNICATION SERVICES AND EQUIPMENT USE

7.4.1 Use of telephones and facsimile

Table 39: Telephones and Facsimile Use

Technology or service	Telecentre	Users (N)	Mean	Standard Deviation
Fixed-line telephone use - incumbent operator (Telkom)	Hoxani	43	2.7	1.4
	MACIS	48	2.2	1.3
	Siyabonga	45	1.8	1.1
	Tombo	46	1.8	1.2
	Total	182	2.2	1.4
Mobile phone use Company A (Mobile Telephone Networks or MTN)	Hoxani	42	2.4	1.5
	MACIS	47	1.9	1.3
	Siyabonga	51	3.5	1.1
	Tombo	47	4.2	1.0
	Total	187	3.1	1.6
Mobile phone use Company B (Vodacom)	Hoxani	45	2.7	1.6
	MACIS	49	2.1	1.4
	Siyabonga	46	1.8	1.3
	Tombo	46	1.7	1.2
	Total	186	2.1	1.5
Mobile phone use Company C (Cell C)	Hoxani	40	1.8	1.1
	MACIS	46	1.7	1.1
	Siyabonga	45	1.6	1.0
	Tombo	45	1.4	.8
	Total	176	1.7	1.0

Technology or service	Telecentre	Users (N)	Mean	Standard Deviation
Facsimile	Hoxani	40	1.9	1.1
	MACIS	49	1.8	1.0
	Siyabonga	47	2.4	1.3
	Tombo	45	3.3	1.3
	Total	181	2.4	1.4

The scale used in this question was: 1 = Not available, 2 = Never, 3 = Seldom, 4 = Often and 5 = Very often. Regarding Table 41, the Hoxani telecentre mean use of fixed-line incumbent operator Telkom telephones or calls (M = 2.7 and SD = 1.4), was more than those of the other centres, MACIS telecentre (M = 2.2, SD = 1.3), Siyabonga telecentre (M = 1.8 and SD = 1.1), and the Tombo telecentre (M = 1.8, SD = 1.2). Reasons for this could be that Telkom phones were available at the Hoxani telecentre and that the teachers using the Hoxani MPCC could afford to pay (most South Africans cannot afford to pay the expensive Telkom rates – cf. Chapter 1). At the time of administering the questionnaires at these telecentres, there were no Telkom lines for public use at Siyabonga, the MACIS and the Tombo MPCCs. There were, however, Telkom lines at the centres for office and telecentre administration. Siyabonga and the Tombo MPCC used mobile phone Mobile Telephone Networks public phone shops for telecentre users.

Standard deviation findings indicate that respondent answers differ more at the Hoxani and MACIS centres because the SD values of these centres are higher than those of the other centres. Respondent answers concerning the use of Telkom phones differ less at Tombo and Siyabonga centres because the SD values of the latter centres are lower.

With reference to the use of MTN phones, Table 39 shows that the Hoxani centre mean use of MTN mobile phones (M = 2.4, SD = 1.5) was less than that for Siyabonga centre (M = 3.5, SD = 1.1) and the Tombo MPCC (M = 4.2, SD = 1.0), but more than that of the MACIS centre (M = 1.9 and SD = 1.3) – the unit of analysis being mobile phone calls. This means that MTN phones were most used at the Tombo

and Siyabonga centres, which both own MTN public phones. The Hoxani centre small usage of MTN phones could be because they made more use of Vodacom and Cell C mobile phone services.

Regarding the differences between respondents about the use of Vodacom phones, Hoxani MPCC users differ more, because the SD value is more, than users at the other centres where the SD values are smaller (cf. Table 30). The Hoxani telecentre mean use of Vodacom mobile phones (M = 2.7 and SD = 1.6), is more than those of the three other centres, the MACIS centre (M = 2.1, SD = 1.4), Siyabonga centre (M = 1.8, SD = 1.3) and the Tombo MPCC (M = 1.7, SD = 1.2). MTN public pay phones were visibly used at Tombo MPCC. It is also possible that people cannot afford mobile phones. Reasons for this usage pattern could be customer preferences and income, type of mobile phone and the availability of mobile phone company service.

With reference to Cell C mobile phones usage, the Hoxani centre mean (M = 1.8 and SD = 1.1), is more than those of the other centres, MACIS (M = 1.7, SD = 1.1), Siyabonga (M = 1.6, SD = 1.0) and Tombo (M = 1.4, SD = .8). This means that Cell C phones were more used at the rural Hoxani centre, also more used at MACIS and Siyabonga centres, than at the rural Tombo MPCC. Cell C services were least used at Tombo MPCC. Reasons for this usage of Cell C's service by location could range from the availability of a particular mobile phone company's services in that area to location, customer preferences and affordability.

The Hoxani centre mean facsimile use (M = 1.9 and SD = 1.1), is less than Tombo MPCC (M = 3.3, SD = 1.3) and Siyabonga centre (M = 2.4, SD = 1.3), but more than MACIS centre (M = 1.8, SD = 1.0). These results indicate that the facsimile was more used at Tombo MPCC, Siyabonga and Hoxani MPCCs respectively and least used at the MACIS telecentre. The SD values indicate that respondent answers regarding the facsimile usage differ more at Siyabonga and Tombo centres because of the bigger SD values and differ less at Hoxani and MACIS centres because of the smaller SD values at the latter centres.

Table 39 indicates that telephone services are still not much available at the centres because these services are not widely available at all centres, except for the MTN

public phones available at Tombo and Siyabonga centres. Available telephones are MTN public phones, seldom used at Siyabonga telecentre and often used at Tombo MPCC.

Table 40: Internet Communication - Computer Software Use

Technology or Service	Telecentre	Users (N)	Mean	Standard Deviation
Electronic mail	Hoxani	49	1.7	1.0
	MACIS	50	2.9	1.3
	Siyabonga	51	3.2	1.3
	Tombo	48	1.8	1.0
Internet information search (WWW)	Hoxani	48	1.6	1.0
	MACIS	50	3.2	1.3
	Siyabonga	50	3.5	1.3
	Tombo	48	2.6	1.2
VoIP	Hoxani	49	1.4	.7
	MACIS	49	1.5	.6
	Siyabonga	48	1.9	.6
	Tombo	48	1.4	.6
Internet radio	Hoxani	49	1.5	1.0
	MACIS	47	1.6	.6
	Siyabonga	46	2.1	.9
	Tombo	48	1.3	.7
Internet facsimile	Hoxani	49	1.6	1.0
	MACIS	48	1.7	.8
	Siyabonga	48	2.1	.9
	Tombo	48	1.4	.7
Electronic library	Hoxani	50	1.9	1.1
	MACIS	49	1.6	.8
	Siyabonga	51	1.9	1.0
	Tombo	46	1.4	.8

The scale used in the above question in Table 42 was: 1 = Not available, 2 = Never, 3 = Seldom, 4 = Often and 5 = Very often. The Hoxani telecentre mean use of e-mail (M = 1.7 and SD = 1.0), was less than those of the other centres, MACIS (M = 2.9, SD = 1.3), Siyabonga (M = 3.2 and SD = 1.3), and Tombo (M = 1.8, SD = 1.0). These values indicate that e-mail was more used at the urban Siyabonga and MACIS telecentres respectively and less used at the rural telecentres of Tombo and Hoxani respectively. There were no e-mail services for the teachers or users at the Hoxani MPCC during the time of administering questionnaires and most of the teachers suggested that they would like to have e-mail services, as revealed by interviews conducted by this researcher (cf. Chapter 8).

Respondent answers regarding e-mail use differ more at the urban MACIS and Siyabonga centres because of the bigger SD values and differ less at the rural Hoxani and Tombo centres because the smaller SD values at the latter centres indicate fewer respondent answer differences.

Regarding the use of the Internet, the Hoxani centre mean use of the Internet for information search (M = 1.6, SD = 1.0) is less than those of the other centres, MACIS (M = 3.2, SD = 1.3), Siyabonga (M = 3.5, SD = 1.3) and Tombo (M = 2.6 and SD = 1.2). Again, these values indicate similar usage patterns to those indicated by e-mail usage, that the urban telecentres used the Internet for information searches more than the rural telecentres, with Siyabonga and MACIS using the Internet more respectively than the Tombo and Hoxani MPCCs respectively. The Internet was not widely used at the rural Tombo MPCC. In fact, in an interview with former telecentre administrator, Nangamso Smauza (2005), it emerged that they no longer provided Internet to users as the latter did not use the service much when it was offered in 1999 (when the centre opened) until the service was discontinued for the public two years later.

The SD figures indicate that respondents differ more about the use of Internet for information search at MACIS and Siyabonga centres because the SD values are bigger and differ less at Tombo and Hoxani centres respectively because the SD values are smaller in the latter centres.

Regarding VoIP usage, the scale used was also 1 = Not available, 2 = Never, 3 = Seldom, 4 = Often and 5 = Very often. The Hoxani mean use of VoIP (M = 1.4 and SD = .7), is less than Siyabonga telecentre (M = 1.9, SD = .6), and MACIS telecentre (M = 1.5, SD = .6) but more than Tombo MPCC (M = 1.4, SD = .6). The rural Hoxani centre mean use of VoIP, M = 1.4 and SD = .7, is less than that of Siyabonga telecentre (M = 1.9, SD = .6), and that of the MACIS telecentre (M = 1.5, SD = .6) but more than that of the rural Tombo MPCC (M = 1.4, SD = .6). Also, VoIP was more used at the urban telecentres, more at Siyabonga and then at MACIS, but less used at the rural telecentres, Tombo and Hoxani. The SD for VoIP usage is the same in the rural telecentres and indicates that this service is not available. SD figures indicate that there are more respondent answer differences at Hoxani centre because the SD value is bigger (.7), and there are less respondent answer differences at the other centres because the SD values are smaller (all .6) – very small difference, almost equal.

The finding concerning the use of VoIP is also true for Internet radio. Because Siyabonga telecentre mean use of Internet radio (M = 2.1) differed from that of the other centres, with MACIS (M = 1.6), Hoxani (M = 1.5) and the Tombo MPCC (M = 1.3). The scale used in this question was 1 = Not available, 2 = Never, 3 = Seldom, 4 = Often and 5 = Very often.

The Siyabonga telecentre mean use of Internet radio (M = 2.1, SD = .9) differs from that of the other centres, with MACIS (M = 1.6, SD = .6), Hoxani (M = 1.5, SD = 1.0) and Tombo (M = 1.3, SD = .7). The Hoxani centre mean use of Internet radio (M = 1.5, SD = 1.2) is less than those of the MACIS telecentre (M = 1.6, SD = .6) and that of Siyabonga telecentre (M = 2.1, SD = .9), but more than that of the Tombo MPCC (M = 1.3, SD = .7). The urban telecentres exhibit more use of Internet radio than the rural telecentres, with Siyabonga making more use of the service than MACIS and Hoxani centre using the service more than Tombo MPCC. It is apparent that users at the township of Orange Farm (Siyabonga telecentre) were more interested in Internet-related services offered by the centre. At rural Hoxani and Tombo MPCC, a few teachers expressed interest at making use of the Internet in the future to improve their teaching preparation, planning and implementation. Respondent answers concerning

Internet radio usage differ more at Hoxani and Siyabonga MPCCs because the SD values are higher and differ less at Tombo and MACIS centres because the SD values are smaller at the latter centres.

The Hoxani centre mean usage of Internet facsimile (M = 1.6 and SD = 1.0) is less than MACIS (M = 1.7, SD = .8) and Siyabonga telecentres (M = 2.1, SD = .9), but more than Tombo MPCC (M = 1.4 and SD = .7). These values indicate more usage of the Internet facsimile at the urban centres Siyabonga and MACIS, respectively, and less usage of this service at the rural centres, Hoxani and Tombo MPCCs respectively. SDs indicate more respondent answer differences at Hoxani and Siyabonga centres because the SD is bigger at those centres and respondent answers differ less at MACIS and Tombo MPCCs regarding the use of Internet facsimile because the latter centres' SDs are smaller.

The scale used was also 1 = Not available, 2 = Never, 3 = Seldom, 4 = Often and 5 = Very often. The Hoxani centre mean use of the e-library (M = 1.9, SD = 1.1) is similar to that of Siyabonga telecentre (M = 1.9, SD = 1.0) but more than at MACIS centre (M = 1.6, SD = .8) and Tombo MPCC (M = 1.4, SD = .8). The e-library was more used at the rural Hoxani MPCC and urban Siyabonga telecentres, but less used at the urban MACIS centre and rural Tombo MPCC respectively. SDs indicate that respondent answers differ more on the use of the e-library at Hoxani and Siyabonga MPCCs because the SDs are bigger and there are less respondent differences about the e-library usage at MACIS and Tombo centres (because the smaller SDs indicate that). Telecentres that used Internet-based services more were the urban Siyabonga and MACIS.

Most of the technology referred to Table 40 is not available at the centres except for the Internet for information search, seldom used at MACIS and Siyabonga centres and e-mail, seldom used at Siyabonga telecentre.

Table 41: Desktop Applications

ICT or Service	Telecentre	Users (N)	Mean	Standard Deviation
Word processor	Hoxani	49	3.1	1.5
	MACIS	49	4.4	.8
	Siyabonga	50	4.2	.9
	Tombo	48	4.0	1.1
Desktop publishing	Hoxani	49	2.0	1.1
	MACIS	47	2.6	1.3
	Siyabonga	50	2.5	1.2
	Tombo	48	2.4	1.1
Web page design	Hoxani	47	1.6	.8
	MACIS	48	2.2	1.1
	Siyabonga	48	2.3	1.0
	Tombo	46	1.5	.5
Spreadsheet applications	Hoxani	49	2.4	1.3
	MACIS	50	4.0	1.1
	Siyabonga	51	3.2	1.2
	Tombo	48	3.5	1.0
Visual presentation	Hoxani	49	2.3	1.3
	MACIS	50	3.9	1.1
	Siyabonga	49	2.8	1.1
	Tombo	48	3.0	1.0

The scale used for this question was 1 = Not available, 2 = Never, 3 = Seldom, 4 = Often and 5 = Very often. The Hoxani centre mean use of word processing (M = 3.1, SD = 1.5), was less than MACIS (M = 4.4, SD = .8), Siyabonga (M = 4.2, SD = .9) and Tombo MPCC (M = 4.0, SD = 1.1). Word processing software was more used at the urban telecentres of MACIS and Siyabonga respectively and less used at the rural

centres of Tombo and Hoxani respectively. MACIS centre users typed more documents than users at other centres, and this could be attributed to the more computer courses offered by that centre. Users at MACIS centre produced more personal documents than users at the other centres because it was established that most users at that centre were students producing assignments, curriculum vitae and job applications. These reasons also apply to the finding on desktop publishing (DTP) stated later in this section. SD values indicate that rural Hoxani and Tombo MPCC respondents differ more regarding how often the word processor is used because the SD values of these centres are bigger. On the other hand, the smaller SD values of urban Siyabonga and MACIS centres for the use of the word processor indicate fewer respondent differences in answering the question.

The Hoxani centre mean use of DTP (M = 2.0, SD = 1.1), was less than the MACIS centre (M = 2.6, SD = 1.3), Siyabonga centre (M = 2.5, SD = 1.2) and the Tombo MPCC (M = 2.4, SD = 1.1). The telecentres which produced more publications such as newsletters, advertisements and pamphlets was Siyabonga. The Hoxani MPCC produced the newsletter mentioned in Chapter 6. Examples of small publications produced at Siyabonga centre are mentioned in Addendum C. SD values indicate that respondent answers differ more about the use of DTP at MACIS and Siyabonga centres because the SD are bigger and differ less at Hoxani and Tombo centres because the SDs are smaller at the latter centres.

The Hoxani centre mean usage of Web page design programs (M = 1.6, SD = .8) was less than at the MACIS centre (M =2.2, SD = 1.1) and Siyabonga telecentre (M = 2.3, SD = 1.0), but more than the Tombo MPCC (M = 1.5, SD = .5). Internet-related service were more used by users at Siyabonga and the MACIS centres (urban) and less by the rural Tombo and Hoxani MPCC users. At the Tombo MPCC, a few users use Internet services through the free government PIT portal.

The Hoxani centre mean use of spreadsheets programs (M = 2.4, SD = 1.3) was less than at the MACIS (M = 4.0, SD = 1.1), Siyabonga telecentre (M = 3.2, SD = 1.2) and Tombo MPCC (M = 3.5, SD = 1.0). Spreadsheets were more used at the urban MACIS and rural Tombo MPCCs respectively, and less used at Siyabonga and Hoxani centres respectively. SD values indicate that respondents at Hoxani MPCC

differ in answering the question more, because of the bigger SD, than respondents at the other centres. Fewer respondent answer differences are at Tombo MPCC regarding the use of spreadsheets.

The Hoxani telecentre mean use of visual presentation software (e.g., VPS or Microsoft PowerPoint), M = 2.3, SD = 1.3, is less than that of the other centres, MACIS centre (M = 3.9, SD = 1.1), Siyabonga telecentre (M = 2.8, SD = 1.1) and the Tombo MPCC (M = 3.0, SD = 1.0). These values indicate a similar result as that revealed by the use of spreadsheets, that VPS was more used at the urban MACIS and rural Tombo MPCCs respectively, and less used at the urban Siyabonga and rural Hoxani MPCCs respectively. Once again, this VPS result indicates that business interests in the township telecentres can be associated with this result. Also the type of courses taught at each telecentre influence this finding as business courses are likely to make use of spreadsheets more than other courses. SDs indicate more respondent differences regarding VPS usage at Hoxani MPCC, then MACIS and Siyabonga MPCCs because the SD is bigger and less respondent differences in answering the question about the use of VPS at Tombo centre because the SD is smaller at Tombo MPCC[4].

To summarise Table 41 word processing was seldom used at Hoxani MPCC and often used at the other centres. DTP was never used at the centres. Web page design was never used at MACIS and Siyabonga centres and not available at Tombo and Hoxani centres. Spreadsheet applications were seldom employed at Siyabonga and Tombo centres, often used at MACIS centre but never used at Hoxani MPCC. Visual presentation software was seldom employed at Tombo and MACIS centres but never used at Siyabonga and Hoxani MPCCs.

[4] ANOVA tests and post hoc tests conducted on the findings in Tables 39 and 40 yielded similar results. However, the results of these tests are not been included to avoid repetition of similar tables.

Table 42: Computer Hardware Use

ICT or Service	Telecentre	Users (N)	Mean	Standard Deviation
Scanner	Hoxani	47	2.2	1.4
	MACIS	50	1.9	1.0
	Siyabonga	49	2.8	1.1
	Tombo	47	2.5	1.1
Printer	Hoxani	49	2.5	1.4
	MACIS	50	3.1	1.4
	Siyabonga	51	3.5	1.1
	Tombo	47	4.2	.8
CD-ROM	Hoxani	48	2.6	1.4
	MACIS	48	3.4	1.3
	Siyabonga	51	3.2	1.1
	Tombo	46	2.6	1.0

The scale used for the question was 1 = Not available, 2 = Never, 3 = Seldom, 4 = Often and 5 = Very often. The mean and the standard deviation reveal that the scanner was more frequently used at Siyabonga telecentre (M = 2.8, SD = 1.1), than Tombo MPCC (M = 2.2 SD = 1.1), but less than the Hoxani telecentre (M = 2.2, SD = 1.4) and MACIS telecentre (M = 1.9 and SD = 1.0). There was more scanner usage at Siyabonga and Tombo MPCCs respectively and less scanner usage at Hoxani and MACIS respectively. Reasons for this pattern could emanate from many personal publications produced by the Siyabonga telecentre. Users at the Hoxani MPCC also produce newsletters, so scanners are often used. Standard deviations indicate that Hoxani MPCC respondents differ more about how often they use the scanner than the other centres because the SD (1.4) is bigger at that centre than at the other centres. Respondents differ less about how often they use the scanner at Tombo MPCC as the SD is smaller (1.1).

Printers are the most used hardware with a sample mean of 3.3, followed by CD-ROM use with sample mean of 2.9 and SD of 1.3 and the scanner with sample mean of 2.3. The Tombo MPCC mean use of printers (M = 4.2, SD = .8) is more than that of the other centres, with Siyabonga telecentre (M = 3.5, SD = 1.1), the MACIS centre (M = 3.1, SD = 1.4) and the Hoxani centre (M = 2.5, SD = 1.4). More document printing is at the rural Tombo MPCC, followed by the urban Siyabonga centre, MACIS and then Hoxani MPCCs respectively. Printing is also related to documents produced. The more documents typed and produced, the more likely these documents are printed. Hoxani and MACIS MPCC users differed more in their answers regarding how often they use printers because the SD values are bigger (both 1.4). At Tombo MPCC, respondents differed less in answering the question of how often printers are used because the SD is smaller (.8).

CD-ROM data showed that the MACIS centre mean use of this device (M = 3.4 and SD = 1.3) is more than those of the other centres, Siyabonga telecentre (M = 3.2, SD = 1.1), the Hoxani MPCC, M = 2.6 and SD = 1.4) and the Tombo MPCC, M = 2.6, SD = 1.0. Most MACIS centre CD-ROM users play music and movies. CDs were more used at the urban telecentres of MACIS and Siyabonga respectively and less used at both rural telecentres, Tombo and Hoxani. CD-ROM SDs indicate more respondent opinion differences at Hoxani and MACIS centres because the SDs are bigger and less respondent opinion differences at Siyabonga and Tombo centres as the SDs are smaller at the latter centres.

Table 42 indicates that the scanner and CDs were more used at the urban telecentres than at the rural telecentres, but that the printer was more used at the rural Tombo MPCC than all the other centres. All media or facilities were least used at the rural Hoxani MPCC.

Table 43: Mean and Standard Deviation: Television, Radio and Other Media Usage

Technology	Telecentre	Users (N)	Mean	Standard Deviation
Television	Hoxani	50	2.9	1.5
	MACIS	50	2.1	1.3
	Siyabonga	50	2.5	1.2
	Tombo	48	1.7	1.0
Video recorder	Hoxani	48	2.4	1.2
	MACIS	49	1.8	1.2
	Siyabonga	50	1.8	.9
	Tombo	48	1.7	1.0
Tape recorder	Hoxani	50	2.2	1.3
	MACIS	50	1.7	1.0
	Siyabonga	50	1.9	1.0
	Tombo	48	1.5	.7
Video camera	Hoxani	50	1.7	.9
	MACIS	49	1.4	.5
	Siyabonga	50	1.9	1.0
	Tombo	48	1.5	.7
Digital camera	Hoxani	48	1.6	1.0
	MACIS	50	1.4	.7
	Siyabonga	49	1.9	1.1
	Tombo	48	1.4	.7
Radio	Hoxani	50	2.4	1.5
	MACIS	50	2.0	1.3
	Siyabonga	50	2.7	1.2
	Tombo	48	1.9	1.3

The scale used for the above question was 1 = Not available, 2 = Never, 3 = Seldom, 4 = Often and 5 = Very often. The Hoxani centre mean use of television (TV) (M = 2.9, SD = 1.5) is more than that of the other centres, the MACIS centre (M = 2.1, SD = 1.3), Siyabonga telecentre (M = 2.5 and SD = 1.2), and the Tombo MPCC (M = 1.7, SD = 1.0). TV was more used at Hoxani centre and then at Siyabonga centre, and less used at the MACIS and Tombo MPCC respectively. However, according to an interview with the centre manageress, Ndlovu (2005), Hoxani MPCC teachers who used the telecentre employed television and video to watch OBE lessons which are later practiced on computers and implemented in class. SDs indicate that respondents differ more about how they view the use of television at Hoxani MPCC, because the SD is bigger and differ less at MACIS, Siyabonga and Tombo MPCCs because of the smaller SDs at the latter centres. The Hoxani centre teachers use television and video to watch OBE lessons which are later practiced on computers and implemented in class (as revealed by qualitative data presented in Chapter 8).

The Hoxani centre mean use of the video recorder (M = 2.4, SD = 1.2, was significantly different from the other centres, the MACIS telecentre (M = 1.8, SD = 1.2), Siyabonga telecentre (M = 1.8, SD =.9) and Tombo MPCC (M = 1.7 SD = 1.0). Again Hoxani MPCC used the video recorder more, followed by MACIS and Siyabonga centres, and the device was less used at Tombo MPCC. Teachers, at Hoxani MPCC, used the video recorder to watch OBE lessons which they later practised on computers and implemented in their schools. No television sets are available at Siyabonga and the Tombo MPCC, while at the MACIS centre the television was available but not used by the general users but by staff and stored in the office.

The Hoxani centre mean use of tape recorders (M = 2.2, SD = 1.3) is significantly greater than other telecentres, MACIS (M = 1.7, SD = 1.0), Siyabonga (M = 1.9, SD = 1.0) and Tombo MPCC (M = 1.5, SD = .7). There was more usage of the tape recorder at rural Hoxani MPCC and at urban Siyabonga centre but less use of this technology at MACIS and Tombo MPCCs respectively. Also, the frequent use of the tape recorder at Hoxani MPCC could be attributed to use for OBE lessons by teachers

listening to tapes at the centre. SDs indicate more respondent differences concerning the use of tape recorders at Hoxani MPCC as the SD is bigger and less respondent differences at Tombo centre because the SD is smaller.

The Hoxani telecentre mean use of video camera (M = 1.7, SD = 1.0) is less than that of the MACIS centre (M = 1.9, SD = 1.0), and more than Siyabonga telecentre (M = 1.4, SD = 1.0) and Tombo MPCC (M = 1.5, SD = .7). The video camera was more used at the urban Siyabonga and rural Hoxani centres respectively, but less used at the rural Tombo and urban MACIS centres respectively. SDs indicate that respondents differ more on video camera usage at Siyabonga MPCC because the SD is bigger and respondent answers differ less at MACIS centre because the SD is smaller.

The Hoxani centre mean use of digital camera (M = 1.6, SD = 1.0) is less than that of Siyabonga telecentre (M = 1.9), and more than MACIS centre (M = 1.4, SD = .5) and Tombo MPCC (M = 1.4, SD = .7). These results indicate that the digital camera was more used at Siyabonga and Hoxani centres respectively and less used at MACIS and Tombo centres respectively. SD findings indicate more respondent answer differences about digital camera usage at Siyabonga centre because the SD is bigger and less respondent differences in answering the question at MACIS and Tombo MPCCs because the SDs are smaller at the latter centres.

The Hoxani telecentre mean use of radio (M = 2.4, SD = 1.5) differed from that of other centres and is less than that of the Siyabonga centre (M = 2.7, SD = 1.2) and more than both the MACIS centre (M = 2.0, SD = 1.3) and Tombo MPCC (M = 1.9, SD = 1.3). Radio is more used at the urban Siyabonga and rural Hoxani centres and less used at the urban MACIS and rural Tombo MPCCs respectively. It is often expected that the rural MPCCs radio use is more than the township MPCCs, but it is the township telecentre of Siyabonga that used radio more. The reasons for the use of radio are education, information and entertainment.

The most used educational facilities at the centres are television (total mean = 2.3 and SD = 1.3) and radio (total mean = 2.2 and SD = 1.4). The least used educational equipment are digital camera (total mean = 1.6 and SD = .9) and video conference technology (VCT) (total mean = 1.6 and SD = .7). As the researcher was at the

telecentres throughout the period of the field research conducting the research, the VCT was not available at the centres during the period of questionnaire administration[5]. VCT data were omitted from the table during data analysis because all MPCCs stated that they neither had nor used this technology.

In summary, because the means in Table 43 indicate that most of the technologies stated in the table were more used at Siyabonga and Hoxani centres than at MACIS and Tombo centres respectively. In fact, all the devices were least used at Tombo MPCC, TV, the video and tape recorders more used at Hoxani MPCC and the video and digital cameras and radio more used at Siyabonga MPCC.

Table 44: Use of Office Equipment

Technology	**Telecentre**	**Users (N)**	**Mean**	**Standard Deviation**
Photocopier	Hoxani	50	2.8	1.6
	MACIS	48	2.9	1.6
	Siyabonga	51	3.8	1.0
	Tombo	48	4.3	1.0
Laminator	Hoxani	50	1.7	1.0
	MACIS	50	1.6	.6
	Siyabonga	50	2.5	1.2

[5] Post hoc tests and the ANOVA conducted on the above findings produced similar results as those presented in Table 44. However, these test results are excluded to avoid repetition of the same information.

Technology Telecentre	Telecentre	Users (N)	Mean	Standard Deviation
	Tombo	47	1.6	.6
Overhead projector	Hoxani	48	2.2	1.2
	MACIS	50	1.7	.9
	Siyabonga	49	1.9	1.0
	Tombo	47	2.0	1.1
Public information terminal	Hoxani	48	1.7	1.1
	MACIS	47	1.7	.8
	Siyabonga	48	1.9	.9
	Tombo	48	3.3	1.0

The scale used for the question was also 1 = Not available, 2 = Never, 3 = Seldom, 4 = Often and 5 = Very often. The MACIS centre photocopier usage (M= 2.9, SD = 1.6) is more than that of Hoxani centre (M = 2.8, SD = 1.6) but less than that of the Siyabonga centre (M = 3.8, SD = 1.0) and the Tombo centre (M = 4.3, SD = 1.0). The photocopier was more used at the rural Tombo MPCC and urban Siyabonga MPCC respectively and less used at the urban MACIS and rural Hoxani MPCCs respectively. The photocopier was the most used office equipment in the centres and reasons for this could be study and business-related since it was established earlier in this chapter that most users at the centres are students and others interested in business. SDs indicate that respondents differ more about how often they use the photocopier at Hoxani and MACIS MPCCs because the SD is bigger (1.6 both centres), and differ less at Siyabonga and Tombo centres because at the latter centres the SD is smaller (1.0 both centres).

The Hoxani mean use of a laminator (M = 1.7, SD = 1.0) is less than that of the Siyabonga telecentre (M = 2.5, SD = 1.2), but more than that of those of MACIS centre (M = 1.6, SD = .6) and Tombo MPCC (M = 1.6, SD = .6). More usage of the laminator is at Siyabonga and Hoxani MPCCs respectively and the device is less used at MACIS and Tombo MPCCs respectively. The laminator is mostly used to cover personal documents such as certificates, publications such as greeting, birthday and invitation cards. A laminator is not available at the Tombo, MACIS and Hoxani MPCCs. SDs indicate that respondents differ more about the use of the laminator at Siyabonga and Hoxani centres because the SDs are bigger and differ less at Tombo and MACIS centres because the SDs are smaller.

The Hoxani telecentre mean use of an overhead projector (M = 2.2, SD = 1.2) is more than those of the other centres, MACIS (M = 1.7, SD = .9), Siyabonga (1.9, SD = 1.0) and Tombo (M = 2.0, SD = 1.1). More usage of the overhead projector is at the rural telecentres, Hoxani and Tombo, respectively, and less usage of the device is at the urban centres, Siyabonga and MACIS, respectively. This is because the teachers attending OBE classes at the Hoxani centre frequently made use of the projector during class. At the other telecentres this device was not much used because most lessons are computer-based. Differences between respondent answers are more at Hoxani and Tombo centres because of the bigger SDs and are less at Siyabonga and MACIS centres because the SDs are smaller at the latter centres.

The Tombo MPCC mean use of a public information terminal (PIT) (M = 3.3, SD = 1.0) is more than the other telecentres, Hoxani (M = 1.7, SD = 1.1), MACIS (M = 1.7, SD = .8) and Siyabonga (M = 1.9, SD = .9). There was more PIT usage at the rural Tombo MPCC and urban Siyabonga centre but less usage of this technology at urban MACIS and rural Hoxani MPCCs respectively. As the researcher took notice of what was available or not available at the centres during the time of research, there was no PIT at the Hoxani, MACIS and Siyabonga centres - during the time of this researcher's field research visits to the centres. The Tombo MPCC PIT was donated to the centre by government on the day the centre was opened. The donation enabled users to access government services such as applications for identity documents, birth and death certificates, and applications for financial grants such as disability, child

and services for the elderly. SDs indicate more respondents differences of opinion about the PIT usage at Hoxani and Tombo centres because the SDs are bigger and less respondent differences at MACIS and Siyabonga centres because the smaller SDs at the latter centres are an indication of fewer differences in answers provided by respondents about the use of the PIT[6].

A conclusion from Table 44 is that the photocopier was more used at Tombo MPCC and less used at Siyabonga centre while the PIT was more used at Tombo MPCC. The next section provides data on educational facilities employed at the telecentres for individual and community development.

7.5 EDUCATIONAL SERVICES

7.5.1 Use of Educational Facilities

Table 45: Use of Educational Facility

Facility or Medium	Telecentre	Users (N)	Mean	Standard Deviation
Video cassette	Hoxani	48	2.4	1.4
	MACIS	50	1.7	.9
	Siyabonga	50	1.7	.7
	Tombo	48	1.5	.9
Audio cassette	Hoxani	50	2.0	1.3
	MACIS	50	1.8	1.1
	Siyabonga	50	1.6	.6
	Tombo	48	1.5	.7
Newspaper	Hoxani	49	2.6	1.5

[6] Qualitative data (cf. Chapter 8) support this finding and suggest that Tombo residents employ the PIT to access government services.

Facility or Medium	Telecentre	Users (N)	Mean	Standard Deviation
	MACIS	49	2.5	1.5
	Siyabonga	52	2.5	1.4
	Tombo	47	2.8	1.1
Book	Hoxani	50	3.0	1.5
	MACIS	50	2.9	1.3
	Siyabonga	52	2.4	1.4
	Tombo	46	2.8	1.2
Magazine	Hoxani	50	2.6	1.4
	MACIS	48	2.1	1.2
	Siyabonga	50	2.1	1.1
	Tombo	48	2.6	1.1

The scale used for the question in Table 45 was also 1 = Not available, 2 = Never, 3 = Seldom, 4 = Often and 5 = Very often. The Hoxani centre mean use of video cassette (M = 2.4, SD = 1.4) is more than that of the MACIS centre (M = 1.7, SD = .9), Siyabonga telecentre (M = 1.7 and SD = .7), and Tombo MPCC (M = 1.5, SD =.9). These values indicate that the video cassette was more used at Hoxani and MACIS centres respectively and less used at Siyabonga and Tombo MPCCs respectively. SDs indicate that respondent answers differ more at Hoxani centre, differ less at MACIS and Tombo centres (regarding video cassettes) and differ even lesser at Siyabonga telecentre.

The Hoxani centre mean use of audio cassette (M = 2.0, SD =1.2, is more than the MACIS telecentre (mean = 1.8, SD 1.1), Siyabonga telecentre (M = 1.6, SD = .6) and Tombo MPCC (M = 1.5 SD = .7). These values indicate that there is more audio cassette usage at Hoxani and MACIS centres respectively and less usage of the audio cassette at Siyabonga and Tombo MPCC respectively. SDs indicate that respondent answers differ more at Hoxani centre, differ less at MACIS and Tombo centres and differ even lesser at Siyabonga telecentre.

The Hoxani telecentre mean newspaper use (M = 2.6, SD = 1.5) is less than the Tombo MPCC (M = 2.8, SD = 1.1), but more than MACIS centre (M = 2.5, SD = 1.5) and Siyabonga centre (M = 2.5, SD = 1.4. This indicates that newspapers are more used at the rural telecentres, with more usage at Tombo MPCC, then Hoxani MPCC and less used at the urban centres of MACIS and Siyabonga respectively. SDs indicate that respondents differ less in answering this question at Hoxani and MACIS centres and less at Siyabonga and Tombo centres.

With regards to the use of book, the Hoxani centre mean (M = 3.0, SD = 1.5) is more than at the other telecentres, MACIS (M = 2.9, SD = 1.3), Siyabonga (M = 2.4, SD = 1.4) and Tombo (M = 2.8, SD = 1.2). Again, these figures indicate more usage of the book at the rural Hoxani MPCC, and at the urban MACIS centre but less at Tombo and Siyabonga MPCCs. This indicates that books are very rarely read at Siyabonga MPCC. SDs indicate that respondents differ more in answering this question at Hoxani MPCC, than at Siyabonga telecentre and there are even lesser respondent differences at MACIS and Tombo centres.

The magazine is more used at the rural centres of Hoxani and Tombo respectively but less at the urban centres of MACIS and Siyabonga respectively. SD values indicate that respondents differ more concerning magazine reading at Hoxani MPCC, MACIS but there are fewer respondent differences at Siyabonga and Tombo telecentres.

Table 46: Telecentre ICT for Educational Use

Educational Activity	Telecentre	Users (N)	Mean	Standard Deviation
Information on course availability	Hoxani	47	1.7	1.0
	MACIS	50	2.2	1.0
	Siyabonga	47	2.1	0.9
	Tombo	47	2.6	0.9
	Total	191	2.2	1.0
Course registration	Hoxani	49	1.6	0.9
	MACIS	50	1.7	1.0
	Siyabonga	49	1.9	0.8
	Tombo	46	2.2	0.9
	Total	194	1.9	.9
Contact with lecturers	Hoxani	50	1.7	1.1
	MACIS	49	1.8	1.1
	Siyabonga	49	2.1	1.0
	Tombo	45	2.1	0.9
	Total	193	1.9	1.0
Obtaining information relating to assignments	Hoxani	49	1.7	1.0
	MACIS	50	2.5	1.2
	Siyabonga	49	2.1	0.9
	Tombo	47	2.4	0.9

Educational Activity	Telecentre	Users (N)	Mean	Standard Deviation
Obtaining information relating to assignments	Total	195	2.1	1.0
Completing assignments	Hoxani	48	1.8	1.0
	MACIS	48	2.4	1.1
	Siyabonga	51	2.0	1.0
	Tombo	47	2.6	.9
	Total	195	2.1	1.0
Discussing study issues with fellow students	Hoxani	50	1.8	1.1
	MACIS	49	2.5	1.2
	Siyabonga	50	2.1	1.0
	Tombo	47	2.2	1.0
	Total	196	2.1	1.1
Submitting assignments	Hoxani	50	1.5	.9
	MACIS	48	1.7	1.0
	Siyabonga	49	1.9	1.0
	Tombo	45	2.3	1.0
	Total	194	2.2	1.1
Library services	Hoxani	49	1.5	.9
	MACIS	47	1.9	1.0
	Siyabonga	48	1.7	.8
	Tombo	45	1.4	.7
	Total	189	1.6	.9

The scale used for this question (Table 48) was 1 = Never, 2 = Seldom, 3 = Often and 4 = Very often. Table 46 indicates that information on available courses is more sought at the Tombo telecentre (M = 2.6, SD = .9), MACIS telecentre (M = 2.2, SD = 1.0) and less sought at Siyabonga telecentre (M = 2.1, SD = .9) and Hoxani MPCC

(M = 1.7, SD = 1.0). There were even students registered at universities and high schools visiting the Tombo MPCC and posting assignments to the universities at the telecentre post office, as interviews with these students also revealed (cf. Chapter 8). Accordingly, there is much information seeking from telecentre staff by student users especially at telecentres with a high proportion of student user (Tombo, MACIS and Siyabonga).

At Hoxani MPCC there were few student users as most users were teachers most of whom were not pursuing further study but focused on teacher in-service training to improve OBE skills and qualifications. SDs indicate that respondent answers regarding information seeking on available courses differed more at Hoxani and MACIS telecentres, because of the bigger SDs and that respondent answers were less different both at Siyabonga and Tombo telecentres.

Course registration was more undertaken at the Tombo MPCC (M = 2.2, SD = .9), and Siyabonga telecentre (M = 1.9, SD =.8), and less undertaken at MACIS telecentre (M = 1.7, SD = 1.0), and Hoxani centre (M = 1.6, SD = .9). These values indicate more course registrations at Tombo MPCC and less course registrations at Hoxani MPCC. These registrations in all the centres could be attributed to the fact that all centres offered computer and other human resources courses that many users registered for. SDs indicate that users' answers differed more at the MACIS, Tombo and Hoxani centres as SD values are bigger at these centres, and the answers differed less at Siyabonga MPCC as the SD is smaller.

Additionally, contact with lecturers of registered courses was more undertaken at Siyabonga telecentre (M = 2.1, SD = 1.0) and Tombo MPCC (M = 2.1, SD = .9), but less undertaken at MACIS (M = 1.8, SD = 1.1), and Hoxani telecentres (M = 1.7, SD = 1.1). Telecentres with many student users report higher numbers making contact with lecturers (Tombo and Siyabonga). Contact with lecturers SDs indicate that respondent answers differ more at Hoxani and MACIS centres, and then at Siyabonga centre and last but not least, Tombo MPCC with the smallest SD.

Obtaining information for assignment preparation and writing for courses was more undertaken at MACIS (M = 2.5, SD = 1.2) and Tombo (M = 2.4, SD = .9) centres but

less undertaken at Siyabonga (M = 2.1, SD =.9) and Hoxani (M = 1.7, SD =1.0) centres respectively. SD values indicate that respondents differed more at MACIS and Hoxani centres but there were less respondent differences at Siyabonga and Tombo centres. Completing assignments for courses occurred more at Tombo centre (M = 2.6, SD =.9) and MACIS centre (M = 2.4, SD = 1.1) but occurred less at Siyabonga centre (M = 2.0, SD = 1.0) and Hoxani MPCC (M = 1.8, SD = 1.0), respectively. SDs indicate that there were more respondent differences at MACIS, Hoxani and Siyabonga centres and less respondent differences at Tombo MPCC.

Discussing issues related to studies with fellow students happened more at MACIS (M = 2.5, SD = 1.2) and Tombo centre (M = 2.2, SD = 1.0) but less so at Siyabonga centre (M = 2.1, SD = 1.0) and Hoxani telecentre (M = 1.8, SD = 1.1). SDs illustrate that when it comes to discussion of study issues with other students, respondents differed more at MACIS, and Hoxani centres and there were fewer differences between respondents at Siyabonga and Tombo MPCCs.

Assignment submissions occurred more at the rural Tombo MPCC (M = 2.3, SD = 1.0) and also at Siyabonga (M = 1.9, SD = 1.0), but happened less at the urban MACIS (M = 1.7, SD = 1.0) and rural Hoxani MPCC (M = 1.5, SD = .9). SDs indicate that respondents differed more at MACIS, Siyabonga and Tombo MPCCs and less at Hoxani telecentre. These study-related activities were performed most often when many student users were present, i.e., at Tombo, MACIS and Siyabonga MPCCs. Library services were more used or accessed at MACIS centre (M = 1.9, SD = 1.0) and Siyabonga centre (M = 1.7, SD = .8), but less accessed at the rural telecentres of Hoxani (M = 1.5, SD = .9) and Tombo (M = 1.4, SD = .7). SDs indicate that respondent answers regarding library services usage differed more MACIS, Hoxani and Siyabonga centres and less at the Tombo MPCC.

Table 46 shows that most of the educational activities stated in the table are more undertaken at the rural Tombo MPCC, and then at Siyabonga and MACIS centres, but the activities are less undertaken at the rural Hoxani centre. Overall, assignment submission was the most undertaken educational activity at Tombo, MACIS and Siyabonga MPCCs.

Table 47: Results of Analysis of Variance: Use of ICT for Educational Purposes

Educational Activity		Sum of Squares	df	Mean Square	F	Sig.
Seeking information on available courses	Between Groups	20.044	3	6.681	6.279	.000
	Within Groups	198.992	187	1.064		
	Total	219.037	190			
Course registration	Between Groups	7.940	3	2.647	2.763	.043
	Within Groups	181.998	190	.958		
	Total	189.938	193			
Contact with lecturers of courses registered for	Between Groups	4.963	3	1.654	1.469	.224
	Within Groups	212.851	189	1.126		
	Total	217.813	192			
Obtain assignment information for courses registered for	Between Groups	19.373	3	6.458	5.856	.001
	Within Groups	210.607	191	1.103		
	Total	229.979	194			
Completion of assignments for courses registered for	Between Groups	16.664	3	5.555	4.798	.003
	Within Groups	219.959	190	1.158		
	Total	236.624	193			
Discussing study-related issues with fellow students	Between Groups	15.761	3	5.254	4.256	.006
	Within Groups	236.989	192	1.234		
	Total	252.750	195			
Assignment submission for courses registered for	Between Groups	17.329	3	5.776	5.414	.001
	Within Groups	200.588	188	1.067		

	Total	217.917	191			
Using library services	Between Groups	8.072	3	2.691	3.272	.022
	Within Groups	152.129	185	.822		
	Total	160.201	188			

Regarding the use of ICT to seek study information, as the Sig. is .000, which is less than .05, the level of significance, there were statistically significant differences between the telecentres regarding how users employ ICT for that purpose (using ICT to seek information about available courses). The same applies to use of ICT for course registration (Sig. = .043), obtaining information for courses registered for, completion of assignments, discussion of study-related issues with feloow students, assignment submission for courses registered for and ICT usage for library services (Sig. = .022).

No statistically significant differences were established between the telecentres regarding how users employ ICT to contact lecturers of courses registered for (Sig. = .224. The most important results of Scheffe post-hoc comparisons can be summarized as: Respondents at Hoxani telecentre made significantly less use of the facilities at telecentres to seek information on available courses than those at Tombo telecentre. Hoxani telecentre users also used the telecentre facilities significantly less for course registration than those at Tombo MPCC. With regard to obtaining information relating to assignments, the completion of assignments as well as the submission of assignments, Hoxani MPCC users used the telecentre facilities significantly less than both MACIS and Tombo MPCC users. However, with regard to the submission of assignments, MACIS users used the telecentre facilities also less than Tombo MPCC users. Hoxani telecentre users, on the other hand, used the telecentre facilities significantly less than MACIS users to discuss issues with fellow students and to gain access to library services.

The overall tendency that can be discerned is that telecentre users at Tombo made more use of the facilities at telecentres for most educational purposes than the other telecentres, but Hoxani in particular. MACIS telecentre users, on the other hand, made more use of the telecentre facilities to discuss issues with fellow students and to gain

access to library services. Overall, Hoxani MPCC users employed the telecentre facilities the least for educational purposes, while Tombo users – and MACIS users to a lesser extent – made particularly frequent use of the facilities at telecentres to advance their education.

Table 48: Telecentre Impact: Training in Computer Use

Users who received computer training at telecentre	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Yes	43	91.5	48	98.0	40	78.4	36	75.0	167	85.6
No	3	6.4	1	2.0	11	21.6	12	25.0	27	13.8
Service not available	1	2.1	0	0.0	0	0.0	0	0.0	1	0.5
Total %	**47**	**100.0**	**49**	**100.0**	**51**	**100.0**	**48**	**100.0**	**195**	**100.0**

Table 48 indicates that 85.6 per cent of the users (167 of the 200 sample) stated that they had received computer training at the telecentres; 43 of these individuals (91.5 per cent of the users at that centre) were at Hoxani centre, 48 persons (98 per cent of the MACIS group) were at MACIS centre, 40 persons were at Siyabonga centre (78.4 per cent of that centre's users) and 36 persons were at Tombo MPCC (comprising 75.0 per cent of users at the centre).

Only 27 persons stated that they have received no computer training at the telecentres and this figure represents 13.8 per cent of the total sample. In this untrained group, three users were at Hoxani MPCC (6.4 per cent of that centre's respondents), one person was from MACIS centre and that is 2.0 per cent of that centre's respondents, 11 users were at Siyabonga centre (21.6 per cent of that centre's users) and 12 persons

were at Tombo telecentre, comprising 25.0 per cent of that centre's users. There was only one user who stated that there was no computer training available at Hoxani MPCC (individual represents 2.1 per cent of that centre's respondents). At the other telecentres – MACIS, Siyabonga and Tombo - no one stated that computer training was not available.

Table 49: Chi-Square test: Training of Users in How to Use a Computer

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.481 [a]	6	.005
Likelihood Ratio	20.296	6	.002
Linear-by-Linear Association	8.889	1	.003
N of Valid Cases	195		

a. Four cells (33.3%) have expected count less than 5. The minimum expected count is .24.

As the sample Asymp. Sig. (2-sided) is .005, there are statistically significant differences between the telecentres regarding computer training received by the users at each telecentre – because the Asymp. Sig is less than 0.05, the level of significance.

Regarding computer training received at the telecentres, the most important differences between the telecentres were the following:

(a) More respondents indicated that they did receive computer training at Hoxani and MACIS than at the other two telecentres (Tombo and Siyabonga);
(b) More respondents indicated that they did not receive computer training at Siyabonga and Tombo than at Hoxani and MACIS centres; and
(c) Despite these differences, the majority of respondents indicated that they did receive computer training.

Table 50: Analysis of Variance Results: Computer Training and Technical Assistance Received

		Sum of Squares	df	Mean Square	F	Sig.
Training in how to use a computer	Between Groups	1.612	3	.537	4.093	.008
	Within Groups	25.075	191	.131		
	Total	26.687	194			
Training in computer software (e.g., training in word processing, etc.)	Between Groups	2.447	3	.816	4.442	.005
	Within Groups	35.071	191	.184		
	Total	37.518	194			
Technical assistance when using the technology or facility	Between Groups	3.857	3	1.286	3.407	.019
	Within Groups	66.784	177	.377		
	Total	70.641	180			
Training in Web site design	Between Groups	6.163	3	2.054	5.473	.001
	Within Groups	63.814	170	.375		
	Total	69.977	173			
Training in business courses	Between Groups	20.044	3	6.681	6.279	.000
	Within Groups	198.992	187	1.064		
	Total	219.037	190			

Regarding the computer training activities referred in Table 50 above there were statistically significant differences between the telecentres because the Sig. values are all less than .05, the level of significance. Therefore, there are statistically significant differences between the telecentres regarding training received by users in how to use

a computer (word processing skills), training in business skills, technical assistance received by users from telecentre staff and also training in Web site design. There are also significant differences between the telecentres with regard to training in computer software (p =. 005<0.05). The other differences between the telecentres are explained in the discussion of Table 51.

Table 51: Extent of Improvement of Users' Computer Literacy by the Telecentres

Extent to which users' computer literacy improved	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
To a large extent	24	50.0	34	68.0	20	39.2	16	33.3	94	47.7
To a reasonable extent	13	27.1	14	28.0	26	51.0	25	52.1	78	39.6
Neutral	2	4.2	1	2.0	2	3.9	3	6.3	8	4.1
To a small extent	4	8.3	1	2.0	1	2.0	2	4.2	8	4.1
Computer skill not improved at all	5	10.4	0	0.0	2	3.9	2	4.2	9	4.6
Total %	**48**	**100.0**	**50**	**100.0**	**51**	**100.0**	**48**	**100.0**	**197**	**100.0**

Ninety-four users (47.7 per cent of the total sample) stated that the telecentres had improved their computer literacy to a large extent. Seventy-eight respondents (39.6

per cent of the sample) stated that the telecentres improved their computer literacy to a reasonable extent. Of the 94 users, 16 persons were at Tombo MPCC (33.3 per cent of the users at that centre), 20 persons were at Siyabonga centre (39.2 per cent of users at that centre), 34 persons were at MACIS (68.0 per cent of users at that centre) and 24 people were at Hoxani MPCC. Thirteen of the 78 persons (who received computer literacy or improved it to a reasonable extent), were at the rural Hoxani MPCC (27.1 per cent of the centre users), 14 were at MACIS centre (28.0 per cent of the centre users), 26 users were at Siyabonga centre (51 per cent of users at that centre) and 25 persons (52.1 per cent of users at Tombo centre) were at Tombo MPCC.

Eight respondents (4.1 per cent of the total sample) had a neutral view (could not specify how their computer skills were improved by the telecentres) about the extent to which their computer skills were improved. Two persons were at Hoxani and Siyabonga telecentres each (4.2 and 3.9 per cent per telecentre respectively), one individual was at MACIS (2.0 per cent of MACIS users) and three respondents were at Tombo MPCC (6.3 per cent of that centre's users).

Eight other respondents (4.1 per cent of the total sample) stated that their computer skills were improved "to a small extent" by the telecentres. Of these eight persons, four were at Hoxani MPCC (8.3 per cent of that centre's users), one respondent was at MACIS and Siyabonga centre each (2.0 per cent per telecentre), and two respondents were at Tombo MPCC (4.2 per cent of that centre's users).

The last group of nine users (4.6 per cent of the total sample) stated that their computer literacy was "not at all improved" by the telecentres. Two of this nine were at Tombo MPCC (4.2 per cent of the centre's users), five were at Hoxani MPCC (10.4 per cent of that centre's users), another two were at Siyabonga telecentre (3.9 per cent of users at that centre) and no one provided this answer at MACIS telecentre.

The discussion above reveals that most respondents (i.e., 94) had their computer literacy improved "to a large extent" and others (i.e., 78) "to a reasonable extent" by computer training they obtained from the telecentres.

7.5.2 ICT: Business Use

Table 52: Telecentre ICT for Business Use

Business Activity	Telecentre	Users (N)	Mean	Standard Deviation
Obtaining business-related information	Hoxani	50	1.4	.9
	MACIS	49	2.1	1.1
	Siyabonga	49	2.3	1.0
	Tombo	47	2.3	1.0
Business skills	Hoxani	50	1.4	.9
	MACIS	50	2.0	1.1
	Siyabonga	49	2.4	1.0
	Tombo	47	2.0	.9
Employment information	Hoxani	48	1.4	.8
	MACIS	50	2.2	1.1
	Siyabonga	48	2.1	1.1
	Tombo	46	2.2	1.0
Employment applications	Hoxani	48	1.4	.8
	MACIS	48	2.2	1.2
	Siyabonga	48	2.2	1.0
	Tombo	46	2.1	.9
Personal business (e.g., Internet banking)	Hoxani	50	1.3	.8
	MACIS	50	1.5	.9
	Siyabonga	49	1.9	.9
	Tombo	45	1.4	.8
Banking and insurance inquiries	Hoxani	49	1.3	.8
	MACIS	49	1.1	.4

	Siyabonga	51	1.7	.8
	Tombo	45	1.7	.9

The scale used to obtain the data in Table 52 was 1 = Never, 2 = Seldom, 3 = Often and 4 = Very often. The mean usage of ICT to obtain business-related information search was higher at Tombo MPCC (M = 2.3, SD = 1.0), and Siyabonga telecentre (M = 2.3, SD = 1.0), and less at MACIS telecentre (M = 2.1, SD = 1.1) and Hoxani centre (M = 1.4, SD = .9). This result indicates that ICT was more employed to seek business-related information at urban Siyabonga and rural Tombo centres but less sought and obtained at MACIS and even lesser at Hoxani MPCC. SDs indicate that respondent answers differ more at MACIS, less at Siyabonga and Tombo centres and that there are not many respondent differences at Hoxani MPCC about this issue.

ICT usage mean for learning business skills was greater at Siyabonga centre (M = 2.4, SD = 1.0), than MACIS and Tombo centres (both Ms = 2.0, MACIS SD = 1.1 and Tombo SD = .9) and Hoxani MPCC (M = 1.4, SD = .9). These results indicate that business skills were more often obtained at the urban centres of Siyabonga and MACIS respectively but less often obtained at the rural centres of Tombo and Hoxani respectively.

As explained in Chapter 6, Orange Farm, where Siyabonga telecentre is situated, is a fast growing urban area which presents residents with many business opportunities as the nearest cities are located kilometres away from the township. A small business located in the township can bring services closer to locals thus reducing travelling and other costs. Therefore, it is understandable and makes a lot of sense that the Siyabonga telecentre mean use of ICT for business skills is the highest of the four centres. SDs indicate that respondents differ more at the urban MACIS and Siyabonga centres. There are fewer respondent differences at both rural centres, Tombo and Hoxani.

Employment search in ICT is reported more at MACIS centre (M = 2.2, SD = 1.1) and also Tombo MPCC (M = 2.2, SD = 1.0) but less reported at Siyabonga centre (M = 2.1, SD = 1.1) and Hoxani telecentre (M = 1.4, SD = .8). A reason for this finding

could be that there are many unemployed users at Tombo, MACIS and Siyabonga MPCCs. Most Hoxani MPCC users were employed and essentially there is less information-seeking about jobs at that centre. SD values regarding the use of ICT to seek employment information indicate that respondent answers differ more at MACIS and Tombo centres, and Siyabonga centre and differ less at Hoxani MPCC.

Reported centre job activity is at the urban centres of MACIS (M = 2.2, SD 1.2) and Siyabonga (M = 2.2, SD =1.0) and less job-related activity is less reported at the rural centres of Tombo (M = 2.1, SD = .9) and Hoxani MPCCs (M = 1.4, SD = .8). SDs indicate that respondents differ more regarding how ICT is employed for employment applications both at urban MACIS and Siyabonga centres, less at the semi-rural Tombo telecentre (semi-rural because this centre has similar qualities and characteristics, as well as activities, similar to those of the urban centres more than the other rural telecentre of Hoxani) and rural Hoxani telecentre.

Table 53: Extent to which the Telecentres Assisted Users to Obtain Employment

Extent to which telecentres assisted users to find employment	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
To a large extent	7	14.6	15	31.3	10	20.0	6	12.8	38	19.7
To a reasonable extent	9	18.8	10	20.8	17	34.0	7	14.9	43	22.3
Neutral	2	4.2	1	2.0	2	3.9	2	4.2	7	14.9
To a small extent	6	12.5	6	12.5	3	6.0	6	12.8	21	10.9
Telecentre did not assist to find employment at all	17	35.4	9	18.8	16	32.0	17	36.2	59	30.6
Total %	**48**	**100.0**	**48**	**100.0**	**50**	**100.0**	**47**	**100.0**	**168**	**100.0**

Table 53 illustrates that 38 users (19.7 per cent of the total sample) stated that the telecentres had assisted them to obtain employment to a large extent, 43 respondents (22.3 per cent of the total sample) stated that the telecentres had helped them to find employment "to a reasonable extent", seven persons (14.9 per cent of the sample) were neutral about this issue – which means that they did not know whether the

centres had helped them to find employment or not, 21 persons (10.9 per cent of the sample) stated that the centre assisted them to obtain employment “to a small extent” and 59 respondents (30.6 per cent) were not assisted by the telecentres to find employment “at all”.

Of the 38 who were assisted “to a large extent” by the centres to obtain work, six (12.8 per cent of that centre’s users) were at Tombo MPCC, 10 persons (20.0 per cent of Siyabonga users) were at Siyabonga centre, 15 were at MACIS centre (31.3 per cent of that centre’s users) and seven were at Hoxani MPCC (14.9 per cent of respondents at Hoxani centre). In the group of 43, who were reasonably assisted by the centres to obtain work, seven were at Tombo MPCC (14.9 per cent of that centre’s users), 17 were at Siyabonga centre (34.0 per cent of that centre’s users), 10 users (20.8 per cent) were at MACIS centre and nine were at Hoxani MPCC (18.8 per cent of centre respondents). The neutral group had two persons (4.2 per cent) based at Hoxani MPCC, one person (2.0 per cent) were at MACIS, two at Siyabonga (comprising 3.9 per cent of respondents there) and two people at Tombo MPCC (4.2 per cent of users at that centre). Those assisted by the centres, “to a small extent”, to find work, were six each at Hoxani and MACIS MPCCs (12.5 per cent per telecentre), three at Siyabonga (6.0 per cent of that centre’s users) and six (12.8 per cent) were at Tombo MPCC.

Of the 59 respondents (30.6 per cent of the sample) who were not assisted by the telecentres “at all” to find employment, 17 were at Tombo MPCC (36.2 per cent of the centre’s users), 17 were at Hoxani MPCC (35.4 per cent of that centre’s users), 16 were at Siyabonga telecentre (32.0 per cent of users at that centre) and nine were at MACIS telecentre (18.8 per cent of centre respondents).

It is clear from the discussion above, that most respondents (52.9 per cent of the sample) mentioned that the telecentres had assisted them – to some extent – to find employment while others (30.6 per cent of the sample) were not assisted towards obtaining employment.

Table 54: Extent to which users were ssisted by the Telecentres to start their own Businesses

Extent to which the users were assisted by the centre to start one's business	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
To a large extent	7	15.6	3	6.8	7	14.0	1	2.2	18	9.8
To a reasonable extent	3	6.7	8	18.2	18	36.0	6	13.3	35	19.0
Neutral	6	13.3	10	22.7	7	14.0	12	26.7	35	19.0
To a small extent	4	8.9	7	15.9	5	10.0	4	8.9	20	10.9
Telecentre did not assist one to start one's business at all	25	55.6	16	36.4	13	26.0	22	48.9	76	41.3
Total %	**45**	**100.0**	**44**	**100.0**	**50**	**100.0**	**45**	**100.0**	**184**	**100.0**

The largest single proportion of the respondents (76 or 41.3 per cent of the total sample) said that the centres did not at all assist them to start their own businesses. Of the 76, 22 users (48.9 per cent of the centre respondents) were at Tombo MPCC, 13

people (26.0 per cent of centre respondents) were at Siyabonga MPCC, 16 persons (36.4 per cent of centre respondents) were at MACIS and 25 (55.6 per cent of centre respondents) were at Hoxani MPCC. Of the 35 “neutral” group, 12 were at Tombo MPCC (26.7 per cent of that centre’s users), seven (14.00 per cent) were at Siyabonga centre, 10 persons (22.7 per cent) were at MACIS and six persons (13.3 per cent) were at Hoxani MPCC.

Respondents assisted to some extent by the centres to start their own businesses were 73 (36.5 per cent of the total sample). Altogether 35 respondents stated that the telecentres assisted them “to a reasonable extent” to start their own businesses; three of these (6.7 per cent of centre respondents) were at Hoxani centre, eight (18.2 per cent of centre respondents) were at MACIS, 18 (36.0 per cent) at Siyabonga centre and six (13.3 per cent of centre respondents) at Tombo MPCC. A total of 18 (9.8 per cent of the sample) of the respondents expressed the view that the telecentres assisted them to start their businesses “to a large extent”. Of these, one user was at Tombo MPCC (2.2 per cent of users there), seven each were at Hoxani and Siyabonga (15.6 and 14.0 per cent per telecentre respectively) and three users were at MACIS centre (6.8 per centre of users at that centre).

From the statistics above, it is reasonable to conclude that many respondents (i.e., 76 persons or 41.3 per cent of the sample) were not assisted by the telecentres to start their own businesses.

7.5.3 Medical, Political and Other Uses of Telecentre Technology

Table 55: Telecentre ICT for Medical, Political and Other Uses

ICT Use	Telecentre	Users (N)	Mean	Standard Deviation
Medical information	Hoxani	49	1.3	.8
	MACIS	49	1.7	1.0
	Siyabonga	48	1.6	.9
	Tombo	43	1.7	.9
Information search on issues of interest	Hoxani	49	1.5	.9
	MACIS	50	2.2	1.1
	Siyabonga	50	2.3	1.0
	Tombo	46	2.6	1.0
Interacting with government	Hoxani	49	1.3	.7
	MACIS	50	1.8	1.1
	Siyabonga	49	1.6	.9
	Tombo	46	2.7	1.0
Other personal business	Hoxani	50	1.3	.7
	MACIS	50	1.4	.8
	Siyabonga	51	2.1	1.0
	Tombo	45	1.7	1.0

To evaluate respondent answers in Table 55 the Likert scale used was 1 = Never, 2 = Seldom, 3 = Often and 4 = Very often. Using telecentre ICT to obtain medical information access occurs less at all the centres, MACIS (M = 1.7, SD = 1.0), Siyabonga (M = 1.6, SD =.9), Tombo (M = 1.7, SD = .9) and Hoxani (M = 1.3, SD =.8) telecentres. The above table indicate that medical information was most used (more sought and obtained) at Tombo and MACIS centre and less sought and obtained at Siyabonga and Hoxani centres. It is obvious that both rural and urban users are concerned about medical conditions and problems and all users from all

centres sought medical information from the centres. SDs indicate that the answers received from the respondents at the urban MACIS, Siyabonga centres, and the semi-rural Tombo centre (this centre is regarded as more semi-rural than rural because it is characterised by business activity usually prevalent in urban locations) were different between each respondent at those centres, than the differences in the answers obtained from the respondents who answered the questionnaire at the rural Hoxani MPCC.

Information search activity or issues of personal interest is reported at all the centres, more at Tombo (M = 2.6, SD = 1.0), Siyabonga (M = 2.3, SD = 1.0) and MACIS (M = 2.2, SD = 1.1) respectively but less reported at Hoxani MPCC (M = 1.5, SD = .9). Tombo MPCC once again indicates telecentre user patterns similar to those or the urban telecentres in this regard. Again, this result indicates that there was more information search at the three centres with many student users (Tombo, MACIS and Siyabonga), with fewer requests for information at the Hoxani MPCC mostly employed by old and middle-aged (30 years and above) teachers. SDs indicate that user answers differ more at the urban centres, MACIS and Siyabonga, also at the semi-rural Tombo MPCC, and that there are less respondent answer differences at the rural Hoxani telecentres.

Using the telecentre ICT to interact with government officials is reported to occur more at Tombo MPCC (M = 2.7, SD = 1.0) but occurring less at the other centres than at Tombo MPCC; MACIS (M = 1.8, SD 1.1), Siyabonga (M = 1.6, SD = .9) and Hoxani (M = 1.3, SD = .7) respectively. Tombo MPCC users accessed all Internet and e-government services through the government-sponsored PIT. SDs indicate that respondent answers are more different at MACIS and Tombo centres, but less different at Siyabonga and Hoxani telecentres.

Other personal business, using ICT, is carried out more, indicated by the bigger mean value, at Siyabonga telecentre (M = 2.1, SD = 1.0) but occurs less at the other centres, Tombo (M = 1.7, SD = 1.0), MACIS (M = 1.4, SD = .8) and Hoxani (M = 1.3, SD = .7) respectively. Bigger SD values indicate that respondent answers differ more at Siyabonga and Tombo and smaller SD values at Hoxani and MACIS MPCCs are an indication of fewer differences between respondents about using ICT for other personal business.

Conclusions drawn from Table 55 can be summarised thus: medical information, information on issues of personal interest and interaction with government officials are more often sought and obtained at Tombo MPCC and least sought and obtained at Hoxani MPCC. Other personal business is conducted more at Siyabonga telecentre and less at Hoxani MPCC.

The respondents also stated that the telecentres developed them in other areas of development – these areas were not specified in the question and, therefore, were also unspecified in respondent answers. Table 56 summarises responses to this effect.

Table 56: Extent to which the Telecentres Developed Users in Other Areas (of Development)

Extent to which the telecentres developed users in "other areas of development"	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
To a large extent	22	44.9	16	32.7	16	31.4	6	12.5	60	30.5
To a reasonable extent	9	18.4	14	28.6	20	39.2	21	43.8	64	32.5
Neutral	3	6.1	6	12.2	8	15.7	7	14.6	24	12.2
To a small extent	5	10.2	9	18.4	3	5.9	8	16.7	25	12.7
Telecentre did not assist one to develop one in other area of development at all	10	20.4	4	8.2	4	7.8	6	12.5	24	22.2
Total %	**45**	**100.0**	**44**	**100.0**	**50**	**100.0**	**45**	**100.0**	**197**	**100.0**

Most respondents (124) were of the opinion that the telecentres developed one “other area” in their lives, with six persons (30.5 per cent of the sample) stating that this area was developed “to a reasonable extent” and 60 persons stating that the area was developed “to a large extent”. Of the 64 (32.5 per cent of sample developed in one area of life to a reasonable extent), 21 persons (43.8 per cent of centre respondents) were at Tombo MPCC, 20 respondents (39.2 per cent of centre respondents) were at Siyabonga centre, 14 (28.6 per cent at centre) were at MACIS and nine (18.4 per cent at Hoxani centre) were at Hoxani MPCC. Of the 60 who were developed to “a large extent”, six (12.5 per cent of centre users) were at Tombo MPCC, 16 (31.4 per cent of centre respondents) were at Siyabonga centre another 16 (32.7 per cent of users at that centre) were at MACIS and 22 persons (44.9 per cent) were at Hoxani MPCC. Twenty-five persons (12.7 per cent of the sample) stated that the telecentres developed an area of their lives to “a small extent); of these five (10.2 per cent) were at Hoxani MPCC, nine (18.4 per cent) were at MACIS, three (5.9 per cent) were at Siyabonga and eight (16.7 per cent) were at Tombo MPCC.

The 24 persons (22.2 per cent of the total sample) who were not at all developed in any other area of their lives comprised six from Tombo centre (12.5 per cent of centre group), four from Siyabonga and MACIS each (7.8 and 8.2 per cent per telecentre respectively) and 10 persons (20.4 per cent of centre group) were at Hoxani MPCC. Another 24 persons (12.2 per cent of the sample) were neutral, stating that the centres had no impact on them in other areas of developing their lives, with three (6.1 per cent of Hoxani centre group) of these at Hoxani centre, six (12.2 per cent of group at MACIS) at MACIS centre, eight (15.7 per cent of group at Siyabonga centre) at Siyabonga and seven (14.6 per cent of the Tombo centre group) stating this fact at Tombo MPCC.

In summary, most respondents reported in Table 56 felt that some area of their lives was developed by the telecentres.

7.5.4 Other ICT uses

Responses to the open question concerning "*other*" purposes for which respondents employ the telecentre ICT are post-coded in this sub-section. The respondent's coded answers for all the open questions are listed in Addendum D.

The sub-section below provides post-coding of answers to Question 16 of the questionnaire.

Table 57: *Other* Purposes the ICT is Used for at the Centres

	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		
Response	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**Total (N)**
No answer	10	20	10	20	7	13.5	2	4.2	29
Irrelevant answer	0	0	1	2	0	0	0	0	1
Gained computer skills or studies computer course(s), e.g., ICDL, Info-Lit, etc.	20	40	15	30	11	21.2	18	38	64
Obtained job and interview-related skills (from staff)	0	0	4	8	1	1.9	0	0	5

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total (N)
	N	%	N	%	N	%	N	%	
Use government services	0	0	0	0	0	0	6	12.5	6
Gained knowledge or used the Internet for information purposes	2	4	3	6	13	25	2	4.2	20
Make photocopies at the centre	1	2	1	2	3	5.8	6	11.5	11
Acquired building and bricklaying (business skills)	0	0	0	0	4	7.7	0	0	4
Fax documents and receive faxes	0	0	0	0	3	5.8	1	1.9	4
Seek jobs on the Internet	0	0	7	14	5	9.6	0	0	12
Improve my English	1	2	0	0	0	0	0	0	1

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total (N)
	N	%	N	%	N	%	N	%	
Conduct workshops (e.g. for business and HIV Aids) and use the centre for examinations	1	2	1	2	0	0	0	0	2
Need computer skills or literacy as I want to work in an office or bank	0	0	0	0	2	3.9	0	0	2
Learning computer skills to teach others	2	4	1	2	1	1.9	1	2.1	5
Have gained nothing yet or just came to the telecentre to register for a computer course	0	0	1	2	0	0	0	0	1
Using the post office	2	4	0	0	0	0	3	6.3	5

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total (N)
	N	%	N	%	N	%	N	%	
Learning OBE teaching skills on computers	13	26	0	0	0	0	3	6.3	16
Learning cooking and baking skills (business)	0	0	0	0	2	3.9	0	0	2
Selling products to others	0	0	1	1.2	0	0	1	1.2	2
Seeking banking and courier information	0	0	0	0	0	0	1	1.2	1
Seeking study information	0	0	0	0	7	13.5	2	4.2	9
Buying airtime	0	0	0	0	1	1.9	0	0	1
Want cheaper ICT services and the telecentre is near home instead of town	0	0	4	8	0	0	0	0	4

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total (N)
	N	%	N	%	N	%	N	%	
Use public telephones	2	4	0	0	1	1.9	2	4.2	5
Scan documents	0	0	0	0	2	3.9	0	0	2
Read newspapers	1	2	0	0	0	0	0	0	1
Laminate documents	0	0	0	0	1	1.9	0	0	1
Use the tuck shop	0	0	0	0	1	1.9	0	0	1
Type and print documents	0	0	0	0	0	0	1	2.1	1
Submit assignments	0	0	0	0	2	3.9	1	2.1	3
Learn sewing and knitting	0	0	0	0	2	3.9	0	0	2
Meet and socialise with other people, want entertainment; play games and music on the CD-ROMs	0	0	1	2.1	1	1.9	1	2.1	3

Table 57 illustrates that 20 per cent of Hoxani telecentre respondents did not answer this question, while the corresponding percentages at MACIS were 38, 13.5 at Siyabonga telecentre and 4.2 at Tombo MPCC. One person provided an irrelevant answer at MACIS while no one provided an irrelevant answer at Hoxani, Tombo and Siyabonga MPCCs. Most respondents were undertaking computer literacy training at the centres, and the proportion of users undertaking such training were 40 per cent at Hoxani MPCC, 20 per cent at MACIS, 21.2 per cent at Siyabonga telecentre and 38 per cent at Tombo MPCC. Respondents who gained Internet-usage skills were two individuals (four per cent) at Hoxani MPCC, six per cent of MACIS telecentre users, 25 per cent of Siyabonga telecentre users and 4.2 per cent of Tombo MPCC respondents.

Four individuals (7.7 per cent) learnt bricklaying and building skills at Siyabonga telecentre and no individuals gained these skills at the other centres. No one acquired business-related skills at Tombo MPCC, while one individual gained such skills at the other centres (one person per telecentre; 2 per cent of Hoxani MPCC users, 2 per cent of MACIS users and 1.9 per cent of Siyabonga telecentre users). ICT is also used to seek jobs at the urban telecentres but not at the rural telecentre because 22 per cent of MACIS users employed the Internet to seek work and 9.6 per cent of Siyabonga centre users employed ICT for that purpose. No one at Tombo and Hoxani MPCCs employed ICT to seek work through the Internet. One person (1.9 per cent) at Siyabonga telecentre sought work information from the telecentre staff while four persons (eight per cent) of MACIS users sought this information, and also information about how they should perform at job interviews, from telecentre staff verbally. No one sought employment information from rural Tombo and Hoxani telecentre staff.

Photocopies were also made at the telecentres, by two per cent of Hoxani telecentre users, two per cent of MACIS users, 5.8 per cent of Siyabonga telecentre users and 12.5 per cent of Tombo MPCC users. Two persons (one from Hoxani MPCC and one from MACIS, two per cent of users from each telecentre) used the telecentre to conduct workshops and employ the telecentre as a venue for examinations. One Hoxani MPCC user (two per cent of the centre users) employed the telecentre ICT to improve English skills and no one employed ICT for this purpose at the other telecentres. Two individuals at Siyabonga telecentre (3.9 per cent of centre users)

employed the ICT to seek work in a bank or an office and no one else employed ICT for this purpose at the other telecentres.

Six persons at Tombo telecentre (12.5 per cent of users at this centre) used ICT for government services and no users employed ICT for this purpose at the other centres. One person at Hoxani MPCC (two per cent of that centre's users) employed the telecentre to study and no one used the telecentre for that purpose at the other centres. Others users gained computer skills at the centre to teach others in the community and there were two persons (four per cent of centre users) at Hoxani MPCC, and one person each at the other telecentre. No one stated that they had gained nothing at the telecentre but one person at the MACIS (two per cent) stated that she or he had gained nothing yet at the centre but planned to register for a computer skills training course.

Twenty-six per cent of the Hoxani MPCC (13 persons) users gained OBE teaching skills from the centre, three persons (6.3 per cent of centre users) gained these skills at Tombo MPCC, and no one gained these skills at the urban centres. Two persons (four per cent of the centre users) attended cooking and baking classes at Siyabonga telecentre and no one else attended the classes at the other centres. Two individuals (four per cent of centre users) at Hoxani MPCC and three persons at Tombo MPCC (6.3 per cent of centre users) used the post office services at the rural telecentres. No one used a post office service at the urban telecentres.

Two persons (one at MACIS and another at Siyabonga telecentre) employed the telecentre to meet other people or socialise with others. No one at the rural telecentres employed the centre for socialising purposes. Five persons used telephones at the telecentres; two persons at Hoxani MPCC (four per cent), one person at Siyabonga MPCC (1.9 per cent) and two persons at Tombo MPCC (4.2 per cent of centre users). No one employed telephones at MACIS. One individual (two per cent of centre users) read newspapers at Hoxani MPCC and no one read newspapers at the other centres. Two persons (3.9 per cent of centre users) scanned documents at Siyabonga telecentre and no one scanned documents at the other centres.

One individual (1.9 per cent of centre users) employed Siyabonga telecentre to buy airtime but no one employed the other centres for this purpose. One person laminated

documents (1.9 per cent of centre users) and another (again 1.9 per cent of the centre users) used the tuck shop at Siyabonga telecentre but one other people employed the other centres for these ends. One person (2.1 per cent of centre users) printed documents at Tombo MPCC and no one printed documents at the other centre. Two persons submitted university or school assignments at Siyabonga MPCC (3.9 per cent of the users) and one person (1.9 per cent of centre users) at Tombo MPCC used the telecentre for that purpose. At Hoxani and MACIS centres, no one employed the ICT to submit university assignments.

One person (1.9 per cent of centre users) bought airtime at Siyabonga MPCC and no one else at the other centres. One individual (two per cent of centre users) studied art and crafts at Hoxani MPCC but no one else employed the telecentre for this purpose at the other centres. Two persons (3.9 per cent of centre users) learned gained and knitting skills at Siyabonga MPCC and no one gained these skills at the other centres. One person faxed documents at Siyabonga (1.9 per cent of centre users) telecentre and another at Tombo MPCC (2.1 per cent of centre users). At the other centres no one faxed documents. Seven persons (13.5 per cent of centre users) sought study information from Siyabonga telecentre and two persons at Tombo MPCC (4.2 per cent of centre users) employed ICT to seek study information. No one sought study information at Hoxani and MACIS telecentres.

One person (2.1 per cent of centre users) sought courier and banking information from Tombo telecentre and no one else sought this information from the other centres. Two individuals sold products at the telecentres to other people; one person (2 per cent of centre users) at MACIS centre and another (2.1 per cent of centre users) at Tombo MPCC. At MACIS MPCC four persons (8 per cent of centre users) used this telecentre for its cheaper services and also because the centre was near home, compared to the city. No one stated using the other telecentres for the latter reason at the other telecentres.

From the discussion above, it is clear that the greatest single proportion of users employed the telecentre to learn computer literacy skills (64 persons or 32 per cent of the 200 total sample), and obtain OBE knowledge and skills (16 persons or 8 per cent

of the total sample of 200 telecentre users) to teach children at schools. Other totals regarding what users employed ICT for can be seen in Table 57.

7.5.5 Telecentre ICT charges

Table 58: Means: Respondent Views about Telecentre Technology Prices

User feelings about telecentre prices	Hoxani (Rural)	MACIS (Urban)	Siyabonga (Urban)	Tombo (Rural)
Users (N) Mean	48 3.2	49 2.9	51 2.9	48 3.2
Standard Deviation	.8	.7	.8	.5

The scale used in this question (for Table 58) was: 1 = Very expensive, 2 = Expensive, 3 = Affordable or Reasonable, 4 = Cheap and 5 = Very cheap. The Hoxani centre mean concerning users' feelings about the prices charged at the telecentres for equipment usage (M = 3.2, SD = .8), is more than that of MACIS (M = 2.9, SD = .7), and Siyabonga (M = 2.9, SD = .8) telecentres but equals that of Tombo MPCC (M = 3.2, SD = .5). Using the scale above to interpret the data, urban MACIS and Siyabonga centre users regarded the prices as expensive since the centre means of 2.9 each represent more or less expensive prices or more than expensive in the scale. However, rural users at Tombo and Hoxani MPCCs stated that the prices were affordable because the means of 3.2 at both centres indicate more than affordable in the question scale. Respondent answers were more different between the users because of bigger SD values, at Hoxani and Siyabonga centres and differ less at MACIS and Tombo telecentres, because the SDs are smaller at the latter centres. Very little difference between SD values of Hoxani, MACIS and Siyabonga MPCCS is indicated.

However, when considering all the respondents together, according to the data reported in Table 59, 69.4 per cent of the 200 (136 persons) expressed the view that the telecentre prices were reasonable or affordable, 9.7 per cent of the sample or 19 persons regarded the prices as expensive, 3.1 per cent of the sample or six persons, viewed the prices as very expensive, 10.7 per cent of the total sample or 21 persons regarded the prices as cheap and 7.1 per cent stated that the prices were very cheap. Of the 136 respondents (69.4 per cent of the sample) who regarded the telecentre prices as affordable, most – 36 (75.0 per cent) were at Tombo MPCC, 35 (68.6 per cent) were at Siyabonga centre, 34 (69.4 per cent) were at MACIS centre and 31 persons (64.6 per cent) answered the questionnaire at the rural Hoxani MPCC.

The 19 persons (9.7 per cent of the total sample) who stated that the prices were expensive comprised two from Tombo MPCC (4.2 per cent), five from Siyabonga centre (9.8 per cent), another five from Hoxani centre (10.4 per cent) and seven from MACIS. Six individuals stated that the prices were very expensive; compared to no one from Tombo and Hoxani MPCCs (.0 per cent respectively), two persons at MACIS (4.1 per cent) and four people at Siyabonga centre (7.8 per cent). Those who regarded the prices as cheap were 21 (10.7 per cent of the sample), eight people (16.7 per cent) from Tombo centre, five persons each from Siyabonga and Hoxani centres (9.8 and 10.4 per cent per telecentre respectively) and three people from MACIS (6.1 per cent of respondents at that centre).

The total number of respondents interpreting the prices as very cheap and was 14 (7.1 per cent of the sample). Seven of the group (14.6 per cent of Hoxani MPCC respondents) were at Hoxani centre, three (6.1 per cent of centre users) were from MACIS, and four persons were at Siyabonga and Tombo MPCC – two per telecentre (3.9 per cent and 4.2 per cent of the respondents at each telecentre respectively).

The statistics above are summarised in Table 59.

Table 59: Respondent Feelings about Telecentre Prices

Respondent feelings about prices charged by the telecentres	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Very expensive	0	0.0	2	4.1	4	7.8	0	0.0	6	3.1
Expensive	5	10.4	7	14.3	5	9.8	2	4.2	19	9.7
Affordable	31	64.6	34	69.4	35	68.6	36	75.0	136	69.4
Cheap	5	10.4	3	6.1	5	9.8	8	16.7	21	10.7
Very Cheap	7	14.6	3	6.1	2	3.9	2	4.2	14	7.1
Total %	**45**	**100.0**	**44**	**100.0**	**50**	**100.0**	**45**	**100.0**	**196**	**100.0**

7.5.6 Benefits to users: Impact on Non-formal and Formal Education

Coding of answers relating to specific ICT training received by users at the telecentres yielded the responses in Table 60.

Table 60: ICT or Services used by the Respondents at the Centres

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
No answer	22	44	18	36	30	57.7	24	50	91
Irrelevant answer	1	2	1	2	0	0	0	0	2
ICDL computer course learning	6	12	0	0	1	1.9	6	12.5	13
Gaining DTP skills	0	0	0	0	1	1.9	0	0	1
Internet (Windows Explorer) usage skills gained	0	0	4	8	0	0	0	0	4
Training in customer service skills	5	10	2	4	0	0	0	0	7
Computer literacy course: Introduction to PCs or	5	10	5	10	3	5.8	6	12.5	19

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Nothing	0	0	0	0	0	0	6	12.5	6
Gained OBE teaching skills	6	12	0	0	0	0	4	8.3	10
Use the PIT for government services	0	0	0	0	0	0	6	12.5	6
Doing Internet banking training	0	0	0	0	1	1.9	0	0	1
Doing Internet banking training	0	0	0	0	1	1.9	0	0	1
Completing E-Citizen course and Cisco Network Associate course	0	0	0	0	0	0	6	12.5	6

Response	Hoxani (Rural) N	%	MACIS (Urban) N	%	Siyabonga (Urban) N	%	Tombo (Rural) N	%	Total N
Completing the "Experiential Learning or Public Management Course"	4	8	4	8	0	0	2	4.2	10
Learned public speaking and presentation skills	6	12	5	10	7	13.5	0	0	18

Ninety-one persons of the sample 200 (45.5 per cent of the group) did not answer this question; 22 at Hoxani MPCC (44 per cent of centre respondents), 18 at MACIS (36 per cent of respondents at centre), 30 at Siyabonga (57.7 per cent of centre group) and 24 at Tombo MPCC (50 per cent of centre users). Two persons, one from Hoxani MPCC (2 per cent) and another from MACIS (also two per cent) did not answer what was asked but provided irrelevant answers. Six persons at Tombo MPCC (12.5 per cent of the centre users) held the view that they gained nothing from the telecentre whereas at the other centres no one mentioned that. Six persons at the Hoxani MPCC (12 per cent of centre users) learned the ICDL course at the centre, one individual (1.9 per cent of centre users) studied this course at Siyabonga MPCC and six persons at Tombo MPCC studied the ICDL course (12.5 per cent of the centre users). One Siyabonga telecentre user (1.9 per cent of total centre users) stated that he or she gained DTP skills at the centre and no one in the other centres stated that. Four persons (8 per cent of centre users) used the Internet at MACIS centre and no one from the other centres mentioned using this service in this particular question.

Nineteen persons from all the centres gained computer literacy skills at the centres (5 persons or 10 per cent at Hoxani and MACIS centres each, three persons or 5.8 per cent at Siyabonga telecentre and six persons or 12.5 per cent of Tombo MPCC users).

Six individuals (12.5 per cent of centre users) studied the E-Citizen and Cisco Certified computer courses at Tombo MPCC and no other persons studied these courses at the other centres. Eighteen persons learned public speaking or presentation skills at the telecentres; six persons (12 per cent) from Hoxani MPCC, five people (10 per cent) from MACIS centre and seven persons (13.5 per cent) from Siyabonga telecentre. No one stated gaining the latter skills at Tombo MPCC in this question. Six persons (12.5 per cent of centre users) employed the PIT for government services at Tombo MPCC and no one else from the other centres. Training in how to deal with customers was received by five persons at Hoxani MPCC (10 per cent of centre users), two persons at MACIS centre (four per cent us centre users) and one individual at Siyabonga centre (1.9 per cent of centre users) and no one at Tombo MPCC.

Training in Internet banking was undertaken by one individual at Siyabonga telecentre (1.9 per cent of centre users) and by no one else at the other centres. OBE teacher training was received by six individuals (12 per cent of centre users) at Hoxani MPCC and four persons (8.3 per cent of centre users) at Tombo MPCC. Four persons studied the "Experiential Learning or Public Management Course" both at Hoxani and MACIS centres (eight per cent of users at each centre) and two persons (4.2 per cent of centre users) studied this course at Tombo MPCC – no one at Siyabonga telecentre stated that they studied that particular course.

In conclusion, most benefits gained by users at the telecentres, as far this question is concerned, Table 62, shows that 19 persons of the sample of 200 sample (9.5 per cent of 200) undertook computer literacy training at the centres, while 18 persons (9 per cent) gained public speaking skills, six persons (three per cent of 200) employed the PIT to access government services and completed the E-Citizen and Cisco Certified Network course, seven persons (four per cent of 200) were empowered with customer service skills and 10 people (five per cent of the sample) gained OBE teaching skills.

Table 61: Telecentre ICT Benefits - Impact of Telecentres on Non-formal and Formal Education

Impact on user education	Telecentre	Users (N)	Mean	Standard Deviation
Extent to which telecentre improved respondent non-formal education	Hoxani	20	1.4	.6
	MACIS	20	1.1	.4
	Siyabonga	21	1.7	.8
	Tombo	27	1.1	.4
Extent to which telecentre assisted respondent formal education	Hoxani	46	3.1	.8
	MACIS	50	3.1	.7
	Siyabonga	51	3.0	.7
	Tombo	48	3.2	.8

The scale employed in this question relating to education was 4 = To a large extent, 3 = To a reasonable extent, 2 = To a small extent and 1 = Not at all. The centre means for improvement of non-formal education are Hoxani MPCC (M = 1.4, SD = .6), MACIS (M = 1.1, SD = .4), Tombo centre (M = 1.1, SD = .4) and Siyabonga centre (M = 1.7, SD = .8) and these means indicate that telecentre user non-formal education was more improved at Siyabonga and Hoxani MPCCS than at MACIS and Tombo centres. SDs indicate that respondents disagree more on this question at Siyabonga and Hoxani centres because of the bigger SDs. Respondent answers are less different on the issue at MACIS and Tombo centres, because the smaller SDs at these latter centres indicate that.

Overall, the results indicate that respondents at the telecentres felt that the telecentres did not improve their non-formal education very much but improved their formal education to a large extent as the mean scores were higher throughout than for non-formal education.

Formal education improvement mean scores of the centres are Hoxani (M = 3.1, SD = .8), MACIS (M = 3.1, SD = .7), Siyabonga (M = 3.0, SD = .7) and Tombo (M = 3.2, SD = .8). SDs indicate that there are more respondent opinion differences on ICT impact on formal education at rural Hoxani and Tombo centres because of the bigger SDs, and less respondent opinion differences about this issue at urban MACIS and Siyabonga centres, as the smaller SDs at the latter centres indicate that.

The specific ways in which the centres improve the users' formal education are stated in Table 62.

Table 62: ANOVA: Telecentre Impact on Non-formal and Formal Education of User

		Sum of Squares	Df	Mean Square	F	Sig.
Extent to which the telecentre improved respondents' non-formal education or lifelong learning	Between Groups	4.370	3	1.457	3.630	.016
	Within Groups	33.710	84	.401		
	Total	38.080	87			
Extent to which the telecentre assisted respondents in advancing their formal education	Between Groups	.767	3	.256	.398	.754
	Within Groups	122.617	191	.642		
	Total	69.977	173			

As the Sig. is .016, which is smaller 0.05, there are statistically significant differences between the telecentres regarding the extent to which the telecentres improved respondents' non-formal education or lifelong learning. The same applies to the extent to which the telecentres assisted respondents in advancing their formal

education (Sig. = .754). The specific ways in which the centres improve the users' formal education are stated in Table 63.

Table 63: Ways in which User Formal Education are advanced by the Telecentres

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
No answer	13	26	22	44	14	27	2	4.2	56
Faxing documents and receiving faxes	0	0	0	0	0	0	2	4.2	2
Irrelevant answer	0	0	1	2	0	0	0	0	1
Gained OBE computer-based training for teachers or improved work planning and quality of teaching	7	14	0	0	0	0	2	4.2	9

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Print and fax documents	0	0	0	0	0	0	1	2.1	1
Improved education received at college at telecentre	1	2	0	0	2	3.8	0	0	3
Receive certificates for courses passed at telecentre	2	4	1	2	1	1.9	0	0	4
Completed a college computer course; completed a school computer course; passed a call centre course after learning computer skill at telecentre	1	2	0	0	1	1.9	2	4.2	4

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Learned computer literacy skills	18	36	13	26	11	21.2	5	10.4	47
Nothing or nothing yet as the user is still new at telecentre	0	0	1	2	1	0	0	0	2
DTP skills	0	0	0	0	3	6	0	0	3
Studied (LAN) computer networking course or passed the ICDL course and received certificates for completed courses	2	4	0	0	1	1.9	4	8.3	7
Centre near home, no travel town to access cheap ICT	0	0	3	6	0	0	2	4.2	5

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Got promoted at work; telecentre computer training advanced career	0	0	5	10	1	1.9	0	0	6
Learnt how to use Internet services (e-mail, e-banking, e-shopping) and use the Internet to seek study information, general information and apply for work	2	4	2	4	13	25	14	29.2	31
Scanning Documents	0	0	0	0	0	0	1	2.1	1
Completed E-Citizen course	0	0	0	0	0	0	1	2.1	1

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Obtaining information for my studies, faxing study information and receiving faxes	0	0	0	0	0	0	6	12.5	6
Learned presentation skills (MS PowerPoint) or taught me confidence when presenting	0	0	0	0	3	5.8	1	2.1	4
Learnt Batho Pele or Customer Service Principles; Obtained Experiential Learning course	0	0	0	0	0	0	4	8.3	4

Response	Hoxani (Rural) N	%	MACIS (Urban) N	%	Siyabonga (Urban) N	%	Tombo (Rural) N	%	Total N
Use telephones at the telecentre	0	0	1	2	0	0	0	0	1
Taught me hard work or how to stand up for myself and work hard or life skills; "taught me not to fear computers" and that computer is a necessity in life	2	4	0	0	0	0	2	4.2	4

At Tombo MPCC, two persons (4.2 per cent of centre users) failed to answer the question while two other persons employed the facsimile. Two other persons gained OBE skills, one individual (2.1 per cent) completed the ICDL course, two persons (4.2 per cent) completed a university or college computer course with ease after receiving assistance from the telecentre with computer skill. Five persons (10.4 per cent) gained computer usage skills and three persons (6.3 per cent) studied a computer networking course. Two people (4.2 per cent) stated that hey were glad to use cheaper IT services at the centre which is also closer to home and 14 users (29.2 per cent) used the Internet to seek study information. Three users (6.3 per cent) obtained business-

related skills and six others (12.5 per cent) employed the facsimile to send and receive study materials.

One user (2.1 per cent of centre users) learnt presentation skills and another completed the E-Citizen course. Two more stated that they had learnt from the centre "not to fear computers but use them", another two employed the PIT to access government services and four persons (8.3 per cent) learnt a customer service course or what they referred to as "Batho Pele Principles" employed in the public sector.

At Hoxani MPCC, 13 people (26 per cent of centre users) did not answer the question while 18 persons (36 per cent) gained computer usage skills at the telecentre. Seven people (14 per cent) learned OBE teaching skills, one individual (two per cent) claimed to have bettered his or her education received from university, two persons (four per cent) stated that the telecentre made them purchase computers because it taught them that a computer is a necessary tool to have if one is a teacher or someone who needs knowledge; two persons (four per cent) obtained certificates at the centre for courses passed and another two persons obtained the ICDL course. One individual (two per cent of the centre group) passed a call centre course after completing a computer literacy course at the telecentre and two other persons (four per cent) used the Internet for research and writing their work.

At MACIS centre, 22 people (44 per cent of that group) did not answer this question, while two (four per cent) individuals obtained business-related skills from the centre. One person (two per cent) got promotion at work after completing a computer literacy course at the centre, 13 persons (26 per cent) gained computer literacy skills, an individual (two per cent) stated that she or he employed telephones at the centre while another individual (two per cent) provided an irrelevant answer to the question. Four other individuals (8 per cent) stated that the centre assisted them to obtain better jobs, three persons (6 per cent) stated that they employed the centre because it offered cheaper services and it was located near home, one person (two per cent) gained nothing from the centre and another person (two per cent of the MACIS respondents) stated that it was good that they received certificates from the centre for courses studied because this enabled them to obtain work.

Thirteen individuals (25 per cent) at Siyabonga telecentre received Internet-usage skills while three persons (5.8 per cent) received DTP skills, 11 persons (21.2 per cent) received computer literacy skills and three users (5.8 per cent) gained public speaking skills which enabled them to speak "confidently" in workshops to people in the public and private sectors. Fourteen persons (27 per cent of centre users) failed to answer the question and one individual (1.9 per cent of centre users) obtained business skills, another passed a call centre course after completion of the telecentre computer course, one other individual stated that she or he obtained a better job after completing the telecentre computer literacy course while another person stated that she or he gained nothing from the centre. Another person obtained the ICDL course while two persons (3.8 per cent of the Siyabonga respondents) stated that they had improved the education received from university at the centre.

Ways in which user formal education was improved are learning computer lliteracy skills (47 persons) and learning how to use Internet-related services (by 31 persons).

The post-coding of respondent answers to Question 25 of the questionnaire, regarding other ways in which the telecentres assist the users, produced the responses in Table 64.

Table 64: *Other Ways* in which the Telecentres Assisted Users

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Obtained business-related information and skills	0	0	1	2	7	13.5	3	6.3	11
Type school work or assignments	0	0	0	0	0	0	3	6.3	3

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Receive and send faxes	0	0	0	0	0	0	5	10.4	5
Learnt how to use the Internet-related services (e-mail, apply for work via the Internet, etc.);	1	2	5	10	8	15.4	2	4.2	16
Learnt word processing skills and how to use other computer software	21	42	12	24	16	30.8	9	18.8	58
Obtain study-related information from telecentre	0	0	2	4	1	1.9	4	8.3	7
Obtain information on time, communication is made easy at the telecentre	3	6	0	0	1	1.9	2	4.2	6

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Community service – teach other computer skills and health issues	3	6	0	0	0	0	1	2.1	5
Learnt OBE skills	5	10	0	0	1	1.9	0	0	6
Learnt customer service skills and how to deal with different clients and students	0	0	0	0	2	3.8	2	4.2	4
Teaching acquired skills to others I offer community service at the telecentre	2	4	0	0	2	3.8	3	6.3	7
No answer	10	20	23	46	7	14.6	0	0	50
Meet other people who inform me about jobs in cities	0	0	0	0	0	0	1	2.1	1

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Got promotion at work after completion of telecentre computer course	1	2	2	4	0	0	0	0	3
Telecentre computer training assisted me to pass a degree or another course	1	2	0	0	1	1.9	1	2.1	3
Receive certificates for courses passed at telecentre	1	2	0	0	0	0	2	4.2	3
Telecentre taught me self-discipline and gave me confidence to achieve what I want to achieve and not “fear computers”	2	4	3	6	2	3.9	3	6.3	10

No one learned business courses at Hoxani MPCC while one person (2 per cent of users at that centre), seven persons at Siyabonga centre (13.5 per cent of the group) and three users at Tombo MPCC (6.3 per cent of the users) gained business-related skills, according to Table 64.

Three users at Tombo MPCC (6.3 per cent) typed school work. The Internet was used by one person at Hoxani MPCC (2 per cent of the users at the centre), five people at MACIS (10 per cent of the users), eight persons at Siyabonga centre (15.4 per cent) and two at Tombo MPCC (4.2 per cent). Five persons employed the facsimile at Tombo MPCC (10.4 per cent). The greatest single proportion users at the centres gained word processing skills, 21 at Hoxani MPCC (42 per cent), 12 at MACIS (24 per cent), 16 at Siyabonga (30.8 per cent) and nine at Tombo MPCC (18.8 per cent). Six persons obtained information more easily at the centres and one stated that "communication is made easy at the centre" and in this group there were three persons at Hoxani centre (six per cent), one at Siyabonga centre (1.9 per cent of users at that centre) and two at Tombo MPCC (4.2 per cent). Other users learned OBE skills, five at Hoxani MPCC (10 per cent) and one individual at Tombo MPCC (2.1 per cent of the centre users).

Seven persons mentioned being involved in community service by teaching others skills learnt, e.g., computer usage skills, two persons each from Hoxani and Siyabonga centres (four per cent and 3.8 per cent respectively), and three users at Tombo MPCC (6.3 per cent of the centre users). Fifty persons (25 per cent of the sample) did not answer the question from all the centres. Three persons at MACIS centre (six per cent of centre users) provided answers that did not answer what was asked. It should also be stated that there was no consistency in the way users answered the open questions because some answered some questions but left other questions (in the same questionnaire) unanswered.

Some users obtained study-related information from the centres, two persons at MACIS (four per cent of centre users), one at Siyabonga centre (1.9 per cent of centre users) and four at Tombo MPCC (8.3 per cent). Three users appreciated receiving certificates from the telecentres upon completion of computer training because the certificates enabled them to obtain work; one of these persons was at Hoxani MPCC

(two per cent of users) and two were at Tombo MPCC (4.2 per cent of centre users). Three users gained work promotions after completing a telecentre computer course, one from Hoxani centre (two per cent of centre users) and two from MACIS (four per cent of centre users). Three persons said the telecentre computer training they received assisted them to pass other college courses, one from Hoxani centre (two per cent), one at Siyabonga centre (1.9 per cent of centre users) and another from Tombo MPCC (2.1 per cent of users at the centre). Lastly, ten persons learnt "not to fear computers" at the centres and gained "self-discipline to finish projects" and "meet deadlines" – two at Hoxani centre (four per cent), three at MACIS (six per cent), two from Siyabonga centre (3.9 per cent of users at the centre) and three at Tombo MPCC (6.3 per cent).

The most "other" learnt skills by users at the centre, according to Table 64, are how to use computer software (by 58 persons), use of Internet services (by 16 persons), teaching of self-discipline, confidence and "not to fear computers" (stated by 10 persons) and obtaining of business-related skills (by 11 persons).

The users, however, still required other services from the telecentres and these are stated in Table 65.

7.6 USER UNMET NEEDS

7.6.1 "Other" technology and services required

An analysis of the unmet needs of the respondents (Question 17 of the questionnaire) yielded the answers in Table 65.

Table 65: Unmet Needs per Telecentre

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
No answer	12	24	20	40	12	23.1	0	0	44
More younger people to use the centre	1	2	0	0	0	0	0	0	1
More involvement by community members in telecentre activities	1	2	0	0	0	0	0	0	1
More telecentre staff to assist users who come at different times	2	4	0	0	0	0	2	4.2	4
Nothing	1	2	3	6	1	1.9	0	0	5
Internet, E-Mail and other Internet-related services	19	38	8	16	19	37	2	4.2	48

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
More or new fast computers	0	0	1	2	0	0	0	0	1
Computer technician course, technician to fix computers	2	4	0	0	0	0	0	0	2
Training in computer software skills	4	8	0	0	0	0	0	0	4
Accreditation of courses	3	6	0	0	0	0	0	0	3
Sports facilities or gym	1	2	0	0	0	0	1	2.1	2
More printers, colour printer	2	4	2	4	1	1.9	2	4.2	7
Business skills	2	4	1	2	1	1.9	2	4.2	6
Employment for young people	0	0	0	0	0	0	1	2.1	1

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Video conference	1	2	0	0	0	0	0	0	1
Videos, games or Entertainment	1	2	0	0	1	1.9	0	0	2
Video camera	1	2	1	2	0	0	0	0	2
PIT	2	4	0	0	0	0	0	0	2
Radio or Internet radio	2	4	1	2	0	0	0	0	3
Facsimile and Photocopier	2	4	4	8	0	0	0	0	6
Web design course	3	6	0	0	2	3.9	0	0	5
Television	0	0	1	2	0	0	0	0	1
Digital camera	0	0	0	0	0	0	2	3.9	2
Convert centre into a multipurpose centre to offer more services	1	2	0	0	0	0	0	0	1
Big space to accommodate more people	0	0	1	2	1	1.9	0	0	2
Other computer courses	5	10	0	0	6	11.5	6	12.5	17
VoIP	0	0	2	4	2	3.9	0	0	4

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Overhead projector	1	2	2	4	4	7.7	0	0	**7**
VoIP	0	0	2	4	2	3.9	0	0	4
Free Internet	0	0	2	4	1	1.9	0	0	3
Tuck shop	0	0	1	2	0	0	0	0	1
Telephones	0	0	1	2	0	0	0	0	1
Laminator	0	0	2	4	0	0	0	0	2
Satellite dish or DsTV	1	2	1	2	1	1.9	0	0	3
CD writer, DVD player, CD player	0	0	2	4	1	1.9	0	0	3
Irrelevant answer	1	2	0	0	0	0	0	0	1
Workshops about technology	0	0	1	2	0	0	0	0	1
Photocopier; more photocopiers	2	4	2	4	0	0	0	0	4
Library	0	0	0	0	5	9.6	3	6.3	8
Jobs	0	0	0	0	0	0	5	10.4	5
Books and Magazines	0	0	0	0	1	1.9	2	4.2	3
Scanners	0	0	3	6	0	0	0	0	3
Pastel Accounting	0	0	0	0	0	0	2	4.2	2

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Reduce telecentre prices and provide transport to centre	0	0	1	2	2	3.9	1	2.1	4
Technician to fix computers or technician course	1	2	0	0	0	0	0	0	1
ICDL course	0	0	2	4	0	0	0	0	2
Videos and video games	0	0	0	0	1	1.9	0	0	1
Starter packs (mobile phone)	0	0	0	0	2	3.9	0	0	2
Recharge vouchers	0	0	0	0	5	9.6	0	0	5
Sewing course	0	0	0	0	2	3.9	0	0	2
Educational video cassettes	0	0	2	4	3	5.9	0	0	5
Educational audio cassettes	0	0	0	0	3	5.8	0	0	3
PA or Secretarial course	0	0	0	0	1	1.9	2	4.2	3

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Medical Aid	0	0	0	0	1	1.9	0	0	1
Insurance	0	0	0	0	1	1.9	0	0	1
Catering course (baking and cooking)	0	0	0	0	2	3.9	0	0	2
Extend opening hours to accommodate those working during the day or after-hours computer training	1	2	0	0	1	1.9	0	0	2
DVDs and Headphones	0	0	1	2	0	0	0	0	1
DTP or Journalism skills	0	0	0	0	0	0	5	10.4	5
Binder	0	0	0	0	0	0	2	4.2	2
Post office banking service or ATM	0	0	0	0	0	0	2	4.2	2
Courier service	0	0	0	0	0	0	1	2.1	1

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Conference room	0	0	0	0	1	1.9	0	0	1
Lotto machine	0	0	0	0	0	0	1	2.1	1
Entertainment hall	0	0	0	0	0	0	2	4.2	2
More post office facilities (e.g., stationary)	0	0	0	0	0	0	2	4.2	2
Slide projectors	0	0	1	2	0	0	0	0	1

Twenty persons (40 per cent) did not answer the question at MACIS centre while eight persons (16 per cent) required a facsimile and photocopier. One person (two per cent) wanted telecentre prices to be reduced as “we live in an impoverished area”, another wanted telephones, one other individual needed DsTV, particularly sports channels on DsTV, another individual wanted workshops on technology and what technology can do for them, another person wanted slide projectors while another wanted new fast computers; one other individual required an overhead projector and one more needed radio services; another person wanted a tuck shop, one individual required a bigger room for computing purposes to accommodate more people during training and another business skills. Two persons (four per cent) wanted laminators, two others required VoIP, another two needed educational video cassettes while another wanted DVDs and CD writers; the last two persons wanted an overhead projector for educational purposes. Three persons (six per cent) stated that they wanted nothing in particular from the telecentre; another three wanted scanners and four persons (eight per cent) wanted more printers or multifunctional printers and photocopiers.

At Siyabonga MPCC 19 persons (36.5 per cent) required Internet-related services, two persons (3.8 per cent) required sewing lessons and another two cooking skills. One person (1.9 per cent) required books and magazines, another one wanted games or entertainment, one more wanted a secretarial or personal assistant course, another wanted DsTV for entertainment, another required a DVD or CD player, one person required "after-hours" computer training to "accommodate people who come late from work", one individual wanted free Internet services, another business skills, one more required multifunctional printers, one person wanted nothing, another wanted bigger space for the computer room, another wanted the telecentre to offer medical aid, insurance while another individual wanted videos or video games to be available at the centre for leisure.

Five persons (9.6 per cent) at Siyabonga telecentre wanted recharge vouchers for mobile phones; six persons (11.5 per cent) wanted more computer courses for new forms of training, four persons 7.7 per cent wanted overhead projectors for learning purposes, other five persons wanted a library, three persons (5.8 per cent) wanted educational video cassettes and two persons (3.8 per cent) wanted a Web design course to be offered by the telecentre staff.

At Hoxani MPCC different individuals (an individual wanted each service, two per cent per service required) wanted DsTV, an overhead projector, games or entertainment, sports facilities or a gym, after-hours computer training to perfect skills, technicians to take care of the computers when they are not operating; one individual suggested that the telecentre be changed to a multipurpose centre offering different services instead of focusing only on teacher training, another person wished to see more involvement in telecentre activities by older and younger community members, and another person wanted video conference technology for teaching purposes for education. Two persons (four per cent of respondents from this centre) wanted a facsimile and printers, another two persons requested more photocopiers, two more persons wanted business-related skills and another two computer engineering skills, two other people requested that the telecentre employ more staff to assist computer trainees, two other people requested a PIT as they wanted Internet

services, two others wanted radio services and two more added that photocopiers had to be doubled at the centre as there were many users.

Four persons (eight per cent) wanted training in software such as Microsoft Excel and PowerPoint, three (six per cent) persons requested training in Web design and 12 persons (24 per cent of the whole group) did not answer this particular question. Five individuals (10 per cent) wanted more computer courses to be introduced at the telecentre as they had completed the OBE courses and one individual (two per cent) provided an answer that did not answer the question (irrelevant). One last person (two per cent) stated that he or she wanted nothing extra from the centre but was interested in computer training which was available.

At Tombo MPCC, two users (4.2 per cent) required more staff to assist uses with their needs; two users wanted Internet skills (4.2 per cent of centre users). One person (2.1 per cent of centre users) wanted sports facilities or a gymnasium. Two users (4.2 per cent – every two persons represent that percentage at this centre) wanted training in job-related, another pair wanted business skills, two others required more printers, one person (2.1 per cent) wanted suggested that there should be employment arranged by the telecentre at companies for unemployed young people, especially graduates and Matriculants. Three persons (6.3 per cent) wanted a library and training on how to use it, six persons (12.5 per cent) needed additional computer courses and five people (10.4 per cent of the centre's users) wanted jobs.

Two persons (4.2 per cent) wanted books to be available at the centre for reading purposes, two others requested the centre to offer the Pastel Accounting business course and one user (2.1 per cent) needed transport to travel to the centre as he or she apparently travelled a long distance to reach the centre and reduced centre prices. Two persons required a secretarial course, another two wanted a binder, another pair requested post banking services, another two needed entertainment services and another pair asked for more services to be offered at the post office and one named school stationery to cut travel costs to town.

Five persons (10.4 per cent of centre users) requested a journalism course and one stated that he or she wanted to start a community newsletter. Another person wanted

the centre to offer courier services and another one requested a Lotto machine (each person constituting 2.1 per cent of centre users) to play and try to win millions.

At MACIS centre three persons (six per cent of centre users) did not answer this question. Three others required marketing skills, so did two from Siyabonga centre (3.8 per cent of the centre users) and one from Tombo MPCC (2.1 per cent). Three persons wanted a computer programming course, also two persons at MACIS centre (four per cent), and one person at Siyabonga (1.9 per cent). Five persons wanted health-care education or how to take care of the sick at home and in this group were one person at Hoxani MPCC (two per cent), another individual at Siyabonga centre (1.9 per cent) and three persons at Tombo MPCC (6.3 per cent).

Three users wanted a facsimile; one at Hoxani MPCC (two per cent), and two at MACIS centre (four per cent). Sixteen persons wanted ICDL computer training at the centres, four users at Siyabonga centre (26.9 per cent of users at this centre), one person at MACIS (two per cent) and another at Tombo MPCC (2.1 per cent). Six users required the Pastel Accounting course to be offered at the centres – four users at Siyabonga centre (7.7 per cent) and two persons at Tombo MPCC (4.2 per cent of centre at that centre). Four people wanted a computer engineering course, two at MACIS (four per cent) and two at Siyabonga (3.8 per cent). Three users wanted training concerning how to conduct workshops and two of these were at Hoxani MPCC (four per cent) and one was at Siyabonga centre (1.9 per cent of that centre's users).

Thirty-three persons wanted training in how to use the Internet – 19 users at Hoxani MPCC (38 per cent of users at the centre), six persons at MACIS (12 per cent), one person at Siyabonga centre (1.9 per cent of users at that centre) and seven persons at Tombo MPCC (13.5 per cent of users at this centre).

In conclusion, unmet user needs were Internet services (by 48 persons) and other computer courses, required by 17 persons.

7.6.2 Other ICT training required

Answers to Question 20 (other ICT training required by the respondents) are listed in Table 66.

Table 66: Further ICT Training Required by the Respondents

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
No answer	0	0	3	6	0	0	0	0	3
Marketing skills	0	0	0	0	2	3.8	1	2.1	3
Computer programming course	0	0	2	4	1	1.9	0	0	3
Health care or home-based care training courses	1	2	0	0	1	1.9	3	6.3	5
Facsimile	1	2	2	4	0	0	0	0	3
ICDL	0	0	1	2	14	26.9	1	2.1	16
Pastel Accounting	0	0	0	0	4	7.7	2	4.2	6
Computer technician course or PC Engineering course	0	0	2	4	2	3.8	0	0	4

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Conducting workshops	2	4	0	0	1	1.9	0	0	3
Internet usage skills or Internet Café	19	38	6	12	1	1.9	7	13.5	33
DVDs and CDs	0	0	4	8	0	0	0	0	4
Community development strategy	0	0	0	0	0	0	1	2.1	1
Drama or Acting classes	0	0	0	0	2	3.8	0	0	2
Photocopier	0	0	1	2	0	0	0	0	1
How to apply for jobs using the Internet	0	0	4	8	0	0	0	0	4
Secretarial or Office Management course	0	0	0	0	0	0	1	2.1	1
Beauty course	0	0	1	2	0	0	0	0	1
Youth development skills	0	0	1	2	2	3.8	0	0	3

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Dance and music classes	0	0	0	0	1	1.9	0	0	1
Call centre skills	0	0	0	0	1	1.9	0	0	1
Aerobic classes	0	0	0	0	1	1.9	0	0	1
DTP skills or community newsletter	4	8	0	0	0	0	2	4.2	6
Business management or financial management skills	6	12	6	12	3	5.8	13	27.1	28
Rewriting Matric	0	0	0	0	1	1.9	0	0	1
Internships for unemployed Matriculants and graduates	0	0	1	2	0	0	2	4.2	3
Irrelevant answer	2	4	2	4	2	3.8	0	0	6
Web design course	3	6	5	10	2	3.8	1	2.1	11

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Security guard training classes	0	0	0	0	1	1.9	0	0	1
UNISA study material to be made available at telecentre	0	0	0	0	0	0	2	4.2	2
Human Resources course	0	0	0	0	0	0	2	4.2	2
Big computer room	0	0	0	0	1	1.9	0	0	1
Management or Leadership skills	0	0	0	0	0	0	3	6.3	3
A+ course	0	0	1	2	1	1.9	2	4.2	4
Life skills to teach those who see no purpose in life	0	0	0	0	1	1.9	0	0	1
Music course	0	0	0	0	1	1.9	0	0	1

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Photoshop and other software (MS Excel, MS PowerPoint, etc.)	7	14	0	0	1	1.9	0	0	8
Bookkeeping skills	0	0	0	0	0	0	1	2.1	1
More computer classes or after hours training classes or more time to work on computers	7	14	2	4	1	1.9	0	0	10
Library and library training	1	2	0	0	0	0	2	4.2	3
Graphic design course	0	0	1	2	1	1.9	0	0	2
More computers	0	0	0	0	1	1.9	0	0	1
More IT courses	1	2	0	0	0	0	0	0	1

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Fashion design course or sewing and knitting	0	0	1	2	1	1.9	0	0	2
Adult school and rewriting Matric	1	2	2	4	0	0	0	0	3
Career guidance	1	2	0	0	0	0	0	0	1
Tourism course	1	2	0	0	0	0	1	2.1	2
Database administration	0	0	1	2	0	0	0	0	1
Agricultural training or other forms of training for rural development	0	0	0	0	0	0	1	2.1	1

Four persons at MACIS centre (eight per cent of centre users) wanted DVDs and CDs. One Tombo MPCC users (2.1 per cent of centre users) wanted the telecentre to offer a rural development course. Two individuals at Siyabonga MPCC (3.9 per cent) required acting lessons and four at MACIS (eight per cent) required Internet job-seeking skills.

One Tombo MPCC user (2.1 per cent) wanted an office management or secretarial course while one MACIS user (two per cent of centre users) wanted a beautician course. Three persons needed youth development projects to be offered by the centres; one from MACIS (two per cent) and two from Siyabonga centres (3.9 per cent). One Siyabonga user wanted call centre skills and another required dance and music lessons (each 1.9 per cent of users at the centre). Six persons wanted to acquire DTP skills from the telecentres; four persons in this group at Hoxani MPCC (eight per cent of centre users) and two persons at Tombo MPCC (4.2 per cent). Twenty-eight persons needed business-related skills from all centres; six at Hoxani MPCC (12 per cent), six at MACIS (12 per cent), three at Siyabonga centre (5.8 per cent) and 13 at Tombo MPCC (27.1 per cent). One Siyabonga centre user wanted to rewrite Matric and would prefer if this centre were a Matric-writing venue instead of travelling to the city, while another user required a bigger computer room to accommodate more potential computer trainees in the telecentre's waiting list for computer training.

A Siyabonga centre user required the centre to offer security guard training courses and three users suggested that the telecentres should arrange internships with companies for unemployed graduates and Matriculants - one user from MACIS centre (two per cent) and two persons from Tombo MPCC (4.2 per cent). Two answers at MACIS and Siyabonga telecentres did not answer what was asked and were, therefore, irrelevant answers. Eight individuals wanted the centres to offer Web design courses, five people at MACIS centre (10 per cent), two at Siyabonga centre (3.9 per cent) and one person at Tombo MPCC (2.1 per cent). Two Tombo MPCC users (4.2 per cent of centre users) required UNISA study material to be made available at the telecentre. One of these was the school principal who studied a Masters degree in Education at UNISA via distance education.

Three persons at Tombo MPCC (6.3 per cent) desired leadership or management courses while two (4.2 per cent) required a human resources course. Four persons wanted the centres to offer the A+ business course, one at MACIS centre (two per cent), one at Siyabonga centre (1.9 per cent) and two at Tombo MPCC (4.2 per cent). One Tombo telecentre user (2.1 per cent) wanted bookkeeping skills and was hopeful the centre would in future offer such skills. Another Siyabonga telecentre user (1.9

per cent) wrote that the “telecentre should offer people life skills especially those who see no purpose in life”.

One more Siyabonga telecentre user (1.9 per cent) required more computers because the computer trainees at the centre have to wait for others to finish tasks before they can access computers, and another wanted a music course. Eight persons asked that other software lessons be offered and one user wrote “e.g., Photoshop” – seven similar requests were presented from Hoxani MPCC (14 per cent), two from MACIS (four per cent) and one from Siyabonga telecentre (1.9 per cent of centre users). Two persons from Tombo MPCC (4.2 per cent) and one at Hoxani MPCC (two per cent) wanted a library and training on library usage. Two persons, one at MACIS and another at Siyabonga centres, wanted a graphic design course. Two more persons wanted a fashion design course, one from each urban telecentre, MACIS and Siyabonga.

One Siyabonga centre user (1.9 per cent) wanted a career guidance course, one at Hoxani MPCC required more IT courses to be offered at the centre and one required a tourism course. The tourism course was also required by another Tombo MPCC user. Lastly, two MACIS centre users wanted the telecentre to arrange with the Department of Education that the centre be a Matric rewriting venue and these two constituted four per cent of the centre’s users.

In summary, the most reported trends in Table 66 above are that the users require more training in Internet use (33 persons), ICDL computer course (by 16 persons) business or financial management skills (by 28 persons) and after-hours (for those who work during the day) computer training classes or more time to work on computers (practising and implementing what has been taught – by 10 persons).

Users’ non-formal education improved in ways described in Table 67.

7.6.3 Extent of Improvement of Users’ Non-Formal Education

Answers to the question: “To what extent has the telecentre improved your informal education” are listed in Table 67 (Question 21 of the questionnaire).

Table 67: Extent of Improvement of Users' Non-Formal Education

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Learning English at the telecentre	3	6	4	8	0	0	0	7	7
Gained OBE teaching skills	7	14	0	0	0	0	3	6.3	10
Learnt how to use the Internet, email and related skills	0	0	2	4	4	7.7	2	4.2	8
Conducting research for study purposes	2	4	0	0	0	0	1	2.1	3
Gained communication skills	3	6	1	2	0	0	8	16.7	12
Irrelevant answer	1	2	1	2	0	0	1	2.1	3
Dealing better with clients	0	0	2	4	0	0	3	6.3	5

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
No answer	2	4	7	14	12	23.1	0	0	26
Got access to cheaper PCs	1	2	0	0	0	0	1	2.1	2
Gained basic computer usage skills	16	32	13	26	16	30.8	12	25	65
Use PIT to access government services	0	0	0	0	0	0	5	10.4	5
Telecentre develops the community	0	0	0	0	0	0	1	2.1	1
Telecentre taught me not to fear computers	7	14	0	0	1	1.9	1	2.1	9
Learnt how to use the facsimile and photocopier	0	0	0	0	0	0	4	8.3	4
Promoted at work after completing computer course at the telecentre	2	4	2	4	2	3.9	0	0	6

Response	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total
	N	%	N	%	N	%	N	%	N
Learnt how to work under pressure and meet deadlines	1	2	1	2	2	3.9	1	2.1	5
Telecentre course helped me to pass the end-user computer course	1	2	1	2	0	0	0	0	2
Telecentre gave me work	0	2	2	4	1	1.9	0	0	3
Nothing	1	2	1	2	0	0	0	0	2
Gained business and financial management skills	0	0	2	4	2	3.9	1	2.1	5
Improved my knowledge of the SOS market and government services	0	0	0	0	0	0	3	6.3	3
Obtaining information about daily life issues at telecentre	0	0	0	0	3	5.8	0	0	3

Response	Hoxani (Rural) N	%	MACIS (Urban) N	%	Siyabonga (Urban) N	%	Tombo (Rural) N	%	Total N
Education received from telecentre similar to that offered at college	0	0	5	10	1	1.9	0	0	6
Conducting research for school work	0	0	2	4	1	1.9	2	4.2	4
DTP skills obtained from telecentre	6	12	0	0	1	1.9	0	0	7
Have access to cheap computers at the telecentre and centre is near home	0	0	4	8	6	11.5	0	0	10

Seven users improved English at the centres, three at Hoxani MPCC (six per cent), and four at MACIS centre (eight per cent). Ten users gained OBE skills at the rural telecentres, seven persons at Hoxani MPCC (14 per cent) and three at Tombo MPCC (6.3 per cent). Eight persons learnt Internet skills at the centres, two at MACIS (four per cent), four at Siyabonga (7.7 per cent) and two at Tombo MPCC (4.2 per cent). Five persons conducted research at the centres for study purposes – two at MACIS centre (four per cent), one individual at Siyabonga centre (1.9 per cent) and two at Tombo MPCC (4.2 per cent). According to information obtained for Table 67, DTP skills were learned by six persons at Hoxani MPCC (12 per cent) and one at

Siyabonga centre (1.9 per cent). Ten persons has access to cheaper computers "near home" and did not travel to cities to access computer any longer, four from MACIS centre (eight per cent) and six at Siyabonga centre (11.5 per cent of users of that centre).

Communication skills were learnt by 12 persons, three at Hoxani MPCC (six per cent), one at MACIS centre (two per cent) and eight at Tombo MPCC (16.7 per cent of users of that centre). Five persons learnt how to deal with clients better – two at MACIS (four per cent of centre users) and three at Tombo MPCC (6.3 per cent). Sixty-five users gained computer literacy skills – 16 at Hoxani centre (32 per cent of centre users), 13 at MACIS (26 per centre of that centre's users), 16 at Siyabonga centre (30.8 per cent) and 12 at Tombo MPCC (25 per cent). Five Tombo MPCC users employed the PIT and they constituted 10.4 per cent of that centre' users. Twenty-six users did not answer the question, two at Hoxani centre (four per cent), and 12 at Siyabonga centre (23.1 per cent).

A Tombo MPCC user stated that the centre developed communication at the community but this was regarded as an irrelevant answer to the question asked. Nine users were taught "not to fear computers but use them", seven at Hoxani MPCC (14 per cent) and one person each at Siyabonga centre (1.9 per cent) and Tombo MPCC (2.1 per cent). Four Tombo MPCC users (8.3 per cent) learned how to use the facsimile and photocopier. Six persons obtained work promotion as a result of computer a telecentre computer course – two at Hoxani centre (four per cent), two at MACIS (also four per cent of this centre's users) and two at Siyabonga centre (3.9 per cent). Furthermore, five persons learnt how to work under pressure and meet deadlines – one each from Hoxani and MACIS centres (two per cent from each centre), two persons at Siyabonga telecentre (3.9 per cent) and one user at Tombo MPCC, constituting 2.1 per cent of this centre's users.

Additionally, two users were assisted at the centres to pass "end-user computing" courses, one each at Hoxani and MACIS MPCCs (two per cent per telecentre). Two individuals gained nothing from the centres – one at MACIS and the other at Hoxani (two per centre per centre). Also, five persons learnt business-related skills, two at MACIS (four per cent) and two at Siyabonga (3.9 per cent) and one person at Tombo

centre (2.1 per cent of centre users). Three persons provided irrelevant answers, although the answers were meaningful, they did not answer what this particular question asked; one person each at Hoxani, MACIS (two per centre per telecentre) and Tombo centres (2.1 per centre of this centre's users).

Finally, three persons at Tombo MPCC (6.3 per cent) improved knowledge of government services or what two persons and two persons mentioned "knowledge of the SOS market", and three persons at Siyabonga centre (5.8 per cent) obtained information about daily life at the centre. Six urban telecentre users stated that education they had received at college or university was similar to information received at the centres, five at MACIS centre (10 per cent of this centre's users) and one at Siyabonga centre (1.9 per cent of centre users).

In summary Table 67 reveals that aspects of user non-formal education that were much improved are computer usage skills (65 persons), communication and public speaking skills (12 users), OBE teaching skills (10 users) and saving travelling costs as users accessed computers "near home" (also stated by 10 users).

The last part of the questionnaire asked respondents information pertaining to the impact of the centres on community development and the following last section of this chapter provides answers gained in answering that question.

7.7 RATING OF THE TELECENTRES BY USERS

Question 26 of the questionnaire requested users to rate the telecentre in terms of services offered, technical assistance and technology training offered by telecentre staff to users, the attitude of telecentre staff and technical competence of the telecentre staff. Answers to this question are provided in the following section.

Table 68: Telecentre Rating by Users with Respect to Staff Attitude

Staff attitude rating by users	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Very good	19	38.0	24	48.0	26	50.0	28	58.3	97	48.5
Good	18	30.0	15	30.0	21	40.4	16	33.3	70	35.0
Average	7	14.0	9	18.0	5	9.6	4	8.3	25	12.5
Poor	2	4.0	0	0.0	0	0.0	0	0.0	2	1.0
Very poor	4	8.0	2	4.0	0	0.0	0	0.0	6	3.0
Total %	**50**	**100.0**	**50**	**100.0**	**52**	**100.0**	**48**	**100.0**	**200**	**100.0**

Ninety-seven users (48.5 per cent of the total sample) stated that the telecentre staff attitude was very good. Of these 28 were at Tombo MPCC (58.3 per cent of centre respondents), 26 were at Siyabonga (50 per cent of the users at that centre), 24 were at MACIS (48.0 per cent of centre users) and 19 were at Hoxani MPCC (38.0 per cent of the centre users). Seventy respondents (35 per cent of the sample) viewed staff attitude as good, with 16 individuals in this group coming from Tombo MPCC (33. 3 per cent of respondents at this centre), 21 persons at Siyabonga centre (40.4 per cent of the centre's users), 15 persons answering the questionnaire at MACIS centre (30 per cent of centre users) and 18 persons coming from Hoxani MPCC (30 per cent of centre users).

There were 25 respondents who stated that the staff attitude was average and they comprised 12.5 per cent of the total sample. Of this 25, seven persons were at Hoxani MPCC (four per cent of respondents at the centre), nine persons were at MACIS (18 per cent of users at this centre), five persons were at Siyabonga centre (9.6 per cent of users at that centre) and four individuals were at Tombo MPCC (8.3 per cent of the users at that centre).

Those who stated that the staff attitude was poor were only two out of the sample of 200, which represents one per cent of the sample. These two persons were at Hoxani MPCC (four per cent of users at that centre) and no one else provided this answer at the other centres (MACIS, Tombo and Siyabonga).

Six persons, of the 200 sample (or three per cent of the total sample), stated that the staff attitude was very poor. Of this six, four persons were from Hoxani MPCC (eight per cent of the centre users) and two persons were from MACIS centre (four per cent of that centre's users). No one provided this answer at Siyabonga and Tombo MPCCs.

The staff members were also rated with reference to the technical assistance they provided to users when they required assistance with how to use the computers and other facilities. Table 69 lists the results of this rating.

Table 69: Telecentre Staff Rating with Respect to Technical Assistance they Offer to Users

Rating of telecentre according to technical assistance offered to users	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Very good	19	38.8	16	32.7	15	29.4	13	27.1	63	31.8
Good	18	36.0	15	30.0	21	41.2	28	58.3	82	41.4
Average	8	16.0	13	26.0	14	27.5	6	12.5	41	20.7
Poor	4	8.0	4	8.2	1	2.0	1	2.1	10	5.1
Very poor	1	2.0	1	2.0	0	0.0	0	0.0	2	1.0
Total %	**50**	**100.0**	**49**	**100.0**	**51**	**100.0**	**48**	**100.0**	**198**	**100.0**

The largest single proportion users, 63 or 31.8 per cent of the total sample, stated that the technical assistance they received from telecentre staff was very good. Nineteen of the 63 were at Hoxani centre (38.8 per cent of the centre users), 16 users were at MACIS (32.7 per cent of the centre users), 15 were at Siyabonga centre (29.4 per cent of the centre users) and 13 persons were at Tombo MPCC (27.1 per cent of the centre's users). There were 82 users (41.4 per cent of the total sample) who stated that technical assistance provided by staff was good. In this group, 18 persons were at Hoxani centre (36 per cent of users at that centre), 15 persons were at MACIS (30 per

cent of centre users), 21 users were at Siyabonga centre (41.2 per cent of centre users) and 28 persons were at Tombo centre (58.3 per cent of centre users).

Altogether 41 users expressed the view that the technical assistance they received from staff was average. This group represented 20.7 per cent of the total sample. In this group, eight persons were at Hoxani centre (16 per cent of centre users), 13 were at MACIS (26 per cent of users at that centre), 14 were at Siyabonga centre (27.5 per cent of centre users) and six were at Tombo centre (12.5 per cent of centre users).

Ten respondents (5.1 per cent of the total sample) stated that the technical assistance they received from the staff was poor. In this group, four persons were at Hoxani centre (8 per cent of users at that centre), four persons were at MACIS centre (8.2 per cent of users at that centre), one person was at Siyabonga centre (two per cent of centre users) and one individual was at Tombo telecentre (2.1 per cent of the centre's users). Two persons (one per cent of the total sample) stated that the technical assistance telecentre staff offered them was very poor; one person in this group was at Hoxani (two per cent of centre users) and the other one was at MACIS (also two per cent of that centre's users). No one provided this answer at Siyabonga and Tombo MPCCs.

Overall, the majority of respondents (73, 2 per cent) rated the staff at their respective telecentres as or good or very good. Only a small minority (6.1 per cent) rated the staff as poor or very poor.

Table 70: Telecentre Rating with Respect to ICT Training Offered

Telecentre rating according to ICT training offered	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Very good	25	51.0	20	40.0	19	38.8	15	31.3	79	40.3
Good	12	24.5	17	34.0	23	46.9	28	58.3	80	40.8
Average	8	16.3	11	22.0	7	14.3	3	6.3	29	14.8
Poor	3	6.1	0	0.0	0	0.0	2	4.2	5	2.6
Very poor	1	2.0	2	4.0	0	0.0	0	0.0	3	1.5
Total %	**49**	**100.0**	**50**	**100.0**	**49**	**100.0**	**48**	**100.0**	**196**	**100.0**

Seventy-nine respondents (40.3 per cent of the total sample) stated that the ICT training they received from the centres was very good. Of the 79 persons, 25 were at Hoxani MPCC (51 per cent of users at that centre), 20 persons were at MACIS centre (40 per cent of centre respondents), 19 people were at Siyabonga centre (38.8 per cent of the respondents at this centre) and 15 were at Tombo centre (31. 3 per cent of centre respondents). Eighty users (40.8 per cent of the total sample) stated that the received ICT training was good; 12 persons from Hoxani centre (24.5 per cent of centre respondents), 17 persons at MACIS (34 per cent of centre respondents), 23 persons at Siyabonga centre (46.9 per cent of centre respondents) and 28 persons at Tombo MPCC (58.3 per cent of that centre's users).

Persons who stated that the received ICT training was average were 29 (representing 14.8 per cent of the sample). Eight persons were at Hoxani centre (16.3 per cent of respondents at this centre), 11 persons were at MACIS (22 per cent of centre respondents), seven persons were at Siyabonga centre (14.3 per cent of centre respondents) and three persons were at Tombo centre (6.3 per cent of respondents at that centre).

Five respondents (2.6 per cent of the total sample) stated that the ICT training they received at the telecentres was poor. Three of this group were at Hoxani centre (6.1 per cent of the centre respondents) and two persons were at Tombo telecentre (2.6 per cent of the centre respondents). No one provided this answer at MACIS and Siyabonga telecentres.

Three persons (1.5 per cent of the total sample) viewed the ICT training they received at the centres as very poor, two persons from MACIS centre (four per cent of the respondents at the centre) and one individual from Hoxani MPCC (two per cent of the respondents at this centre). No one at Siyabonga and Tombo telecentres stated that the ICT training they received was very poor.

The overall pattern depicted in Table 70 is that there is an overwhelming satisfaction with ICT training offered at telecentre as 81, 1 per cent of the respondents indicated that training received was good or very good.

Table 71: Telecentre Rating with Reference to Services Offered

Telecentre rating according to services offered	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Very good	24	50.0	20	40.0	21	41.2	31	64.6	96	48.7
Good	15	31.3	19	38.0	25	49.0	13	27.1	72	36.5
Average	7	14.6	11	22.0	5	9.8	4	8.3	27	13.7
Poor	2	4.0	0	0.0	0	0.0	0	0.0	2	1.0
Total %	**48**	**100.0**	**50**	**100.0**	**51**	**100.0**	**48**	**100.0**	**197**	**100.0**

Ninety-six respondents (48.7 per cent of the total sample) stated that services offered by the telecentres were very good. Of the 96 persons, 24 were at Hoxani MPCC (50 per cent of users at that centre), 20 persons were at MACIS centre (40 per cent of centre users), 21 people were at Siyabonga centre (41.2 per cent of the users at this centre) and 31 were at Tombo centre (64. 6 per cent of centre users).

Seventy-two users (36.5 per cent of the total sample) stated that the telecentre services were good; 15 persons at Hoxani centre (31.3 per cent of centre users), 19 persons at MACIS (38 per cent of centre users), 25 respondents at Siyabonga centre (49 per cent of centre users) and 13 persons at Tombo MPCC (27.1 per cent of that centre's users). Twenty-seven persons regarded the telecentre services as average (representing 13.7 per cent of the sample). In this category, seven persons were at Hoxani centre (14.6 per cent of respondents at this centre), 11 persons were at MACIS (22 per cent of

centre users), five persons were at Siyabonga centre (9.8 per cent of centre users) and four persons were at Tombo centre (8.3 per cent of users at that centre). Two respondents (one per cent of the total sample) stated that the telecentre services were poor and these two came from Hoxani centre (four per cent of the centre users). At the other telecentres (Siyabonga, MACIS and Tombo) no respondent stated that the services offered by the telecentres were poor. No one stated that the telecentre services were very poor either.

Table 72: Rating of Telecentres with Respect to Staff Technical Competence

Rating of telecentre relating to staff technical competence	Hoxani (Rural)		MACIS (Urban)		Siyabonga (Urban)		Tombo (Rural)		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Very good	19	38.8	19	38.0	18	34.6	16	33.3	72	36.2
Good	17	34.7	15	30.0	23	44.2	21	43.8	76	38.2
Average	6	12.2	13	26.0	10	19.2	8	16.7	37	18.6
Poor	2	4.1	1	2.0	0	0.0	2	4.2	5	2.5
Very poor	5	10.2	2	4.0	1	1.9	1	2.1	9	4.5
Total %	**49**	**100.0**	**50**	**100.0**	**52**	**100.0**	**48**	**100.0**	**199**	**100.0**

Regarding Table 72, seventy-two respondents (36.2 per cent of the total sample) stated that the staff technical competence was very good. Of the 72 persons, 19 were at Hoxani MPCC (38.8 per cent of users at that centre), 19 persons were at MACIS

centre (38 per cent of centre users), 18 people were at Siyabonga centre (34.6 per cent of the users at this centre) and 16 persons were at Tombo centre (33. 3 per cent of centre users).

Seventy-six users (38.2 per cent of the total sample) stated that staff technical competence was good; 17 persons were at Hoxani centre (34.7 per cent of centre users), 15 persons were at MACIS (30 per cent of centre respondents), 23 at Siyabonga centre (44.2 per cent of centre users) and 21 persons at Tombo MPCC (43.8 per cent of that centre respondents).

Persons who stated that staff technical competence was average were 37 (18.6 per cent of the sample). Six persons were at Hoxani centre (12.2 per cent of respondents at this centre), 13 persons were at MACIS (26 per cent of centre respondents), 10 persons were at Siyabonga centre (19.2 per cent of centre respondents) and eight persons were at Tombo centre (16.7 per cent of respondents at that centre).

Five respondents (2.5 per cent of the total sample) stated that the telecentre staff technical competence was poor. Two of this group were at Hoxani centre (4.1 per cent of the centre respondents), two persons were at Tombo telecentre (4.2 per cent of the centre users) and one individual was at MACIS (two per cent of centre respondents). No one provided this answer at Siyabonga telecentre.

Nine persons (4.5 per cent of the total sample) viewed the staff technical competence as very poor. Two persons in this category were at MACIS centre (four per cent of the centre respondents), five individuals at Hoxani MPCC (10.2 per cent of the respondents at this centre), and one person each at Siyabonga and Tombo centres (1.9 and 2.1 per cent per telecentre respectively).

7.8 TELECENTRE IMPACT ON COMMUNITY DEVELOPMENT

Table 73: Telecentre Impact on Community Development

Impact on community	Telecentre	Users (N)	Mean	Standard Deviation
Telecentre offers a good service to the community	Hoxani	49	4.1	1.0
	MACIS	50	4.4	.6
	Siyabonga	51	4.5	.5
	Tombo	47	4.4	.6
	Total	197	4.4	.7
The telecentre enhances the educational levels of people in the community	Hoxani	48	4.2	.8
	MACIS	50	4.3	.6
	Siyabonga	51	4.3	.7
	Tombo	47	4.1	.6
	Total	196	4.3	.7
The telecentre promotes computer literacy in the community	Hoxani	47	4.4	.8
	MACIS	49	4.4	.7
	Siyabonga	51	4.5	.5
	Tombo	47	4.3	.6
	Total	194	4.4	.7
	MACIS	50	4.2	1.2
	Siyabonga	50	4.2	.8
	Tombo	48	4.3	.8
	Total	195	4.1	.6
The telecentre is an asset to the community	Hoxani	46	4.3	.9

Impact on community	Telecentre	Users (N)	Mean	Standard Deviation
	MACIS	50	4.4	.8
	Siyabonga	50	4.4	.7
	Tombo	46	4.3	.6
	Total	192	4.4	.5
The telecentre will be missed if no longer there	Hoxani	48	4.5	.7
	MACIS	50	4.6	.7
	Siyabonga	49	4.6	.8
	Tombo	47	4.4	.5
	Total	194	4.6	.7
The telecentre links the community with the rest of the world	Hoxani	48	3.4	.7
	MACIS	49	4.0	1.3
	Siyabonga	51	3.8	.9
	Tombo	44	3.5	1.0
	Total	192	3.8	.9
Telecentre brought more wealth to the community	Hoxani	46	3.5	1.1
	MACIS	48	3.5	1.1
	Siyabonga	50	3.6	1.2
	Tombo	47	3.1	1.0
	Total	191	3.5	1.3
Things changed for the worse since the establishment of the telecentre in the community	Hoxani	46	2.4	1.2
	MACIS	46	2.3	1.3
	Siyabonga	48	2.1	1.2
	Tombo	46	1.8	1.2
	Total	186	2.2	1.3

Impact on community	Telecentre	Users (N)	Mean	Standard Deviation
Telecentre contribution to the economic development of the community	Hoxani	47	3.6	1.0
	MACIS	50	3.6	1.2
	Siyabonga	50	3.8	.7
	Tombo	47	3.4	1.2
	Total	194	3.7	1.1
The telecentre has a negative impact on the community	Hoxani	46	2.1	1.3
	MACIS	49	1.7	1.0
	Siyabonga	51	1.9	1.1
	Tombo	47	1.3	.8
	Total	193	1.8	1.2

The scale used in this question was 5 = Strongly Agree, 4 = Agree, 3 = Neither Agree nor Disagree, 2 = Disagree and 1 = Strongly Disagree. The Hoxani centre mean regarding the service offered by this centre to the community (M = 4.1, SD = 1.0) is less than those of the other centres, MACIS (M = 4.4, SD = .6), Siyabonga (M = 4.5 and the SD = .5) and Tombo (M = .4, SD = .6). All the centres agree that the centre offers a good service to the community but Siyabonga telecentre respondents thought, to the largest extent, that the telecentre offered a good service to the community more than the other centres. This is probably because this centre offered community members more computer courses, business and life skills, and users had access to e-mail and the Internet, while at the other centres such as the Hoxani and Tombo centres most Internet-based services were unavailable. It can be argued therefore, that Siyabonga telecentre offered more value for money to users than the other centres but these telecentres did not offer similar services so comparing the services offered may not be just because the communities are different, have different development needs and the centre offer different services. SDs indicate that users differ more in their answers at Hoxani centre, which has a bigger SD, then at MACIS and Tombo centres, and lastly at Siyabonga centre, with a small SD.

Regarding enhancement of the educational needs of community members, Hoxani centre mean (M = 4.2, SD = .8) is less than those of MACIS (M = 4.3, SD = .6) and Siyabonga (M = 4.3, SD = .7) centres, but more than that of Tombo MPCC (M = 4.1, SD = .6). Again all the centres agreed that the telecentres enhance community members' educational needs. The urban centres, Siyabonga and MACIS, are regarded as enhancing the educational needs of the community more than the rural centres. This finding supports the previous one as far as Siyabonga centre is concerned, because that centre's users felt that this centre enhanced their educational levels more than the other centres possibly because the centre offered them a variety of services and different computer courses. SDs indicate that respondents differ more in this instance or answer at Hoxani and Siyabonga MPCCs and less at MACIS and Tombo telecentres.

Promotion of community computer literacy Hoxani MPCC mean (M = 4.4, SD = .8) equals that of MACIS centre (M = 4.4, SD = .7), is less than that of Siyabonga centre (M = 4.5, SD = .5), but more than that of Tombo MPCC (M = 4.3, SD = .6). Respondents at all the centres agree that the telecentres promote computer literacy of community members. SDs indicate that users differ more at Hoxani and MACIS centres, because of the bigger SD values and less at Siyabonga and Tombo MPCCs, because of the smaller SDs.

The Hoxani centre mean regarding being an asset to the community (M = 4.3, SD = .8) is less than those of MACIS (M = 4.4, SD = .7) and Siyabonga (M = 4.4, SD = .6) centres but equals that of Tombo MPCC (M = 4.3, SD = .5). Respondents at all the centres agreed that the centres are assets to their communities. This finding means that Siyabonga and the MACIS are regarded as assets to the communities more than Tombo and Hoxani telecentres. This, however, did not suggest that the Tombo and Hoxani centres were not regarded as assets by their users because all the telecentres are valued and regarded as assets to the communities. SDs indicate that users differ more at MACIS, Tombo and Hoxani centres, because the SDs are bigger and differ less at Siyabonga telecentres because the small SD is an indication of fewer differences between respondents.

The respondents at all the centres agreed that the centres would be missed if removed from the community, with the Hoxani MPCC mean (M = 4.5, SD = .7) less than those of the other centres, MACIS (M = 462, SD = .7) and Siyabonga centre (M = 4.6, SD = .8) and more than that of Tombo MPCC (M = 4.4, SD = .5). SD values indicate that respondents agree with the question statement more at Siyabonga centre, where the SD is bigger than those of the other centre and agreed less with the statement at Tomboo MPCC with the lowest SD value.

Linkage of the community to the rest of South Africa Hoxani MPCC mean (M = 3.7, SD = 1.2) is less than those of the other centres, MACIS (M = 4.2, SD = .8), Siyabonga (M = 4.2, SD = .8) and Tombo (M = 3.9, SD = .7). Urban MACIS and Siyabonga respondents agreed that these centres link the communities to the South African community. This could be because no Internet service was offered at the Hoxani centre, a service which made it possible for users at the MACIS and Siyabonga centres to be connected to other people nationally by using e-mail. The Siyabonga and Tombo MPCCs also offered users MTN public pay phones which linked users to other people nationally. Rural respondents at Tombo and Hoxani neither agreed nor disagreed with the statement that the telecentres link the villages with the rest of South Africa. SDs indicate that users differ more at the rural Hoxani and Tombo centres, because of the bigger SD values and less at the urban centres of Siyabonga and MACIS, because of the smaller SDs.

Regarding the statement to the effect that the telecentres link the community with the rest of the world, users at Hoxani MPCC neither agreed nor disagreed with that statement (M = 3.4, SD = .7). The SD indicates that the respondents differed less in their answers. At MACIS, Siyabonga and Tombo MPCCs, respondents agreed with the statement that the telecentres link the communities to the rest of the world, (M = 4.0, SD = 1.3), (M = 3.8, SD = .9) and (M = 3.5, SD = 1.0) respectively. Respondent answers differed more as MACIS centre and less at Hoxani MPCC as indicated by the SD values.

As far as bringing wealth to the community, the Hoxani centre mean (M = 3.5, SD = 1.0) equals that of MACIS centre (M = 3.5, SD = 1.2), but is less than that of Siyabonga centre (M = 3.6, SD = 1.0) and more than that of Tombo MPCC (M = 3.1,

SD = 1.3). This means that Siyabonga telecentre is the centre most regarded as bringing wealth to Orange Farm township while the Tombo centre is least regarded as bringing wealth to Tombo village. SDs indicate that users differ more at Tombo and MACIS centres, because of the bigger SD values and differ less at Siyabonga and Hoxani MPCCs, because of the smaller SDs.

Regarding things changing for the worse since telecentre establishment, the Hoxani centre mean (M = 2.4, SD = 1.3) is more than those of the other centres, MACIS (M = 2.3, SD = .1.3), Siyabonga (M = 2.1, SD = 1.2) and Tombo (M = 1.8, SD = 1.3). Respondents at Hoxani, MACIS and Siyabonga telecentres disagree with the statement that "things have changed for the worse since the telecentre establishment" and users at Tombo MPCC strongly disgreed with the latter statement. This means that the Tombo telecentre is regarded as having improved things for the better at that community, more than the other centres. SDs indicate that respondents differ more in this instance or answer at Hoxani and MACIS MPCCs and differ less at Siyabonga and Tombo telecentres.

Concerning economic community development by the telecentre, the Hoxani centre mean (M = 3.6, SD = 1.0) equals that of MACIS telecentre (M = 3.6, SD = 1.2), but is less than that of Siyabonga MPCC (M = 3.8, SD = .7) but less than that of Tombo MPCC (M = 3.4, SD = 1.2). All centre respondents neither agree nor disagree with the question statement that the telecentre has an "economic contribution to the community". SDs indicate that respondents differ more in this instance at MACIS and Tombo telecentres but differ less at Hoxani and Siyabonga telecentres.

Finally, as far as the telecentre having a negative impact on the community, the Hoxani centre mean (M = 2.1, SD = 1.3) is more than those of the other centres, MACIS (M = 1.7, SD = 1.0), Siyabonga centre (M = 1.9, SD = 1.1) Tombo MPCC (M = 1.3, SD = .8). The means indicate that at MACIS, Siyabonga and Tombo centres, respondents strongly disagreed with the question statement that the centre has a negative impact on the communities, and at Hoxani MPCC users disagreed with that statement. SDs indicate that users differ more at Hoxani and Siyabonga centres, because of the bigger SD values and differ less at MACIS and Tombo MPCCs, because of the smaller SDs.

Table 74: ANOVA – Telecentre impact on individual and community development

Impact or Service Offered		Sum of Squares	df	Mean Square	F	Sig.
Telecentre offers a good service to the community	Between Groups	5.194	3	1.731	3.192	.025
	Within Groups	104.674	193	.542		
	Total	109.868	196			
The telecentre enhances the educational levels of people in the community	Between Groups	1.862	3	.621	1.206	.309
	Within Groups	98.806	192	.515		
	Total	100.668	195			
The telecentre promotes computer literacy in the community	Between Groups	1.321	3	.440	.867	.459
	Within Groups	96.437	190	.508		
	Total	97.758	193			
The telecentre has linked this community with the South African community	Between Groups	8.949	3	2.983	3.341	.020
	Within Groups	170.538	191	.893		
	Total	179.487	194			
The telecentre is an asset to the community	Between Groups	.475	3	.158	.310	.818
	Within Groups	96.191	188	.512		
	Total	96.667	191			
We will miss the telecentre if relocated	Between Groups	1.667	3	.556	1.056	.369
	Within Groups	99.962	190	.526		
	Total	101.629	193			
The telecentre has linked the community with the rest of the world	Between Groups	10.591	3	3.530	2.945	.034
	Within Groups	225.409	188	1.199		
	Total	236.000	191			
The telecentre has brought more wealth to the community	Between Groups	7.590	3	2.530	1.819	.145

	Within Groups	260.148	187	1.391		
	Total	267.738	190			
Things have changed for the worse telecentre establishment	Between Groups	9.820	3	3.273	1.869	.136
	Within Groups	318.675	182	1.751		
	Total	328.495	185			
This telecentre has contributed to the economic development of the community	Between Groups	3.842	3	1.281	1.075	.361
	Within Groups	226.323	190	1.191		
	Total	230.165	193			
The telecentre has a negative impact on the community	Between Groups	13.339	3	4.446	3.447	.018
	Within Groups	243.780	189	1.290		
	Total	257.119	192			

There are statistically significant differences between the telecentres – as the Sig. values are less than 0,05, the level of significance, regarding the variables in Table 74, including the offering of a good service by the telecentres to the communities (Sig. = .025), linkage of the communities by the telecentres to South Africa as a whole (Sig. = .020), linkage of the communities by the telecentres to the world (Sig. = .034), and the telecentre having a negative impact on the community (Sig. = .018).

However, there were no statistically significant differences between the telecentres regarding the other varibles in the question, including the enhancement of community members' educational levels (Sig. = .309), promotion of computer literacy in the community (Sig. = .459), the telecentre being an asset to the community (Sig. = .818), the telecentre going to be missed if removed from the community (Sig. = .369), the telecentre bringing wealth to the community (Sig. = .145), things changing for the worse since the establishment of the telecentre in the community (Sig. = 136) and the statement to the effect that the telecentre contributed to the economic development of the community (Sig. = .361).

7.9 SUMMARY AND OUTLINE OF CHAPTER 8

This chapter has provided data and statistics indicating that users sampled in this study hold the view that telecentres have improved their non-formal and formal education in ways stated in specific ways. In terms of non-formal education, users acknowledged that they learned computer literacy and DTP skills at the centres. As far as formal education is concerned, users study computer usage courses, including those accredited by the University of the Witwatersrand. Upon completion of these courses at the centres, some users have obtained work and others promotion (cf. Chapter 8). Users indicated that their life-long learning was not improved although many indicated much improvement to their formal education and computer literacy skills such as word processing, Internet search engines usage and production of local content small publications.

It is concluded, therefore, that all four telecentres sampled in this research have a positive influence on the education of the users, and that most of the users have improved their computer literacy and general knowledge about issues of development as a result of employing the telecentres. Evidence of this development and personal growth is provided in this chapter using tables, figures, ANOVA and post hoc statistical tests, means and standard deviations conducted. There was no substantial evidence to support the view that the telecentres contribute economically to the communities although users neither agree nor disagree with that view. However, substantial evidence is provided to the effect that telecentre develop individuals educationally.

PREAMBLE

Chapter 8 provides data gained from personal interviews in terms of specific themes and interprets the themes based on the theory which laid this study's foundation in earlier chapters. Chapter 8 also summarises the characteristics and profiles of the telecentres researched in this study in a new telecentre model. This model is ideal for establishing and operating local urban, semi-urban and rural telecentres. Addenda containing information supporting the findings provided in the chapter are included at the end of the thesis.

CHAPTER 8
QUALITATIVE DATA ANALYSIS

8.1 INTRODUCTION

This chapter provides qualitative data gained from the personal interviews. Tables supporting information detailed below are in included in Addendum C. Information included in this chapter was obtained from interviewees who provided some answers – most persons interviewed did not provide much information about telecentre benefits to the community as most had just registered to undertake computer literacy training and most stated that they did not know what the telecentre impact on the community was. Detailed answers were instead obtained from telecentre staff. Also, most persons interviewed seemed to be uneducated and did not possess the much-needed information and the researcher viewed this as one of the reasons these persons were visiting the centres in search of some education.

Siyabonga was the first telecentre explored and information from Siyabonga telecentre is presented first, with information from Tombo MPCC presented last because the last telephone interview was conducted with a Tombo MPCC staff member. Some of the information gathered with the interviews is summarised in the telecentre model proposed in Chapter 9, because the model includes all telecentre characteristics described by interviewees. The information in the model was yielded by the questionnaires and the rest constitutes the researcher's recommendations on future telecentre improvement. The model, therefore, includes what works in a local telecentre (because the four centres studied were operating normally at the time the research was conducted) and also includes factors that could improve present telecentre operations.

8.2 DATA GAINED FROM PERSONAL INTERVIEWS

8.2.1 Siyabonga telecentre

The information supplied by Reginald Msimango and Patricia Makoro yielded the following data.

(a) ICT available and used at the telecentre

Altogether, ICT available at the telecentre comprised six Mobile Telephone Networks (MTN) telephone lines, 10 computers (with Internet), a photocopier, a scanner and a facsimile. The facsimile was located at Makoro's house so users did not have immediate access to it (Makoro 2005a). She further stated that she had transferred the facsimile to her house after a break-in at the centre a few years ago during which equipment was stolen before their security improved. Makoro faxed users' documents at home. Telecentre users employed all these facilities, especially computers and the Internet. Sentech provided the Internet via satellite a facsimile machine –). All other ICT services offered at this telecentre are stated in Table 15(in Chapter 6) and are therefore not repeated here.

(b) Other business and life skills offered at Siyabonga telecentre

According to Msimango (2005), Internet use was increasing, which contributed to both formal and non-formal education of users.

Community members no longer travelled to Johannesburg to produce personal documents and this provided economic benefits to members because they save on travel and other ICT usage costs. For bulk photocopying, telecentre staff requested that they be informed in time because bulk photocopying "may require extra paper, toner and overtime work".

It can be concluded that users receive both formal and informal education from the telecentre because, according to Msimango (2005), users interested in learning the skills referred to above were taught, at agreed costs, through short courses offered and certificates accredited by the University of Witwatersrand.

(c) Computer and Internet training at Orange Farm telecentre

In addition to the use of telephones, computers and Internet usage training constituted the main service offered by this telecentre, according to Msimango (2005). Internet training at the telecentre started in 2003. Interest in this service grew because most local people run small businesses and viewed the Internet as an information resource for business and financial management skills. Computer literacy courses included teaching users ICT skills such as "word processing, spreadsheets, office administration, making of training manuals and Internet applications" (Makoro 2005a).

Computer courses taught demonstrate that Siyabonga telecentre ICT improves the education of users (both formal – for those courses accredited by the University of the Witwatersrand and non-formal – for those courses that the telecentre offers on its own (including computer literacy classes, cooking and baking lessons, a sewing class, financial management and building courses. Telephones and the Internet link telecentre users with people from Orange Farm and beyond. The computer courses train users to type and develop documents and this kind of education (DTP), is similar to that offered by higher education institutions, but at a relatively low cost. In addition, interviewed users voiced satisfaction with services received with some gaining work as a result of computer training obtained from the telecentre (Msimango 2005).

The Info-Lit course was accredited by the University of the Witwatersrand and comprised three parts – Information and Communications Technology lectures, including six modules, namely:

- Introduction to ICT, Africa in the Information Age, Information Economy, South Africa in the Information Age, ICT and Development and Universal Access and Telecentres;
- Computer Practical Sessions, also consisting of six modules namely Introduction to Personal Computers, Microsoft Windows 95, Microsoft Windows 97, Windows Explorer, Microsoft Excel 97 and
- Microsoft PowerPoint and Technology Sessions consisting of seven modules namely Bits, Bytes and Kilobytes, Data Transmission, Modem Technology,

Networks, Connectivity Devices, Connecting Networks and the Internet. MACIS telecentre also offered a similar course to users, which was very popular, according to the ICT trainer (Maako 2005).

Telecentre users received study material prepared by the University of Witwatersrand, but the material was taught by telecentre staff. Fees for short courses were paid to the telecentre to allow continued centre development, e.g., Siyabonga staff constructed a modern building in 2005 and expected more computers from the USAA as soon as they moved into the new building in 2006. During the teaching sessions, users were taught typing and Internet skills during the morning sessions and afforded an opportunity to practise lessons taught in the afternoons and on Saturday mornings.

(d) Siyabonga telecentre user economic development

The ICT trainers (Reggie Msimango and assistant, Bheki Mathe) were paid monthly salaries of between R800 and R1200 at the time, according to Makoro (2005a), but the salaries also depended on the telecentre's monthly operating costs and income. The salaries were paid from the fees paid by ICT trainees. Makoro's husband (2005b) taught users computer software, and also taught business skills such as bricklaying and building skills. The salaries that the ICT trainers received from the course fees were "better than nothing" (Msimango 2005). Msimango mentioned that they were glad to act as ICT trainers because they contributed to the "development of people" rather than "sitting at home doing nothing and being frustrated". "We enjoy meeting new interesting people almost every day who come here and receive help, even people from overseas (UNESCO). Other people who came here were from England, Canada and Norway to do different projects and we learn from these people a lot" (Msimango 2005).

Other local people and researchers visit the telecentre often, to receive assistance usually to run community development projects in the case of government departments (such as the Departments of Social Welfare and Labour) or research-related projects to acquire information on one of South Africa's fastest growing urban areas, Orange Farm. The telecentre received income from projects that private sector companies, government agencies and NGOs ran at the telecentre. Msimango provided

an example of the British Broadcasting Corporation (BBC), which visited the telecentre in 2004 to conduct research, and paid the telecentre staff for their time, assistance and information (Msimango 2005). The BBC compiled a television documentary about the use of computers in Africa.

Msimango also asserted that some former computer trainees had become employed as a result of the training they received. He provided an example of two women who had received computer training – one of whom started a sewing business (making clothes, bedding, curtains and interior decorations) and the other former student obtained a receptionist's job at a nearby petrol station. The sewing business was successful and the owner later opened two new branches in other sections of Orange Farm, employing seven people. The growth could be attributed to Orange Farm's fast growth as an urban area with many RDP houses being built. Also because people move from shacks to houses they need home furnishings and curtains. The business woman learnt sewing (or fashion design) at this telecentre (Makoro 2005a).

(e) Telecentre impact on user education

Telecentre users were taught skills at the women's development project of which the telecentre is a part (both men and women registered for the programmes). Skills taught included sewing, catering, bricklaying and building skills, and computer literacy skills such as Internet browsing and word processing, spreadsheets and business management skills using software**.**

According to Msimango (2005) both "older" and "younger" persons registered for the centre's computer courses but he emphasised that: "We interview older people before we register them for computer courses to establish if they are sure it is what they want to do and whether they will understand computers because older people take time to understand computer programs while younger people take less time to know how to use the programmes".

Msimango stated that there were, however, more "young" than "older" persons at the telecentre. Computer training bridged the educational gap between high school and higher education since most impoverished young South Africans cannot afford to

pursue higher education - hence they seek ICT training through short courses available in townships. By learning computer skills at the telecentre, this economic group did not need to travel to cities to attend universities (unless for advanced IT and engineering courses), and saved on the cost of travel and consumables.

In addition to bridging the digital divide between the township and Johannesburg, the centre staff taught computer skills useful in working situations. For example, a few ICT trainees at the MACIS telecentre obtained jobs in formal computer training after studying computers at telecentres (Maako 2005). Others who received computer training at MACIS were employed but are seeking promotion or new jobs with improved conditions.

Telecentre users gained educationally, informally, because they learnt from each other's experiences when conversing after classes, and from national and international visitors who ran projects and conducted research at the telecentres. Users also browsed the Internet for information for business development to alleviate poverty.

Msimango (2005) remarked that after receiving computer training from Siyabonga telecentre, users were able to "produce leaflets and advertisements which they post on the telecentre notice board" and elsewhere in the township. While administering the questionnaire, the researcher came across a number of telecentre users typing business plans and salary slips. One interviewee who was creating business documents said that he ran a construction company and that since registering his company he was required to complete financial planning, make statements and submit tax forms to the South African Revenue Service (SARS). He accessed SARS forms from the Internet and compiled salary slips, invoices and spreadsheets at the telecentre.

Msimango (2005) kept a record of all transactions conducted by users. Appointments with staff at non-computer class times were arranged. According to Msimango (2005), telecentre users appreciated computer lessons because the courses gained previous trainees work in cities, and others envisioned similar futures. Other interviewed users (two men and one woman) commented that the centre was useful educationally for computer training, email usage and Internet browsing. A female respondent indicated that she was studying computer skills, in preparation for a

fashion design course for which she planned to enrol at the Tshwane University of Technology (TUT), as soon as she had finished the computer literacy course at Siyabonga.

Makoro (2005b) commented that he sometimes used the telecentre to make phone calls and obtained different types of information electronically. He said that a number of government departments, such as the Department of Labour (DoL), had approached the centre intending to run development projects and occupational learnership courses at Siyabonga. The DoL is a government department running projects aimed at reducing unemployment by teaching informal job skills at training institutions called Sector Education and Training Agencies (SETAs).

(f) Community support for the telecentre and community development

Telecentre manager Makoro (2005a) stated that the telecentre is "well-known and well-supported by Orange Farm residents".

She unveiled plans to move to a bigger building (being constructed next to the computer laboratory). Makoro (ibid.) regarded the telecentre as highly successful and was pleased that the centre services were "in high demand". She further asserted that: "we always have people registering for our courses and when we have a bigger room we will get more computers from the USA and train more people".

Makoro (2005a) added that she was even more pleased about the contribution made by the telecentre in improving people's lives because: "people here like the telecentre because they want to learn about computers and want jobs".

The impression persons gained, according to Makoro (2005a), was that "if one knows how to use computers, one has a better chance of finding computer-related work in an office or business" or in nearby cities.

The telecentre users to whom this writer spoke were satisfied with the computer training they received: one said she had not paid a lot of money but was confident of finding a secretarial job upon completing her studies. She said that even when she

became a secretary she would study further because she was still young (19 years old). Other users the researcher spoke to were young persons who had not received any other form of computer training before visiting the centre. They viewed the telecentre as a source of local ICT training. A male user voiced his satisfaction with the services received, including making telephone calls, “when I do not have airtime on my phone (mobile)”. Internet training is “helpful” because he would “find employment” when “computer training was completed”. A female trainee said that she did not have money to enrol for post-Matric studies at university and decided to enrol in computer studies at the telecentre rather than “just stay at home cleaning the house”.

The principles of Development Support Communication (DSC) were identified in the ways in which users employed ICT at the telecentre and communicated with staff, as Makoro (2005a) stated that the centre consulted users before introducing changes, where technology or new services, and offered what users required. For example, building a new bigger venue was a result of observing that they turned many people away who required computer training because the training room was full. She expected to register all those on a waiting list for training when the new building was opened and increase telecentre activity and profit. Also, finding a job is a dream for many South Africans, and ICT usage in this centre assisted users towards gaining employment.

8.2.2 Mamelodi telecentre

Room B30, in the Mamelodi municipality building where MACIS is located, is small, with eight computers used for daily computer classes. Another room that served as an office contained a computer, a printer, a television set and a photocopier. All technology was used but computer trainees worked only at Room B30. This telecentre was opened by the former USA in 1999. The Info-Lit and ICDL computer courses were offered and the ICT trainer was Maako (2005). The Info-Lit computer programme ran from 13h00 to 16h00 while the ICDL course ran from 08h30 to 12h00 (Mondays to Thursdays). However, class times were also altered to accommodate trainees who worked during the day and there were Saturday morning classes as well.

(a) Impact of MACIS ICT on user education

Two courses were offered at MACIS on a formal basis (because trainees received certificates on completion of courses accredited by the University of the Witwatersrand were Computer Literacy and the ICDL.

The courses included the following components:

(a) a computer literacy course where basic computer and typing skills were taught, including Microsoft Word 97, Microsoft Excel 97 and Microsoft PowerPoint. This course was offered on Saturdays for a registration fee of R400.00. Another R262.00 was paid later. The total course fee was therefore, R662.00 (Maako 2005); and

(b) ICDL which, according to Maako (2005), is the best end-user computer course in the world. This was why he had made it available at MACIS. The standard for ICDL was jointly set by the major European Computer Societies and the ICDL was the only European Union (EU) recognised IT qualification at the time (Maako 2005). In South Africa, the ICDL is administered by the Computer Society of South Africa (CSSA). The course covered modules including Basic ICT concepts, Using the computer and managing files, word processing (MS Word XP), spreadsheets (MS Excel XP), databases (MS Access XP), presentation tools (MS PowerPoint), information and communication (Internet Explorer and Electronic Mail – Outlook).

At MACIS, the ICDL course cost users R1750.00 (registration costs R650.00) (Maako 2005). The course ran for three months and the examination fee was R80.00.

In 2005, the ICDL course was available in 140 countries, including South Africa, in 36 languages and had five million candidates worldwide. Eighteen million tests have been passed and 20 000 test centres operated worldwide. In South Africa organisations offering ICDL included Volkswagen South Africa, Sappi, UNISA, Absa Bank, Tiger Brands, Shell, BMW, the African Reserve Bank, Damelin and the South

African Reserve Bank. The ICDL-Foundation (ICDL-F) is an international non-profit organisation with the mission to raise the level of computer skills in Africa. The foundation is an initiative of the CSSA. ICDL is designed for those who wish to gain a benchmark qualification in computing, to enable them to develop their IT skills and enhance their career prospects. No prior knowledge of IT is required to study the ICDL course and it is open to anyone regardless of age, gender, education, experience or background. The syllabus is mapped to the South African Qualifications Authority (SAQA) qualification number 49077 (ibid.).

8.2.3 Hoxani (or Bushbuckridge) telecentre

Manageress Elsie Ndlovu was an educator, ICT trainer and advisor on outcomes-based education (OBE), possessing Bachelor of Arts and Bachelor of Education degrees. After the establishment of democracy, in 1994 the South African government introduced OBE to all South African schools and universities in 1996. All educators were obliged to learn the OBE system. OBE is an education system in which educators have to demonstrate to students what they are teaching so that students are better able to practice what they have been taught. OBE promotes the use of technology, while learning-by-doing rather than learning-by-listening. For example, if a lecturer teaches journalism, students should be taught, by being shown and practicing on computers how to write a news story, edit it and publish it instead of reading this information only from a textbook.

Ndlovu received OBE instruction in the late-1990s when the government was training people in this system. She “saw an opportunity to train others” who “were afraid of learning the new system and learning about new technology like computers” (Ndlovu 2005). She commented that she had obtained sponsorship of the computer laboratory from MultiChoice (broadcasting and entertainment company), whose aim is to form public-private partnerships (PPPs) for training educators and improvement in subjects such as science, mathematics and information technology.

Ndlovu (2005) said that she had noticed that teachers, after teaching with a different teaching system for many years, were reluctant to learn OBE because most of them

were not sure that they would understand “this new OBE so I took it upon myself to teach them”. During the interview in May 2005, Ndlovu stated:

> We are dedicated to equipping teachers with practical OBE knowledge that they can use in their classrooms. We function, along with numerous other Shoma Centres around the country, to use technology (e.g., computers and videos) to achieve the purpose of empowering educators to function in OBE. The Shoma programmes re-introduce OBE in an interactive way that helps educators to actually use OBE in the classroom.

(a) Hoxani MPCC impact on user education via OBE educator training and ICT training

Hoxani telecentre taught teachers, especially school principals, management skills and improved the education and computer literacy of users. A female user said that she had learnt all that she knew about computers at the telecentre, mostly word processing, file management and data processing. She said that she had learnt basic word-processing using Microsoft Word and Microsoft Excel and OBE courses (Hlatshwayo 2005). Ndlovu also taught desktop publishing and produces a newsletter entitled, *Hoxani Shoma News – An Empowerment Newsletter* (cf. Figure 7 in Chapter 6). Ndlovu indicated that the word Shoma means “work”, and that the Shoma project was a joint venture between MultiChoice Africa and the Department of Education. According to this newsletter (2005:2), the OBE programme offered inculcated GET in three stages:

- a video lesson in the broadcast room;
- computer interaction in the computer room; and
- lesson development in the discussion room.

During the OBE video lesson, a television facilitator explained, highlighted and demonstrated important aspects of practical OBE. Trainees then proceeded to the computer room where they spent time accessing information on OBE, practising OBE examples interactively, discussing and developing learning activities for learners. Further Education and Training (FET) modules were also loaded onto the computers by MultiChoice for educators who wanted to advance their knowledge in this area but Ndlovu had not yet started teaching FET modules at Hoxani MPCC. Security in computer laboratories had been tripled, with burglar proofs on doors and windows, and an alarm system installed in the building. A security guard protected the grounds where the Hoxani Teacher Training College in which the MPCC was located.

(b) Women at the forefront of ICT training in the Hoxani MPCC

Three women ICT trainers were employed at this telecentre when this research was undertaken. Most educators taking ICT training classes at Hoxani MPCC were women and Ndlovu (2005) remarked that most of the educators she trained were women. Great interest was shown by rural women in learning about computers to improve their education and, ultimately, quality of life. This might be attributed to the fact that most women still have low-paying jobs and some women are bread-winners.

Most women in Limpopo Province rural areas cared for their families while men worked in cities. Most educators who performed exceptional work in 2003 regarding teaching duties were more women than men (Ndlovu 2005). In 2004 and 2005 the best trainee educators were women from local schools which supported the telecentre, such as Njanji and Wielverdiend Primary Schools, and Mkhukhumba Secondary School. Unemployed teachers were assisted by the MPCC to find teaching posts in Limpopo and Mpumalanga Provinces. Ndlovu and research assistant Benedict Mnisi assisted with language translation (Shangaan to English and vice versa), because some respondents asked questions in the local language (Shangaan, which this researcher does not understand). Teachers trained at the telecentre received certificates, and that these certificates aided some of the educators to gain better positions, even in other provinces. She added that at the MPCC, educators were taught to “be OBE literate

and enjoy their work". It was clear that the educators at this MPCC were eager to learn, enjoyed computers but some seemed tense while working on the computers, which could have indicated the "technology fear" (Ndlovu 2005).

Forty-eight educators were trained at the MPCC in 2003, and 96 in 2004 and 2005. Ndlovu enlisted the assistance of three OBE trainers. In 2004 the MPCC started a school principal training module; 22 principals received certificates after sharpening their management skills at the centre. The school managers' module comprised OBE modules on the best way to manage learners and educators within the OBE teaching environment where the curriculum changed as the need arose (Ndlovu 2005). The school principals were taught "flexible management styles which encouraged more use of technology together with verbal communication to interact with other educators and school principals" even beyond Limpopo Province.

Basic computer training cost R250.00 for 12 lessons which comprised an introduction to computers, typing skills in Microsoft Word 97 and basic business skills in Microsoft Excel 97. Publishing skills were also taught so that educators were able to produce newsletters at schools. According to Ndlovu (2005), the Department of Health in Limpopo Province subsidised the telecentre computer training because "the department wanted to pursue health education campaigns through the telecentre, including HIV/Aids education, in the light of increasing numbers of educators who had died of the pandemic in the past few years". She could not provide statistics, but had been informed of this situation by the Department of Health and said that she was aware that the number of HIV/Aids-related deaths was on the rise.

Educators began computer classes at the telecentre at 13h00, three days a week. Two main groups existed but members of each group could join a third one for practice sessions (Ndlovu 2005). Sessions lasted for two to three hours. Most educators who participated in this study arrived at the MPCC by taxis but a few came by cars. They remarked that they were glad to be given the OBE and computer lessons because they were confident that they could teach pupils better using OBE principles. They felt that this would secure their jobs and prevent relocation to schools far from home because they did not possess the required teaching knowledge.

8.2.4 Tombo telecentre

Interviews were conducted in April 2004 and additional information was sought by telephone during September, October and November 2005. Four individuals were interviewed – the telecentre manager, Lusapho Njenge, the assistant telecentre administrator and ICT trainer, Nangamso Smauza, and female high school students. Smauza informed this writer about the technology available and used at the telecentre and about the other services offered. According to Ms Smauza (2004) the telecentre possessed the technology stated in Table 15 (in Chapter 6). According to Smauza (2005), the services most often used comprised postal services, computers, photocopiers, the facsimile and telephones. She added that: "As you know that most rural people like duplicating everything" – referring to document photocopying. Information derived from Smauza (2005) revealed that she made telephone calls, faxed documents and received faxes, typed and printed documents, used the Internet and taught other users (a few interested as most were not interested in the Internet) how to use computers, Internet and e-mail" and "postal services". In an additional facsimile sent to this researcher, Smauza stated that the whole of Tombo used the telecentre for post office (postal banking services, which the Post Office paid the telecentre an amount per month for postal sorting and distribution), the local pre-schools typed printed their documents and graduation certificates at the telecentre, and the local supermarket produced its advertising leaflets at the centre.

In 2005, the telecentre did not offer an Internet service because, according to Smauza (2005), the Web was not widely used. Most clients used telephones, facsimile services and post office services. Hence the staff wanted to focus on services required by community members and reducing running costs. The costs of using facilities at the telecentre are included in Addendum C.

The Tombo Telecentre IT Academy (as it is called) intended to provide ICT training mostly to women in business, and young girls who sought training, with intentions of pursuing business interests. Most ICT trainees at the ICT Academy were young women. Njenge (2004) stated that Sentech had provided the telecentre with free Internet services for a year, and that in addition to the well-secured computer laboratory at the telecentre, the telecentre ran another ICT training centre or academy

situated in Umtata (nearby town), which had 20 computers to offer computer training. Njenge indicated that there was much enthusiasm in Tombo and Umtata about learning computer skills, and that their ICT training academy was regarded as successful, even though it had been operating for only a few years.

ICT courses were taught at Tombo MPCC by Smauza and two trainers from the University of Fort Hare (UFH), East London campus and courses and training developments at the centre comprised the following:

> E-Citizen and the International Computer Driving License (ICDL). In 2003-2004 we had 25 students doing ICDL; about 10 of them passed. We realised that ICDL is advanced because most of the people around are computer illiterate, so E-Citizen was established by the ICDL Foundation due to the high number of failures in other centres. So E-Citizen is the basic course we teach and it teaches people about the Internet. E-Citizen costs R1500 per course for three months. Classes are held from Mondays to Thursdays, between 16h00 and 18h00 (with practice on Saturdays) (Smauza 2005).

Technology for Women in Business (TWIB), in partnership with the Departments of Trade and Industry and Science and Technology, companies Cisco Systems, Microsoft South Africa and Digital Partners, and a national research institute - the Centre for Scientific and Industrial Research (CSIR), are instrumental in establishing the computer courses at Tombo telecentre. Tombo MPCC constitutes a PPP (discussed in Chapter 1), promoting ICT capacity-building and training in a rural area. Njenge (2004) stated that he was busy trying to get the ICDL course under way, and at that stage he was consulting with government departments and educational institutions (ICDL and UFH). The ICDL course was the same as that offered at MACIS.

According to Njenge (2004), the Tombo MPCC is located in the O.R. Tambo District Municipality, about five kilometres from the town of Port St. Johns (in the Eastern Cape Province). The telecentre was opened by the late South African Minister of

Public Works, Stella Sigcau in 1999 and was the first of three government ICT pilot projects, aimed at testing the government's MPCC concept of introducing technology to rural areas for development communication purposes. Njenge commented that in the modern age, it was crucial for people to know how to use computers, because even if they had left the rural areas to work in a city, they needed computer literacy. In Njenge's opinion, the telecentre was bridging the technological and information divides between rural and urban areas by teaching residents the computer skills necessary for the digital workplaces such as urban-based government departments.

Technological equipment at the telecentre was also used (in addition to the members of the general public), by the Department of Health clinic situated in the building next to that of the Port St. Johns Local Municipality (where the telecentre was located). The Department of Home Affairs visits the telecentre twice weekly (Tuesday and Thursday) to provided residents with services – from identity book and birth certificate applications to applications for government social grants for the elderly and child support. ICT was employed while processing applications from local to national government. Residents also accessed health information (flyers and pamphlets) about diseases such as tuberculosis. The telecentre also provided welfare services to develop the community and offered an example of a partnership entered into with the Umtata Child Abuse Resource Centre (UCARC) (Njenge 2004).

Another partnership existed between the telecentre and the Tombo Entrepreneurial Development Centre (TEDC), aimed at assisting small business to start and register enterprises, and taught financial skills such as fundraising and bookkeeping (ibid.). Njenge, however, was unable to state how many local people are served by the MPCC but assessed that there were many villages surrounding Tombo village, whose inhabitants had employed the telecentre services. Information from interviewees was similar and mostly included the need to train in computers and seek work in urban areas, nearby towns and government. Other users made telephone calls at the centre, faxed documents and received faxes, and sought other types of information from staff.

The last two interviews were conducted with two high school students who said that they used the telecentre to make telephone calls, utilise computers to type documents, post and receive mail.

It was evident to this researcher, at the time, that the Tombo MPCC taught local persons ICT skills that contributed to the enhancement of computer literacy of residents and persons from nearby villages. The telecentre reduced travelling costs as users did not travel to cities to access ICT. Computer courses taught via the telecentre were part of formal education. Computer trainees gained recognition and accreditation from higher education institutions such as the ICDL-F and UFH. As the researcher was employed at UFH before joining UNISA in 1999, she believes that there was an improvement in ICT skills development at UFH because when she taught there (1991 to early-1999), computers for student use and were not available and students studied via textbooks only. The ICDL Foundation teaches computer literacy not only in telecentres but also in universities such as Fort Hare and UNISA.

Smauza resigned from the centre in January 2006 and commenced work at the nearby St. Mary's hospital. Before leaving, Smauza introduced the author to the new telecentre administrator, Nomvelo Rholo, who answered further questions about the future activities of the telecentre. Smauza (2005) remarked that she was glad to have been employed at the telecentre because she received valuable computer training and had passed knowledge to others.

Information in this chapter revealed that telecentres play some role in advancing the education of persons employing the centres for different reasons.

8.2.5 Selected respondent answers

Most of these answers are stated above: a few are mentioned in this sub-section and verbatim responses are given. A 21-year old Eastern Cape Technikon female student from Tombo village said:

> I learnt how to make a draft Business Plan and a Constitution, to type my own work and also to assist other telecentre users. I learnt Business Skills, since I'm a Business Management student at the E. C. Technikon, I would like the telecentre to offer Business and Managerial Skills such as Web Design

> and Information Technology courses such as Cisco Certified Networking.

A 24-year old female secretary responded that she uses the telecentre to

> "check my correspondence" and "post letters".

She added that as a secretary she wanted the telecentre to offer courier services and open a "Mzansi" account (a new banking system introduced in South Africa by four banks; it is intended for poor people and charges the poor few or no fees for using the service). She also wants the telecentre to offer Internet services and electronic mail (a few other respondents stated this), a laminator and document binders. She stated that the telecentre had taught her computer and communication skills ('how to deal with high volume of clients', 'work plan development'), and gives her 'information on time'.

A 50-year old male teacher from Tombo stated that the telecentre

> "helped to improve my speed when typing documents for the library".

He also wanted "older people" to "become involved in training on how to use computers. Also young people from as little as six years old from the primary schools need to be encouraged to use the computer facilities."

As a regular user of the telecentre, former telecentre administrator, Nangamso Smauza, aged 28, said that she had been trained in three formal courses at the telecentre, namely, Cisco Certified Network Associate (Computer Networking), ICDL and E-Citizen (this course teaches users about matters such as Customer Care, Working with People in Government, Financial Management, Reporting and Liaison Skills, Working under Pressure and working unsupervised to manage the telecentre or any other small business). Smauza wants to learn other computer skills including Web design, Pastel Accounting (a more advanced financial management course for business development). A few other users echoed the need to own small businesses.

A 32-year old male security officer from MACIS stated that he wants night classes to practise computer skills he had learnt during the day, and

> "create a wide space for slow-learning students"
> to "get used and be more familiar with techniques".

A 24-year old male student at Siyabonga telecentre commented that;

> "the prices are affordable and it's in our community,
> we don't spend much for transport".

He added that he uses the telecentre

> "for the access in use of computer, fax and phones".

Another Siyabonga user, a 20-year old male with a Bachelors degree, said he learnt baking and brick-laying skills at the telecentre because he is interested in "youth development". He remarked that through the:

> "use of the Internet, we are able to browse the Net and
> get the information we want".

He has finished studying and is unemployed, looking for work. A 24-year "baking instructor" at Siyabonga telecentre wrote that he uses the telecentre for "typing out of manuals and setting of assessments and tests". He wants the telecentre to offer a business and secretarial course. He further wrote:

> "I am now more fluent in writing and speaking English
> because this is the language that the computer normally
> use. I am still waiting to learn about Internet and Web site".

A 45-year old female high school educator at Hoxani telecentre wrote down that she used the telecentre

> "to develop myself on how to teach learners" and to learn "the use of OBE in education".

She plans to learn "all the computer programmes" offered by the telecentre, after Completing her OBE skills training. A 20-year old grade 12 student at Hoxani (or Bushbuckridge) telecentre stated that he uses the telecentre for:

> "Typing of documents, e.g., CV, covering letters. I also use the computers to improve my knowledge and skills required to master these computers".

He also wrote that he uses the telecentre for "Internet training", and wanted young people in their rural community to be encouraged to use the telecentre more fully because their telecentre is mostly used by older people (primary and high school teachers).

A 38-year old male at MACIS wrote that the telecentre

> "taught me how to use e-mail", "helped me to communicate with the world", and added that he wants to study "computer programming".

A 19-year old female student at Siyabonga telecentre stated that the telecentre

> "has improved my computer skills very much because I knew very little about a computer before coming here but now I know much more".

She added that she hoped to study Marketing, Drama, ICDL and Music, and that the telecentre did not teach her "everything" about computers but had provided her with "knowledge to a reasonable extent".

8.3 SUMMARY AND OUTLINE OF CHAPTER 9

This chapter indicated that telecentre users sampled in this study view telecentres as having improved their non-formal and formal education. In terms of non-formal education, the telecentres users stated that they learned computer literacy, and as far as formal education was concerned, also learned computer courses recognised by universities such as Fort Hare and Wits.

It is concluded therefore, that the telecentres have, in some instances, a positive influence on users and in other cases no impact - where users stated that they gained nothing from a centre. In cases where users' education was improved, either through learning computer literacy skills or gaining general knowledge about issues of self-development, the telecentres had a positive impact on the lives of those users. Unmet user needs and further ICT training required were stated in Chapter 7. There is evidence, also, that users saved on travel and ICT usage costs (as the services cost cheaper in rural areas than cities) as they no longer travelled to cities to access ICT.

In Chapter 9 the role of telecentres in telecentre user development in general is discussed and a local telecentre model is proposed which summarises the characteristics of the urban, rural and semi-urban telecentres identified by this study is proposed. Chapter 9 also provides recommendations for future telecentre research.

CHAPTER 9
FINDINGS AND CONCLUSIONS

9.1 INTRODUCTION

This chapter summarises specific areas in which the telecentres have developed the education of users and provides recommendations for future research on local telecentres and also the role of ICT in the education of users and in local development. The chapter first comments on the research findings and ends with the telecentre model.

9.2 FINDINGS

The study's principal findings are:

(a) Centres were established through public-private partnership (PPP) funding.

(b) Computer literacy was a major resource offered. A number of respondent answers – provided in several tables (cf. Chapter 7) indicate that the role of the telecentres in computer skills training is prominent and comprises the most important educational function of the telecentres, while it also represents the most important educational need of respondents (cf. Tables 57, 63, 64 and 65 in Chapter 7). In this sense, telecentres play a very important role in bridging the digital divide and information gaps. Therefore, it is crucial that telecentres continue to be developed and operated in South Africa as they play a significant educational role in a country with high illiteracy levels, which telecentres help reduce in a small but necessary way.

(c) Education, e.g., OBE teacher-training courses and business-related courses were offered.

(d) Although the telecentres were established by supply-driven initiatives, demand-based community interest and development strategy drives telecentre operation and sustainability.

(e) The rural telecentre users at Tombo and Hoxani travelled long distances to reach telecentres. In fact, even in the urban telecentres most users travelled

longer (than could have been imagined since some believe that persons staying in urban areas access ICT services closer to home than rural residents) distances to reach the centres, e.g., most of the users (at both the urban and rural centres) or 38.4 per cent of the sample, travelled one to four kilometres to reach the centres. According to legislation persons should reach telephones or ICT services within a 30 minutes walk. Many people walk two kilometres in 30 minutes. Therefore, time taken to walk three to four kilometres is often longer than 30 minutes, thus those walking three to 10 kilometres to access ICT services are not within acceptable reach of ICT services and these services have to be brought nearer their homes. In telecom universal access literature, walking to a telephone is considered rather than "travelling" to one because most rural people have no cars, taxis or transport so they walk to telephones.

The second largest single proportion of the sample (26.8 per cent of the sample) travelled less than a kilometre to the centres. However, the third largest proportion of the sample (40 telecentre users or 20.2 per cent of the sample, travelled 5 to 10 kilometres). This is unacceptable as people should travel far shorter distances than that to reach the centres. For example, one cannot travel five or 10 kilometres to make a telephone call to report an emergency. Telecentres should be located near homes to enable easier access and usage by users.

(f) Telkom's fixed-line telephones were not used by or accessible to many users and they had more access to mobile phones (cf. data, Chapter 7).

(g) Centre success is driven by local champions, the telecentre managers, administrators or computer trainers.

(h) Telecentre income is generated through computer course fees and payments for other services offered.

(i) The centres produce minimal localised content in publications such as newsletters produced, pamphlets and advertisements;

(j) Most respondents (from the rural and urban centres) regarded telecentre services prices as affordable (cf. Table 59 in Chapter 7) – 69.4 per cent of the sample stated that the prices were affordable (64.6 per cent of respondents at rural Hoxani MPCC, 69.4 per cent of respondents at urban MACIS, 68.6 per

cent of Siyabonga centre respondents and 75 per cent of rural Tombo MPCC respondents;

(k) Formal education of users is improved, e.g., through computer literacy and business-related courses offered and certificates provided but users believed that their non-formal education was not improved (cf. Chapter 7). Ways in which formal education was improved are stated in Chapter 7. These were mostly Internet usage skills learned, publishing skills where users learned desktop publishing and use of other software and business-related skills enabling the persons to start or continue their existing businesses with some computer-related skills.

(l) One rural centre, Tombo MPCC and the urban telecentres, MACIS and Siyabonga, further provided users with opportunity and economic empowerment, while the rural Hoxani MPCC provided users with opportunities for career advancement and training in teaching skills.

(m) More men used the centres the centres than women at Hoxani, MACIS and Tombo centres but at Siyabonga centre usage was spread equally between men and women respondents. Accordingly, there could be an urgent need to promote telecentre usage among young women and provide young women with ICT capacity-building by establishing gender-specific IT courses at the centres, schools and other MPCCs and even provide women with ICT university scholarships.

(n) Telecentres should be marketed more for expanded public awareness about what they can offer community members, especially women. The USAA (now called USAASA) will be sensitised by the research on this finding (and to other findings so that they can employ the information for telecentre improvement);

(o) Learning computer skill at the centres is regarded as a means to access higher education, migrate to cities to seek work opportunities, access work and obtain promotion at existing jobs. This was stated by several interviewees during the interviews with the researcher, that they sought computer literacy skill at the telecentres with the aim of seeking work or improving their education elsewhere (mainly in cities). The interviewed teachers, at Tombo and Hoxani MPCCs – stated that due to low salaries they were receiving, they saw further computer skills training as a means to better salaries or promotions;

(p) Access, affordability and saving on transport costs played a major role in explaining why users studied certificate and computer courses at the telecentres instead of attending colleges and universities, because the latter are far away and have higher fees.

(q) More rural users were highly educated, while the largest single proportion urban telecentre users had lower educational levels.

(r) Electronic and new media (e.g., Internet-related services, CDs and desktop publishing) were mostly employed at urban telecentres. Old media, such as the overhead projector and the book were used at the rural telecentres (mostly at Hoxani MPCC). However, other media were unavailable or never used at the centres.

(s) Education and monthly income influenced the use of telecentres, e.g., Hoxani centre users employed technology such as telephones (Telkom and Vodacom) more than users at other centres and Tombo MPCC users employed technology such as the facsimile more than other centre users and this can be attributed to the fact that the rural telecentre users were more educated and therefore, there were more employed users at these centres than at the urban centres.

9.2.1 Other findings and theoretical conclusions

Results of this study have also shown that most of the users were young, male students (younger mostly at Tombo, MACIS and Siyabonga centres, and more males at Tombo and MACIS, with equal numbers of males and females at Siyabonga centre) and older users or teachers (aged between 30 and 50) at Hoxani MPCC.

Based on data gained from using both qualitative (personal interviews) and quantitative (survey questionnaire) methods, it was found that the greatest single proportion of users (43.2 per cent of the sample) had achieved a higher educational level and had diplomas. However, the diplomas this group had do not earn people work often as they are not like university degrees. Therefore, they came to the telecentres to improve the computer skills that higher education could have provided them. In fact, today even persons with university degrees do not obtain work (cf. Chapter 1). In sum, educated persons in the sample are those with university degrees,

namely 21.5 per cent of the sample and most of this group came from the rural telecentres, 44.9 per from Hoxani centre and 25 per cent from Tombo telecentre (while 10 per cent were from MACIS and 7.7 per cent from Siyabonga). The greatest single proportion of respondents from the urban centres had Grade 12 (42.0 per cent of MACIS respondents and 36.5 per cent of Siyabonga centre respondents) – while the corresponding proportions were 16.3 per cent at Hoxani and 16.7 per cent at Tombo centres.

Therefore, if more persons at the centres had diploma courses but still used the telecentres to study computer literacy, this implies that they require other forms of computer training to improve the qualifications they have in order to access work – which most of the users did not have at the time of the research. Thus these telecentres contribute to the improvement of the education of users who passed high school (Grade 12) and diploma courses, but who learn computer skills at the centres to upgrade the knowledge base. Knowledge and careers of teachers learning OBE computer skills at the centres are also advanced because the teachers improve teaching skills and work opportunities. Some users completed business-related courses at the centres, and use this knowledge in small business management. ICT skills learnt at the centres are used as a help to entering universities and other institutions of higher learning. Also, telecentres provide unemployed persons with computer literacy skills, with unemployed rural and urban users flocking to centres in search of computer literacy skills.

Generally, telecentre deployment is supply-driven, but introduction of new centre services is demand-driven. This demonstrates that there is a localised increase in the understanding, diffusion, adoption and acceptance of the telecentre concept as local people make use of telecentre services and demand new services from telecentre staff based on communication needs and financial capacity. For example, Internet service provision was discontinued for public usage at Tombo MPCC because users were not using and could not afford the service, and requested staff for a post office which they used efficiently and can afford (Smauza 2005 *Interview with author*). The users also requested staff to introduce post office banking and courier services and the staff were in the process of introducing these services at the time the research was conducted.

The findings on Internet usage and post office demand support economic development literature which states that telecommunications investment policy and efforts continue to be supply-driven, but urge greater emphasis on demand-based strategies (Youtie, Shapira and Laudeman 2007:347). As with international telecommunications and information policy, local telecentre policy has focused on increasing the supply of ICT services to spread universal access and achieve larger social and economic goals. Developing ICT supply is equated with economic development success. However, ICT policy makers and implementers are considering the importance of demand-driven ICT deployment to satisfy local consumer need. This development supports the Development Support Communication literature used as the groundwork for this research, which states that ICT has positive outcomes if employed to meet local communication needs and support local culture (cf. Chapter 3).

The research also established that many users *still travel long distances* to visit the telecentres. For example, 34.8 (with 20.2 per cent of the sample travelling 10 kilometres or more) per cent of the respondents travelled five kilometres and more to reach the telecentres; 38.4 per cent of the users travelled between one and four kilometres to access the telecentres. At Hoxani MPCC, the issue of travelling longer distances to reach the centres is even more acute; 72 per cent of the Hoxani centre users travelled five kilometres and more to access the telecentre. The fact that most Hoxani MPCC users had forms of transport to travel to the telecentre does not improve the situation because persons have at least to walk (rather than drive to one or catch a bus or taxi to get to one) 30 minutes to reach these centres. Rural areas in South Africa do not have readily available public transport services that transport people every two or three hours of the day. In those areas that are fortunate there could be one public sector bus or one taxi travelling from a rural area to the nearest town and that bus or taxi usually comes back to a village in the late afternoon. So during the day persons have to walk to reach their destinations. In emergency cases, persons should not have to walk beyond 10 or 20 minutes to access ICT services to gain assistance. Therefore, even the “walking for 30 minutes” definition may not be realistic in cases of emergency, which implies that time taken to walk to a phone could be shorter than 30 minutes.

Therefore, there is still an ICT access problem in all four areas that needs to be resolved by those mandated by legislation to provide ICT services to these areas, e.g., the USAASA. This telecom services universal access problem necessitates that issues of universal access to telecommunications services be *revisited* as it is crucial that telecom services be established near users' homes to bridge the digital divide, access and usage gaps. Local champions drive and *support the telecentres and community members* also support the telecentres hence they were operating with some level of success. Dedicated local champions were telecentre managers or administrators, and assistants or ICT trainers. Telecentre income and sustainability was generated through computer course fees.

Data in this chapter also demonstrate that the centres were providing *localised content, albeit small* (e.g., providing users with information, government services and producing newsletters and other publications in English. Some advertisements and pamphlets produced by Siyabonga users were written in local languages). Local content makes telecentres relevant to a community and induces community members to associate themselves with the centre as they can relate to centre offerings. Telecentre made ICT services were regarded as *affordable* by the rural users and this is an important factor in increasing diffusion, usage and acceptance of a telecentre. It is important therefore, that issues of ICT access, local content and champions, and affordability be incorporated in processes of planning the spatial location and operation of telecentres as these factors can significantly improve diffusion and usage, and ultimately improve centre financial viability and economic sustainability.

The research aim was to examine the telecentre impact on formal and non-formal education of telecentre users and this chapter proves that the telecentres improve aspects of the users' formal education (e.g., computer training courses taught which gain users certificates presented by local universities working in collaboration with the centres, business-related knowledge gained and OBE teacher training). Users stated that their non-formal education of users was not advanced by the centres, but general knowledge and information received at the centres may be regarded as non-formal education or life-long learning.

A large number of the less-educated urban respondents studied computers at the centres which were cheaper and took only a few months to complete (usually between three and twelve months). There are many colleges and similar educational institutions nationally, which offer such certificate courses that facilitate gaining employment, and offer these courses at lower cost than universities. University education is expensive hence some resort to studying shorter courses at cheaper institutions such as telecentres. If one considers that the ICDL course taught at the telecentres is the same as that taught at UNISA and Fort Hare University, there is no need to study at a university because it will serve the same purpose but is expensive at university while cheap at the telecentres. The course is cheaper at the telecentres than at the universities. Certificates are obtained at both the universities and at the telecentres.

Access, affordability and saving on transport costs (e.g., walking to a local telecentre instead of travelling to a university in the city), play an important role in explaining why most users studied short certificate courses or diplomas at the centres. This finding supports other research which has established that ICT users are likely to use centres more when these are near their place of residence. For example, Chigona (2006:3) concludes that a telecentre or ICT centre should be easily accessible both physically and socially for different groups. Furthermore, Milne (2006:2) asserts that affordability of a telecom service reduces the "barrier effect", (which prevents people from owning or using a telephone or ICT service which in this case is a telecentre delivered services).

This conclusion also applies to access to and availability of educational institutions. If educational institutions are distantly located and offer expensive services, people obtain educational services from institutions or centres located locally to reduce the "barrier" and "inhibitor" effects. Recent (end-2007 and beginning of 2008) universities of Johannesburg, and Pretoria, and Tshwane University of Technology (TUT) student protests and demonstrations against annually increasing university fees also demonstrate that university education is a luxury many cannot afford and therefore alternative affordable education is necessary and should be provided by institutions nearer to poorer communities in the quest to eradicate illiteracy and reduction of high unemployment. Universities seem to be oblivious of the fact that

South Africa needs affordable education to rid the country of high levels of illiteracy and reduce poverty, if the country aims to fulfil or achieve the Millennium 2014 Development Goals, or at least some of them.

This study has also confirmed results of other studies, that whether or not a service is affordable to a household depends primarily on service price and household disposable income, though also on other marketing and user factors (Milne 2006:2). Milne maintains that access to ICT and telecentres provides transport substitution to users, therefore, saving users transport and travel expenses. It is, therefore, crucial to locate telecentres nearer residential areas and ensure that the services are affordable.

There were more users with higher education at the rural telecentres and more users with low education at the urban centres. For example, according to Table 23 in Chapter 7, 19.6 per cent of the total sample had a university degree and 43.2 per cent of the sample indicated that they had completed a post-matric certificate. The most educated telecentre user was a 52-year old high school principal at the Tombo MPCC who had a Master of Education degree and was continuing to study. The school principal made use of computers, the facsimile, post office, and photocopier at the centre because his school did not have these facilities (the school only had a telephone). The fact that most rural telecentre users had higher educational qualifications than the urban users could be attributed to rural people using education as a means to gain access to work and relocate to cities, while most young urban persons tend to leave school early, most do not undertake university study and usually find employment in low-paying jobs since they leave school early and have low educational levels. For rural people, gaining education is a priority in enabling economic empowerment. For most township residents education does not seem to be a priority as most leave high school early and other resort to crime for survival.

Also, most township youth spend time on entertainment and social events rather than on books and libraries, as the former ANC Youth League President Fikile Mbalula stated in early-2008, according to media reports, that most youth is engaged in unconstructive behaviour rather than studying and this leader stated that his organisation was designing strategies of eliminating this scourge. In most rural areas, this affliction has not been reported.

Because there were fewer women than men studying computers at the telecentres, there should be more national information campaigns aimed at teaching younger women about technology and its usage. Women should also be ICT trained to advance them in careers and life in general. Provincial and national government has also recognised the need to train women in ICT skills, e.g., there have been a few conferences in the past year or two inviting women "only" to "ICT Indaba" (meetings or conferences), such as the "2010 World Cup Women in Communication" held in October 2007 in Rosebank, Johannesburg, whose aim was to educate women about ICT in advertising, media and communications in general in preparation for the 2010 Soccer World Cup (Qaba 2007).

Also the "North West Women in ICT Indaba", was held in Mafikeng in September 2007. The aim of the "North West Women in ICT Indaba" was to educate women about the role of ICT in the achievement of the Millennium Development Goals (MDGs) towards fighting poverty, improving access to health and education and meeting other local development goals. Efforts such as these conferences are to be commended and should continue to build women's capacity in the ICT sector and promote gender-specific ICT training programmes. However, conferences and "Indabas" such as the two examples above tend to invite women that already have advanced knowledge in ICT, i.e., educated women such as academics, economically empowered and business-owning women.

There is a more pressing need for government and the private sector (or partnerships between these parties) to educate rural, township and less-educated women about the role of ICT in the improvement of their lives, as these groups are not yet exposed to ICT and need most education about what technology can do for them and how they can use technology effectively, e.g., telecentres, for developing their communities.
The researcher was informed by female telecentre users interviewed who were studying the computer networking course at Tombo MPCC, that the Tombo IT Academy was mainly aimed at women ICT skills development. Therefore, there is a government recognition that the country has to develop women ICT skills. However, these attempts should be strengthened and many women should be trained and thereafter employed. International research has established that marketing and public

awareness of telecentres induces more usage by community members. For example, Chigona (2006:3) mintains that community members must first become aware of the telecentre communal computing facilities (CCF) or telecentre and its services before becoming involved. Therefore, South Africans should accelerate ICT educational campaigns aimed at young women.

The new paradigm for capacity development and institutional innovations (cf. Chapter 3), supports the above conclusion when it states that the lack of ICT should be addressed by interventions such as technology transfer, ICT skills transfer and human resources capacity building. Technical assistance is inadequate to build capacity in IT skills. Technical skills training are needed more than technical cooperation between countries.

Local women are more dedicated to development projects than males (cf. Legoabe 2007, in Chapter 2 on local MPCC development). If women are taught how to use telecentres effectively and pursue ICT development projects, they pursue the projects with vigour and ensure that the projects succeed (Legoabe 2007). However, most of these women are not highly educated and require capacity building in business and ICT skills. Therefore more women should receive ICT skills training nationally.

Ideally, telecentres should be located near people's homes, within a short walking distance. Users do not have to drive cars or ride buses and taxis to reach telecentres, as users at the Hoxani MPCC do to reach the telecentre. Fifty-two per cent of Hoxani centre users travel 10 kilometres to reach the centre. The issue of access to ICT centres should be addressed because that telecentre has not eliminated access barriers that inhibit persons in using that centre.

Although the location of an ICT centre does not guarantee that those living near it will use it, it does eliminate barriers to access that centre and provides individuals with an opportunity to use that centre. The situation in Limpopo Province, and also in the Eastern Cape Province, where this researcher has observed that telecentres are few and far apart and also located far from people's homes is problematic and needs rectification by government and its universal service administering agency, the USAASA.

Most users said that they were satisfied with the telecentres' services, although some desired new services to be provided (see Chapter 7). The telecentres should meet the demands to ensure continued centre usage and increase user numbers. Research suggests that reducing the cost of technology alone is not enough to raise demand, more attention should be paid to tailoring policy to stimulate demand through targeted applications and broader supporting policies (Youtie, Shapira and Laudenman 2007:347). The *technology factor* and telecentre staff friendliness were crucial in determining how long a person used the telecentre or enjoyed employing the telecentre, as some interviewees stated in all the centres, that staff at the telecentre were supportive and made learning "easier" and were "approachable", which made the computer training "easy" and enjoyable. Community informatics theory also states that users employ telecentres if staff have a positive attitude and support users in the learning process.

Age was also not a contributing factor to the time spent by users per visit but the type of course studied affected time spent at the centres. The older users (at Hoxani MPCC) did not spend more time than the younger users at the other centres, as would have been expected. The Orange Farm ICT trainer, Reginald Msimango, mentioned during an interview (2005), that it took him more time to teach the older users because the old took time to "grasp" lessons. The average time spent by Hoxani centre users was one to two hours, similar to users of the urban telecentres, MACIS and Siyabonga. Tombo MPCC users spent, on average, less than one hour at the telecentre per visit.

9.3 CONCLUSIONS

Telecentre activities concentrated on the provision of the following services which both more and less educated users employed:

(a) computer literacy classes;
(b) Internet for information-seeking (for instance, Siyabonga telecentre);
(c) photocopying (mostly at Tombo MPCC; the telecentre manageress even said that "as you know that rural people like to duplicate everything");

(d) communication and information from centre staff, about issues of interest and job-related requests and applications (online at the urban telecentres);
(e) MTN public telephones (at Tombo and Siyabonga telecentres); and
(f) post office services – at Tombo MPCC.

The post office and computer services were the most used services at Tombo MPCC. At Hoxani telecentre the main service offered and used was the OBE teacher development programmes and computer lessons. The course allowed teachers to up-grade teaching skills, knowledge and capacitate students. Teachers also gained a better ability to prepare class presentations, management and human resources skills by school principals and better student performance. Bozeman and Rogers' (2002) churn model explains this as the role of ICT in developing users as information is gained from ICT and users turn valuable information to other types of information or empower other persons through technology and information transfer to bridge the digital and information divides.

Computer classes and Web surfing were the requested services at Siyabonga centre. Also, most Siyabonga telecentre users possessed (visibly displayed) mobile phones and some users stated that they needed new computer courses such as Pastel Accounting because they owned small businesses and were interested in financial management and how to run a small business. Telephone (MTN public phones) service usage was high only at Tombo telecentre. Most MACIS centre users and Hoxani telecentre teachers required managers to introduce computer courses, e.g., computer technician course A+ and a business administration course, Pastel Accounting. At Hoxani MPCC, most users did not mention specific names of computer courses but wanted to pursue learning more about computers to keep busy. One interviewee who had just lost her husband stated that she needed to "keep busy working on computers" because she stayed alone at home and her two children were away studying at tertiary institutions.

It is concluded that ICT is much needed in these telecentres for personal and career development, as is the case at Hoxani MPCC. Other conclusions drawn from this study's findings are:

9.3.1 Universal access to ICT through telecentres

The telecentres have succeeded in improving ICT access and use, although some persons still travel more than 10 kilometres to reach telecentres. Computer, photocopying, Internet, postal, facsimile and public telephones services have become accessible even to people living in rural areas.

Telecommunication service prices charged by the telecentres can still be lowered, especially in the urban telecentres where users viewed the prices as expensive, because the prices are crucial in ICT access and usage debates since lower prices motivate more ICT usage. Affordability of services means that the users can continue to use the telecentres, ensuring sustainability and continued functionality.

The MACIS telecentre manager, Mr Maako, stated that cheaper computer training costs attracted computer trainees, as universities offer expensive education. Telecentres satisfy the demand for computer courses at lower cost. Although the quality of some telecentre computer courses may not be the same as that offered by universities, the outcomes are the same as telecentre computer courses manage to secure the trainees work and the trainees also receive certificates for courses passed. There is a market for cheap computer courses which universities fail to satisfy because of high fees and this market is served by the telecentres (and other similar institutions).

While low fees for ICT services are an advantage, the purpose of lower fees is more inclusion than use. Attendance of computer classes at the telecentres was high, which illustrated a great demand for computer skill. Telecentres with small computer rooms sent persons back home and informed them to visit the centres for training after six months when other users had completed training. This indicates that there is a high demand for computer skill training. Trainees intend to get jobs in the ICT sector, with some female respondents at the Tombo MPCC making their intentions clear, “to go to the city and get better jobs”, because “there are no jobs in the village”. Other users at Tombo village saw the computer courses they were learning at the telecentre as stepping stones to university courses. Interviewees at Siyabonga MPCC viewed the courses as vehicles for accessing work and promotions.

Telecentres, therefore, succeed in teaching useful computer skills which the users "transform" into value (work, promotion or improved salary), further education and training and teaching others in the community. Certificates and diplomas enable users to obtain work. Further, telecentres expedite the rural-urban migration of Tombo MPCC and also in the case of some Hoxani MPCC interviewees who stated that the OBE skills that they received made them "confident" to seek work in many schools, "even in cities".

9.3.2 ICT usage and maintenance

An important aspect of telecentre continuity is ICT servicing and maintenance. The telecentres maintained and serviced ICT. Managers serviced computers periodically and occasionally took them to the nearby cities for any technical problems. However, Siyabonga MPCC ICT trainer, Msimango (2005), stated that most computers were outdated and slow, that they expected new ones from the USAA. Another reason managers wanted to teach computer technician courses was to enable them to ensure that technical computer problems were solved at the centre rather than having to take them to the city. Other computers were sent to the USAA in Johannesburg, kilometres away, for replacement or software updating. Updating software enabled managers to update software knowledge, receive new training about use of that software and improve their hardware knowledge.

Typically, telecentres depended on other external parties for ICT support, e.g., the USAASA and CSIR. Public-private partnerships, in this regard, are a means of support for telecentre growth and sustainability. For example, the MACIS centre was assisted by the CSIR, which provided replacement computers after the centre was vandalised in 1999. Tombo MPCC is underused during mornings because most of its users, school children and teachers are at school, and other computer trainees are at work and only attend classes in the evenings. A handful of users could be seen during the day making telephone calls and using the post office but more computer activity started after 16h00. Photographs taken by this researcher, of users using the telecentre during the day showed users making telephone calls, faxing documents, practicing computer lessons at the laboratory and posting assignments to UNISA. Therefore, the

telecentres are self-reliant as they have devised survival skills to avoid telecentre maintenance costs, but commonly request sponsorship or financial assistance (and technology offers) for infrastructure (such as rent-free buildings) and other financial resources from local insitutions. For example, Tombo telecentre is supported by the local municipality with free accommodation, electricity and salaries.

9.3.3 Telecentre model

Figure 8 summarises the characteristics and functions of telecentres identified by this research. Aspects of the model not identified by the results in Chapter 7 and 8 are recommended by this researcher as important aspects in telecentre development and operations. However, the model is not included in the recommendations section because most information in the model was yielded by the study's results.

Figure 8: Telecentre Model

(a) Local or municipal authority, or government-supported telecentre, e.g., school and post office centres; the Hoxani MPCC is in this category as it is an Outcomes-Based Education Teacher Training (OBETT) telecentre supported by government and located at a teacher-training college. Tombo telecentre is a local municipal multipurpose centre set up by government to service the community. The Hoxani telecentre can also be regarded as a Co-operative Multipurpose Telecentre because it is managed by community members through cooperation between users and managers.

(b) Community-based organisation telecentre focusing on computer skill training and providing other services (a multi-purpose centre), e.g., Siyabonga and MACIS telecentres fall into this category as they are computer skill training and information telecentres. This is because they focus on teaching users computer skill and offer other ICT and information services such as the Internet, facsimile and photocopying services, business lessons and general life skills; and

(a) Public-Private Partnership telecentres – those established and supported by PPP funding ventures and all four centres in this study were in this category.

9.3.4 Transformational computer usage and impacts on user education

Clearly the telecentres play a crucial role in improving the formal education of users (cf. Chapters 7 and 8). These computer skills are employed in job searches hence some users trained at Siyabonga telecentre gained employment in nearby towns (Msimango 2005). Most of the users stated that before registering for telecentre computer training they had no prior computer knowledge.

Further, the telecentres researched in this study are information centres (ICs) that provide end-user computing to local users. Community informatics (CI) theory, which forms the theoretical basis of this study, emphasises that telecentres should play a role in being ICs as community members get developed if obtain information they require. Evidence in this thesis has shown that telecentres do not provide users with all the information and skills they need (cf. unmet needs in Chapter 7) but nevertheless some types of information are obtained from the centres. Therefore, from the findings of

this study telecentres are succeeding in developing community members although they do not satisfy all user needs and therefore, not yet at advanced stages of telecentre development. Managers need to improve telecentre offerings to serve new demand-driven interests.

In addition, the new paradigm for capacity development and institutional innovations discussed in Chapter 3 argued that there is a need for ICT capacity building in LDCs to create new knowledge. This research also revealed that most educational facilities are either not available or never used at these telecentres, a situation telecentre managers should pay attention to as computers alone may not eliminate illiteracy. Some people should read books because the future of the book is not bleak but books need readers and libraries need visitors and users too. This thesis also emphasises the crucial role played by partnerships in ICT capacity building. Developed countries with ICT skilled labour could assist developing countries in ICT capacity building. It can be concluded that in this study, telecentres provide ICT capacity building in the communities but are not yet producing innovations.

9.4 A SUMMARY OF THE IMPACT OF THE TELECENTRES ON USERS: EDUCATIONAL, ECONOMIC AND SOCIAL ASPECTS

Chapter 1 of this thesis identified some of the aspects analysed in telecentre studies when assessing the impact of telecentres on individual and community development (cf. Amariles et al. [Sa]; Whyte 2000). This section summarises the educational, economic and social impact of the telecentres on users. A summary of this impact is provided in this section.

9.4.1 Educational and economic impact of the telecentres on users

Table 19 in Chapter 7 shows that 173 adults (those 20 to 55 years old, representing 86.5 per cent of the sample) gained educational benefits from the telecentres, either in terms of learning new computer skills (courses and certificates obtained shown in different tables in Chapters 6 and 7), improving computer knowledge, offering practice sessions to users so that they can improve computer skills gaining new knowledge from telecentre staff and the Internet about topics of interest, and other

personal changes stated in Chapters 7 and 8 that the users did not have prior to using these telecentres.

Forms of adult education obtained from the telecentres include the OBE computer lessons received by the users at Hoxani MPCC (teachers stated how these lessons improved the work production), computer lessons for business skills at Siyabonga MPCC and other computer courses learnt in other centres (cf. Tables 60 and 61 for the course names). Asked, in the questionnaire, if the telecentres improved individual educational levels and developed the community (cf. Table 74, Chapter 7), the users agreed that the centres developed the community and improved personal lives. Means of telecentre ICT benefits (and therefore impact, cf. Table 61 in Chapter 7) indicated that the telecentres improved user non-formal education (through knowledge and information gained), while at MACIS and Tombo MPCCs the means indicated that user non-formal education was almost not improved (or it improved just a little). Respondents at all four centres expressed the view that their formal education was improved by the telecentres "to a reasonable extent". All these figures and statistics reveal the telecentres' impact on telecentre users' lives, as stated by the users themselves.

Minimal distance education impact was identified at the rural centres of Hoxani and Tombo, where students were using the centres to study and write (type, proofread, print and post in the case of Tombo MPCC) university assignments, discuss work related issues with other students (Tombo) or teachers (Hoxani) and then send the assignments to the universities. Tombo students studied at UNISA and the former Rand Afrikaanse University (now University of Johannesburg) and Hoxani MPCC users were UNISA students who were also seeking to ask UNISA to use the telecentre as an examination venue so as to save the costs of travelling to the main towns.

Another educational impact is the improvement of user language, English, (cf. Whyte 2000). In this study, seven users (three at Hoxani centre and four at MACIS) stated that their English language skills were improved after using the telecentre (cf. Table 67). Another educational impact indicated is in the area of gained computer skills, which is also a business-related impact (cf. Whyte 2000). These skills learnt by the users are word processing, spreadsheet applications, and other skills very useful in

work and business such as desktop publishing (DTP) at Siyabonga centre where users produced personal and marketing pamphlets and flyers which are displayed at the centre and distributed in the township. This indicates positive telecentre impact which is also community building.

Skills such as DTP are mostly obtainable at colleges and universities but at Siyabonga telecentre they are obtainable at cheap prices. DTP is a human resources development skill which results in obtaining work, job improvement or pay rise to anyone who can acquire the skill. Other work-related skills obtainable at Siyabonga centre are spreadsheet business applications, MS PowerPoint, bricklaying (or building) and catering skills, fashion design and needlework, and all these are serious business skills which enable one who has learnt them to start their own businesses and earn a living. However, most users who were studying these skills at the centre already had some small businesses and attended the centre to excel in the crafts and build already existing capacity and businesses (this was also explained in Chapter 6; cf. Tables 41, 56, 60, and 63 in Chapter 7).

Tombo MPCC focused more on computer typing skills, a LAN computer course and human resources development courses for people who were working or planning to work in government by teaching them how to deal with other people in the workplace (e.g., the Batho Pele and the E-Citizen courses). There is also ample evidence in the tables in Chapter 7 illustrating that telecentre users gained what some authors (cf. Chapter 1) have called “self-development” or self-empowerment. The latter can emanate from information or knowledge gained that one uses to upgrade oneself, or it can be information obtained from the Internet. Users were not asked why they used mobile phones and faxed documents, but there is a high possibility that some phone calls made and facsimiles sent and received were business related, thus illustrating another economic impact of the centres on community members.

Business accounting skills are also taught at the centres in the form of Pastel and A+ business courses (MACIS and Siyabonga centres). The other economic impact of the centres on users is that users saved time and money by accessing ICT near their homes and not travelling to towns far away to access the services. In telecoms literature time and cost saving are economic benefits, therefore economic impact. The

post at Tombo MPCC has the same value or impact on its users because they save money and do not have to travel to Port St. Johns town to send and receive mail. In turn, the post office pays the telecentre a monthly figure for doing the post work of mail distribution and safe-keeping. The telecentre was furthering its relationship with the post office and starting the post office banking service, at that time of questionnaire administration. One Tombo centre user was selling goods to the telecentre users daily and was making a living that way and some of her goods were valuables purchased in Durban and was making a reasonable business profit.

At Siyabonga centre, the telecentre owners also own the tuck and phone shops and the restaurant next to the telecentre so telecentre users do almost all activities within the telecentre building, i.e., they attend computer classes at the centre, but food and airtime at the tuck shop, make telephone calls at the phone shop and also eat at the restaurant. The interesting thing about the business ICT such as the photocopier, facsimile and telephones (MTN) was that they were mostly used at the rural telecentre of Tombo MPCC. Also most education-related activities were conducted more at Tombo MPCC. The township centres of Siyabonga and MACIS mostly used Internet related services, radio, television (at MACIS, no TV at Siyabonga centre) and mobile phones.

Hoxani users mostly used the book, an overhead projector, television, audio-visual media, computers for typing and other old media. Statistics, in Chapter 7, however, showed that most of these are used minimally, hence one of this study's recommendations is that these media are necessary at the centres because they are either not there or unused. Tombo MPCC users did not use the Internet as it was used by the staff but used the public information terminal to access government services such as applications for identity documents and accessing social grants. Therefore, this Tombo MPCC is also contributing to poverty reduction as the social grants it distributes reduce poverty in the community. A security guard (cf. Table 25), at MACIS centre stated that he had received a salary increase at work after completing the telecentre computer course. There were other similar cases at Siyabonga centre so the computer courses taught at the centres even gain users work promotions.

All these services are provided by one business owner (Siyabonga MPCC) who saw a business gap in the community and simply provided what local people require at one place or building. Their brick-making business is also not far from the telecentre building and one can walk to the site to see what community members learn at the site and how they are taught how to make bricks and further their businesses in this field. This is a very good telecentre as it teaches uneducated people life skills. In life one needs a skill to use to earn some money and this is what this telecentre instils in its users – "help yourself before expecting the government and other people to help you", which in local language is simply known as "zenzele".

9.4.2 Telecentre impact on community organisations

All four centres have good relations with different community organisations, universities, government departments and other institutions (e.g., research institutions such as the CSIR). Most of these institutions and their impact on the telecentres (which has implies telecentre impact on these organisations between they have mutually beneficial relationships), are discussed in sections headlined "public-private partnerships" involved in establishing and maintaining the telecentres in one way or another (cf. Chapter 6). For example, the Tombo MPCC teamed up with a local organisation to curb woman and child abuse (cf. Chapters 6 and 8). Siyabonga MPCC teamed up with government departments such as the Department of Labour to start learnerships to train unemployed residents in skills wanted in the work place. Hoxani is developing teachers and schools by linking up with business to empower the schools and teachers. The schools empowered are named in Chapters 6 and 8 of this thesis. Tombo MPCC is also assisting many local schools with ICT and training school children and teachers, including principals (this researcher interviewed a school principal studying a Masters degree in education through UNISA at Tombo MPCC) in computer skills. Electronic commerce activities were identified at Siyabonga MPCC where users produced documents for their private businesses and one building company owner was filling in a South African Revenue Service (SARS) tax form at the telecentre during one of this researcher's visits to the centre.

Hoxani MPCC further started a community newsletter (cf. Figure 7, Chapter 6) to empower community members and organisations since local organisations advertise

in the newsletter and publish their news and activities in that newsletter. This is, unquestionably, community development in action and evidence provided in the previous three chapters clearly shows.

9.4.3 Social and cultural impact of the telecentres on users and impact of the telecentres on human behaviour

The social and cultural impact of the telecentres on users includes increased use of communication media such as mobile phones and computers for personal, family and work-related communication. One Siyabonga user was a script writer for a media company and used the telecentre to write "scripts". This user was a very confident and educated woman who was serious about her work and future and other details of her work are discussed in Chapter 8. The media company she worked for was based in Johannesburg.

The telecentres also changed mindsets at Siyabonga and Hoxani MPCCs. At Siyabonga centre, the ICT trainer mentioned that the younger users "laughed at old people" who used the telecentre for learning computer skills. He also told this researcher that the staff "interviewed old people" before registering them in their courses, to understand if they were serious about studying the courses because older people "are slow to grasp computer skills" and "it takes us longer time to teach them computer applications and help them practice the skills so we interview them to make sure that they understand what they have to do early so that they do not leave the process along the way". However, Msimango (cf. Chapter 8) also stated that the telecentre staff was educating the younger users not to laugh at the older users because everybody who wants to learn about computers can do so. He added that it was becoming acceptable in their community to see old people learning new computer skills.

At Hoxani telecentre, a few users stated that they had been "afraid" of using computers before using the telecentre because they had thought that old people like themselves would not be able to understand what computers can do for them. This mindset was also changed by the telecentre staff. It was also changed by the schools as the teachers were apparently told by their principals (according to interviewees),

that if they did not undertake the OBE-computer skills training at the telecentre, they stood less chance of advancing in their careers and could also lose their jobs because government expected them to undertake the course so that they can change the way they teach students. One female teacher even stated that she had consequently bought herself a home computer after learning basic computer skills at the telecentre and was practising computer skills and producing work at home. Consequently, these cases demonstrate that the telecentre changed mindsets, cultural perceptions that affect age groups, and individual behaviour.

At Siyabonga and MACIS telecentres there were users as well who voiced that telecentre staff were having a positive influence on their lives and taught them to be self-empowering and words such as “proud”, “positive” and “confident” were often used to associate how users felt about the impact telecentre staff had had on them. Many users first come to the telecentres with certain negative feelings of helplessness, perhaps due to being uneducated, unemployed and other reasons, but most leave the telecentres with feelings of improved self-worth, improved knowledge about general issues, computers and other things. The positive impact of these lessons on the teachers, in terms of improving how they prepare school work and teach students, was also described in Chapter 8.

There is no doubt that users viewed the telecentres as having a positive impact on individual behaviour and development, and also on community development (cf. Tables 73 and 74). The statistics in Table 74 illustrate how strongly the users agree with the assrtions in the questionnaire which stated that the telecentres have a positive or negative impact on individual and community development. Business and educational activities undertaken at the telecentres are summarised in Table 75. Media and ICT employed at the telecentres for educational and business activities are listed in Table 76 and telecentre impact (other telecentre gains for the user, educational, economic and social or cultural) on users discussed in this section are contained in Table 77.

The statistics (means), employed in Chapter 7, illustrate and scientifically reveal that the users agreed with those statements that implied that the telecentres have a positive impact on individual and community development. Additionally, the users disagreed

with statements written in the questionnaire which implied that the telecentres have a negative impact on individual and community development. The standard deviations further indicated whether there were many opinion or feeling differences between respondent answers or not. Small standard deviation values indicate that there were not many differences between respondent answers at a particular telecentre.

Bigger standard deviation values indicate that the respondent answers differed more, at a particular telecentre. Statistically determined telecentre user differences are valuable to the research and confirm the validity of the research results. However, every study and research methodology has its limitations. A critique of this study's research methodology was provided in Chapter 6. Limitations of this study as a whole are stated next.

Table 75: Educational and economic activities at the telecentre – benefits to users

(In Table 75, No means the ICT or stated activity is not available and yes means the ICT or activity is available or carried out at the centre).

Educational or Economic Activity at Telecentre	Hoxani (Rural)	MACIS (Urban)	Siyabonga (Urban)	Tombo Telecentre (Rural)
Seeking of information on available courses	No	Yes	Yes	Yes
Course registration	No	No	No	Yes
Contact with lecturers	No	No	Yes	Yes
Obtaining of assignment related information	No	Yes	Yes	Yes
Completion of assignments	No	Yes	Yes	Yes
Discussion of study issues with fellow students	No	Yes	Yes	Yes
Assignment submissions	No	No	No	Yes
Obtained business skills	No	Yes	Yes	Yes
Gained business skills	No	Yes	Yes	Yes
Training in computer software literacy skills	Yes	Yes	Yes	Yes
Obtained business information	No	Yes	Yes	Yes

Educational or Economic Activity at Telecentre	**Hoxani (Rural)**	**MACIS (Urban)**	**Siyabonga (Urban)**	**Tombo Telecentre (Rural)**
Conduct personal business (e.g., Internet banking, online shopping, etc.)	No	No	Yes	No
Received employment information	No	Yes	Yes	Yes
Make banking and insurance inquiries	No	No	Yes	Yes
Telecentre and ICT training received at centre assisted users to find employment	No	Yes	Yes	Yes
Training received at telecentre assisted users to start one's business	No	Yes	Yes	No
Receive medical information at telecentre	No	Yes	Yes	Yes
Search the Internet for information about issues of interest at the centre	Yes (minimal)	Yes	Yes	Yes
Interact with government departments and individuals at the centre (at Tombo through the public information terminal and verbally)	No	No	Yes	Yes

Educational or Economic Activity at Telecentre	**Hoxani (Rural)**	**MACIS (Urban)**	**Siyabonga (Urban)**	**Tombo Telecentre (Rural)**
Gained job-related skills (e.g., interview and public speaking skills); telecentre "taught me confidence" "to believe in myself" and "not to fear computers"	Yes	Yes	Yes	Yes
Gained class planning and management skills in OBE training	Yes	No	No	Yes
Telecentre developed user in "other areas of development"	Yes	Yes	Yes	Yes

Table 76: ICT available and used at the telecentres

Old or New Technology (Medium or Facility, or ICT Application) available and used at centre	Hoxani (Rural)	MACIS (Urban)	Siyabonga (Urban)	Tombo Telecentre (Rural)
Visual presentation software (MS PowerPoint)	No	Yes	Yes	Yes
Printer	Yes	Yes	Yes	Yes
Scanner	Yes	No	Yes	Yes
CD-ROM for information or music	Yes	Yes	Yes	Yes
Television	Yes	No	Yes	No
Radio	No	No	Yes	Yes
Tape and video recorder/s	Yes	No	No	No
Photocopier	Yes	Yes	Yes	Yes
Laminator	No	No	Yes	No
Overhead projector	Yes	No	No	Yes

Old or New Technology (Medium or Facility, or ICT Application) available and used at centre	**Hoxani (Rural)**	**MACIS (Urban)**	**Siyabonga (Urban)**	**Tombo Telecentre (Rural)**
Video and audio cassettes	Yes	No	No	No
Internet for accessing information	No	Yes	Yes	No
Facsimile	Yes	Yes	Yes	Yes
Telephones	Yes	Yes	Yes	Yes
Book	Yes	No	No	No
Magazines and Newspapers (very minimal usage at centres	Yes	Yes	Yes	Yes
Word processors (MS Word)	Yes	Yes	Yes	Yes
Using Spreadsheets for business applications	No	Yes	Yes	Yes

Table 77: Educational, Economic and Social Impact of the Telecentres on Users

Educational Benefit or Impact	Economic Impact	Social Impact	Hoxani (Rural)	MACIS (Urban)	Siyabonga (Urban)	Tombo (Rural)
Gained computer literacy skills (courses, DTP, E-Citizen, OBE, Windows Explorer, ICDL, etc.); gained certificates after completing courses	Gained computer literacy skills (most courses learnt have business implications); certificates allow users to seek and obtain work thus contributing to economic empowerment and unemployment reduction; other users received work promotion upon completing computer courses at telecentres	User social interaction with other users at telecentre during and after computer classes; users who obtained work after completing centre computer course gain income and contribute to poverty reduction	Yes	Yes	Yes	Yes

Educational Benefit or Impact	Economic Impact	Social Impact	Hoxani (Rural)	MACIS (Urban)	Siyabonga (Urban)	Tombo (Rural)
Learnt computer skills at centre to teach others	Users who later teach others gain their own income or offer this service free of charge	Providing computer lessons to other in the community contributes to social uplifting, community building and illiteracy reduction	Yes	No	Yes	Yes
Gained information and knowledge from the Internet	Information gained from the Internet can have positive business spin-offs, buy can also be used in negative ways (e.g., Internet banking or fraud incidents)	Information obtained from the Internet can improve social relations with others, national and internationally, but can also lead to negative behaviours if people learn bad things online	Yes (staff not general users)	Yes	Yes	Yes

Educational Benefit or Impact	Economic Impact	Social Impact	Hoxani (Rural)	MACIS (Urban)	Siyabonga (Urban)	Tombo (Rural)
Make copies for educational purposes	Make photocopies for business purposes		Yes	Yes	Yes	Yes
Fax educational documents (and receive faxes)	Fax business documents and job applications (and CVs)	Fax and receive private documents	Yes	Yes	Yes	Yes
	Buying airtime at centre		No	No	Yes	No
Learnt bricklaying and building skills	Learnt same building skills as these are business skills one can use in future for economic empowerment	Users association with other users at business classes and at building sites	No	No	Yes	No
Improve English at centre	Improved English skills can also impact positively on one's business development	Improved English can also impact positively on one's social relations and result in better communication				

		skills	Yes	No	No	No
Educational Benefit or Impact	**Economic Impact**	**Social Impact**	**Hoxani (Rural)**	**MACIS (Urban)**	**Siyabonga (Urban)**	**Tombo (Rural)**
Learnt cooking and baking skills; and also knitting and sewing business skills	One can start one's catering business (and also a fashion design and home decorating business) after obtaining these skills	Women get a chance to interact at a social level at these classes as there were only women at these classes (at the time of research)	No	No	Yes	No
Learnt how to use the Internet to seek and apply for jobs	Seek jobs on the Internet at the telecentre	Users sent friends and family members in other cities e-mail for social reasons and also enquiring about work vacancies	No	Yes	Yes	No
Learnt OBE teaching skills	Promotion at work or improved post at other schools	Improved working relations with other teachers and students	Yes	No	No	Yes
Read newspapers	Newspapers offer economic knowledge	Newspapers improve knowledge of social issues	Yes	No	No	No

Educational Benefit or Impact	Economic Impact	Social Impact	Hoxani (Rural)	MACIS (Urban)	Siyabonga (Urban)	Tombo (Rural)
Obtained study-related information	Studied persons can obtain work	Persons who are able to obtain work can gain income	No	Yes	Yes	Yes
Educational workshops conducted at telecentre (on HIV Aids, business and other topics)	User attend business workshops and gain business knowledge	Users attend workshops and learn about health and social issues such as HIV Aids and business	Yes	Yes	Yes	No
Use of government services at the centre, e.g., apply for identity documents, register births	Users access social grants at centre and other services	Social grants alleviate poverty in poor urban and rural areas more especially in the credit crunch era	Yes	Yes	No	Yes
	Selling products to others at the centre	Income gained reduces poverty and feeds family	No	Yes	No	Yes
	ICT services near home, save travel costs	Saved funds can be used to satisfy other social needs	No	Yes	Yes	No

Educational Benefit or Impact	Economic Impact	Social Impact	Hoxani (Rural)	MACIS (Urban)	Siyabonga (Urban)	Tombo (Rural)
Users learn how to use post office services and own post boxes for the first time. Students type, print, post and receive university assignments at the post office.	Use of the telecentre post office and save travel costs to town post office; other users receive money at the post office from family members working in cities	Finance in form of travel costs saved by users; funds received by family members at the post office help build homes and feed the rural families.	No	No	No	Yes
	Use of public telephones can have economic spin-offs	Telephones are used for job seeking and maintaining family relationships with family members located elsewhere	Yes	Yes	Yes	Yes
Users learnt how to scan documents and pictures	Scanned documents for business	Scanned documents also for social and private uses	No	No	Yes	Yes

Educational Benefit or Impact	Economic Impact	Social Impact	Hoxani (Rural)	MACIS (Urban)	Siyabonga (Urban)	Tombo (Rural)
Users learnt document lamination	Business documents laminated, e.g. the DTP business documents at Siyabonga	Private advertisements, funeral and wedding programmes (and other private publications) laminated	No	No	Yes	No
	Gained access to cheaper computers and cheap computer classes	Money saved by studying cheap courses.	No	Yes	Yes	Yes
	Use the tuck shop at the centre	Tuck shop offers users food and other social benefits	No	No	Yes	No
Users learned how to type and print documents, including school work and a newsletter	Typed documents are also business documents	Documents also for personal reasons, e.g., letters to family members to maintain relations	Yes	Yes	Yes	Yes

Educational Benefit or Impact	Economic Impact	Social Impact	Hoxani (Rural)	MACIS (Urban)	Siyabonga (Urban)	Tombo (Rural)
Gained public speaking skills and customer management	These skills can be used for economic gain, e.g., if one starts working as a motivational speaker in the community	Public speaking skills can lead one to participate in community building projects and thus earn respect in the community	Yes	Yes	Yes	Yes
OBE classes improved quality of teaching	Some teachers received promotions (after completing computer courses at centre)	Communications skills with colleagues and students improved and salaries increased	Yes	No	No	Yes
Telecentre "taught me self-discipline and how to meet deadlines", "hard work" and "not to fear computers"	All these lessons (stated in previous column) teach one skills required at the workplace, should one obtain work	These work-related skills, e.g., self-discipline and "not fearing computers" have social spin-offs and teach users skills required in today's computer-using world	Yes	Yes	Yes	Yes

Educational Benefit or Impact	**Economic Impact**	**Social Impact**	**Hoxani (Rural)**	**MACIS (Urban)**	**Siyabonga (Urban)**	**Tombo (Rural)**
Obtained computer course at telecentre; passed a call centre course easily after completing telecentre computer course; passed school course better after completing telecentre computer course	Obtained work promotion after completing telecentre computer course	Users performed better in other courses and work tasks after passing telecentre computer courses – better performance in tasks results in improved self-image and high self-esteem which can improve one's social life in different ways.	Yes	Yes	Yes	Yes
Learnt how to use the Internet (e-mail, Internet banking and seeking information)	E-mail and other Internet applications can be used for economic gain	Internet applications are used to undertake social activities	No	Yes	Yes	No

The aspects of telecentre impact on users stated in Table 77 are encapsulated in the telecentre model in Figure 9. Typical telecentre user profiles and characteristics of each telecentre and services provided by the centres are added at the end of the thesis as Addenda E and F.

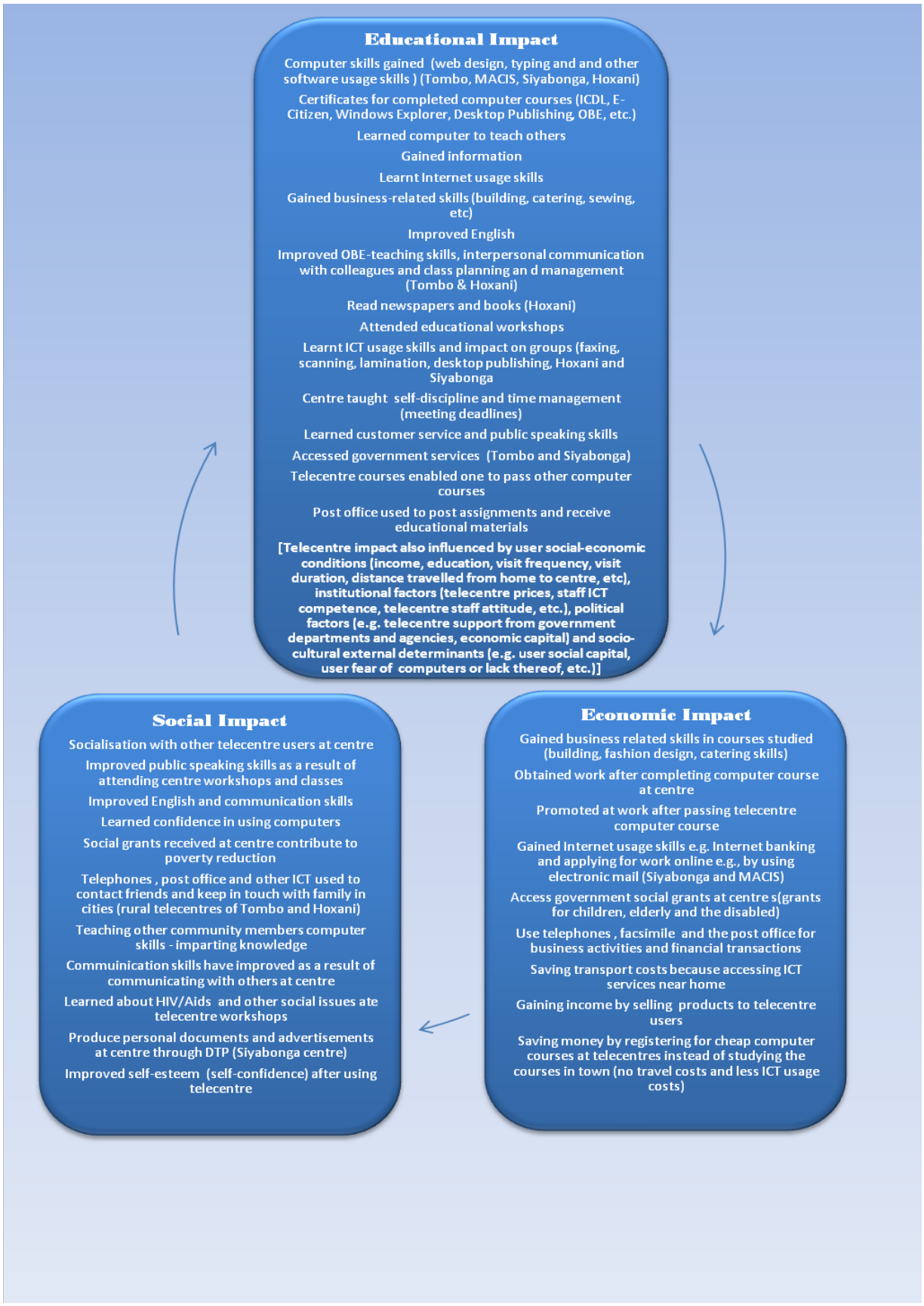

Figure 9: A Theoretical Model of Telecentre Impact on the South African User: A Multi-dimensional View

Figure 9 illustrates the educational, social and economic impact of the telecentres on users as yielded by data and defined by post-evaluation of the users' initial (tried and tested) use of the telecentres, experience with the telecentres as having a positive impact on individual and community development expressed as a positive feeling by users (satisfaction, indifference [cf. user choices in questions or Likert scales in survey questionnaire where users neither agreed or disagreed with statements assessing whether the telecentres have a negative or positive impact on individual and community development], or negative feeling of user (dissatisfaction also expressed by users, in Chapter 7) about the telecentres and also other user feelings which demonstrated some form of user dissatisfaction about services they received from the telecentres, e.g., unmet user needs and unimproved non-formal education of the user. Positive user feelings about the positive impact of the telecentres on their lives are summarised in Figure 9.

In electronic learning (e-learning) environments, an online student is regarded as a customer of the educational institution providing distance education through electronic media or online. This definition of an online student can be adopted in this telecentre impact analysis and the telecentre user could be regarded as the customer of the telecentre and according to Section 7.7 of Chapter 7 (rating of the telecentres by users), most users (as established by percentage values in tables in that section) regarded the telecentre staff attitude, technical assistance offered by staff, services offered by the telecentres and other telecentre services as either good or very good. These positive ratings of the telecentre by users for various aspects indicate that the centres have a positive impact on the customer or user.

Furthermore, Tables 73 (means and standard deviations) and 74 (results of the analysis of variance of telecentre impact on individual and community development) indicate that users felt that the telecentres have a positive rather than a negative impact on their lives and also on community development. Examples of this are improved computer literacy of community members, linking the community with the rest of South Africa and the world, the telecentre is an asset to the community, "we will miss the telecentre if removed from the community", telecentres improve educational qualifications of members of the community. However, most users were indifferent to two statements in Table 73, one statement implied that the telecentres

brought them economic wealth and the other statement declared that the telecentres developed the community economically. Negative feelings of users were expressed where they disagreed that the telecentres have a negative impact on the communities and that "things have changed for the worse since the establishment of the telecentre" in the communities.

Figure 9 also summarises other factors influencing the impact of the telecentres on the users, internal telecentre staff, ICT and other factors (e.g. ICT prices, staff competence and attitude), support received by the telecentres from government agencies, or political capital and how it impacts on telecentres, e.g. financial and other support given to the telecentres and staff training. User socio-economic characteristics also affect how users use telecentre ICT to improve themselves, e.g., educational qualifications, will to learn about computers and find employment, ability to pay for telecentre services or individual or household income, frequency of visits to the telecentres, duration of stay at telecentre, human-to-human interaction (interaction between user and telecentre staff member and other user), human-to-computer interaction (ability of user to communicate with or use a computer effectively towards self-development), cultural or personal factors (e.g. "fear of computers", or personal drive to want to use computers) and other personal differences.

In sum, the impact of the telecentres on users is determined by many factors which influence the users while they are at the telecentres. Other factors are external to the telecentre environment but also influence how users ultimately use and are impacted on by the centres, e.g. the distance travelled by users to reach the telecentre before using the centre has an impact on usage. It is easier and more convenient for users to make frequent use of telecentres if they reside near the telecentres but not if they have to travel five to 10 kilometres before reaching and using the centres. Therefore, telecentres may generally have a more positive impact to users who live near the telecentre and use the centre more frequently than others. The telecentre impact on user analysis provided in this section, however, only reflects user feelings at the antecedent stages (experience of using the telecentre stage and the telecentre effect stage). This research did not analyse user feelings before or prior to telecentre use or what the users did after they had passed computer courses at the telecentre, although the managers were asked if they knew of any previous telecentre users who had

obtained employment after learning computer skills at the telecentres and that information was discussed in Chapter 8 .

9.5 LIMITATIONS OF THE STUDY

The shortcomings of the research were discussed in Chapter 6. The limitations of the study are that the study only focused on answering the research questions asserted in Chapters 1 and 6. It was not the purpose of this research to investigate what telecentre users did or had done with the educational qualifications or computer skills acquired from the telecentres, although some users, at Siyabonga MPCC, volunteered this information when answering questions asked (e.g., one user who was learning sewing skills and fashion design at the telecentre owned a small business of making curtains and duvets but attended the telecentre to upgrade her skills in this craft; another female user worked at the nearby garage as a cashier and had received a promotion and a salary increase at the garage after completion the computer course at the centre). Other research questions and concerns about the telecentres could be addressed in future studies. This study answered the questions that were the focus of research. However, the results of the four telecentres cannot be generalised to all South African telecentres and only apply to the telecentres studied.

9.6 RECOMMENDATIONS

1. It is recommended that more telecentres be established in Limpopo and Eastern Cape Provinces by the USAASA which should fund the centres and ensure that newly-established telecentres are located near users' residences. The USAASA should be aware that some rural and urban ICT users feel that the agency is not deploying ICT centres ideally or as it should considering the enormous funding and budget the agency receives from government. National universal service and access targets have not been met. Therefore, that is another goal the agency should aspire to attain. This researcher will forward the results of this study to the USAASA so that the agency, when defining under-serviced areas in telecom, in future, should also consider the areas investigated in this study because these areas are still without some ICT services. This will be a valuable contribution to the formulation of national telecom policy aimed at bridging the huge rural-urban divide.

2. Additionally, this study recommends the undertaking of more collaborative research between the USAASA (and other similar government research bodies in the ICT sector) and universities, in the search for solutions for national ICT problems such as issues of the digital divide and universal access. The USAASA may believe that some ICT is available at the telecentres when in fact the ICT is not available in some telecentres (cf. Table 62). The USAASA, on the agency's Web site (2008b), maintains that telecentres (or Thusong Service Centres) have ICT such as television, but in reality most telecentres do not have the technology and where there is such technology, it is unused. ICT training is also crucial and should be provided at telecentres to reduce high national illiteracy levels, as Tongia (2006: 3) stated in Chapter 2, that access or connectivity to ICT, relevant ICT content and ICT capacity building are crucial for individual and community development. If persons have access to ICT, they can access information for self-improvement. In cases where ICT remains unused, ICT training is required to ensure that such technology is used in future – because persons at these four telecentres have proven that there is willingness to use ICT when people know how to use it, e.g., computers. The challenge of access to ICT should first be overcome, before issues of content development and advanced ICT training are accelerated. ICT service providers should also contribute by providing such access where required, training persons where they can and ensuring that the national ICT sector develops because, as stated by the "ICT Access Rainbow" development model, all stakeholders should perform their responsibility or duty at the different ICT levels (cf. Chapter 3).

3. A third recommendation concerns telecentre staff. Telecentre staff ought to focus on teaching community members also about other aspects of general education, e.g., health education (e.g., about Tuberculosis, HIV/AIDS and cancer), business skills training and youth development programmes (as one interviewee stated at Siyabonga MPCC that there youth programmes aimed at teaching "young people skills preparing them for the job market instead of these young people roaming the streets"). Further, there are no other facilities at the telecentres for education promotion (those available were never used and staff may need assistance from other institutions to make use of unused technology, i.e., if the problem is that they do not know how to use the technology). It is, however, unknown to this researcher why some technology was not

used at the telecentres. Ideally, telecentres should make more educational facilities available, e.g., radio and television, in particular, as these media contribute to non-formal education. Radio and television educate users in local languages, unlike the Internet which mostly employ English which uneducated users may fail to fully comprehend.

4. Lastly, this study recommends that academics and universities should play a role in assisting telecentres to educate the poor and rural who cannot reach institutions of higher learning due to distance and affordability. UNISA makes its reading materials available at some local telecentres, but the materials are not available at the telecentres researched in this study. UNISA could, in future, expand its reach and provide its services to all telecentres so that the rural poor can easily access distance education. In future, this researcher aims to assist telecentres with educational support that they require, however small the support.

The onus is on telecentre staff members to seek the assistance they require, e.g., assistance in teaching some new courses and course accreditation. University staff could run seminars and workshops at telecentres, teaching users about issues they lack information about instead of only evaluating ICT development issues behind desktops. Academics should also play a meaningful role in ICT training at community level, which is where ICT training is lacking. Typically, the sampled telecentres have started small by introducing computer courses and offering communication technology. However, new services demanded by users at the centres, and those already introduced by the centres upon user request, indicate that there is more room for telecentre growth and economic sustainability.

ADDENDUM A: INTERVIEW QUESTIONS

A: INTERVIEW QUESTIONS FOR THE HOXANI MULTIPURPOSE CENTRE MANAGERESS: MS ELSIE NDLOVU

DATE OF INTERVIEWS: 31 May 2005

First let me thank you for giving me this time for this interview. I know you are busy here with all this training you provide the teachers so I highly appreciate you taking off your training time to accommodate me and giving me permission to take some photographs of the place and the people who work in it. Can I also just ask that after this interview, or even during the interview if necessary, that you show me the rooms that you use for all the training you undertake at this telecentre, e.g., computer training rooms and other rooms that are important for what you do here. Thank you. I will now start with the first question.

1. What technology do you have at the telecentre? (e.g., two telephone lines, two printers - one colour, one black and white – 10 computers, etc). Who sponsored you with these computers and other technology here such as the television, etc.?

2. What prices do you charge people at this telecentre for using the services that they use here? You can provide me with a price list if you have one, including the prices of the courses that you teach.

3. What computer courses do you teach or offer here?

4. How much the users pay for these courses?

5. Who designed the courses for the telecentre and are the courses accredited? If the courses are accredited, which institution accredits them?

6. Can you please explain to me what you teach these teachers in order to upgrade their qualifications?

7. What is the role of the Department of Education in what you have just explained to me about the upgrading of the teachers' skills? How do they help you in addition to what MultiChoice offers?

8. Don't you think the cost of your computer courses is very cheap? (R250 - 00 for 12 lessons).

9. What do you think is the greatest role of this telecentre in developing this Hoxani community?

10. What other important things would you like to tell me to show that this telecentre has improved some lives of some people in this community or the community at large, bearing in mind that this is a very rural area and it looks remote although it is near a town but this area here is all alone – this teacher training college?

11. Who pays your monthly salary? What is your monthly salary? If you don't mind me asking that; if you do mind, please don't state the amount. Please also tell me your educational qualifications because I want to know what qualifies you to be a trainer here and principal of this training centre.

12. Are you the only educator or trainer at the telecentre? If there are other people teaching here, who are those people and what do they teach the telecentre users? Where were you all trained and what did your colleagues (e.g., Rose) study at those institutions?

13. How many local schools are served by this telecentre or use this telecentre for some services? Can you also please name these schools or at least some of them? Are the schools near this training centre or are they far?

14. Do you think this telecentre will be sustained over a long period of time and will continue to grow from strength to strength? Please, explain your answer further.

15. Which other organisations help this telecentre somehow (and please how they help you), maybe financially or with computers or in any other form of assistance or help?

16. When do you have the computer classes because I believe these teachers work in their respective schools in the mornings? Do you also have classes during school holidays? How long does each computer class take and what comprises each class - briefly?

17. Who provided this telecentre with these computers and other technology here?

18. Are you happy with the services provided to your telecentre by service providers such as Telkom, MTN, etc? Do you find the prices charged by these services providers affordable to community members, with this area being a very rural area?

19. How has this telecentre improved the education of the people who use this telecentre? Think about education in general, state everything that these people have learned from this centre which may have helped them somehow to improve their education in one way or another and not just the Outcomes-Based Education (OBE) teacher training courses in videos and computers.

20. Last but not least, do you know of anyone who received computer training here who got a job somewhere after completing your computer classes here? How come you don't have Internet services here, don't the teachers want to use the Internet or when do you plan to have this service and who will provide it to you?

Thank you very much for your assistance in this regard, can I also speak to your two assistants? If there's something else that you wish to tell me about concerning these questions above, please phone me or fax the information to me at your earliest convenience. I will also phone you again if there's something that I would like to ask again or clarify based on what we spoke about today. Can we then go and see the labs and meet the other people? Can I also take some pictures if you don't mind? Thank you very much and I appreciate the fact that you waited for us this whole time, it is

far from Pretoria here – it took us four and a half hours to get here - so thank you very much.

B: INTERVIEW QUESTIONS FOR MACIS TELECENTRE MANAGER: MR LUCAS MAAKO

DATES OF INTERVIEWS: 27 June, 28 July and 06 August 2005

First let me thank you for giving me this time for this interview. I know you are taking off your lunch-time so I appreciate your kindness. Let me also ask you to show me all the rooms that use as part of the telecentre, e.g., if you have any other computer rooms besides this one, or an office, etc. Thank you again for having me, we can now start with the interview. I would also like to ask for permission to take some few photographs of the telecentre environment and some users while they work on their computers – if that is not a problem with you.

1. When was the telecentre opened?

2. What technology is used at your telecentre? For example, computers, phones, etc.; What prices do you charge the consumers for the use of each service and what do your computer courses cost?

3. How many telephone lines do the telecentre users make use of at this telecentre?

4. Do the people use Telkom, Vodacom, MTN and Cell C phones at this telecentre?

5. How many computers are available for public use at the telecentre?

6. As I have seen that you provide computer lessons at this telecentre, what courses do you teach the telecentre users who attend computer literacy classes here? (Comment: I have taken a copy of the ICDL pamphlet which you also give to the computer class attendees so I have also seen from this pamphlet what the course entails). Please also provide me with full details of the InfoLit Programme.

7. Who owns this telecentre?

8. Who are the main users of this telecentre?

9. What are the minor constraints that constrain the working of this telecentre? What do you want to improve at the telecentre at present?

10. What is the contribution of the community and that of community-based organisations (CBOs) towards the development and maintenance of this telecentre?

11. Which community-based organisations do you sometimes work with and how do they specifically help the telecentre?

12. Which other organisations – outside Mamelodi – help the telecentre in one or another? e.g., the Universal Service Agency (USA) and the Centre for Scientific and Industrial Research (CSIR).

13. If you receive help from the organisations that you have stated in Question 12 above, what kind of help do those institutions provide the telecentre?

14. What are the major constraints that need to be removed so that the telecentre performs or operates better?

15. How does the telecentre make its profit?

16. Do you get paid a monthly salary? If yes, who pays your salary and how much do you get paid? (Note: You do not have to state the amount you get as a salary if you do not want to state it, this is optional and if you do not want to state it, then don't state it).

17. Would you say your monthly salary is sustainable and are you satisfied with it? (Note: also you do not have to answer this question if you feel that you do not want to answer it. However, I need to know whether this telecentre and the job you have here has provided you with any kind of personal and/or socio-economic development or

improved your life better than when you were not working here. I ask all the telecentre managers involved in this research this question so you do not have to feel as if I am just asking you at MACIS this question alone and perhaps invading your privacy. Thank you; I hope you understand that clarification).

18. How do you see this telecentre as improving the education of these people who use this telecentre on a daily basis? Education here means everything they learn here, not just computer literacy skills.

19. What other things would you like to offer as new services at this telecentre?

20. Do you know how many people have got jobs because of the training they have received from your telecentre? If you do know them, what kind of jobs did they get? Have you helped any people get jobs after they passed their computer courses here?

Note: If you would like to add any other comment on the above questions after I have left, please send me a message and I will call you back on your mobile phone to get the new information that you would like to add and thank you very much for your assistance in this research and for helping me getting the people to answer the questionnaires.

C: INTERVIEW QUESTIONS FOR THE SIYABONGA TELECENTRE MANAGERESS AND ASSISTANT MANAGER IN ORANGE FARM TOWNSHIP.

MANAGERESS: MRS PATRICIA MAKORO
ASSISTANT MANAGER: MR REGINALD MSIMANGO

DATES OF INTERVIEWS: 02 February, 16 March and 20 May 2005

First before we start with the questions let me thank you very much for having me here and answering my questions. (Patricia answers, “it’s my pleasure” and asks the researcher if she can offer her tea and cake – she runs a restaurant and the interview is held at her restaurant which is located in the room next to the telecentre computer

room because at the telecentre Reginald is busy with computer training classes. I accept the offer for tea and cake, which is served later). We continue with the interview and the researcher asks the first question. Both Ms Makoro and Mr Msimango were asked the same questions on the same day. Ms Makoro was interviewed first and the researcher asked for permission to take photographs of the telecentre and the telecentre users while at work.

1.When was this telecentre opened and what was the reason for starting it?

2. Who owns this telecentre and who runs it on a daily basis?

3. What are the main services offered at this telecentre and what do they cost the user to use them?

4. What is the general contribution of the community towards this telecentre and does the community support and/or love or make use of this telecentre?

5. What are the major constraints of this telecentre? In other words what major problems cause the operations of this telecentre not to run smoothly and how do you overcome such problems?

6. What were the initial aims of this telecentre and have these changed now? If so, how and what new uses are there for this telecentre in the community?

7. What computer courses do you teach at this telecentre and/or what information technology and/or computer literacy skills do you teach the computer trainees here?

8. What monthly salaries do the telecentre workers earn (if you don't mind that question; if you do mind me asking that question, please don't answer it).
9. What is the focus of this telecentre? i.e., what is it that you want this telecentre to contribute to this community or help community members with?

10. Which other community organisations support this telecentre and how do those organisations support the telecentre? Which other organisations outside Orange Farm support the telecentre and in which way? e.g. the Universal Service Agency.

11. Other computer trainees from this telecentre, what do they do now after completing their computer courses here, do you know of any?

12. Which telephones are offered by this centre (Telkom, MTN, Vodacom, Cell C) and how much do they cost?

13. What is the unemployment rate here at Orange Farm? This is a very big place and there are people everywhere?

14. How do you market this telecentre around this township or how do people in this township get to know about the telecentre and what it can offer them?

15. Are there any government departments that assist this telecentre in any way and please explain that way if there are any such department?

16. What other services have people here requested that you offer at the telecentre that you don't offer at present?

17. What are you building here next door and who is funding this new building project?

18. What do people here generally say about this telecentre to you in terms of how it has helped their lives or improved their knowledge or education?

19. Is this telecentre used by old or young people most of the time?

20. What do these telecentre users use the Internet for, because I can them using Internet and browsing through the Web?

Thank you having me and answering my questions. Please feel free to call me on my mobile phone if you would like to add any more information on any of these questions above. I will see you again on another day in order to continue with the work on the questionnaires. Ngiyabonga kakhulu, ke a leboga (Thank you very much).

D: INTERVIEW QUESTIONS FOR TOMBO MULTIPURPOSE CENTRE MANAGER AND MANAGERESS
MANAGER: MR LUSAPHO NJENGE
MANAGERESS: MS NANGAMSO SMAUZA

DATES OF INTERVIEWS: 20 April 2004, 15 November 2005 and 30 November 2005.

First let me thank you for giving me this time for this interview. I know you are busy here running the centre so I highly appreciate this time. Can I just ask that after the interview can you show me your computer rooms laboratories and the satellite dish which provides you the Internet services to this telecentre because I do not see these in this office.I would also like to take some photographs of the telecentre surroundings and people – if that is fine with you. Ndiyabulela ngolu ncedo lwakho, mandibulele ndisaqala nje inkulu le nto ondenzele yona. Singaqala ke ngoku ngombuzo wokuqala [Ms Smauza].

[Mr Njenge was asked first but a few questions about the development of the telecentre and the contribution of the telecentre in community development. He also showed the researcher the computer laboratories, the telecentre grounds and other equipment, and also introduced the researcher to some telecentre users who were busy working in the computer room on their own IT projects. Because he had had to leave the telecentre on other business, the interview with him was short and the interview was continued with Ms Smauza who was asked all the questions that follow]. Both were accorded due appreciation and thanks for their participation in the research.

1. What technology do you have at the telecentre? (e.g., two telephone lines, two printers - one colour, one black and white – 10 computers, etc).

2. What prices do you charge people at this telecentre for using the services that they use here? You can provide me with a price list if you have one, including the prices of the courses that you teach.

3. What computer courses do you teach or offer here?

4. How much the users pay for these courses?

5. Who designed the courses for the telecentre and are the courses accredited? If the courses are accredited, which institution accredits the courses?

6. Is there an educational institution or university that certifies your qualifications and/or courses?

7. If your answer to Question 6 above is yes, name this institution or university.

8. If your answer to Question 6 is No, would you like to have your courses certified by a university of educational institution?

9. What do you think is the greatest role of this telecentre in developing this Tombo community?

10. What other important things would you like to tell me to show that this telecentre has improved some lives of some people in this community or the community at large?

11. Who pays your monthly salary? What is your monthly salary? If you don’t mind me asking that; if you do mind, please don’t state the amount.

12. Are you the only educator or trainer at the telecentre? If there are other people teaching here, who are those people and what do they teach the telecentre users? Where were you trained and what did you study at those institutions?

13. How many local schools are served by this telecentre or use this telecentre for some services? Can you also please name these schools?

14. Do you think this telecentre will be sustained over a long period of time and will continue to grow from strength to strength?

15. Which other organisations help this telecentre somehow (and please how they help you), maybe financially or with computers or in any other form of assistance or help?

16. When do you have the computer classes because I can see that there are no classes here at this time of the day or is it just today that there's no computer class? Also, which universities assist you in teaching the computer classed that you teach here and/or certify your certificates?

How did it come about that you ended up working with those universities, who arranged the working relationship?

17. Who provided this telecentre with this Public Information Terminal (PIT) and what does the PIT offer the telecentre users?

18. Are you happy with the services provided to your telecentre by service providers such as Telkom, MTN, etc.? Do you find the prices charged by these services providers affordable to community members, with this area being a rural area?

19. How has this telecentre improved the education of the people who use this telecentre? Think about education in general, state everything that the people have learned from this centre which may have helped them somehow to improve their education in one way or another.

20. Last but not least, do you know of anyone who received computer training here who got a job somewhere after completing your computer classes here?

Thank you ke Nangamso ntombi for your help. Enkosi ndiyabulela kakhulu undincedile yaye ndibulela nangoncedo lwakho ukucela aba bantu baseTombo ukuba bandiphendulele ezi khweshine. Ukuba kukho nto ingenye ofuna ukundazisa yona malunga nale mibandela ingentla, uze uncede unditsalele umnxeba undichazele, okanye undithumele umyalezo wemfono-mfono ze mna ke ndikutsalele umnxeba. Ungandifeksela nokundifeksela kuba kaloku wena unayo nefeks apha, ingxaki ayikho. Nam ndizakuthinta ngomnxeba xa ndibuyele emsebenzini. Nangamso.

ADDENDUM B: SURVEY QUESTIONNAIRE FOR TELECENTRE USERS

INTRODUCTION

Dear telecentre user,

I'm a Doctoral degree candidate at the University of South Africa in the Department of Communication Science. My research aims at identifying the impact of telecentres on the formal and non-formal education of telecentre users in South Africa.

By answering the questionnaire, you are contributing to the generation of knowledge about telecentres in South Africa. This knowledge is important so that telecentres can, in future, be used to serve people better in providing appropriate communication services. Your opinions in this questionnaire are valuable and I highly appreciate them. I am also grateful for your time, co-operation and openness in answering the questions.

Please read all the questions carefully before answering them.
You do not have to provide your name and telephone number at the end of the questionnaire, but if you do provide your name, all responses will be kept confidential and will only be used for the purpose of completing this study. You are also welcome to answer the online version of the questionnaire which can be sent to you via electronic mail (e-mail), if you have access to e-mail and if you request me via e-mail to send you the e-questionnaire. I can get the filled-in questionnaire from you after further consultation with you.

Once you finish completing it, please give to me or send via e-mail. You can also give it to your telecentre manager/manageress or research assistant.

ADDENDUM C: ICT SERVICES AND TRAINING OFFERED AT SIYABONGA TELECENTRE (AND COSTS THEREOF) AND COST OF ICT SERVICES AT TOMBO TELECENTRE

ICT services and forms of computer training offered at Siyabonga telecentre are listed in Tables 78 to 83 which follow:

Table 78: Siyabonga telecentre telephone and facsimile services and costs

	MTN phone shop	Facsimile sent	Facsimile received
	Standard unit price is R0.85c (local call) per minute	R5.00 (local destinations) every first page Discretion (at the time) is employed to charge for international facsimiles because they are rare	R2.00 (from local areas) per first page Discretion (at the time) is employed to charge for international facsimiles because they are rare
	Standard unit price is R3.00 (international calls) per minute	R2.00 per other page (after first page) for local destinations	R2.00 per other page (after first page) for facsimiles received from local areas

		Price for sending facsimiles differ by distance, e.g. a facsimile to Cape Town is more costly than to Johannesburg	Prices for receiving facsimiles also differ by distance, e.g. one from Cape Town costs are more than Johannesburg

Table 79: Siyabonga centre typing, printing and multi-media service costs

	Multimedia	Typing	Printing	Internet and data processing
	Costs R8.00 per hour	Text only is R7.00 per page (black & white)	One page printout costs R2.00 (plain text)	Internet use costs R8.00 per hour
	One brings one's own CD ROM and receives assistance on use	Text, graphics and pictures R9.00 per page	Printout of pages with graphics and tables is R3.00 per page No colour printing	Internet subscription: one month use for 12 hours is R75.00 15 minutes is R7.50 30 minutes is

				R15.00 and 1 hour is R30.00

Table 80: Siyabonga telecentre photocopying costs

Page size	Quantity	Charge per page
A4	1	R0.70
A4	50	R0.50
A4	100	R0.45
A4	200 and up	R0.30
A3	1	R1.40
A3	50	R1.00
A3	100	R0.90

Table 81: Siyabonga telecentre desktop publishing costs

DTP service	Quantity	Cost
Business cards (black & white)	100	R85.00
Business letterheads	100	R85.00
Letterhead design	1	R25.00
Greeting and birthday cards	1	R15.00
Identity cards (e.g. for businesses: their employees and	20	R200.00

schools: for their learners)		
Laminating	1	R5.00
Scanning	1	R5.00
Floppy and stiffy sales	1	R5.00
Envelopes	1	R2.00
Posters	1	R10.00
Pamphlets	8	R10.00
Program (e.g. wedding)	1	R15.00
Reports	1	R7.00
Assignments	1	R7.00
Business plans	Minimum 3 pages	R20.00
Proposals	Minimum 3 pages	R20.00
Curriculum vitae	3 pages	R20.00
Certificates	15	R200.00

Table 82: Computer and ICT training costs at Siyabonga telecentre

Course	Duration	Tuition Fee
Info-Lit	3 months	R650.00
Software Applications	3 months	R650.00
Modern Applications	3 months	R650.00

Table 83: Siyabonga telecentre computer and ICT training costs

Siyabonga Multi Centre

Registration Fee: R120 [Not Refundable]

Course Name	5 Months	Full Fees	Deposit	Installment
Computer Class	5 Months	R1 500	R500	R250 x 4 Months
Bakery & Confectionery	5 Months	R1 300	R500	R200 x 4 Months
Catering	5 Months	R1 900	R620	R320 x 4 Months
Business Admin & Secretarial Procedures	5 Months	R1 900	R620	R320 x 4 Months

For more Information

Siyabonga Multi Centre, Stand 15954, Link Road, Extension 4 Orange Farm, P.O. Box 1042, Kiasha Park 1820

Cell: 082 2591 239

E-mail: siyatele@netative.co.za

Source of Siyabonga tables: Msimango (2005)

Table 84: Costs of using ICT facilities at Tombo telecentre

Photocopying	50 cents per A4 page R1. 00 per A3 page
Faxing	R7.50 Outgoing local and national per page R12.00 International facsimile per page R2. 00 receiving a facsimile per page
Public phones	90 cents per minute national and local calls R3.00 per minute international calls
Scanner	R15.00 per page colour printing R10.00 for scanning a black and white page
Printing	R5.00 per page, black and white R7.00 per page, colour printing

Source: Smauza (2005)

ADDENDUM D: CODED ANSWERS TO OPEN QUESTIONS

Question 14

This question was cancelled during the process of data analysis because there had been a mistake. The researcher was given to understand that the questionnaire was in order but in fact coding numbers had not been allocated for this question at the time of constructing the questionnaire. After consultation with the research methodology supervisor, it was agreed that this question should be removed during data analysis because it would be difficult to code. Also, not many respondents had answered this question so it became apparent that not much data would be lost if these responses were removed.

Question 15

Question 15 was analysed quantitatively and the answer to it is in Chapter 7.

Question 16 answers

The coding of answers to this question was conducted as follows:

00 – No response
01 – Nothing (or no training) or none
02 – Irrelevant response
03 – Computer skills and technology literacy, word processing, learn software usage skills or literacy - e.g. typing, use of MS Office, etc.
04 Sewing and knitting
05 – Catering skills (cooking and baking)
06 – Bricklaying and building skills
07 – Use of Internet facilities - e.g. information seeking using the Internet, e-mail use, etc., contacting family and friends by e-mail, sending ‘episodes to work’ by e-mail (users a writer)

08 – Skills related to job seeking and applications for jobs/ useing the Internet to seek employment

09 – Learning computer literacy skills in order to teach others in the community

10 – Computer courses, such as, Pastel Accounting and the International Computer Driving License (ICDL), want to study a computer engineering course; learning or registering for computer courses

11 – Faxing

12 – Making photocopies

13 – Use of computer for school purposes or projects, such as, writing assignments and essays, setting tests and learner assignments

14 – Making telephone calls

15 – Scanning

16 – Printing

17 – Laminating

18 – Using the tuck shop

19 – Business related skills, such as, learning about Microsoft Excel and other related software usage skills

20 – Accessing Outcomes-Based Education (OBE) lessons and information from the Multi-choice Foundation Computer Programmes; in-service training about OBE skills

21 – Improving my knowledge of English by using the computers

22 – Selling my products to people who use the telecentre; telesales, telemarketing

23 – Posting mail at and receiving mail from the telecentre post office

24 – Meeting other people, entertainment and playing games on the computer

25 – To study art and crafts

26 – Wanting to get a job in government – doing a computer course at the telecentre; seeking jobs over the Internet; want to get a job after completing computer course at the telecentre; want a job in the private sector; want to work in an office or bank

27 – Making job applications in newspapers on the Internet

28 –Use the telecentre as a venue for examinations and workshops

29 – Buying airtime

30 – Information about new services that the telecentre should start e.g. Mzansi account and courier services

31 – Using the Internet for its other services, like, beyond information seeking and e-mail usage

32 - Seeking information to advance my studies from staff using study material; the Internet is not available at this telecentre; use computers to submit assignments; use computers for study purposes

33 – Using newspapers

34 – Telecentre is cheaper compared to town

35 – I want or use government services at the telecentre

Question 17 answers

00 – No response

01 – Nothing or No training

02 – Irrelevant responses

03 – Sewing

04 – Baking and catering

05 – Overhead projector

06 – More computer courses- e.g. Pastel Accounting and ICDL

07 – Library and e-library

08 – Scanner

09 – Facsimile or facsimile and photocopier combination

10 – Broadband (fast) Internet, Internet facilities - e.g. e-banking, e-government, etc. Internet Café, free Internet service, and using the Internet for information search

11 – Tuck shop

12 – Printer or multifunctional printer-photocopier, colour printer, enough printers

13 – Training in job-seeking skills

14 – After-hours computer training to practise computer skills; extend telecentre opening time to accommodate working persons

15 – Free or cheaper access to the Internet

16 – Voice over the Internet (VoIP)

17 – Educational video cassettes

18 – Personal computer (PC) engineering

19 – More space for the telecentre to accommodate more people; 'many are not happy to attend computer classes once a week because there are many people but few

computers, more computers are required to train more people about how to use computers'

20 – Insurance

21 – Medical aid

22 – Books and magazines

23 – Video and video games

24 – Recharge vouchers for mobile telephones

25 – Laminator

26 – Public information terminal (PIT)

27 – Binder of documents

28 – Reduced costs because we live in an impoverished area;
'we need transport to deliver us at the telecentres'

29 – Web designing course

30 – Microsoft Excel and Microsoft PowerPoint

31 – Technician to fix computers when they are broken or a computer technician course

32 – Radio

33 – Accreditation of our courses

34 – Video conference

35 – More community involvement in telecentre activities

36 – More staff for the telecentre to help us with computer training

37 – Slide projectors

38 – Workshops or seminars about technology

39 – Desktop publishing – want to be a journalist

40 – Community radio station

41 – New and fast computers (Pentiums)

42 – DVD writer and DVD player; digital camera; CD writer

43 – Greater participation by young people in the telecentre must be encouraged (user from Hoxani telecentre in Bushbuckridge)

44 – More efficient photocopiers, which do not breakdown easily when people make many copies

45 - Change telecentre to a multipurpose centre, which offers different services not just computers

46 – Digital satellite television (DsTV) and Supersport Channels; television

47 – Secretarial or personal assistant course

48 – Sports facilities or a gym

49 – Games or entertainment (DVDs); entertainment facilities and headphones to listen to music privately

50 – Business and entrepreneurial skills and business funding; we want jobs

51 – Advanced OBE lessons and skills

52 – Telephones (questionnaire from MACIS telecentre)

Question 18

Answers quantitative and in Chapter 7.

Question 19 answers

00 – No answer

01 – Nothing or None

02 – Irrelevant response

03 – Computer training skills; use of keyboard - use of software packages, such as, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, electronic mail, Word Perfect

04 – Studied ICDL course

05 – Desktop Publishing - e.g. typing invitation and business cards, producing flyers, advertisements, letterheads, etc.

06 – Banking facilities , such as, electronic or using the Internet to access the bank

07 – Medical aid facilities

08 – OBE training classes and workshops

09 – Internet (Windows Explorer)

10 – Life skills to change the mindset of other people in the community to use the telecentre and ‘see value in life’

11 – How to develop computer networks

12 – Better presentation and public speaking skills

13 – Customer services and how to serve people better in a business and financial management

14 – Studied the Cisco Certified Network Associate (computer networking) and the E-Citizen Course
15 – Use of a public information terminal (PIT)
16 – Experiental learning - public management course

Question 20 answers

00 – No answer
01 – Nothing
02 – Irrelevant answer
03 – Business related skills or business course and financial management; bookkeeping skills, Pastel Accounting Business Course
04 – Sewing and knitting; cooking and baking lessons; fashion design; 'I need a course to own a business after completing it'
05 – Aerobic classes
06 – Music and dance classes
07 – Youth development skills; community development strategy 'we need to develop others in the community so that they can find work'; 'advertise the telecentre in newspapers so that youth can know about it'
08 – International Computer Driving License (ICDL) course
09 – Call centre skills (job related skills)
10 – Life skills
11 – A+ course (A plus computer course) and Pastel Accounting course
12 – Web site development course; Photoshop software
13 – Desktop publishing, for instance, community newsletter
14 – Programming skills like a computer programming course
15 – Internet related skills like using e-mail; 'I have my own e-mail address'; Internet Café
16 – Computer technician course
17 – Photocopier
18 – More computer classes and more time for training for present computer classes; 'free computer training because we do not have money to pay for computer training'
19 – Library
20 – Workshops to discuss how to 'grow' or develop the telecentre further

21 – Afternoon and weekend training for school children who do not have computers at school

22 – More space or bigger building for more computers and more training; weekend computer classes to accommodate others who want the training;

23 – Home care of health education for home-based care; education about health issues such as HIV Aids and tuberculosis 'to educate the community'

24 – Project management course

25 – Leadership skills or management course; Human Resources Course

26 – Rewriting Matric examinations; 'Adult school to complete high school'

27 – Security officer training course

28 – Secretarial course

29 – More information technology (IT) courses

30 – Facsimile

31 – 'Database administration'

32 – Marketing or promoting a business

33 – Drama or acting classes

34 – 'How to produce music using a computer or sound engineering'

35 – Graphic design course

36 – Use of DVD writer and use of CDs

37 – Videos and television

38 – How to apply for jobs using the Internet

39 – Beautician course including how to do facials, manicures and pedicures

40 – Laminator

41 – Internships for matriculants and unemployed graduates

42 – Tourism and travel course

43 – Career guidance or training

Question 21 answers

00 – No response

01 – Nothing

02 – Irrelevant response

03 – Facsimile, photocopying, printing

04 – Financial management; bookkeeping and accounting skills for business management - ‘book balancing skills’
05 – How to manage while working under pressure and unsupervised, that is, supervision skills
06 – Reporting skills; communication skills; liaison skills with people in government; communication skills and confidence when speaking to people both in the public and private sectors or liaison skills communicating with leaders in government, higher education institutions and funders in the private sector while developing computer courses and accrediting courses; leadership skills; customer care skills; ‘telecentre staff are flexible and down to earth teach us things in an easy way’, learn how to conduct meetings at the telecentre and draw up an agenda; ‘telecentre staff a positive influence on the community and teach people many things that they teach at the centres; ‘Improved my human relations – taught me how to live better with other people’
07 – Outcomes-Based Education or Shoma Outcomes-Based Education teaching skills - ‘I now know how to teach a crowded class because of Shoma classes’; How to encourage my staff (teachers) to work better in an organisation by developing staff motivation skills in an organisational or school setting
08 – Basic computer literacy skills - e.g. word processing, improved typing skills and increase speed; use of software such as MS Word, Excel, MS PowerPoint, study computer networking course, etc.; general PC usage skills
09 – Desktop publishing skill - e.g. designing letterheads, business cards, flyers, pamphlets, etc.
10 – Obtained work as a result of computer training at telecentre and now live a better life; ‘I am confident I will find a job after finishing the computer course here’
11 – Obtaining information to use in daily life experiences and to be abreast of recent developments and trends generally; ‘I am a bit empowered, broadened my knowledge’
12 – Education that one can receive at a college or higher education institution at less price or cost; ‘Workshops at the telecentre educate us’
13 – Access to affordable use of computers or cheap use of computers which I do not have at the school where I teach; improved community development by bringing IT closer to my community and improving my computer knowledge; cuts the costs of travelling to town to get computers because the town is far away; ‘telecentre cuts

costs of travelling to UNISA in Pretoria to get study material' (user from Tombo telecentre)

14 – Taught me 'not to fear computers anymore but master them'; 'Gained much knowledge and confidence in using computers which I feared before as an old person', 'Taught me everything is possible in life if you put your mind to it and not fear computers' ; 'Telecentre changed my mindset about computers'

15 – Research for my writings and schoolwork from the Internet

16 – Becoming more fluent in English because this is the language of communication and instruction at the telecentre

17 – Learnt how to use electronic mail and the Internet, that is, Windows Explorer

18 – Got promoted at work after finishing computer course at telecentre

19 – Helped me pass my end-user computing course at the technikon

20 – 'Improved my knowledge of the SOS market', 'improved my knowledge about government services'

21 – Dealing with many clients; 'telecentre taught me how to deal with people and know about health issues'

22 – How to use a public information terminal (PIT) and how to access a government portal through the Internet

23 – 'There is community development by telecentre staff'

Question 22 answers

00 – No response

01 – Nothing

02 – Irrelevant answer

03 – Basic and advanced computer literacy; basic typing skills; use of computer software such as Microsoft PowerPoint, Microsoft Excel, etc.

04 – E-Citizen course

05 – Obtained the ICDL course; 'ICDL is an internationally recognised course so I can work anywhere in the world if I want'

06 – Business-related skills

07 – Creating OBE lessons and class preparation or planning skills

08 – Changed my mind about technology and improved knowledge and skills about computers; ‘opened my eyes to a new and exciting world of contacting other people using e-mail’

09 – Designing pamphlets, flyers, advertisements, letterheads and business cards, that is, desktop publishing skills

10 – Buy goods using the computer – electronic shopping; paying accounts using the Internet, tele-banking; e-banking

11 - Use of Internet to find information and search for jobs or research for my writings and schoolwork on the Internet; use the Internet ‘to contact the rest of the world’

12 – The telecentre is a source of information for current affairs and business, ‘I also update my knowledge about things I learnt before’

13 – Access to cheap computer services without any hassles; ‘The telecentre helped me to access computers next to where I live; do not have to spend money travelling far to get access to computers’

14 – A computer is now an accessory you must have at home and the telecentre has given me skills to be able to use my home computer which was always shut down before I came to the telecentre to learn computer skills

15 – Passed my call-centre course after learning computer skills at the telecentre; ‘I passed my technikon computer course easily because I received computer training from the telecentre first’; ‘Helped me get a computer qualification certificate at college easily’

16 – Learning about how to start computer networks (LAN course)

17 – Taught me confidence when speaking to professional people in the public sector

18 – ‘At least we’ get certificates for qualifications received at the telecentre

19 – Improved the neatness of my OBE work; my class planning has improved since doing OBE training at telecentre

20 – Qualifications received from telecentre helped me get a better job; assisted in advising me about careers

21 – Got promotion at work after finishing computer training at telecentre

22 – Improved the education that I received at university, e.g. practise desktop publishing here at telecentre and produce telecentre newsletter

23 – Work planning and dealing with a ‘high volume of’ or many clients; learned Batho Pele Principles which teach us how to deal with people

24 – A lecture room at the telecentre to have Unisa lectures (at the telecentre)
25 – Experiental learning course taught me team-work, problem-solving, good communication skills and how to develop a business plan.
26 – Use telephones
27 – Fax letters
28 – Print documents

Questions 23 and 24

Answers are in Chapter 7.

Question 25 answers

00 – No answer and nothing (combined)
01 – Irrelevant response
02– Learned computer literacy skills in use of software packages
03 – Community service
04 – Communication via the Internet and e-mail; apply for jobs via the Internet; Communication with the world or part of the information society
05 – Teach acquired computer skills to others
06 – Documentation and producing music
07 – Job seeking skills; advance in career
08 – Learning Internet-related skills for study purposes – how to use the Internet for study purposes and to submit assignments
09 – Computer business-related skills, such as, bookkeeping skills; I need information about Umsobomvu Youth Fund because I want to expand my catering business and I got it here at the telecentre and was taught how to do a business plan and apply for funding; received project management skills; compiling financial statements on the computer; 'I need business funding to start my business'
10 – The telecentre 'kept me busy when I did not have a job and had nothing to do at home'
11 – My colleagues are now impressed and compliment me on the better way in which I present my OBE work and how my teaching has improved; learn computer skills to teach children

12 – Learnt customer service and how to please clients and serve them what they need and improved customer relations

13 – Improved confidence, improved self and learner development and assessment skills

14 – At the end of the course we get a certificate from a university and we graduate

15 – Assisted me to complete my B Tech degree an educational management course

16 – I get information for my studies; improve my course knowledge – currently studying at university.

17 – Getting information on time and communication made easier.

ADDENDUM E: TYPICAL TELECENTRE ACTIVITY, USER PROFILE AND IMPACT OF CENTRES ON COMMUNITY DEVELOPMENT

9.3.1 Urban centres (MACIS and Siyabonga)

(a) The urban telecentre user profile: demographic information

Siyabonga telecentre users are 25 per cent female and 25 per cent male. Most users using this centre are between 20 and 24 years of age (34.6 per cent); the next group that uses the centre more are 25 to 29 years old (26.9 per cent), the next age group consists of 36 to 55 years old (9.6 per cent) and the smallest age group using the centre was between 30 and 35 years old. Most users of this centre are young, between 20 and 29 years old. In Chapter 7 it was established that the mean age group using this centre is 25.4. At the MACIS centre there were more women (26.4 per cent of the MACIS group) users than men (23.9 per cent of the group). Age groups using the MACIS centre were similar to those of the Siyabonga centre because the most of the users at this centre (32.7 per cent of the MACIS group) are between 20 and 24 years old; and the next largest group, 26, 5 per cent is between 25 and 29 years old. Following on from this group are teenagers (12.2 per cent of the MACIS group) and last group are 26 to 55 year olds which comprised 12.1 per cent of the whole group. The mean age of users at the MACIS centre is 26.7. Over 80 per cent of users at both centres are single.

According to the above information, it seems that the typical urban telecentre user is between 24 and 30 years old.

The Siyabonga centre user is not highly educated because most have a Grade 12 matriculation certificate (36, 5 per cent of respondents), which represents the last high school year. The next group at this centre have a better education being a post-high school certificate course or diploma (30.8 per cent of Siyabonga respondents); only 7.7 per cent of the Siyabonga users have a university degree. MACIS centre users have comparable educational levels. Forty-two per cent of the MACIS group have Grade 12 (last year of high school) and either a post-high school certificate or diploma course; while only 10 per cent of them have a

university degree. In conclusion then the typical urban telecentre user is not highly educated, both at MACIS and Siyabonga centres, and has only completed high school education or a post-high school certificate course. At MACIS centre there were somewhat more users with university degrees than at Siyabonga centre.

Regarding employment status and occupation, most Siyabonga users are students (40.4 per cent), which is understandable since most are young and unemployed (28.8 per cent). Others worked in sales and marketing jobs (11.5 per cent) and 9.6 per cent of the whole Siyabonga group chose the 'other' occupation. The typical Siyabonga centre user, then, is an unemployed student. When it comes to income earned per month, 57.7 per cent of Siyabonga respondents did not want to divulge what they earn, while 15.4 per cent earn R0 to R399, 11. 5 per cent earn R400 to R999, and only 7.7 per cent earn R1000 – R3999 or R4000 and more. Hence the typical user of the centre earns below R1 000 per month, which is a little less than AU$300 and about US$10. The MACIS centre users have a similar employment and occupation status to those at Siyabonga centre. Forty-four per cent of MACIS centre users are students, 30 per cent are unemployed, 8 per cent are clerical staff and 18 per cent selected the 'other' profession option which implies that they have 'other' jobs. It appears, therefore, that 74 per cent of MACIS centre users are students and/or unemployed.

The typical urban telecentre user, therefore, is unemployed, a student, or has a clerical, sales or marketing occupation. Sixty-four per cent of MACIS centre users did not want to divulge their income, while 12 per cent of them earn R0 to R399 and R1 000 to R3 999 per month. Only 4 per cent of the MACIS group earn R4 000 and over. Considering income earn at both urban centres, of those who stated their income, the typical urban telecentre user earns around R1 000 per month. About 60 per cent of users at both centres refused to divulge their monthly income.

(b) Distance travelled to reach the telecentres; mode of transport employed and transport costs

Siyabonga centre users walk fewer kilometres to reach the centre, at least compared to the rural Hoxani centre users. Fifty-six (55.8) per cent of Siyabonga centre users walk one to four kilometres to reach the centre, 26.9 walk less than a kilometre, 12 per cent four to 10 kilometres and 5.8 per cent of them walk over 10 kilometres to reach the centre. MACIS

centre users walk similar distances to the centre as those users at Siyabonga: 25 per cent less than one kilometre, 50 per cent w one to four kilometres, 10.4 per cent four to 10 kilometres while 14.6 per cent walk over 10 kilometres to reach MACIS centre. This, therefore, means that although there are urban telecentre users who also (as the rural users) travel over 10 kilometres to access centre ICT, most (75 per cent at MACIS and 82.7 per cent at Siyabonga) travel four kilometres or less to reach the urban centres.

The mode of transport to the urban telecentres was mostly by foot, with 54 per cent of MACIS centre users and 53, 5 per cent of Siyabonga centre users walking to the centre. Public transport was the second most used form of transport with 44 per cent of MACIS centre users and 36.5 per cent of Siyabonga centre users utilising it. Privately owned cars are used by few urban telecentre users. Only 2 per cent of MACIS centre users used private transport to reach the centre and 9.6 per cent of Siyabonga centre users travel by private cars to access the telecentre.

It is relatively cheaper to travel to the urban telecentres than to the rural centres because it cost 49 per cent of both the MACIS and Siyabonga centre users less than R2, 00 to travel to the urban centres; 20. 4 per cent of MACIS centre users and 17. 6 per cent of Siyabonga centre users spend between R2, 00 and R5, 00; 22.4 per cent of MACIS and 21. 6 per cent of Siyabonga centre users pay between R5, 01 and R10, 00 to travel to the centre, while 6.1 per cent of MACIS centre users and 11.8 per cent of Siyabonga centre users pay over R10, 00 to travel to the centres. It is fairly cheap then for the typical urban telecentre users to travel to the centres. Most users pay less than R2, 00 while others pay between R5, 01 and R10, 00 to reach the telecentres. However, considering that most of these urban users are unemployed, or students, it may not be cheap for them to have to pay the travel costs to reach the telecentres; hence the urban centre users regard the telecentre services as ‘expensive’.

(c) Visit frequency and visit duration

The frequency of visits to the MACIS centre was 1.5 which indicated almost every day and that of Siyabonga centre was 2.0 which indicated once or more per week. Therefore, the urban telecentre users visit the telecentre almost every day. The typical urban centre user at both centres spends one to two hours per visit

Table 85: Telecentre user demographic profile, access and cost issues: a comparative analysis

User demographic characteristics, access and cost factors	Urban Siyabonga telecentre	Urban MACIS telecentre	Rural (or semi-rural) Tombo Telecentre	Rural Hoxani telecentre
Age	61.5 per cent users between 20 and 29 years; 5.8 per cent between 30 and 35; 9.6 per cent between 36 and 55; 23 per cent teenagers	59.2 per cent of users between 20 and 29 years; 28.4 per cent between 30 and 55; 12.2 per cent teenagers	64.8 per cent between 20 and 29; 16.7 per cent between 30 and 35; 10.4 per cent between 36 and 55 years; 8.3 per cent teenagers	19.2 per cent between 20 and 29; 59.6 per cent between 36 and 55 years; 19.1 per cent between 30 and 35; years; 2.1 per cent teenagers
Mean age	25	28	25	38
Gender	25 per cent male; 25 per cent female	26.4 per cent female; 23.9 per cent female	23 per cent female; 24.8 per cent male	20.7 female; 28.3 per cent male
Marital status	90.4 per cent single; 9.6 per cent married or living with partner	80 per cent single; 20 per cent married or living with partner	68.8 per cent single; 31.3 per cent married or living with partner	25 per cent single; 25 per cent married or living with partner
Highest and lowest educational qualifications	36.5 per cent have Grade 12; 7.7 per cent have a university degree	42 per cent has certificate and diploma courses; 42 per cent have Grade 12; 6.0 per cent have Grade and 10 per cent have a degree	56.3 per cent have a diploma or certificate course; 25 per cent have a university degree; 16.7 have Grade 12	44.9 per cent have a certificate or diploma course; 36.7 per cent have a university degree; 16.3 per cent have Grade 12
Employment status (key	40.4 per cent students; 28.8	44 per cent students; 30	35.4 students; 27.1 teachers;	64 per cent teachers; 14

indicators)	per cent jobless; 11.5 per cent in marketing jobs	per cent unemployed; 14 per cent have other jobs	12.5 in marketing jobs; 12.5 in other jobs	per cent clerical staff; 10 per cent unemployed
Income (highest and lowest only)	57.7 per cent did not divulge it; 7.7 earn between R1000 and R3999 and 7.7 earn R4000 and over	64 per cent did not divulge income; 12 per cent earn R399 and below; 12 per cent earn R1000 to R3999	27.1 per cent earn R4000 and over; 25 per cent earn between R0 and R399	66 per cent earn R4000 and over; 16 per cent earn between R1000 and R3999; ad two per cent earn between R400 and R999
Distance travel or walk to reach telecentre (highest and lowest percentage)	55.8 per cent travel between 1 and 4 km; 5.8 per cent travel 10 km and more	50 per cent travel between 1 and 4 km; 10.4 travel between 5 and 10 km; 14.6 per cent travel 10 km and more	39.6 travel less than 1 km; 35.4 per cent travel between 1 and 4 km; 8.3 per cent travel 10 km and more	52 per cent travel 10 km and more; 20 per cent travel between 5 and 10 km; 16 per cent less than 1 km; 12 per cent travel between 1 and 4 km
Visit frequency Mean	2.0 or once or more per week	1.5 or almost every day	1.9 or almost every day	2.0 or once or more per week
Visit duration	2.3 or one to two hours	2.5 or one to two hours	2.7 or one to two hours	1.9 or less than an hour
Mode of transport mostly used	53.5 per cent of the users walk; 36.5 per use public transport	54 per cent walk; 44 per cent use public transport	62.5 per cent walk; 22.9 per cent use cars; 14.6 per cent use public transport	46 per cent use public transport; 40 per cent use private cars; 14 per cent walked
Cost of getting to telecentre	49 per cent pay less than R2;	49 per cent pay less than	64.6 per cent pay less than	73.5 per cent pay R10 and

today (highest and lowest percentages)	21.6 per cent pay between R5 and R10; 17.6 pay between R2 and R5; 11.6 per cent pay R10 and over	R2; 22.4 pay between R5 and R10; 20.4 per cent pay between R2 and R5; 6.1 per cent pay R10 and over	R2; 16.7 per cent pay R10 and over; 10.4 per cent pay between R2 and R5; 8.3 per cent pay between R5 and R10	over; 14.3 per cent pay between R5,01 and R10; 6.1 per cent pay less than R2 while 6.1 pay between R2 and R5

Table 61 shows differences between Hoxani telecentres and the three other centres which have almost similar user characteristics.

(d) Access to and use of communication technology and Internet-related services

Communication technology such as telephones, facsimile, computer hardware and software and Internet-related services were either not available or never used at the urban centres of MACIS and Siyabonga (cf. Chapter 7 for usage means of the communication technology; some of which is re-stated hereunder). Technology not available at MACIS centre are MTN phones, Cell C phones, the facsimile (mean or M = 1.7), VoIP, Internet radio, Internet fax and the electronic library. Services never used at MACIS were Telkom phones (M = 2.2), Vodacom phones (M = 2.1), and e-mail (mean 2.9). At Siyabonga centre, facilities or services not available were Telkom phones (M = 1.8), Vodacom phones (M = 1.8), Cell C phones, the facsimile (M = 1.6), VoIP (M = 1.9), and the electronic library (M = 1.9). Technology never used at Siyabonga telecentre was the Internet fax and Internet radio (both M = 2.1). At Siyabonga centre MTN phones and electronic mail were seldom used indicated by utilisation rates of 3.5 and 3.2 respectively.

(e) Use of desktop applications

The utilisation of desktop applications – Microsoft Word for word processing, spreadsheets and Microsoft PowerPoint for visual presentation - was better at the urban centres because all these services were seldom or often used. However, indications at both urban centres were that web page design and DTP software was never used (web page design utilised: M = MACIS 2. 2 and Siyabonga 2.5); DTP software utilisation rate of M = MACIS 2.6 and Siyabonga 2.3). MS Word was often used at both centres (MACIS MS Word usage M = 4.4,

Siyabonga, M = 4.2). Visual presentation (MS PowerPoint) software was seldom used at MACIS centre (M = 3.9) but never used at Siyabonga centre (M = 2.8). Spreadsheets were often used at MACIS centre (M = 4.0) and seldom used at Siyabonga centre (M = 3.2).

(f) Use of computer hardware

A scanner was not available at MACIS centre (M = 1.9) and never used at Siyabonga centre (M = 2.8). The printer was seldom used at both urban centres (M = MACIS 3.1 and Siyabonga 3.5). The CD-ROM was seldom used at either centre (M = MACIS 3.4 and Siyabonga 3.2).

(g) Educational facilities usage

Educational facilities are mostly not available at both centres. At any rate available educational equipment was never used at these urban centres where most users are uneducated. At MACIS centre, equipment not available, according to means established in Chapter 7, were the video recorder (M = 1.8), video camera (M = 1.4), the tape recorder (M = 1.7) and the digital camera (M = 1.4). The same equipment is also not available at Siyabonga telecentre although the means were different, video recorder (M = 1.8), video camera (M = 1.9), tape recorder (M = 1.9) and digital camera (M = 1.8). Television and radio are available at both centres but never used. At MACIS centre the television utilisation mean was 2.1 and that for radio 2.0, while at Siyabonga telecentre, the mean for television usage was 2.5 and that for radio 2.7 (both figures represent never used).

(h) Use of office equipment

The only office equipment used at Siyabonga centre was the photocopier (M = 3.8), while the laminator (M = 2.5) was never used, and the overhead projector and the PIT just not available (both M = 1.9). At the MACIS the laminator (M = 1.6), overhead projector (M = 1.7) and the PIT (M = 1.7) are also not available but the photocopier although available was never used (M = 2.9).

(i) Use of educational media and ICT educational activities conducted

Other educational materials are also either never used or unavailable at these urban centres. At both MACIS and Siyabonga centres materials not available are video cassettes (both centres M = 1.7) and audio cassettes (MACIS centre M = 1.8 and Siyabonga centre M = 1.6). At both urban centres newspapers, books and magazines are never used. The mean utilisation of newspapers at the MACIS centre was 2.5, that for books 2.4 and for magazines 2.1. The mean for using newspapers at Siyabonga centre was 2.5 that for book usage 2.8 while that for magazine usage was 2.1. These mean figures indicate that these educational media are never used at both centres.

Conducting ICT activities to pursue educational activities continues to be minimal at both urban centres. ICT educational activities never conducted at MACIS centre are seeking information on available courses (M = 2.5) and information related to assignments (M = 2.5), completing assignments (M = 2.4) and discussion of study issues (M = 2.3). ICT educational activities identified by MACIS respondents as not available are course registration (M = 1.7), contact with lecturers (M = 1.8), submission of assignments (M = 1.7) and use of library services (M = 1.9). At Siyabonga telecentre, ICT education-related activities never conducted are seeking information on available courses and that related to assignments (both M = 2.1), contacting lecturers (M = 2.1), completion of assignments (M = 2.0), and discussion of study issues (M = 2.1). Academic activities identified by Siyabonga centre respondents as being not available were course registrations, submission of assignments and library services. One interested in education would have expected the telecentres to be employed more towards the performance of the above-stated educational activities, but users at these telecentres, on the contrary, did not utilise the ICT for academic purposes.

(j) ICT usage for business

ICT appears not to be used much for business activities at both urban centres because at MACIS centre users seldom use ICT to obtain business information (M = 2.1) and business skills (M = 2.0), while at Siyabonga centre users seldom made use of ICT to obtain business information (M = 2.3) and business skills (M = 2.4). Moreover data at both centres showed that users never employed ICT to contact or interact with government officials (MACIS, M = 1.8 and Siyabonga 1.6).

(k) ICT usage for medical, economic, government and other purposes

Users at both MACIS and Siyabonga centres did not use ICT for medical purposes or to seek medical information from staff (MACIS mean use of ICT to seek medical information is 1.7 and Siyabonga 1.6). At both centres, users also did not utilise ICT for personal business such as e-banking or contacting insurance companies (M = MACIS 1.1 and Siyabonga 1.7). At MACIS, ICT was not used to conduct 'other' business (M = 1.4) and at Siyabonga centre users seldom employed ICT to conduct 'other' business (M = 2.1). At both centres Internet information searches are seldom conducted (MACIS M = 2.2 and Siyabonga, 2.3); seeking employment information via the Internet and from telecentre staff (MACIS M = 2.2 and Siyabonga 2.1); and applying for employment over the Internet (MACIS M = 2.2 and Siyabonga 2.1). What is apparent is that at both centres ICT was used to seek and use business advancement and employment or economic empowerment information from the Internet. However staff at the centre but do not appear to make use of government-related services or contact government officials to obtain similar information.

(l) Telecentre charges: Opinion of the urban user

The urban centre users regard telecentre prices as expensive (both centre M for opinion on centre prices are 2.9). In the question scale, 2 represents expensive. This finding makes much sense and qualifies earlier demographic findings concerning these users who are typically young, less educated and unemployed, and therefore, are unable experience problems relating to telecentre usage and transport costs to travel to the telecentre.

(m) Telecentre impact on formal and non-formal education of the urban telecentre users

Users at both urban telecentres stated that the telecentres did not improve their non-formal education (MACIS M = 1.1 and Siyabonga 1.7) but did improve their formal education 'to a reasonable extent' (MACIS M = 3.1 and Siyabonga 3.0).

(n) Benefits of the urban telecentres on the community

The urban telecentre users concluded that the centres have had a positive development impact on the community because the centres offer a good service to the community (MACIS M = 4.4 and Siyabonga 4.5); enhance community education (both MACIS and Siyabonga 4.3); promote community computer literacy (MACIS M = 4.4 and Siyabonga 4.5); link the communities to the rest of South Africa (both centre M = 4.2); the centres are assets to the communities (both centre M = 4.4) and that they link communities to the world (MACIS M = 4.0). However at Siyabonga centre respondents neither agreed nor disagreed that the centre links the Orange Farm community to the world (M = 3.0). Also, users at both centres neither agreed nor disagreed that the centres bring wealth to the communities nor contribute negatively to the communities. However, users at both centres disagreed that things have changed for the worse since the arrival of telecentres (MACIS M = 2.3 and Siyabonga 2.1). Users at both centres agreed that the telecentres would be missed should they disappear from the communities (both centres M = 4.6).

In conclusion, it is clear, that utilisation of ICT and its' role at the urban centres toward community development, have had positive rewards for users of the telecentres. Although most educational facilities are not available at both centres, and even though most of those available were never used for educational purposes, users at these urban centres employed ICT to seek employment, learn computer literacy skills, obtain business-related skills and information, communicate with other persons nationally and apply for employment via the Internet.

9.3.2 Rural telecentre (Hoxani)

(a) The rural telecentre user profile: demographics

Hoxani telecentre users were 28.3 per cent male and 20.7 per cent female. Contrary to the urban young telecentre user, the average Hoxani centre user was older, between 36 and 55 years of age (59.6 per cent of the whole group). Other user age groups at the Hoxani centre were 30 to 35 years old (19 per cent of the Hoxani group), 20 to 24 years (12.8 per cent of the Hoxani centre users) and only 2 per cent were teenagers. The mean age of the Hoxani MPCC

was 38 years old. Fifty per cent of the respondents were single while 50 per cent were married or living with a partner.

The rural Hoxani telecentre user is better educated than the urban Siyabonga and MACIS centre users. The highest educational qualification of the rural Hoxani centre user was the post-high school certificate or diploma course, with 44.9 per cent of the respondents having this qualification and a university degree, while 36.7 per cent of the Hoxani centre users have university degrees. Only 16.3 per cent of the Hoxani centre users obtained Grade 12 and two per cent completed Grade 11.

As far as employment status and occupation are concerned, rural Hoxani MPCC users have better occupations than the urban telecentre users; with 64 per cent of the Hoxani centre users being primary and high school teachers; 14 per cent of them clerical staff, 6 per cent of them occupying 'other' jobs and another 6 per cent students. However, 10 per cent of the rural Hoxani group was unemployed. Occupations of the Hoxani centre users indicated that the users are more learned and have higher education than the urban users. However, the negative unemployment rate impacted on both urban and rural users.

Consequently, possession of higher education gained Hoxani centre users better occupations and higher salaries. Sixty-six per cent of them earn R4 000 and more per month, 16 per cent earn between R1 000 and R3 999 per month, two per cent earn between R400 and R999 per month and eight per cent earn under R400. Therefore, Hoxani centre users earn better monthly salaries than their urban counterparts.

(b) Distance travelled to reach telecentre; mode of transport employed and transport costs

Hoxani centre users walk long distances to reach the centre, a situation that requires change because national legislation promotes short distance travels to reach telecentres and access ICT. Fifty-two per cent of Hoxani centre users travel 10 kilometres and over, 20 per cent travel between 5 and 10 kilometres, 12 per cent travel 1 to 4 kilometres and 16 per cent travel less than a kilometre to reach the centre. The USAA should establish more centres, in the Eastern Cape and Limpopo Provinces, nearer home so that centres are more accessible.

Public transport was the most used mode of transport to reach rural Hoxani telecentre, with 46 per cent of users employing that transport, 40 per cent of the users employing private transport and 14 per cent walking to gain access to the telecentre. It is fairly expensive to travel to this rural centre because it cost 74 per cent of the users R10, 00 and more to travel to the centre and 14.3 per cent of the users pay between R5, 01 and R10, 00 to visit the centres. It is costly for the typical rural telecentre user to travel to and access this telecentre.

(c) Access to and use of communication technology and Internet services, and use of computer hardware

Communication technology such as telephones (some companies' services), facsimile, computer hardware and software and Internet-related services are either not available or never used at Hoxani MPCC. Technology not available at Hoxani MPCC are Cell C phones (mean 1.8), the facsimile (mean 1.9), and Internet services such as e-mail (mean/M = 1.7), VoIP (M = 1.4), Internet radio (M = 1.5), Internet fax (M = 1.6).The electronic library. Technology and services never used at this rural Hoxani centre are Telkom fixed-line telephones and Vodacom mobile phones (both M = 2.7). Computer hardware facilities such as the scanner (M = 2.2), printer (M = 2.5), and the CD-ROM (M = 2.6).. All the above technology is necessary for communication and education. The centre, however, with assistance from educational institutions or government, should work towards imparting skills to its users on the utilisation of technology, when such technology is available at the centre and also make unavailable technology available because there are many illiterate persons in Limpopo Province which is mainly rural.

(d) Desktop applications

The only seldom used desktop application at this rural centre was Microsoft Word for word processing (M = 3.0). DTP software (M = 2.0), spreadsheets (M = 2.4) and Microsoft PowerPoint for visual presentation (M = 2.3) were never used. Web page design software was not available (M = 1.6).

(e) Use of office equipment

At this rural telecentre office equipment was never used. This applies to the photocopier (M = 2.8) and the overhead projector (M = 2.2). The laminator and the PIT are not available (both M = 1.7).

(f) Utilisation of educational facilities

Educational facilities are either not available or never used. Facilities never used are television (M = 2.9), video recorder (M = 2.4), tape recorder (M = 2.2), video cassettes (M = 2.4), audio cassettes and the radio (M = 2.4). The digital camera was unavailable (M = 1.6).

(g) Use of educational media and ICT educational activities conducted

While newspapers (M = 2.6) and magazines (M = 2.) are never read at Hoxani MPCC, books are seldom read (M = 3.0). ICT activities using educational activities at this telecentre are below the value two (cf. Chapter 7 for mean values). These ICT educational activities consisted of seeking information on available courses, information related to assignments, completing assignments, discussion of study issues, course registration, contact with lecturers, submission of assignments and use of library services. It is apparent that this telecentre focussed on offering OBE teacher training computer lessons, and other computer literacy lessons as educational facilities – all the educational activities stated in the questionnaire were never used as most users were not students. Working teachers may not all be interested in furthering their studies but be more interested in improving work-related skills and job performance, such as, the teachers at this telecentre..

(h) ICT usage for business

ICT was never employed to pursue business interests at the Hoxani MPCC. The findings and means provided in Chapter 7 state this. ICT functions identified in this section are to obtain business information (M = 1.4 which means never conducted), use of ICT to obtain business skills (M = 1.4) and interaction with government officials (M = 1.3). All figures below the value of 2, according to the question measuring instrument, indicate that ICT is never used for that purpose. These figures also suggest that this centre's users were not pursuing

business interests, which is in contrast to the activities of the urban centres, which are mostly geared towards attaining business-related skills. In this regard, Tombo centre users were similar to the urban centre users and often used ICT for business purposes.

(i) ICT usage for medical, economic, government and other uses

Hoxani MPCC users also did not employ ICT to obtain medical, economic and government-related information. Issues addressed in this questionnaire section were the use of ICT to seek medical information (M = 1.3); use of Internet to seek information on issues of interest (M = 1.5); ICT usage to seek employment information (M = 1.4); conducting employment applications (M = 1.4); conducting any other personal business (M = 1.3), and using ICT to contact banks and insurance companies (M = 1.3). Users at this centre were not interested in business, medical and government information, although personal interviews (cf. Chapter 8) revealed that some users would like the centre to offer some business and medical courses. For example, requests for tourism and HIV/Aids training courses indicate interest on the part of a few users for education in business and health issues. Even the centre manager, Ndlovu (2005) was learning about HIV/Aids with the intention of teaching teachers about protecting themselves against the virulent disease.

(j) Telecentre charges: Opinion of the rural user

Hoxani MPCC users regarded telecentre prices as affordable (M = 3.1). This is understandable considerable that they received better salaries per month, compared to their urban counterparts who regarded the prices as expensive.

(k) Telecentre impact on formal and non-formal education of the urban telecentre users

Users stated that their non-formal education was ‘not at all’ improved (M = 1.4) while their formal education has improved ‘to a reasonable extent’ (M = 3.1). The deduction is, from the kind of ICT these users receive from this telecentre, that the formal education improved refers to the computer training conducted to improve the teaching skills. However, all other types of information gained from the centre by the users constitutes non-formal education, although the users did not define this information as such.

(l) Rural community benefits accrued from using the telecentre

Users at this centre mentioned only positive impact of the telecentre on individual and community development. Means stated in Chapter 7 supported this. Users agreed with question statements, that the centre offers a good service to the community in that it enhances community education, promotes community computer literacy, is an asset to the community and will be missed if removed from the community. Users, however, disagreed that the telecentre has a negative impact on community development and that things had changed for the worse since establishment of the centre.

In conclusion, according to users, Hoxani MPCC offers good service to the community, enhances community computer literacy and education. Users stated that the centre has a positive impact on community development and that most community members were positively-inclined towards the centre as their computer skills have improved as a result of using the centre. Almost all the persons interviewed at this centre stated that they knew nothing about computers before visiting the telecentre for the first time and all knowledge they possessed about computers was learned at the centre. Computer literacy was also associated with improvement in school work performance, planning of classes, setting and marking of tests, improved communication and working relations with other teachers, and other teaching duties which have also improved (these are stated in Addendum D - with answers to the open questions at the end of this thesis). Most of the interviewees sought better salaries and promotions as, as most said 'teaching does not pay'.

9.3.3 Semi-rural or semi-urban telecentre (stated in previous research on local telecentres as a rural telecentre Tombo but categorised in this study as semi-rural)

(a) Tombo telecentre user profile: demographics

Tombo telecentre users are 23 per cent female and 24.8 per cent male. Most users using this centre are between 20 and 24 years of age (33.3 per cent), the next group that uses the centre frequently was between 25 and 29 years old (31.5 per cent), the next age group 30 to 35 years old (16.7 per cent), then 36 to 55 year olds (10.4 per cent) and smallest age group was teenagers (8.3 per cent of the Tombo group). Therefore, most users of this centre are young, between 20 and 29 years old (64.8 per cent of the Tombo group) – similar to the urban

telecentre users. Chapter 7 established that the mean age of this telecentre's user is 25.4. Most users were young men, single individuals (68.8 per cent single) and 31.3 per cent of the Tombo respondents were married.

The typical Tombo telecentre user was highly educated, compared to urban telecentre users but has similar educational qualifications to the rural Hoxani telecentre users, although the Hoxani user has more degrees (36.7 per cent as opposed to 25 per cent - than the Tombo user; The Tombo users have more certificate courses and diplomas – 56.3 per cent - than the Hoxani MPCC users – 44.9 per cent). The group with the highest education at Tombo MPCC have certificates or diplomas (56.3 per cent). The second most educated Tombo MPCC group have university degrees (25 per cent). Seventeen per cent of Tombo MPCC users have matric or Grade 12. The least educated group at this centre obtained Grade 11 (only 2 per cent).

Regarding employment status and occupation, most Tombo users are, similar to the other urban centre users, students (35.4 per cent). This is understandable because most users are young; the next biggest group are teachers (27.1 per cent); sales and marketing staff are the third largest group of users (12.5 per cent); 'other' workers comprised 12.5 per cent of the whole group and clerical staff and the unemployed both 6.3 per cent of the Tombo centre users. When it comes to income earned per month, the highest earners at this centre receive R1 000 to R3 999 and R4 000 or over per month (both income groups 27.1 per cent). The second highest earning group earn between R0 and R399 per month (25 per cent of the whole group). The next group of Tombo users, 18.8 per cent, did not want to divulge their income and 2.1 per cent of the whole group receive between R400 and R999 per month. Therefore, it can be concluded that most users at this centre have a higher income per month, considering both their rural status and that they earn better then the urban telecentre users in this research. This observation is at variance with the commonly held perception that urban dwellers earn better salaries than rural dwellers. In this case rural dwellers earn better monthly salaries than urban dwellers because they possess higher educational qualifications.

This is one of the reasons this telecentre is regarded, in this study, as semi-rural or semi-urban, because people in this village use and afford facilities usually associated with urban life, have high educational qualifications and also earn higher salaries than most urbanites. Urban dwellers aspire to the same conditions but will not succeed, especially if they insist on

being uneducated or fail to achieve higher levels of education. At the same time this researcher is fully aware that some people do not achieve higher educational levels because of difficult socio-economic problems but still young persons should persevere towards attaining higher educational qualifications.

(b) Distance travelled to reach telecentre; mode of transport employed and transport costs

Tombo centre users walk only a few kilometres to reach the centre when compared to Hoxani centre users, but walk more kilometres if compared to the urban telecentre users (both MACIS and Siyabonga). Forty (39.6) per cent of Tombo MPCC users walk less than one kilometre to reach the centre; 35.4 per cent walk one to four kilometres; 16.7 per cent walk five to ten kilometres and 8.3 per cent of the users walk ten kilometres and over to reach the centre. Rural telecentre users have to walk a long way to reach the telecentres especially when compared to urban telecentre users. This reveals lack of policy implementation on the part of the USAA because South African telecommunications policy directs and mandates this agency to ensure that rural persons access ICT services within a fifteen-minute walk and there is absolutely no way that persons can walk ten kilometres and over in fifteen minutes. Tombo people need more telecentres to be established, nearer their homes.

The USAASA should provide rural ICT services nearer homes and ICASA should ensure that this is regulated to ensure service rollout where most required. So far, ICASA has failed to ensure that service providers do provide these services within rural persons' reach. The latter still struggle to access telephones and other ICT services. The digital divide remains a policy challenge because if 25 per cent of this centre's users still walk five to over ten kilometres to reach the centre, it means that there are still huge numbers of users who reside a long way from the centre. In short those who require these services find them inaccessible. Why walk over ten kilometres to a telecentre and on arrival you are hungry, tired and find it difficult to fully participate in the learning process of a computer training class.

Walking is the most effective way to get to this centre -- 62.5 per cent of Tombo centre users walk to reach the centre. Privately owned cars are used by 22.9 per cent of the users, while public transport utilised by 14.6 per cent of the users.

It costs less, on average, to travel to Tombo telecentre than the urban telecentres because it cost 64.6 per cent of Tombo centre users less than R2, 00 to travel to the telecentre; 16.7 of the users over R10, 00 to reach the centre; 10, 4 per cent of the users spent between R2, 00 and R5, 00 to reach the centre; and 8.3 per cent of the Tombo users pay between R5, 01 and R10, 00 to reach the telecentre.

(c) Visit frequency and visit duration

The Tombo centre frequency of visiting the telecentre was 1.9 which indicates almost every day per week. This indicates frequent visits and that most users made constant use of the centre. Most users, however, spent a short time at the centre because they spent less than one hour per visit (M = 1.9), and a mean within that range indicates a visit of less than one hour. Staying less than one hour at a telecentre is not adequate. People need spend more time at a telecentre if serious learning is to occur and more ICT skills acquired.

(d) Access to and use of communication technology and Internet-related services

Most communication technology is not available at Tombo MPCC: MTN telephones are often used (M = 4.2); the facsimile is seldom employed (M = 3.3). Technology not available was Telkom's fixed-line telephones (M = 1.8); computer hardware and software, and Internet-related services were either not available or never used (cf. Chapter 7 for means or averages) of all the communication technology, averages of usage of other technology are re-stated hereunder). According to ICT usage criteria stated in Chapter 7, technology not available at the centre is Cell C phones, VoIP, Internet radio, Internet fax, e-mail, Vodacom mobile phones and the electronic library (means range between 1.4 and 1.8). The Internet is also never employed for information search (M = 2.6). The scanner and the CD-ROM (usage means 2.5 and 2.6 respectively) never used, while the printer is often utilised (M = 4.2). To sum u, facilities made use of are MTN mobile phones, facsimile and printer.

(e) Use of desktop applications

Microsoft Word for word processing was often employed whilst MS PowerPoint was seldom utilised; web page design software is not available; DTP software is never used and spreadsheets seldom used. Therefore, Microsoft applications are mostly employed for

spreadsheets, word processing and visual presentations. Users still have to be exposed to advanced and creative computer software, such as that for Web page design, DTP and graphic design.

(f) Educational facilities and other media usage

Educational and other facilities stated in the questionnaire are not available, such as, television, video recorder, tape recorder video camera, digital camera, video and audio cassettes, and radio. The usage means of these facilities range from 1.4 to 1.9, which represent not available. Mass media such as newspapers, books and magazines are never used because the usage means of the media range between 2.6 and 2.8 represent never used. It is crucial, therefore, that the centre managers provide some of these services at the centre, for example newspapers and radio, to contribute to improving literacy levels of community members.

(g) Office equipment usage

The photocopier was often used (M = 4.3), the PIT seldom used (M = 3.3), no laminator was not available (M = 1.6) and the overhead projector never used (M = 2.0). The centre administrator at the time, Smauza (2005), stated that the photocopier was often employed by school teachers, municipal workers, the unemployed who copied personal documents for job applications, workers at the hospital, school and university students. The PIT was employed to access government-related information, services and forms to apply for social services (mostly financial grants).

(h) Use of educational media and ICT educational activities conducted

ICT was seldom employed to conduct education-related activities, including seeking information on available courses, course registration, completing and submitting assignments, contacting lecturers, seeking information related to assignment completion, completing assignments and discussing study issues with fellow students (usage means for these purposes range from 2.1 to 2.6 which represent seldom used). At the same time library services are never used at the centre although there were many students using this centre. It is expected that some ICT activities are study-related. This use of ICT for educational purposes was one

of the criteria employed by this researcher to categorise this centre as semi-urban or semi-rural. Because ICT is employed in ways prevalent in cities and also technology is made use of at the centre, such as, facsimile, printers and MTN phones, are mostly available and used in urban areas. The sub-section below also supports the categorisation of this telecentre as semi-urban because use of ICT for business-related activities and for government services is common in cities but rural Tombo residents perform these activities daily. This researcher decided then that they cannot be categorised 'absolutely rural telecentre users' although they reside in the countryside.

(i) Utilising ICT for business

Users seldom used ICT to obtain business information, learn business skills and interact with government. The ICT utilisation figures for performing these activities reveal that the centre users seldom engage in these activities (cf. Chapter 7 for mean values).

(j) Using ICT for medical, economic, government and other uses

Again ICT was employed at the Tombo MPCC to seek information users found interesting and relevant, to request employment information and conduct employment applications. ICT was seldom in use for business activities. These activities are performed at the urban telecentres, which signify that users at Tombo telecentre are more urban than rural in their electronic activity choices. Mean values show that ICT was never employed to seek medical information or conduct personal business such as Internet banking and contacting insurance companies (means for ICT usage for these activities ranged from 1.4 to 1.7).

(k) Telecentre prices: opinion of the urban user

The typical Tombo telecentre user regarded the prices charged by the centre as reasonable (M = 3.2). This could be because there the centre offered services at low prices, in consideration of users' economic standing.

(l) Telecentre impact on formal and non-formal education of the urban telecentre users

Users stated that the centre has 'not at all' improved their non-formal education (M = 1.1) but has improved their formal education 'to a reasonable extent" (M = 3.2). The improved formal education refers to computer literacy gained in the form of courses offered that users receive certificates for.

(m) Benefits of the urban telecentres on the community

Users viewed the impact of the telecentre on community development as positive, but neither agreed nor disagreed that the centre links Tombo village to the rest of South Africa and the world. They also neither agreed nor disagreed that the centre brought economic development to the community. Users disagreed with the questionnaire statements that the centre has a negative impact on the community and that things have changed for the worse since the telecentre establishment. Positive telecentre impact mentioned included the centre providing good service to the community, improving community education, promoting community computer literacy, being an asset to the community and that the centre would be missed if removed from the community. Users were, therefore, optimistic rather than pessimistic in their views about the centre's role in personal and community development. As stated in Chapter 8, new services were requested from centre managers by users. Managers, in turn, stated that they were busy organising that the introduction of the requested, such as, banking services, stationery and courier services. The managers have previously heeded users' new service requests.

The development of this centre seems positive, gradual and relevant in its addressing of community needs and interests. In addition the centres development surpassed that of the urban centres because Tombo MPCC users communicated their needs clearly to centre managers who have stable and productive relations with government departments, local universities and other parties interested in cultivating the centres activities. Users in the urban centres were less educated, poorly communicated their needs to staff, seemed to be 'only interested in computers' (as most interviewed persons told this researcher). Their inability to express their needs inhibits their capacity to develop or utilise the ICT available at the centres, especially for educational purposes. Most urban telecentre employees stated that they wanted to 'learn computer to get work'. What was apparent in the urban centres was that

computer literacy is associated with securing employment. Computer literacy training was sought to seek employment. A few urban centre users expressed ICT training needs such as training as computer programmers and graphic designers while Tombo telecentre users wanted more business skills and software skills such as Web design.

ICT used and not used at the centres is summarised in Addendum F, as well as reasons why ICT is used. Addendum F also includes users' opinions about ICT prices, impact on their education and influence of the telecentres on community development.

Mrs Zandi Lesame

Department of Communication Science, University of South Africa, P O Box 392, Pretoria, 0001.

Tel: +27(0) 12 429 6693, Fax: +27(0) 12 429 3346, Mobile 072 271 6843

E-mail: lesamnc@unisa.ac.za

http://www.unisa.ac.za/Default.asp?Cmd=ViewContent&ContentID=1252

READ THE INSTRUCTION IN EACH QUESTION CAREFULLY BEFORE ANSWERING THE QUESTION.

SURVEY QUESTIONNAIRE: THE IMPACT OF TELECENTRES ON THE EDUCATION OF USERS IN SOUTH AFRICA

Record number

3

SECTION A: TELECENTRE USER'S PERSONAL DATA

For official use only

Please supply the following personal information. Please make a cross (X) where Applicable or provide an answer in writing where necessary.

1. Please state your gender Female 1 Male 2

[ ]

4

For official use only

2. Please state your age

…….…… years

5-6

3. What is your marital status?

Single	1
Married	2
Divorced	3
Widowed	4
Living together but not married	5

7

4. What is your highest educational qualification?

1. No formal education	01
2. Grade 5/Standard 3 or lower	02
3. Grade 6 to7/Standard 4 to 5	03
4. Grade 8 to 9/Stadard 6 to 7	04
5. Grade 10/Standard 8	05
6. Grade 11/Standard 9	06
7. Grade 12/Matric/Standard 10	07
8. Certificate course	08
9. Diploma course	09
10. Bachelors degree	10
11. Postgraduate qualification (Honours, Masters and/or Doctoral degree)	11
12. Other qualification Please state…… ……	12

8-9

For official use only

5. What is your occupation?

Student	01
Home Executive/Housewife	02
Unemployed due to a physical disability	03
Unemployed – looking for work	04
Unemployed – not looking for work	05
Self-employed or entrepreneur or businessman/businesswoman	06
Other, please state or describe your work …….. …… ……	07

10-11

6. What is your monthly income?

Do not want to divulge/refuse to mention/Do not know	01
R0 to R199	02
R200 to R399	03
R400 to R599	04
R600 to R799	05
R800 to R999	06
R1 000 to R1499	07
R1 500 to R1 999	08
R2 000 to R2 499	09
R2 500 to R2 999	10

R3 000 to R3 499	11
R3 500 to R3 999	12
R4 000 to R4 499	13
R4 500 to R4 999	14
R5 000 to R5 499	15
R5 500 to R5 999	16
R6 000 to R6 499	17
R6 500 to R6 999	18
R7 000 to R7 499	19
R7 500 and more	20

12-13

7. What is the name of the telecentre where you completed this questionnaire?

Bushbuckridge telecentre, Mpumalanga/Limpopo Province	1
Mamelodi Communication and Information Services (MACIS), Gauteng Province	2
Mankweng telecentre, Limpopo Province	3
Mohodi gaManthata telecentre, , Limpopo Province	4
Siyabonga telecentre, Gauteng Province	5
Tembisa telecentre, Tembisa townsgip, Gauteng Province	6
Tombo telecentre, Eastern Cape Province	7
Other telecentre, please state name ……..	8

14

SECTION B: QUESTIONS ABOUT THE USER'S ACCESS TO THE TELECENTRE, COMMUNICATION TECHNOLOGY NEEDS AND USE OF THE TELECENTRES.

For official use only

8. How far do you live from the telecentre?

a)	Less than 1 kilometre away	1
b)	1 to 2 kilometres away	2
c)	3 to 4 kilometres away	3
d)	5 to 6 kilometres away	4
e)	7 to 8 kilometres away	5
f)	9 to 10 kilometres away	6
g)	More than 10 kilometres away	7

15

9. How do you usually get to the telecentre?

a)	I walk/I jog	1
b)	By my own car/private transport	2
c)	By bus	3
d)	By bicycle	4
e)	By train	5
f)	By taxi	6
g)	Other transport, please state in the space below …….. ……..7	

16

For official use only

10. How much did you pay to get to the telecentre today?

a) Nothing

b) Less than R2, 00

c) R2, 01 to R3, 00

d) R3, 01 to R4, 00

e) R4, 01 to R5, 00

f) R5, 01 to R6, 00

g) R6, 01 to R7, 00

h) R7, 01 to R8, 00

i) R8, 01 to R9, 00

j) R9, 01 to R10, 00

k) R11, 00 or more

l) Other please state ☐

……

18

11. How often do you come to the telecentre?

a) Almost every day

b) Once or more per week

c) Once or more in two weeks

d) Once or more per month

e) Once or more in three months

f) Once or more every six months ☐

Less than once every six months

19

12. How many hours do you usually spend at the telecentre?

a) Less than one hour

b) One to two hours

c) Three to four hours

d) Five hours and more ☐ 20

For official use only

13. Please indicate whether you use the following facilities very often, often, seldom or never. If a particular facility is not available at your telecentre, please indicate that by marking "not available".

	Very Often	**Often**	**Seldom**	**Never**	**Not Available**	
Tick only one answer, box or number						
TELEPHONES AND RELATED TECHNOLOGY						
Telkom	5	4	3	2	1	☐ 21
MTN	5	4	3	2	1	☐ 22
Vodacom	5	4	3	2	1	☐ 23
Cell C	5	4	3	2	1	☐ 24
Facsimile/Fax	5	4	3	2	1	☐ 25
COMPUTER SOFTWARE PACKAGES						
Electronic mail	5	4	3	2	1	☐ 26
Internet for information searches (World Wide Web searches)	5	4	3	2	1	☐ 27
Internet phone/Voice over the Internet	5	4	3	2	1	☐ 28
Internet radio	5	4	3	2	1	☐ 29
Internet fax	5	4	3	2	1	☐ 30
Word processor (such as Word Perfect, Microsoft Word)	5	4	3	2	1	☐ 31
Desktop Publishing Software, e.g., Quark Express)	5	4	3	2	1	☐ 32
Web page design software (e.g., PageWeaver, PageMaster)	5	4	3	2	1	☐ 33
Broadband/Wireless Internet	5	4	3	2	1	☐ 34

Question 13 continued

For official use only

	Very Often	Often	Seldom	Never	Not Available		
COMPUTER SOFTWARE PACKAGES							
Spreadsheet Application (e.g., Excel)	5	4	3	2	1	☐	35
Visual presentation software e.g., Microsoft PowerPoint)	5	4	3	2	1	☐	36
COMPUTER HARDWARE APPLICATIONS							
Scanner	5	4	3	2	1	☐	367
Printer	5	4	3	2	1	☐	38
CD-ROM	5	4	3	2	1	☐	39
TELEVISION, RADIO AND RELATED EQUIPMENT							
Television set	5	4	3	2	1	☐	40
Video recorder	5	4	3	2	1	☐	41
Video conferencing Technology	5	4	3	2	1	☐	42
Tape recorder and Player	5	4	3	2	1	☐	43
Video camera	5	4	3	2	1	☐	44
Digital camera	5	4	3	2	1	☐	45
Radio	5	4	3	2	1	☐	46
OTHER OFFICE EQUIPMENT							

Question 13 continued

For official use only

	Very Often	**Often**	**Seldom**	**Never**	**Not Available**		
Photocopier	5	4	3	2	1	☐	47
Laminator	5	4	3	2	1	☐	48
Overhead projector	5	4	3	2	1	☐	49
Public information Terminal	5	4	3	2	1	☐	50
EDUCATIONAL FACILITIES							
Educational video cassettes	5	4	3	2	1	☐	51
Educational audio cassettes	5	4	3	2	1	☐	52
Newspapers	5	4	3	2	1	☐	53
Books	5	4	3	2	1	☐	54
Magazines	5	4	3	2	1	☐	55
Electronic library	5	4	3	2	1	☐	56
ENTERTAINMENT FACILITIES							
Video games	5	4	3	2	1	☐	57
Music CDs	5	4	3	2	1	☐	58
Computer games	5	4	3	2	1	☐	59

14. Mention any other facilities and/or technology that you use at the telecentre

……..

For official use only

15. How often do you use the equipment/facilities at the telecentre for the following purposes?

	Very Often	Often	Seldom	Never		
(a) To seek information on available courses	4	3	2	1	☐	60
(b) To register for courses	4	3	2	1	☐	61
(c) To make contact with educators/ lecturers of courses registered for	4	3	2	1	☐	62
(d) To obtain information for doing or completing assignments of courses that you are registered for	4	3	2	1	☐	63
(e) To do or complete assignments for courses for which you are registered	4	3	2	1	☐	64
(f) To discuss issues related to your studies with fellow students	4	3	2	1	☐	65
(g) To submit assignments for courses for which you are registered	4	3	2	1	☐	66
(h) To obtain business-related information from the centre and/or Internet	4	3	2	1	☐	67
(i) To make use of library services	4	3	2	1	☐	68
(j) To learn business skills	4	3	2	1	☐	69
(k) To interact with government officials and/or department (e.g. for information about voting, birth and death registrations and application for pensions, social grants and identity documents)	4	3	2	1	☐	70
(l) To get medical information	4	3	2	1	☐	71

	Very Often	Often	Seldom	Never	For official use only	
(m) To search for information n issues or topics in which you are interested	4	3	2	1		72
(n) To obtain information on available jobs from the telecentre manager and staff	4	3	2	1		73
(o) To apply for jobs	4	3	2	1		74
(p) To conduct my personal businesses/affairs e.g., Internet banking	4	3	2	1		75
q) To contact other businesses	4	3	2	1		76
(r) To contact banks and other institutions such as insurance companies	4	3	2	1		77

16. For what *other* purposes do you use the equipment/facilities at the telecentre?

……

……

……..

…….. 78-79

17. Which *other* technologies/facilities and services would you like to have at the telecentre? 80-81

For official use only

18. Indicate how you feel about the charges/tariffs you pay for using the equipment and services offered by the telecentre?

Very expensive	Expensive	Affordable/ Reasonable	Cheap	Very cheap
1	2	3	4	5

82

SECTION C: ICT TRAINING AND TELECENTRE IMPACT

19. Have you personally used the following services at your telecentre?

	Yes	No	Service not available		
Training in how to use a computer	1	2	3		83
Training in computer software (e.g., training in word processing Using word Perfect of MS Word)	1	2	3		84
Technical assistance when using the technology/facilities	1	2	3		85
Business courses	1	2	3		86
Training in Web site design 4	1	2	3		87
Other training you have received \ at the telecentre	1	2	3		88

…….

…….

89-90

For official use only

20. Is there any other form of training that you would like the telecentre to offer? Please state this training in the space provided below.

……
……
……..…….

91-92

21. To what extent has the telecentre improved your informal education/lifelong learning (this is general education which is not the education you obtain at school, university, college or any other educational institution)? Describe the influence in the space provided below.

…….
…….
…….
……
……
……..

121-122 (see page 20 of original questionnaire; this questionnaire was coded later in the research)

22. To what extent has the telecentre assisted you in advancing/ improving your formal education (this is education that you from school, college, university or other educational institutions, and then get a qualification or certificate)?

To a large extent	To a reasonable extent	To a small extent	Not at all
4	3	2	1

93

For official use only

23. Explain your answer to Question 22 a little bit more in the space provided below

……

……..

……. [ ][ ] 122-123

(Question 23 was coded later – during data analysis - due a coding error)

24. To what extent have the technologies and/or services at the telecentre helped you in the following:

	To a large extent	**To a reasonable extent**	**Neutral**	**To a small extent**	**Not at all**		
(a) To find information that you need	5	4	3	2	1	[ ]	94
(b) To further your studies	5	4	3	2	1	[ ]	95
(c) To improve your educational qualifications	5	4	3	2	1	[ ]	96
(d) To improve your computer literacy	5	4	3	2	1	[ ]	97
(e) To find employment/a job	5	4	3	2	1	[ ]	98

						For official use only	
(f) To start your own business	5	4	3	2	1	☐	99
(g) To further your existing business	5	4	3	2	1	☐	100
(h) To further your skills in any other area of development	5	4	3	2	1	☐	101

25. Did the technologies/facilities, other services that you used and/or training that you received at the telecentre help you in any other way? Please describe this way in the space provided below.

…….

…….

…….

……

……

…….. ☐☐

102-103

Please turn over for the next question.

For official use only

26. How would you rate this telecentre with regard to the following aspects:

	Very good	**Good**	**Average**		**Poor**	**Very poor**		
Services offered	5	4	3	2	1			104
Technical assistance offered		5	4	3	2	1		105
Training offered		5	4	3	2	1		106
Attitude of staff	5	4	3	2	1			107
Technical competence of staff		5	4	3	2	1		108

Please answer the last question and thank you for your patience.

27. Indicate whether you strongly agree, agree, neither agree nor disagree, disagree or strongly disagree with the following statements: Strongly agree (SA); Agree (A); Neither agree nor disagree (NSND); Disagree (D); Strongly disagree (SD).

	SA	**A**	**NSND**	**D**	**SD**		
(a) The telecentre offers a good service to my community	5	4	3	2	1		109

For official use only

	SA	A	NSND	D	SD		
(b) The telecentre enhances the educational levels of people in our community	5	4	3	2	1	☐	110
(c) This telecentre promotes computer literacy in our community	5	4	3	2	1	☐	111
(d) This telecentre has linked our community with the South African community	5	4	3	2	1	☐	112
(e) This telecentre is an asset to our community	5	4	3	2	1	☐	113
(f) We will miss the telecentre if it no longer here	5	4	3	2	1	☐	114
(g) This telecentre has linked our community with the rest of the world	5	4	3	2	1	☐	115
(h) The telecentre has brought more wealth to our community	5	4	3	2	1	☐	116
(i) Things have changed for the worse since the establishment of this telecentre in our community	5	4	3	2	1	☐	117

For official use only

	SA	A	NSND	D	SD		
(j) This telecentre has contributed to the economic development of our community	5	4	3	2	1	☐	118
(k) The telecentre has a Negative impact on the community services offered	5	4	3	2	1	☐	119

21. To what extent has the telecentre improved your informal education/lifelong learning (this is general education which is not education which you do not obtain from college, school, university, or educational institution)? Describe the influence in the space below.

…….

……

……..

……. ☐☐

120-121

For official use only

23. Explain your answer to Question 22 a little bit more in the space provided below

…….

……

……..

…….

122-123

PLEASE FILL IN TODAY'S DATE HERE ……

AGAIN THANK YOU VERY MUCH FOR COMPLETING THIS QUESTIONNAIRE.

NDIYABULELA KAKHULU KUWE NGOKUPHENDULA KWAKHO LE MIBUZO.

KE LEBOGA THATA THUSO YA GAGO.

NGIYABONGA KUWE NGOKUGCWALISA KWAKHO LE KHWESHINE.

Last Updated: 10 JANUARY 2005

SOURCES CONSULTED

African Connection Project 1998. [O] Available
http://www.africanconnection.org
Accessed on 1999-09-10

Africa Recovery. 1999. Africa Defines Its Electronic Agenda: Several Countries are working on their Information Infrastructure: more will follow. December: 17-20.

Agunga, A. 1997. *Developing the Third World: A Communication Approach*. New York: Nova Science Publishers.

Akhbar, M. 2001. *Bridging the Digital Divide: Bangladesh Aspect*. Dhaka: WomenBD.com

Ali, F. 2003. The South African Telecommunications Environment: A Brief Assessment of Regulatory Change. *Communicatio: South African Journal for Communication Theory and Research* 29(1&2):114-128.

Amariles, F., Paz, O. P., Russell, N. and Johnson, N. [Sa]. The impacts of community telecentres in rural colombia. *Journal of Community Informatics*. Online at:
http://www.ci-journal.net/index.php/ciej/article/download/256/277
Accessed on 2009-01-14

Anderson, B. MoneyWeb. 2005. *Telkom rip-off: SA phone charges highest in world, study confirms*. *The Citizen*. April 21:1-2.

Anderson, J., van Crowder, L., Dion, D. and Truelove, W. 1999. *Applying the lessons of participatory communication and training to rural telecentres.* Development Communication. [O] Available
http://www.fao.org.waicent/faoinfo/sustdev/
Accessed 1999-10-22 & 2000-02-12

Anderson, B. 2008. Take a hike: Telkom tanks. Now shareholders bay for board's blood. *FINWEEK* April 10:12.

Andrew, T. N., and Petrov, D. 2003. The need for a systems thinking approach to the planning of rural telecommunications infrastructure. *Telecommunications Policy* 27(1-2): 75-93.

Anh Dao, T. T. 2004. *Implementation of telecentres in Vietnam*. APEC Telecentre Workshop. Singapore: APEC Telecentre Telecommunications and Information Working Group. September 19-24.

Annual Report Department of Communications. 2003/4. Pretoria: South African Department of Communications.

Arun, S., Heeks, R. and Morgan, S. 2004. ICT Initiatives, Women and Work in Developing Countries: Reinforcing or Changing Gender Inequalities in South India? Development Informatics Working Paper Series.
http:www.sd.manchester.ac.uk/idpm/publications/wp/di/educdi.htm
Accessed on 2008-09-30

Asikhulume Television Programme. 2007. *Is South Africa Succeeding in Bridging the Digital Divide?* South African Broadcasting Corporation/SABC 1. Program hosted by Xolani Gwala. March 18: 18h30-19h30.

Australian Government Department of Communications, Information Technology and the Arts. 2007. *Economic Models of Technological Change: ICT and Productivity*. Barton: Commonwealth Australia.

Australian Rural Telecentre Association (ARTA). 1998. *Telecentres in Australia.*
[O] Available
http://www.arta.org.au

Accessed on 1999-10-22 and 2000-02-12

Babbie, E. R. 1995. *The Practice of Social Research.* Seventh Edition. Belmont, California: Wadsworth.

Babbie, E. 1998. *The Practice of Social Research*. Eighth Edition. Belmont, California: Wadsworth Thomson Learning.

Babbie, E. 2001. *The Practice of Social Research*. Ninth Edition. Belmont, California: Wadsworth Thomson Learning.

Babbie, E. R. and Mouton, J. 2001. *The Practice of Social Research: A South African Edition*. Cape Town: Oxford University Press.

Bailey, K. D. 1994. *Methods of Social Research*. Fourth Edition. New York: The Free Press.

Bailur, S. 2008. *Deconstructing community participation in telecentre projects*. Development Informatics Working Paper Series Paper No. 31. Manchester: University of Manchester. http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/index.htm
Accessed on 2008-10-12

Baker, T. L. 1999. *Doing Social Research*. Boston: McGraw-Hill College.

Barnett, G.A., Jacobson, T., Young, C. and Sun-Miller, S. 1996. An Examination of the International Telecommunications Network. *Journal of International Communication* 3(2):19-43.

Barnett, G.A., Salisbury, J.G.T., Kim, C.W. and Langhorne, A.1999. Globalization and International Communication. *Journal of International Communication* 6(2):7-49.

Barron, C. 2004. Juicy Stake in Telkom was motivated by `Patriotism': The charge of Crony-

Capitalism has surprised the ANC's Watchdog in Chief. *Sunday Times Business Times* November 14: 12.

Barzilai-Nahon, K. 2006. Gaps and Bits: conceptualising measurements for digital divide/s. *The Information Society* 22(5): 269 - 278.

Becker, F. and Patterson, V. 2005. Public-Private Partnerships: balancing financial returns, risks and roles of the partners. *Public Performance and & Management Review* 29(2) 125-144.

Bell, S. and Sadlak, J. 1992. The process and curriculum of technology transfer. *Higher Education Management* 4(2): 227-44.
[O] Available
http://scholar.lib.vt.edu/ejournals/JTS/Winter-Spring-2001pdf/song.pdf
Accessed on 2003-03-11

Benjamin, P. and Dahms, M. 1999. *Socialise the Modem of Production - The Role of Telecentres in Development*. Johannesburg: Link Centre. [O] Available
http://www.idrc.ca/telecentre/evaluation/html/10_Soc.html
Accessed on 1999-12-10

Benjamin, P., Stavrou, A., Burton, P. and McCarthy, C. 2000. *Telecentre 2000: A Synthesis Report*. Johannesburg: Link Centre, University of the Witwatersrand.

Benjamin, P. 2001a. USA Telecentre Survey. Community: Unity through Communication. *South African Community Newsletter*. Johannesburg: Graduate School of Public and Development Management, University of the Witwatersrand.

Benjamin, P. 2001b. Does 'Telecentre' mean the centre is far away? Telecentre development in South Africa. *The Southern African Journal of Information and Communication* 1(1):8-18.
[O] Available

http://link.wits.ac.za/journal/j-01-pb.htm
Accessed on 2003-06-27

Benjamin, P. 2003. *The Universal Service Agency's Telecentre Programme: 1998-2000*. Pretoria: Human Sciences Research Council.

Berg, B. L. 1998. *Qualitative Research Methods for the Social Sciences*. Massachusetts: Allyn and Bacon.

Bertolini, R. 2002. *Telecommunication Services in Sub-Saharan Africa: An Analysis of Access and Use in the Southern Volta Region in Ghana*. Frankfurt: Peter Lang.

Bidoli, M. 2004. MTN Group CEO Phuthuma Nhleko is the JSE's Most Powerful Executive Director.
[O] Available
http://free.financialmail.co.za/projects/topbeecos/fbee.htm
Accessed on 2006/04/18

Bless, C. and Higston-Smith, C. 1995. *Fundamentals of Social Research Methods: An African Perspective*. Second Edition. Kenwyn: Juta & Co. Ltd.

Bodgan, R. C. and Knopp Biklen, S. 2003. *Qualitative Research for Education: An Introduction to Theory and Methods*. Fourth Edition. Boston: Pearson Education Group, Inc.

Boeringer, K. 1996. *Policy Formulation*. Sydney: Macquarie University.

Boloka, M. 2004. Diversity goes global: small fish in the South African Media Industry have had a torrid 10 years. *Rhodes Journalism Review* No 24 (September): 30-31.

Bornman, E. 2006. *Qualitative observational, participatory and self-report methods, in research*, in *international communication: Methodology and Techniques*. Pretoria: University

of South Africa.

Bornman, E., van der Walt, L. and Hanekom, J. 2006. Foundations of Social Science Research and the Research Process, in *Research in International Communication: Methodology and Techniques*. Pretoria: University of South Africa.

Bourdeau de Fontenay, A. and Beltran, F. 2008. *Inequality and economic growth: should we be concerned by the digital divide?* Paper submitted to and delivered at the 17th Biennial Conference of the International Telecommunications Society. Montreal, June 24-27.

Boyle, B. 2008a. President sets 24 sunset targets for final year. *Sunday Times.* February 10: 4.

Boyle, B. 2008b. Fortunately, people want to chat: Never Mind the US Credit Crunch, the Spending Squeeze, Higher Interest Rates and Power Cuts – MTN is Doing Fine. *Sunday Times Business Times* March 23:7.

Bozeman, B. 2000. Technology Transfer and Public Policy: a review of research and theory. *Research Policy* 29:627-655.

Bozeman, B. and Rogers, J. D. 2002. A Churn Model of Scientific Knowledge Value: Internet researchers as a knowledge value collective. *Research Policy* 31:769-794.

Braman, S. 1998a. The information society, the information economy and South Africa. *Communicatio: South African Journal for Communication Theory and Research* 24(1):67-75.

Braman, S. 1998b. *Policy Formulation*. Pretoria: University of South Africa.

Bridging the digital divide, harnessing ICT for economic development, job creation and poverty eradication. 2001. *World of Work* No 38 The Magazine of the International Labour Organization.

Brown, K. 2004. ANC, Cosatu clash looms. *Pretoria News*. November 11:1.

Bucknell, T., Less, H., Skuster, P. and Thornton, M. 2002. *Changing gears: South Africa and the growth, employment and redistribution policy of 1996*. PUBPOL 556. [O] Available http://www-personal.umich.edu/~Kathrynd/soafrica.w02project.pdf
Accessed on 2005-03-04

Burton, S. 2002. Development at any cost. ICTs and people's participation in South Africa. *Communicatio* 28(2):43-53.

Butcher, N. 1998. *The Possibilities and Pitfalls of Harnessing ICTs to Accelerate Social Development: A South African Perspective*. Johannesburg: South African Institute for Distance Education (SAIDE).

2003. Critique of Khulisa offer by COSATU: COSATU calls Khulisa an offer to fool people over privatisation. *Business Day Business Report* January 23:1-3.

Byron, I. and Gagliardi, R. 1998. *Communities and the Information Society: The Role of Information and Communication Technologies in Education*. Ottawa: Independent Development Research Centre (IDRC).

Castells, M. 1998. *Information technology, globalisation and social development.* Berkeley: University of California. Paper prepared for the United Nations Research Institute for Social Development (UNRISD) Conference on Information Technologies and Social Development, Geneva. June 22-24.

Castells, M. 1999. An introduction to the Information Age. In H. Mackay and T. O'Sullivan (eds.). *The Media Reader: Continuity and Transformation*, pp. 398-410. London: Sage.

Cekiso, F. Manager of Ndevana Telecentre. 2000. Interview by author. [Transcript]. 14 April. Ndevana, King William's Town: Ndevana Telecentre.

Cisco Networking Academy. [O] Available
http://www.cisco.com.global/ZA/news/news_s113.shtml
Accessed on 2003-03-11

Chen, T. 2001. *Knowledge community: a synthetics perspective on innovation*. Electronic paper for Winter Conference. Taipei: Graduate Institute of Technology and Innovation Management.

Chetty, M. 2005. *Developing Locally Relevant Applications for Rural South Africa: A Telemedicine Example*. Cape Town: University of Cape Town

Chetty, M., Blake, E. and McPhie, E. 2006. VoIP deregulation in South Africa: implications for under-serviced areas. *Telecommunications Policy* 30(5-6):332-344.

Chibber, N. K. 2002. *Overcoming rural-urban digital divide in South Asian developing countries.* Paper Delivered at the International Telecommunications Society 14th Biennial Conference, Seoul, August 18-1.

Chigona, W. 2006. Should communal computing facilities cohabit with public facilities? *The Journal of Community Informatics* 2(3): 1-11. Available at:
http://ci-journal.net/index.php.ciej/article/viewArticle/276/260
Accessed on 2007-09-10

Chitty, N 2004. Configuring the Future: Framing International Communication within World Politics in the 21st Century. *Journal of International Communication* 10(2):42-66.

Choi, B. 2005. *Digital Divide in the APEC: Myth and Reality*. Perth: Curtin University of Technology. Paper delivered at the International Telecommunications Society Conference.

Chonco, N. 2008. Assimilation is Not Change. *Mail & Guardian* March 20 to 27:2.

Chuenyane, G. 2009. SA's Social Time Bomb. *City Press* January 4:1.

Chwee-huat, T. 1993. Singapore Telecom: from public to private sector. *International Journal of Public Sector Management* 5(4):4-14.

Cloete, E. and Courtney, S. 2002. Small businesses' acceptance and adoption of E-commerce in the Western Cape Province of South Africa. *Electronic Journal on Information Systems in Developing Countries* 10(4):1-13.

Coetzee, C. 2007. *Quantitative Data Analysis*. Tshwane: University of South Africa.

Cogburn, D. L. 2003. Governing global information and communication policy: emergent regime formation and the impact on Africa. *Telecommunications Policy* 27(1&2): 135-153.

CommUnity Newsletter: 2000. Northern Province Telecentre Community Research. *CommUnity: Unity through Communication: South African Community ICT Newsletter*. Vol 1: Edition 4:12-13.

Compaine, B. M. and Weinraub, M. J. 1997. Universal Access and Online Services: an Examination of the Issue. *Telecommunications Policy* 21(1):15-34.

Conradie, P. 1998. Using Information and Communication Technologies for Development at Centres in Rural Communities: Lessons Learned. *Communicare* 17(1): 97-116.

Conradie, D.P. 2001. Reactions to globalisation by the Television Industry in post-apartheid South Africa. *Communicatio: South African Journal for Communication Theory and Research* 27(2): 70-83.

Conradie, D.P., Morris, C and Jacobs, S. J. 2003. Using Information Communication Technologies (ICTs) for deep rural development in South Africa. *Communicatio: South African Journal for Communication Theory and Research* 29(1&2): 199-217.

Cooper, R. and Madden, G. (eds.) 2004. *Frontiers of Broadband, Electronic and Mobile Commerce*. Contributions to Economics. Heidelberg and New York: Physica-Verlag.

Coward, C. 2008. Why Do Telecentres Deserve Ongoing Attention? *Telecentre Magazine*. [O] Available
http://www.cis.washington.edu/2008/121/telecentres-deserve-attention
Accessed on 2009-01-13

Crotty, A. 2005. Company News: Transnet Pension Fund still owns 6.64 per cent of MTN. [O] Available
http://www.busrep.co.za/index.php?fSection1d=563&fArticleId=2639358
Accessed on 2006-04-18

Dahms, M. 2001. *Telecentres - Connecting Africa?* Midrand: Africa Telecom 2001 Conference.

People's Ads. 2005. *Daily Sun* March 7:28.

Davison, R., Vogel, D., Harris, R. and Jones, N. 2000. Technology leapfrogging in developing countries: an inevitable luxury? *Electronic Journal on Information Systems in Developing Countries* 1(5):1-10.

Dawes, N. 2004. Ngcaba laid ground for deal: details emerge of former Director General's self-serving policies, as state resistance hardens to R7bn Telkom Stake. *Mail & Guardian* 12-18 November: 2.

Deane, J. 2000. World Telecommunication Development Report 1999: Mobile Cellular/World Telecommunication Indicators. International Telecommunication Union. *Telecommunications Policy* 24: 271-278.

Deane, J and Opoku-Mensah, A. 1997. *Telecommunications Development and the Market: The Promises and the Problems*. Panos Media Briefing No 23, April.

[O] Available http://www.oneworld.org/panos/briefing/telecoms.htm#chapt3

Accessed on 2004-08-12

De Wet, P. 2007. When Telkom TV came to town. *Maverick*. December 3:57-61.

Delgadillo, K. and Borja, R. 1999. *Learning Lessons from Telecentres in Latin America and the Caribbean*. Quito: ChasquiNet Foundation.

[O] Available

http:www.idrc.ca/telecentre/evaluation/html/16_Lea.html

Accessed on 2000-02-26

Department of Education South Africa. 2001. *Strategy for Information and Communication Technology in Education.* A document with the Department of Communications. Pretoria: Department of Education.

[O] Available

http://education/pwv.gov.za/teli2/ICT%20strategy.htm

Accessed on 2002-12-07

Dewey, J. 2001. *My Pedagogic Creed - What Education Is.* [O] Available

http://www.users.glob.co.uk/~infed/e-texts/e-dev-pc.htm

Accessed on 2002-02-28

Dick, A.L. 2000. Who needs the information society? New circuits of power and resistance. *Communicatio: South African Journal for Communication Theory and Research* 26(1): 3-14.

Disseminating the Fruits. 2001. Video recording by the Independent Development Research Centre. Halfway House: Independent Development Research Centre.

Drake, W. J., and Noam, E. M. 1997. The WTO deal on basic telecommunications: Big Bang or Little Whimper? *Telecommunications Policy* 21(9-10)799-818.

Duncombe, R. and Heeks, R. 1999. Information, ICTs and small enterprise: findings from Botswana. *Development Informatics Working Paper Series, paper No. 7*.

http://www.man.ac.uk/idpm/idpm_dp.htm

Accessed on 2008-09-16

Du Plooy, G. M. 2002. *Communication Research: Techniques, Methods and Applications*. Lansdowne: Juta & Co Ltd.

Elmer, L. 1999. *Education for All in the Information Age: The Potential of Information Technology for Improving Educational Access and Quality in Developing Countries*. Washington D.C.: Tulane University. [O] Available

http://www.idrc.ca/telecentre/evaluation/html/IT_Edu.html

Accessed on 1999-08-30

Emdeni Cisco Digital Village. 2003. [O] Available

http://www.it-ab.net/e1581/e1591/e1795/index_eng.html

Accessed on 2003-05-09 and 2005-01-21

Ernberg, J. 1998. *Universal Access for Rural Development: From Action to Strategies*. [O] Available

http://www.itu.int/ITU-D/

Accessed on 1999-10-22

Esselaar, S., Gillwald, A., and Stork, C. 2006. *South African telecommunications sector performance review*. Johannesburg: Link Centre. Public Policy Research Paper No. 8.

Etta, F. and Parvyn-Wamahiu, S. (eds.). 2003. Information and Communication Technologies for Development in Africa: The experience with community telecentres. Chapter 6: *Telecentres in South Africa*. Volume 2. Independent Development Research Centre.

[O] Available

http://web.idrc.ca/es/ev-56553-201-1-DO_TOPIC.html

Accessed on 2005-01-17

Falch, M. and Anyimadu, A. 2003. Tele-centres as a way of achieving universal access - the case of Ghana. *Telecommunications Policy* 27(1-2): 21-39.

Fife, E., Hosman, L. and Pereira, F. 2008. *Public-Private Partnerships and development: A new and effective model?* California: University of Southern California. Paper delivered at the International Telecommunications Society Conference, Montreal.

Financial Mail. 2007. FM Cover Story. Disconnected: The SA Telecom Industry is set for a radical shake-up as competitors enter the market and Telkom faces up to its dying business model. November 23: 35-40.

Forestier, E., Grace, J. and Kenny, C. 2002. Can information and communication technologies be pro-poor? *Telecommunications Policy* 26(11): 623-646.

Fuchs, C. and Horak, E. 2008. Africa and the Digital Divide. *Telematics and Informatics* 25: 99-116.

Fukuda-Parr, S., Lopes, C. and Malik, K. 2002. Capacity for Development: New Solutions to Old Problems. London: Earth Scan Publishing and United Nations Development Programme.

Galbi, D. A. 2001. *Communications Policy, Media Development and Convergence*. Washington D. C.: Federal Communications Commission.

Garcia-Murillo, M.A. and MacInnes. I. 2001. FCC organisational structure and regulatory convergence. *Telecommunications Policy* 25(6): 311-333.

Garcia-Murrillo, M. and Kuerbis, B. 2005. The effects of institutional constraints on the success of universal service policies: A comparison of Latin America and the world. *Telecommunications Policy*. 29(9-10):779-796.

Garcia-Murrillo, M and MacInnes, I. 2005. The impact of legislative change on the behaviour of telecommunications carriers. *Telecommunications Policy* 29(8):663-684.

Garforth, C., Phillips, C. and Bhatia-Panthaki, S. 2007. The private sector, poverty reduction and international development. *Journal of International Development* 19:723–734.

Gedye, L. 2007a. Mbeki bounces ICASA Bill. *Mail & Guardian Online*. July 18:1. Available at http://www.mg.co.za/articlePage.aspx?articleid=269702&area=/insight/insight_national/ Accessed on 2006-07-18

Gedye, L. 2007b. ICASA's mass exodus. *Mail & Guardian Online*. July 18:1. Available at http://www.mg.co.za/articlePage.aspx?articleid=269702&area=/insight/insight_natio... Accessed on 2006-07-18

Gerrard, M. 2001. Public-Private Partnerships. *Finance and Development*. Sep: 48-51.

Gillingham, A. 2008. Skills development: In for the long haul: Corporate SA can't afford to simply wait for universities to deliver. It needs to invest in its own people. *Sunday Times Business Times*. February 17: 16.

Gillwald, A. 1998. *Convergence, Regulation and the Public Interest.* Midrand: Africa Telecom '98.

Gillwald, A. 2001a. *Policy and regulatory challenges of the digital divide*. Midrand: International Telecommunications Unions Africa Telecom 2001 Conference paper.

Gillwald, A. 2001b. Telecommunication Policy and Regulation for Women and Development. The *Southern African Journal of Information and Communication* 1(1):1-25.

Gillwald, A. 2003a. *National Convergence Policy in a globalised world: preparing South Africa for next generation networks, services and regulation*. Johannesburg: Learning Information Networking and Knowledge (LINK) Centre, University of the Witwatersrand.

Gillwald, A. 2003b. *ICT sector performance review: South African case study*.

November 2003 workshop. [O] Available

http://link.wits.ac.za

Accessed on 2004-08-12

Gillwald, A. and Kane, S. 2003. *South African Telecommunications sector performance review*. Link Centre Public Policy Research Paper No 5. Johannesburg: University of Witwatersrand.

Gillwald, A. and Esselaar, S. 2004. *South African 2004 ICT sector performance review*. Research paper No 7. Johannesburg: Link Centre, University of Witwatersrand.

Gillwald, A. 2005. Good intentions, poor outcomes: telecommunications reform in South Africa. *Telecommunications Policy* 29(7):469-491.

Gillwald, A. and Stork, C. 2008. *ICT access and usage in South Africa*. Johannesburg: Link Centre, University of Witwatersrand.

Girard, B. 2001. Next-generation radio: communication technologies for democracy and development. *Journal of International Communication* 7(2): 70-75.

Give NEPAD a chance: editorial in *The Star*. March 27, 2002:18.

Goldstuck, A. 2002. *South African Internet Report*. Johannesburg: World Wide Worx.

Gómez, R., Hunt, P. and Lamoureux, E. 1999. *Focus on Telecentres: How Can They Contribute to Social Development?* Ottawa: Independent Development Research Centre.

Govender, D. 2001. *International Lessons for South Africa's Telecommunications Deregulation: ICT Sector Overview in ICT in Government Handbook*. Johannesburg: Forge Ahead and BMI TechKnowledge.

Government Communication and Information Services. *Makhuva Multipurpose Community Centre* [O] Available

http://www.gcis.gov.za

http://www.gcis.gov.za/mpcc/initiative/documents/publication/makhuva.html

Accessed on 2000-01-29

Grilli, L. 2004. Special tariffs to promote fixed telephony penetration: reflections from the UK experience during the 1990s. *Telecommunications Policy* 28(3-4): 295-308.

Growth, Employment and Redistribution: A Macroeconomic Strategy of the Republic of South Africa. Pretoria: Government Publishers. [O] Available

http://www.polity.org.za/govdocs/policy/gear-02.html

Accessed on 1999-10-12

Gurnstein, M. 2000a. *Community Informatics, Enabling Communities with Information and Communication Technologies*. Hershey: Idea Group Publishing.

Gurnstein, M. 2000b. *Community Informatics: Enabling Community Uses of Information and Communications Technology*. Surrey: Technical University of British Columbia.

Gurumurthy, A., Singh, P. J., Mundkur, A. and Swamy, M. 2006. *Gender in the Information Society: Emerging Issues*. New Delhi: The Asia-Pacific Development Information Programme.

Gutierrez, L. H. R. and Gamboa, L. F. N. 2008. *Digital divide among low-income people in Colombia, Mexico and Peru.* Paper submitted to and delivered at the 17th Biennial Conference of the International Telecommunications Society. Montreal, June 24-27.

Guy, R. F., Edgley, C. E., Arafat, I., and Allen, D. E. 1987. *Social Research Methods: Puzzles and Solutions*. Boston: Allyn & Bacon, Inc.

Hamelink, CJ. 1994. *Trends in World Communication - On Disempowerment and Self-empowerment*. Penang: Southbound.

Hamelink, C. 1997. *New Information and Communication Technologies, Social Development and Cultural Change*. Geneva: United Nations Research Institute for Social Development.

Hamilton, J. 2003. Are main lines and mobile phones substitutes or complements? *Telecommunications Policy* 27(1-2): 41-52.

Hamlyn, M. 2007. Infraco's repositioning to cut telecoms costs. *Pretoria News Business Report* February 13:21.

Hardy, A. P. 1980. The role of the telephone in economic development. *Telecommunications Policy* 4: 278-286.

Hargittai, E. 2003. The digital divide and what to do about it. In *New Economy Handbook*, Edited by C Jones. New York: Elsevier Academic Press, pp. 821-839.

Harris, R.W. 1999. *Evaluating telecentres within national policies for ICTs in developing countries*. [O] Available

http://www.idrc.ca/telecentres/evaluation/html/18_Eva.html

Accessed on 1999-12-12

Harris, R. 2001. *Telecentres in Rural Asia: Towards a Success Model*. Kathmandu: Conference Proceedings of International Conference on Information Technology, Communications and Development (ITCD).

Hassanin, L. 2003. *Africa ICT Policy Monitor Project: Egypt ICT Country Report.* Cairo: Association of Progressive Communications (APC).

Hazelhurst, E. 2008. Producer inflation smacks forecasts. *Business Day*. May 30:1.

Heeks, R. 1999. Information and communication technologies, poverty and development. *Development Informatics Working Paper Series. Paper No 5*. Manchester: University of Manchester. [O] Available

http://www.man.ac.uk/idpm/educdi.htm

Accessed on 2008-10-22

Heeks, R. 2005. Foundations of ICTs in Development: The Information Chain. *eDevelopment Briefing No. 3*. Development Informatics Group. Manchester: University of Manchester.

http://www.manchester.ac.uk/idpm/dig/briefings.htm

Accessed on 2008-10-22

Heintz, J. 2003. *Out of Gear? Economic Policy and Performance in Post-Apartheid South Africa.* Johannesburg: Independent Development Research Centre.

Henderson, A., Gentle, I. and Ball, E. 2005. WTO principles and telecommunications in developing countries: challenges and consequences of accession. *Telecommunications Policy* 29: 205-221.

Herbst, D. 2006. *Continuing Education at the University of Pretoria*.

[O] Available

http://www.scarlacc.up.ac.za/CEatUP/Public/htms/cenews.htm
Accessed on 2006-08-26

Herselman, M. 2002. *ICT bridging the digital divide amongst learners: a case study in South Africa.*

http://www.ascilite.org.au/aset-archives/confs/2002/herselman.html

Accessed on 2008-10-03

Hills, J. 1993. Telecommunications and democracy: the international experience. *Telecommunications Journal* 60(1): 21-29.

Hodge, J. 2005a. Telecommunications in Africa. *Telecommunications Policy* 29(7):467-468.

Hodge, J. 2005b. Tariff structures and access substitution of mobile cellular for fixed line in South Africa. *Telecommunications Policy* 29(7):493-505.

Holt, L. and Jamison, M. 2006. *Re-evaluating FCC policies concerning the Lifeline and Link-Up Programs*. Washington D. C.: 34th Telecommunications Policy Regulatory Conference Paper. September 30 to October 2.

Horwitz, R.B. 1997. Telecommunications Policy in the New South Africa: participatory politics and sectoral reform. *Communicatio*: *South African Journal for Communication Theory and Research* 23(2): 64-78.

Horwitz, R. B. and Currie, W. 2007. Another instance where privatisation trumped liberalisation: the politics of telecommunications reform in South Africa – a ten year retrospective. *Telecommunications Policy* 31(8-9): 445-462.

Hoxani Shoma News: An Empowerment Newsletter. 2005. *Introducing Shoma* Centres – An OBE Resource for Educators. 1(1) January: 1-8.

Hudson, H. 1994. Universal service in the information age. *Telecommunications Policy* 18(8): 658-667.

Hudson, H.E. 1997. *Global Connections: International Telecommunications Infrastructure and Policy*. New York: Van Nostrand Reinhold.

Hudson, H. E. 2001. Telecentre Evaluation: Issues and Strategies in *Telecentres: Case Studies and Key Issues* by Latchem, C and D. Walker, (eds.) Vancouver: Commonwealth of Learning, pp. 169-182.

Hudson, H. E. 2003. Universal Access: what have we learned from the E-rate? *Telecommunications Policy* 28(3-4): 309-321.

Huesca, R. 2005. *From "Naming the World" to theorising its relationships: new directions for participatory communication. Communication for Development*. [O] Available

http://www.wacc.org.uk/wacc/layout/set/print/publications/media_development/archi...

Accessed on 2007-01-22

Hulbert, D. 2006. *An approach for the sustainability of ICT centres implemented by Technikon SA in developing areas of Southern Africa – case studies*. Pretoria: University of Pretoria Unpublished PhD Information Science Thesis.

Hunt, P. 2001. True stories: telecentres in Latin America and the Caribbean. *Electronic Journal of Information Systems in Developing Countries* 4(5): 1-17.

[O] Available

http://www.arta.org.au

Accessed on 2002-02-20

Independent Communications Authority of South Africa. 2001. *ICASA to rule on Telkom. Business Report.* January 21:1.

Independent Communications Authority of South Africa. 2006. *ICASA Licences Second-Phase Under-Serviced Area Licence Operators.* Johannesburg: Independent Communications Authority of South Africa. Media Notice, August 11.

ICT Summit. 2002. *IT, Communications Sector Drafts Vision for Growth, Job Creation and Service Delivery*. Johannesburg: Nedlac, May 23:1-2.

Disseminating the Fruits. [Sa]. Halfway House: Kagiso Educational Television, Independent Development Research Centre.

Independent Development Research Centre. 2001. [O] Available

http://www.idrc.ca/ca/research/xacacia_e.html

http://www.idrc.ca/acacia/engine/eng_6.htm

Accessed on 2002-04-22

India, Brazil and South Africa Dialogue Forum. 2003. *Brasilia Declaration*. [O] Available

http://www.ibsa-trilateral.org

Accessed on 2009-01-14

India, Brazil and South Africa Dialogue Forum. 2006. *Rio Communique*. [O] Available

http://www.ibsa-trilateral.org

Accessed on 2009-01-14

India, Brazil and South Africa Dialogue Forum. 2008. *New Dehli Summit*. [O] Available

http://www.ibsa-trilateral.org

Accessed on 2009-01-11

International Labour Organisation. 2001. *World of Work: The Magazine of the International Labour Organisation*. *Information Technology: Bridging the Digital Divide*. No 38. Geneva: International Labour Organisation Office. January/February.

International Telecommunication Union World Telecommunication Development Report. 1998. Geneva: International Telecommunication Union.

International Telecommunication Union. 1999.
Challenges to the Network: Internet for Development - Executive Summary. Geneva: International Telecommunication Union.

International Telecommunication Union Bureau for Development. 2000. *Mali Case Study*.

[O] Available

Accessed on 2002-04-26

International Telecommunication Union. 2001. *New Technologies for Rural Applications*. Midrand: Africa Telecom 2001 Conference.

International Telecommunication Union World Telecommunication Development Conference. 2002. *The New Missing Link: The Digital Divide*.

[O] Available

http://www.itu.int/ITU-D/conferences/wtdc/2002/brochure/missing_link.html

Accessed on 2003-05-29

International Telecommunication Union. 2001. ITU Telecommunication Indicators Update, South Africa Country Profile. *ITU News No 9*. November.

World Telecommunication Development Report. 2004. Geneva: International Telecommunication Union.

World Telecommunication/ICT Development Report. 2006a. Geneva: International Telecommunication Union.

Trends in Economics and Finance: The Use of Economic Modelling in Telecommunications. 2006b. Vol 2. Geneva.
[O].
Available: http://www.itu.int/dms_pub/itu-d/opb/fin/D-FIN-TEF2-2006-SUM-PDF-E.pdf
Accessed on 2007-09-13

International Telecommunications Union InfoDev. 2008. *Public-Private Partnerships*.
[O]. Available
http://www.ictegulationtoolkit.org/en/Section.3288.html
Accessed on 2009-01-13

International Institute for Communication and Development. 2006. *Introducing country programmes at IICD.*

[O] Available

http//www.iicd.org/countries/

Accessed on 2006-04-04

International Institute for Communication and Development. 2006. *Uganda Update.*

[O] Available

http//www.iicd.org/countries/uganda/

Accessed on 2006-04-04

Iroanya, R. 2007. *Women and information and communication technologies in the Southern African Development Community (SADC) Region*. Mafikeng: Department of Social Development's Population and Development Regional Conference. March 5-8.

Isa, M. 2006. Mbeki's Economic Legacy. *Sunday Times*. [O] Available

http://www.sundaytimes.co.za/News/Article.aspx?id=394399

Accessed on 2007-02-13

Ivala, E.N. 2000. The Internet and distance education. *Communicatio: South African Journal for Communication Theory and Research* 26(1): 24-30.

Jackson, S. and Mosco, V. 1999. The political economy of new technological spaces: Malaysia's multimedia super corridor. *Journal of International Communication* 6(1): 23-40.

Jacobson, T. L. 1993. A pragmatist account of participatory communication research for National Development. *Communication Theory* 3(August): 214-230.

Jain, R. and Raghuran, G. 2008. *Increasing rural teledensity – search for viable model*. Paper submitted to and delivered at the 17th Biennial Conference of the International Telecommunications Society. Montreal, June 24-27.

James, T. 2001. *An Information Policy Handbook for Southern Africa*. Ottawa: Independent Development Research Centre (IDRC).

Jensen, M., James, T. and Edwards, L. 1997. *Telecentre Site Visits and Strategic Evaluations Northern Province - North West Province - Eastern Cape*. Johannesburg: Independent Development Research Centre.

Jensen, M. 2000. *Access to ICTs in Rural Areas: The African Telecentre Experience*.

[O] Available

http://www.agricta.org/afagrict-1/telecentres.htm

Accessed on 2001-04-04

Jensen, M. 2001a. *Telecentre for Rural Access to Information and Communication Technologies (ICTs)*. Midrand: Africa Telecom 2001 Conference. November 12-16.

Jensen, M. 2001b. *African Internet Status*. In Hurst, R. (ed.). BMI-TechKnowledge Communication Technologies Handbook 2001. Johannesburg: BMI-TechKnowledge.

Jensen, M. 2004. Public telephone and Internet services in Africa - the rise of telecentre and cybercafe. APEC Telecenter Workshop. Singapore: APEC Telecommunications and Information Working Group. September 19-24.

Juma, C., Fang, K., Honca, D., Huete-Perez, J., Konde, V. and Lee, S.H. 2001. Global Governance of Technology: Meeting the Needs of Developing Countries. *International Journal of Technology Management* 22(7/8): 629-655.

Jussawalla, M. 1992. *The Economics of Intellectual Property in a World without Frontiers: A Study of Computer Software*. New York: Greenwood Press.

Jussawalla, M. and Lamberton, D. 1982. Communication economics and development: an economics of the information perspective, in *Communication Economics for Development* edited by Jussawalla M and Lamberton D M. Sydney: Pergamon Press.

Karaki, A. and Benjamin, P. 1996. *Multipurpose Community Centre Research Project.*

[O] Available

http://www.sn.apc.org.nitf/mpcc/conclude.html

http://www.sn.apc.org/nitf/mpcc/results.html

http://www.sn.apc.org/nitf/mpcc/conclude.html

http://www.sn.apc.org/nitf/mpcc/method.html

Accessed on 1999-10-12

Kane-Berman, J. 2005. Scepticism about job figures cuts both ways. *Business Day*. March 10:1.

Karim, H. K. 2004. Re-viewing the "National" in "International Communication": through the lens of diaspora. *Journal of International Communication* 10(2): 90-115.

Kekana, N. 2002. Information, communication and transformation: a South African perspective. *Communicatio: South African Journal for Communication Theory and Research* 28(2): 54-62.

Kekana, N. 2003. E-poch defining. *Rhodes Journalism Review 23*. Special Edition: African Media in the Information Society. Grahamstown: Rhodes University.

Khumalo, F. 1998. *Preliminary Evaluation of Telecentre Pilot Projects*. Johannesburg: Universal Service Agency & Geneva: International Telecommunication Union. [O] Available

http://www.itu.int/ITU-D-UniversalAccess/evaluation/usa.htm

Accessed on 1999-06-30

Kim, S.D. 2003. Strong State, Stronger Capitalism: the political economy of the Korean television industry in the context of globalisation. *Journal of International Communication* 9(1): 52-80.

Kim, J. K. 2005. *Telecommunications merger trends in the context of the convergence – using the U.S. merger cases*. New York: University of Buffalo, The State University of New York. Paper presented at the 33rd Telecommunications Policy and Regulation Conference, Arlington, Virginia, September 23rd – 25th.

Ki-Moon, B. 2007. *Information Economy Report 2007-2008: Science and Technology for Development, the New Paradigm for ICT*. New York and Geneva: United Nations Conference on Trade and Development. This report is available online.

Kingdon, G. and Knight, J. 2005. *Unemployment in South Africa: a microeconomic approach*.

[O] Available at

http://www.csae.ox.ac.uk/resprogs/usam/default.html

Accessed on 2007-05-21

Klein, M. 2004. Ngcaba fights back: blasted over his bid for a R7-billion stake in Telkom. Andile Ngcaba is unbowed and is bent on keeping his job at Didata. *Sunday Times Business Times*. November 14:3.

Knight, R. 2001. *COSATU/CWU submission on the intended Telecommunications Policy*. Johannesburg: COSATU House.

Kutu Mphahlele, M. E and Maepa, M.E. 2003. Critical success factors in telecentre sustainability: a case study of six telecentres in Limpopo. *Communicatio* 29(1&2): 218-232.

Lamoureux, E. 1999. RadioNet: Community Radio, Telecentres and Local Development. Internet online and on air.

[O] Available

http://www.idrc.ca/telecentre/evaluation/nn/23_Rad.html

Accessed on 1999-12-12

Langa, M. 2001. *The role of regulation in telecommunications*. Midrand: International Telecommunication Union Telecom Africa 2001 Conference paper.

Langa, M. 2002. It's about more than just the cost of a call. *Sunday Times*. January 13:19.

Langa, Z., Conradie, P. and Roberts, B. 2006. *Slipping through the Net: Digital and Other Communication Divides within South Africa*. Tshwane: Human Sciences Research Council.
[O] Available
http://www.ictportal.org.za/documents/d00024/
http://www.hsrcpress.ac.za
Accessed on 2006/10/20

LaRocque, N. and Latham, M. 2003. *The Promise of E-Learning in Africa: The Potential for Public-Private Partnerships*. Wellington: New Zealand Business Roundtable.

Latchem, C. and Walker, D. 2001. *Telecentres: Case Studies and Key Issues. Perspectives on Distance Education.* London: The Commonwealth of Learning.

Latin America Telecentre Network. *Telecentre stories in Latin America.* [O] Available

http://www.chasquinet.org/telecentros/recursos/cr_hisn.php3

Accessed on 1999-12-12

Lee, S. 2005. *TV in your cell phone: The introduction of digital multimedia broadcasting in Korea.* Bloomington: Indiana University. Paper presented at the Telecommunications Policy Regulatory Conference, Arlington, Washington DC.

Legoabe, N. 2007. *Thusong Service Centres (formerly MPCCs): a vehicle for communication and information for women*. Mafikeng: South African Department Social Development Polulation and Development Regional Conference Paper. March 5-8.

Lehman-Wilzig, S. and Cohen-Avigdor, N. 2004. The natural life cycle of new media evolution. *New Media & Society* 6(6): 707-730.

Lepebe, P. 2001. In *Disseminating the Fruits* produced by the Independent Development Research Centre. Video recording]. Halfway House: Independent Development Research Centre.

Lesame, Z. 2000. The New Independent Communications Authority of South Africa: Its Challenges and Implications for Telecommunications Liberalisation in the Country. *Communicatio: South African Journal for Communication Theory and Research* 26(2): 28-36.

Lesame, Z. 2001. *New Media Technology*. Pretoria: University of South Africa.

Lesame, Z. 2002a. *An overview of Internet services, problems and a forecast of Internet development in South Africa*. Seoul: Paper delivered at the International Telecommunications Society 14th Biennial Conference. August 18-21.

Lesame, Z. 2002b. *Putting the World Within Your Reach: Telecentre Audit Report*. A Universal Service Agency Study. Pretoria: University of South Africa.

Lesame, Z. 2003a. *Digital villages in South Africa*. Perth: International Telecommunication Society (ITS) Asia-Australasian Regional Conference. Conference paper.

Lesame, Z. 2003b. *Initial Public Offering at the Johannesburg Securities Exchange (JSE) and New York Stock Exchange: the Experience of Telkom South Africa*. Perth: International Telecommunication Society (ITS) Asia-Australasian Regional Conference. Conference paper.

Lesame, N. C. (ed.) 2005a. *New Media: Technology and Policy in Developing Countries*. Pretoria: Van Schaik Publishers.

Lesame, Z. 2005b. *Telecentre photographs taken during telecentre visits*. Hoxani Village, Mamelodi Township, Orange Farm and Tombo Village: Hoxani Telecentre, Mamelodi Telecentre, Siyabonga Telecentre and Tombo Telecentre.

Lie, R. 2001a. *Community development and the Internet*. Conference paper. Kathmandu: International Conference on Information Technology, Communications and Development. November 29-30.

Lie, R. 2001b. Global development and "communication for localisation". *Journal of International Communication* 7(2): 14-24.

Lievrouw, L. A. and Livingstone, S. 2002. *Handbook of New Media: Social Shaping and Consequences of ICTs*. London: Sage Publications.

Lin, Y-C. 2004. *Digital Divide Policy in Chinese Taipei*. APEC Telecentre Workshop. Singapore: APEC Telecentre Telecommunications and Information Working Group. September 19-24.

Lister, M,. Dovey, J,. Giddings, S,. Grant, I, and Kelly, K. 2005. *New Media: A Critical Introduction.* London and New York: Routledge, Taylor & Francis Group.

Local telecommunications market to reach R84bn by 2005, says research firm. 2002. The South African telecommunications sector contributes about 4.5 per cent to the GDP. Pretoria *News Business Report*. Special Survey, World Telecommunications Day. May 17:9.

Love, D. 2005. An Overview of the South African Telecommunications Industry: From Pre-1994 Policy-Making to Gloomy 2005 Realities. Johannesburg: University of Witwatersrand.

Mabanga, T. and Pressly, D. 2004. Row Erupts over `Share-Buy-Back'. *Mail & Guardian* November 12-18:4.

Madden, G., Savage, S. and Simpson, M. 1997. Regional Information Access: The Use of Telecentres to Meet Universal Service Obligations. *Telematics and Infomatics* 14(3): 273-288.

Madden, G. and Savage, S. J. 1998. Central and Eastern Europe Telecommunications Investment and Economic Growth. *Information Economics and Policy* 10: 173-195.

Madden, G., Savage, S., Coble-Neal, G. and Bloxham, P. 2000. Advanced communications policy and adoption in rural Western Australia. *Telecommunications Policy* 24: 291-304.

Maepa, E. 2000. *Bakgaga multipurpose telecentre: a report on the operations of the telecentre.* Unpublished research report available at the University of the North, Department of Media Studies, Polokwane.

Mafu, T. 2008. Joblessness "set to reach 27.2%". *Pretoria News Business Report*. February 13: 28.

Mahao, J. (jeanettem@usa.org.za). 2004/02/20. *List of Telecentres*. E-mail to N C Lesame (lesamnc@unisa.ac.za).
Accessed on 2004/02/21

SA Assembly passes ICASA Bill. 2005. *Mail & Guardian Online*.
[O] Available at:
http://www.sundaytimes.co.za/zones/sundaytimesNEW/business/business1134625830.aspx
Accessed on 2006-07-18

2006 Report Card: Cabinet A to F. *Mail & Guardian*. December 21 2006 to January 4 2007: 5-13.

Committee approves draft changes to ICASA Bill. 2006. *Mail & Guardian Online*. July 16:1.

Available online at
http://www.mg.co.za/articlePage.aspx?articleid=272820&area=/breaking_news/breaking…
Accessed on 2006-07-18

Mail and Guardian. 2006-7. *Learning Channel is an educational organization funded by Standard Bank and the Liberty Foundation*. December 21 2006 to January 4 2007. 22(5):5.

Makhaya, G. and Roberts, S. 2003. Telecommunications in developing countries: reflections from the South African experience. *Telecommunications Policy* (1-2): 41-59.

Makhuvha Multipurpose Community Centre. 2001. [O] Available

http://www.gcis.gov.za

http://www.gcis.gov.za/mpcc/initiative/documents/publication/makhuvha.html

Accessed on 2000-01-29

Makoro, P. Manager of Siyabonga Telecentre. 2004. Interview by author. [Transcript] 12 February. Orange Farm: Siyabonga telecentre.

Makoro, P. Manager of Siyabonga Telecentre. 2005a. Interview by author. [Transcript]. 16 March. Orange Farm: Siyabonga Telecentre.

Makoro, P. User of Siyabonga Telecentre. 2005b. Interview by author. [Transcript]. 16 March. Orange Farm: Siyabonga Telecentre.

Mali Telecentres. 2000. [O] Available

http://www.itu.int/ITU-D-UniversalAccess/pliots/Malicasestudy.doc

Accessed on 2000-12-12

Mamelodi Digital Village appointed as a Cisco Networking Academy. 2002. Cisco systems

[O] Available

http://www.cisco.com/global/ZA/news/news_s113.shtml

Accessed on 2003-04-26

Mandela, R.N. 1998. *Presidential Job Summit*. Midrand: Gallagher Estates.

Mangcu, X. 2005. And the people shall govern – or shall they? In Calland, R, Graham, P (eds.) *Democracy in the Time of Mbeki*. Cape Town: Institute for Democracy in South Africa (IDASA).

Mansell, R. 1999. Information and communication technologies for development: assessing the potential and the risks. *Telecommunications Policy* 23: 35-50.

Mansell, R. and Wehn, U (eds.). 1998. *Knowledge Societies: Information Technology for Sustainable Development.* New York: Oxford University Press.

Manuel, T. 2006. A delicate balancing act: government's GEAR policy was never meant to replace RPD but rather to reinforce it. *Sunday Times.* August 13: 15.

[O] Available

http://www.polity.org.za/attachment.php?aa_id=2947

Accessed on 2006-08-15

Manyi, J. 2009. COPE resolutions "misrepresent affirmative action". *City Press.* January 18: 2.

Maphathane, M. 2006. ICT Research Bulletin. Pretoria: Department of Communications.

Maphathane, M. and Mooko, J. 2006. *Directory of Information and Communication Technology*

Centres and Services in South Africa. Pretoria: Department of Communications.

Mapi, T., Dalvit, L. and Terzoli, A. 2006. *A case study on the adoption of ICTs in a rural area in South Africa*. University of Fort Hare: Department of Computer Science. Paper delivered at South African Communication Conference in Port Elizabeth on December 4-7.

Mashile, M. 2001. It's time to close the digital divide. Morewa.com. *City Press.* February 4:3.

Massey, A. 1999. *Methodological Triangulation or How to Get Lost Without Being Found:* Original Work from "*Explanation in Methodology Studies in Educational Ethnography" 2*: 183-197. Stanford: JAI Press. Available online at:

http:www.freeyourvoice.co.uk/htm/triangulation2.htm

Accessed on 2007-03-20

Mathebe, D. Manager of Moteti Telecentre. 2001. Interview by author. [Transcript]. 28 August. Johannesburg: The Parktonian.

Matlou, J. 2002. Livewire. Phone battle looms: fights are not unexpected as the government tries to balance state involvement in the sector with the pressure to privatise. *Mail and Guardian* March 1 to 7: 27.

Matsepe-Casaburri, I. 2001a. *Budget Speech by the Minister of Communications*. Cape Town: South African Parliament. [O] Available

http://wwwdocweb.pwv.gov.za/docs/sp/2001/budget_speech_2002.html

Accessed on 2002-07-10

Matsepe-Casaburri, I. 2001b. *Message from South Africa's Minister for Communications Ivy Matsepe-Casaburri. Connecting Africa*. *ITU News* No 9:4.

Matsepe-Casaburri, I. 2001c. *Department of Communications Policy Directions.*

[O] Available

http://docweb.pwv.gov.za/docs/policy/policydirections.html

Accessed on 2002-09-30

Matsepe-Casaburri, I. 2001d. *A Speech by the Minister for Communications*. Delivered at the opening of the 2nd National Telecommunications Colloquium. Midrand: Eskom Conference Centre.

Matsepe-Casaburri, I. 2002. *Budget Speech by the Minister for Communications*. Cape Town: South African Parliament. May 7.

Matsepe-Casaburri, I. 2005. *Media Statement: Matsepe-Casaburri to meet with the Under-Serviced Area Licenses (USALs) board members*. Pretoria: Department of Communications. January 27.

Matsepe-Casaburri, I. 2006a. *Foreword to the ICT Research Bulletin*. Pretoria: Department of Communications.

Matsepe-Casaburri, I. 2006b. *Foreword to the Directory of Information and Communication Technology Centres and Services in South Africa*. Pretoria: Department of Communications.

Matsepe-Casaburri, I. 2008. *Address by the Minister of Communications, on the occasion of the switch on of the digital broadcast signal*. Ekurhuleni: Emperors Palace.

Matshikiza, S. 2001. Happy Xmas – you're fired. *The Shopsteward* 1(1):1-2.

Mbeki, T. 1995. *Keynote Address to the G7 Country Summit*. Brussels: G7 Summit.

Mbeki, T. 2001a. Welcome Message from the President of South Africa Thabo Mbeki. Connecting Africa *ITU News* No 9:3.

Mbeki, T. 2001b. *Presidential State of the Nation Address.* Cape Town: South African Parliament.

Mbeki, T. 2002. *Presidential State of the Nation Address*. Cape Town: South African Parliament.

Mbeki, T. 2005. *Presidential State of the Nation Address*. Cape Town: South African Parliament.

Mbeki, T. 2006. *Presidential State of the Nation Address*. Cape Town: South African Parliament.

Mbeki, T. 2008. *Presidential State of the Nation Address*. Cape Town: South African Parliament.

McDonogh, F. 2002. What Women Want!: Interesting Aspects of a Recent Study on Women and IT. E-Technology. *Enterprise Magazine*. March: 54.

McLeod, D. 2007. *Disconnected: The SA telecom industry is set for a radical shake-up as competitors enter the market and Telkom faces up to its dying model*. *Financial Mail* November 23: 35 – 40.

Melkote, S. 1991. *Communication for Development in the Third World: Theory and Practice*. New Delhi: Sage.

Melkote, S. 2006. Everett M. Rogers and his contributions to the field of communication and social change in developing countries. *Journal of Creative Communications* 1(1): 111-121.

Melody, W. 2003a. "Telkom putting a brake on the economy…" *Sunday Times Business Times* Dec 7:1.

Melody, W. H. 2003b. *Assessing Telkom's 2003 price increase proposal: price cap regulation as a test of progress in South African telecom and E-economy development*. Johannesburg: University of Witwatersrand Link Centre Policy Research paper.

[O] Available at
http://link.wits.ac.za/research/wm20021130.htm
Accessed on 2005/06/11

Memela, D. 2005. Research Manager at the Universal Service Agency. Interview by author. [Transcript]. 15 August. Tshwane: University of South Africa.

Meyer, M. 2002. *Outcomes-based Education: Back to Basics or a New Paradigm for Training Staff?* Pretoria: Technikon South Africa.

Microsoft Emdeni Digital Village. 2003. [O] Available

http://www.microsoft.com/southafrica/press/press-429.htm

http://www.microsoft.com/southafrica/community/dv_aims.htm

http://www.microsoft.com/southafrica/press/press-428.htm

http://www.microsoft.com/southafrica/press/press-406.htm

Accessed on 2005-04-05

Milne, C. 1998. Stages of universal service policy. *Telecommunications Policy* 22(9): 775-80.

Milne, C. 2006. *Improving affordability of telecommunications: Cross-fertilisation between the developed and the developing World*. Washington, D. C.: 34th Telecommunications Policy and Regulatory Conference September 30 – October 2.

Mindset Learning Project. 2002. Digital Satellite Channel 82. Pretoria: DsTV.

Mlambo-Ngcuka, P. 2007. *Opening Address by the Deputy President of South Africa, Mrs Phumzile Mlambo-Ngcuka*. Tshwane: University of South Africa.

Mmusi, S. 2004. Head of the Department of Media Studies University of Limpopo. 2004. Interview by author. [Transcript]. 03 October. Polokwane: University of Limpopo.

Mnisi, B. 2004. Research Assistant. Interview by Author. 02 June. Tshwane: University of South Africa.

Mnisi, B. 2005. Research Assistant. Interview by Author. 02 June. Tshwane: University of South Africa.

Mochiko, T. 2007. Vodacom shortlists entries for equity stake. *Business Report*. March 29: 1. [O] Available
http://www.busrep.co.za/index.php?fSectionId=566&fArticleID=3754449
Accessed on 2007-03-29

Modise, J. 2001. *Digital village launched in Emdeni*. [O] Available

http://www.microsoft.com/southafrica/press/press-429.htm

Accessed on 2006-05-10

Moeng, B. 2005. *ITU builds 100 telecentres in Africa*. ITWeb. Johannesburg. [O] Available

http://allafrica.com/stories/200501130539.html

Accessed on 2005-01-28

Mogaki, I. 2004. *Tech boost for Orange Farm*. Available at:
http://www.itweb.co.za/sections/business/2004/0411181113.asp?
Accessed on 2004-11-11

Moholi, P. 1994. Universal service obligations for South Africa. In Kiplagat, B.A. and Werner, M.S.M. (eds.). *Telecommunications and Development in Africa*. Amsterdam: IOS Press: 79-84.

Mosoma, W. 2001. To what extent do rural areas communicate telephonically? Unpublished research report. Polokwane: University of the North.

Motshekga, M. 1999. Speech Delivered by the Premier of Gauteng, Advocate M. Motshekga, at the opening of a multipurpose community centre in Orange Farm on 25 February.
[O] Available
http://www.info.gov.za/speeches/1999/99311_motora99_10263.htm
Accessed on 2006-05-05

Motshweni, J. 2002. Mamelodi Digital Village appointed as a Cisco Networking Academy.

[O] Available

http://www.cisco.com/ZA/news/news_s113.shtml.

Accessed on 2003-04-04

Mouton, J. and Marais, H.C. 1988. *Basic Concepts in the Methodology of the Social Sciences*. Pretoria: Human Sciences Research Council.

Msimango, R. 2004. Assistant Manager of Siyabonga Telecentre and computer trainer. Interview by Author. [Transcript]. 12 February. Orange Farm: Siyabonga telecentre.

Msimango, R. 2005. Assistant Manager of Siyabonga Telecentre and computer trainer. Interview by Author. [Transcript]. 16 March and other dates. Orange Farm: Siyabonga Telecentre.

Msomi, S. and Sigonyela, M. 2001. Hard Sell: Cheers of relief greet decision to push ahead and award third cellular licence. But judicial review could have the Minister with egg on her face. *Sunday Times Business Times Supplement*. February 18:1.

Mueller, M. 1993. Universal service in telephone history: a reconstruction. *Telecommunications Policy* 17: 353-369.

Mukoma, S. 2002. Jobs on the line: The Government's plan to license SMMEs to operate communications services in under-serviced areas will help to alleviate unemployment. *Enterprise* March: 50-51.

Muñoz, M. 2004. *Telecentres: Peru's experience*. Singapore: APEC Telecentre Workshop. APEC Telecentre Telecommunications and Information Working Group. September 19-24.

Mureithi, M. 2003. Self-destructive competition in cellular: regulatory options to harness the benefits of liberalisation. *Telecommunications Policy* 27(1-2):11-19.

Murray, B. and Cornford, D. 1998. *Telecottage and telecentre survey 1998.* [O] Available

http://www.itu-int/ITU-D-UniversalAccess/

Accessed on 1999-07-31

MyADSL. 2006. *ICASA Deemed Useless by Broadband Community*. [O] Available

http://mybroadband.co.za/nephp/?m=show&id=5023

Accessed on 2006-12-12

MyADSL. 2007. *Telkom and DoC in "conflict" about broadband pricing*. [O] Available

http://mybroadband.co.za/nephp/?m=show&id=5956

Accessed on 2007-03-27

Mzolo, S. 2005. Telkom tariffs still not competitive. *Mail & Guardian*. July 28:1.

Nachmias, D. and Nachmias, C. 1987. *Research Methods in the Social Sciences*. Third Edition. New York: St Martin's Press.

Naidoo, J. 1997. *Partnership for the Future*. Pretoria: Department of Communications.

Naidoo, J. 1998. *A Spectrum of Opportunity for the Information Revolution.* Johannesburg: International Telecommunication Union Africa Telecom '98 Conference.

Naidoo, J. 1999. *African Connection Project*. Pretoria: Ministry for Communications.

[O] Available

http://www.africanconnection.org

Accessed on 1999-02-12

Naidu, B. 2008. Vodafone in bid for MTN stake: foot-dragging on Vodacom Spurs Global Giant to start talks with rival. *Sunday Times Business Times.* March 23:1.

Nandi, B. 2002. *Role of telecommunications in developing countries in the 21st Century*. Seoul: International Telecommunications Society 14th Biennial Conference paper. August 18-21.

National Information Telecommunications Forum [O] Available

http://www.sn.apc.org/nitf/mpcc/results.html

http://www.sn.apc.org/nitf/mpcc/conclude.html

http://www.sn.apc.org/nitf/mpcc/method.html

Accessed on 1999-09-14

Naudé, A. M. E. 1999. Communication technology and development: can South Africa afford the information explosion? *Communicatio: South African Journal for Communication Theory and Research 25(1&2): 58-64.*

Ndlovu, E. 2005. Manager of Hoxani Shoma Centre. Interview by author. [Transcript]. 31 May. Bushbuckridge: Hoxani Shoma Telecentre.

Neotel. 2009. *About the shareholders*. [O] Available
http://www.neotel.co.za/neotel/view/neotel/en/page127
Accessed on 2009-07-29

NEPAD at Work. 2002. *Business Day*. Editorial Comment: opinion and analysis. June 7:11.

Neuman, W. L. 2000. *Social Research Methods: Qualitative and Quantitative Approaches*. Fourth Edition. Boston: Allyn & Bacon.

Neuman, W. L. 2006. *Social Research Methods: Qualitative and Quantitative Approaches*. Sixth Edition. Boston: Allyn & Bacon.

New Economic Partnership for Africa's Development (NEPAD) document. Pretoria: Department of Foreign Affairs. [O] Available

http://www.polity.org.za/govdocs/

Accessed on 2004-02-12

Newmarch, J. 2007. Belt tightening ahead for CEOs?: The pay cheques of South Africa's top earners come under scrutiny. *Mail & Guardian.* February 2 to 8:2.

News24.com. 2004. Telkom's strategy fails poor.
Available at
http://www.news24.com/News24/AnanziArticle/0,,1518-24_1584755,00.html
Accessed on 2006-04-18

Ngcaba, A, 1996. *Regulation in South Africa.* Johannesburg: Centre for the Development of Information and Telecommunications Policy (CDITP).

Ngcaba, A. 2001. *Address by the Director General of Communications.* Telecommunications Policy Colloquium. Midrand: Eskom Conference Centre. November.

Nhleko, A. 2004. Manager of Tembisa Telecentre. Interview by Author. [Transcript]. 12 June. Tembisa: Tembisa Multipurpose Community Centre.

Njenge, L. 2004. Manager of Tombo Telecentre. Interview by Author. [Transcript]. 18 May. Tombo: Tombo Multipurpose Telecentre.

Noam, E.M. and Wolfson, A.J. 1997. *Globalism and Localism in Telecommunications.* Amsterdam: Elsevier.

Nulens, G, and van Audenhove, L. 1998. *The African Information Society: An Analysis of the Information and Communication Technology Policy of the World Bank, ITU and ECA***.** Paper presented at the 12th IAMCR Conference. Glasgow: Communication Technology Policy Section.

Nulens, G and van Audenhove, L. 1999. The African Information Society: An Analysis of the Information and Communication Technology Policy of the World Bank, ITU and ECA. *Communicatio: South African Journal for Communication Theory and Research* 25(1&2): 28-41.

Nulens, G., Hafkin, N., van Auenhove, L. and Cammaerts, B. (eds.) 2001. *The Digital Divide in Developing Countries: Towards an Information Society in Africa*. Brussels: Studies on Media, Information and Telecommunication (SMIT).

Nulens, G. (Gert.Nulens@vub.ac.be). 2005/03/17. *ITU to launch 100 Telecentres in Africa.* E-mail to N C Lesame (lesamnc@unisa.ac.za).

Accessed on 2003/03/18

Nxasana, S. 2001a. Building a bridge across the digital divide: Africans are endeavouring to the technologies needed to compete in the global marketplace. *Sunday Times Business Times.* November 4:23.

Nxasana, S. 2001b. *Telkom Bridging the Digital Divide*. Midrand: Africa Telecom Conference.

Nwuke, K. 2007. *The contribution of poverty research to policy-making and implementation in Africa.* Mafikeng: South Africa Department of Social Development Population and Development Regional Conference Paper. March 5-8.

Obregón, R. and Rivera, J. 2001. Participatory communication in high school setting: lessons learned and development alternatives from a development communication project in Colombia. *Journal of International Communication* 7(2): 98-114.

Oelofse, L. and Fabricious, P. 2002. Zimbabwe left out of NEPAD talks: African countries failing to resolve their conflicts face isolation. *Pretoria News* April 8:5.

Olivier, M. 2007. Local loop unbundling should begin early next year – committee chair. *Engineering News.* June 20: 1.

Olsen, W. 2004. Triangulation in social research: qualitative and quantitative methods can really be mixed. Final Version. Forthcoming as a Chapter in *Development Sociology*.

[O] Available:

http://www.ccsr.ac.uk/methods/festival/programme/Sat/pm/MSTreatre/

Accessed on 2007-10-30

Oestmann, S. 2003. *Mobile Operators: Their Contribution to Universal Service and Public Access.* Vancouver: Intelecom Research and Consultancy Ltd.

Organic Technology – Memory Alpha, the Star Trek Wiki. 2009. [O] available

http://memory-alpha.org/en/wiki?organic_technology

Accessed on 2009-07-29

Oosthuizen, L. M. and Qakisa, M. 1996. New World Information Order, in *Introduction to Communication: Journalism, Press and Radio Studies*, edited by L. M. Oosthuizen. Cape Town: Juta: 119-113.

Padayachie, R. L. 2005. *Address by the Deputy Minister of Communications, at the colloquium on the pricing of telecommunications services in South Africa*.
[O] Available
http://www.info.gov.za/speeches/2005/05071910151003.htm
Accessed on 2006-03-20

Pandor, N. 2004. *Foreword to the South African E-Education White Paper*. Cape Town: South African Parliament.

Parkinson, S. 2005. *Telecentres, Access and Development: Experience and Lessons from Uganda and South Africa*. Ottawa: Independent Development and Research Centre.
Available
http://www.idrc.ca/openebooks/189-2/
Accessed on 2006-06-27

Patton, M. Q. 2002. *Qualitative Research and Evaluation Methods*. Third edition. Thousand Oaks and London: Sage Publications.

Pela, M. 2002. SA to focus on rural digital gap. *Pretoria News Business Report* June 5:7.

Petter, S. C. and Gallivan, M. J. 2004. *Toward a framework for classifying and guiding mixed method research in information systems*. Proceedings of the 37th Hawaii International Conference on Systems Sciences. Available at:

http://www.csdl2.computer.org/comp/proceedings/hicss/2004/2056/08/205680.251a.pdf

Accessed on 2007-07-26

Pickard, V. 2007. Neoliberal visions and revisions in global communications policy: from NWICO to WSIS. *Journal of Communication Inquiry* 31(2): 118-139.

Picot, A. and Wernick, C. 2007. The role of Government in broadband access. *Telecommunications Policy* 31(10-11):660-674.

Piliso, S. 2007. Telkom Bans the Usual Suspects. *Sunday Times Business Times*. March 4:1.

Pitout, M. 1999. *Research Methods in the Social Sciences*. Pretoria: University of South Africa.

Pitt, D. and Levine, N. 2003. Into Africa. *Telecommunications Policy* 27(1-2): 1-7.

Polzer, T. 2004. *"We are all South Africans now". The Integration of Mozambican Refugees in Rural South Africa: forced migration*. Working Paper Series # 8. Johannesburg: University of the Witwatersrand Forced Migrations Studies Programme.
[O] Available
http://migration.wits.co.za
Accessed on 2007/05/05

Pongwana, P. 2001. *The state of telecommunications: understanding the challenges facing telecoms advancement in Africa*. Rosebank: African Convergence Conference paper.

Powell, I. 2001. Cell C scored third with SATRA. *Mail & Guardian* March 24 - 30:5.

Proenza, F. J., Bastidas-Buch, R. and Montero, G. 2001. *Telecentres for Socioeconomic and Rural Development in Latin America and the Caribbean: Investment Opportunities and Design Recommendations with Special Reference to Central America.* Washington D C: International Telecommunication Union Development Sector, Food and Agriculture Organisation of the United Nations and Inter-American Development Bank. [O] Available

http://www.iadb.org/regions/itdev/telecenters/index.html

Accessed on 2003-03-12

Qaba, B. (bqaba@ditaba.co.za). 2007/12/09. *2010 World Cup Women in Communication*.

E-mail to N C Lesame (lesamnc@unisa.ac.za).

Qunta, C. 2009. Let it BEE – affirmative action must stay. *Pretoria News*. January 14: 9.

Qvortrup, L. 2001. *A means to social, cultural and economic development of rural communities and low-income urban settlements*. [0] Available

http://www.itu.int/ITU-D/uni_access/casestudies/qvortrup.html

Accessed on 2004-12-07

Radebe, J. 1999. *Address by Minister of Public Works, at the launch of the community based public works programme*. Bushbuckridge.
[O] Available
http://www.info.gov.za/speeches/1999/9907191029a1012.htm
Accessed on 2005-05-04

Radebe, J. 2001. Privatisation: Radebe's RUBICON, can he cross it? *Financial Mail*. March 23: 42-3.

Radebe, J. 2002. *Privatisation interview by Tracy Ducray on Morning Live Television Programme - SABC 2 Channel on October 2*. Johannesburg: South African Broadcasting Corporation (SABC).

Ray, M. 2004. *Turning the Tables*. Interviewing Sizwe Nxasana, CEO of Telkom. *Enterprise Magazine*. March: 12-19.

Reilly, K. and Gómez, R. 2001. Comparing approaches: telecentre evaluation experiences in Asia and Latin America. Ottawa: Carleton University and Independent Development Research Centre (IDRC). *Electronic Journal on Information Systems in Developing Countries* 4(3): 1-17.

Riordon, S. 2001. SchoolNet SA. SchoolNet South Africa: Accessing a World of Learning. http://www.school.za/ [O] Available

Accessed on 2002-02-20

Robinson, S. S. 1999. *Telecentres in Mexico: The First Phase.* [O] Available

http://www.unrisd.org/org/infotech/publict/robi/robi.htm#P41_90.

[O] Available

Accessed on 2000-08-20

Roman, R. and Colle, R. 2002. *Themes and issues in telecentre sustainability*. Manchester: University of Manchester. Development Informatics Working Paper Series.

http://www.sed.manchester.ac.uk/idmp/publications/wp/di/di_wp10.htm

Accessed on 2008-10-10

Roodt, J. and Conradie, D. P. 2001. *A learning centre via information and communication technology*. Pretoria: Human Sciences Research Council. Unpublished paper.

Rosnow, R. L. and Rosenthal, R. 1996. *Beginning Behavioural Research: A Conceptual Primer*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Rostow, W. W. 1960. *The Stages of Economic Growth: A Non-Communist Manifesto*. Cambridge: Cambridge University Press.

Roycroft, T. and Anantho, A. 2003. Internet Subscription in Africa: Policy for a Dual Digital Divide. *Telecommunications Policy* 27(1-2): 61-74.

Rubin, A. and Babbie, E. 2005. *Research Methods for Social Work*. Fifth Edition. Southbank and London: Thomson Brooks/Cole.

Rumney, R. 2008. Does patronage pay? Being politically connected seems to be an important aspect in securing BEE deals. *Mail & Guardian. M & G* Comment. March 20 to 27:3

Sabien, B. 2003. *Telecentres in Australia*. Presentation at the International Telecommunications Society Conference in Perth, Western Australia.

Sagna, O. 2000. *Information and Communication Technologies and Social Development in Senegal: An Overview*. Translated by Paul Keller. Dakar: United Nations Research Institute for Social Development (UNRISD). [O] Available

http://www.idrc.ca/acacia/engine/eng_6.htm

Accessed on 2001-06-30

Samarajiva, R. 2000. Policy Forum. Establishing the legitimacy of new regulatory agencies. *Telecommunications Policy* 24: 183-7.

Samarajiva, R. 2001. The ITU considers problems of fixed-mobile interconnection. *Telecommunications Policy* 25: 155-60.

Samson, R. and Waiters, J. 2002. Telkom's ripping us off - calls have gone up 60 per cent. *The Star*. March 8:11.

Sánchez, M.R. 2002. *The Telecommunications' Regulatory Environment in Chile: Moving Toward Openness and Public Participation?* Seoul: International Telecommunications Society 14th Biennial Conference Paper. August 18-20.

Saunders, R. J., Warford, J. J. and Wellenius, B. 1994. *Telecommunications and Economic Development*. Baltimore: The Johns Hopkins University Press.

Sawhney, H. and Jayakar, K. P. 2005. *Universal Access: Precedents, Prevarications and Progress*. Arlington, Virginia: Proceedings of the 33rd Telecommunications Policy Research Conference.

Schofield, A. and Sithole, H. 2006. *Achievement of the Telecommunications Act Objectives Analysis of the Extent to which the Objectives of the Telecommunications Act (103 of 1996), as Amended were achieved (in the period 1997 to 2004)*. Johannesburg: ForgeAhead.

SchoolNet Africa. 2001. [O] Available

http://www.schoolnetafrica.net

Accessed on 2006-06-30 and numerous other dates

SchoolNet South Africa. 2001. [O] Available

http://www.schoolnet.za/

Accessed on 2006-07-07 and other dates

SchoolNet Eastern Cape. Eastern Cape Schools. [O] Available

http://www.ecape.school.za/

Accessed on 1999-09-12

Schussler, M. 2008. *Interview by Vuyo Mbuli about South African economy and the National 2008 Budget with Finance Minister Trevor Manuel. South African Broadcasting Corporation Channel 2 Morning Live Programme*. February 18.

Selwyn, N. 2004. Reconsidering political and popular understandings of the digital divide. *New Media & Society* 6(3): 341-362.

Sentech Internet Provision [O] Available

http://www.sentech.co.za

Accessed on 2003-09-22

Sėror, A. C. and Fach Arteaga, J. M. 2000. Telecommunications technology transfer and the development of institutional infrastructure: The case of Cuba. *Telecommunications Policy* 24:203-221.

Servaes, J. 1999. *Communication for Development. One World, Multiple Cultures.* New Jersey: Hampton Press, Inc.

Servaes, J. 2001. Globalisation, development and "communication for localisation". *Journal of International Communication* 7(2): 5-13.

Shapshak, D. 2002. Unwiring Africa. *Mail & Guardian Online*.

[O} Available

http://www.mavenmedia.co.za/pages/020301-unwiringAfrica_MG.htm

Accessed on 2004-02-20

Share, P. 1997. Telecommunication and rural remote development. *Rural Society* 3: 16.

Shore, K. 1997. *Connecting the North: Telecommunications Links for Canadian Aboriginal Communities*. Ottawa: Independent Development Research Centre.

[O] Available

http://idrinfo.idrc.ca/archive/ReportsINTRA/pdfs/1997e/112203.htm

Accessed on 1999-10-18

Sharkeya Governorata Technology Access Community Centres. 2001. [O] Available

http://www.tacc.egnet.net

Accessed on 2001-04-12

Shiu, A. and Lam P-L. 2008. *Causal relationship between telecommunications and economic growth: A study of 105 countries*. Paper submitted to and delivered at the 17th Biennial Conference of the International Telecommunications Society. Montreal, June 24-27.

Shoma Education Foundation. 1998. [O] Available

http://www.literacy.org/sltp2/people/hofmeyr/shoma.html

http://www.shoma.org.za

Accessed on 2005-11-30 and 2007-03-17

Simpson, S. 2004. Universal service in converging communications environments: the case of the UK. *Telecommunications Policy* 28(3-4): 233-248.

Smauza, N. 2004. Tombo Telecentre Administrator. Interview by Author. [Transcript]. 18 May. Tombo: Tombo Multipurpose Centre.

Smauza, N. 2005. Tombo Telecentre Administrator. 2005. Interview by Author. [Transcript]. 18 May. Tombo: Tombo Multipurpose Centre.

Smauza, N. 2006. Tombo Telecentre Administrator. Telephone interview by Author. [Transcript]. 18 May. Tshwane: University of South Africa.

Smith, M. K. 2001. Paulo Freire and informal education.

[O] Available

http://www.infed.org/thinkers/et-freir.htm

Accessed on 2004-12-12

SNO Telecommunications. 2006. *A Brief History*. [O] Available

http://www.snotelecom.co.za/sno_history.shtml
Accessed on 2006-08-24

Song, G-S. 2003. Book review of T*elecommunication services in Sub-Saharan Africa: An analysis of access and use in the Southern Volta Region in Ghana* by Romeo Bertolini. *Telecommunications Policy* 27(1-2): 179-181.

South African Post Office Amendment Act of 1991. Pretoria: Government Printers.

South African Constitution. 1996. Pretoria: Government Printers.

South African Telecommunications Act No. 103 of 1996. Pretoria: Government Printers.

South African Convergence Bill. 2003. South African Government Notice 3382 of 2003.

Pretoria: Government Printers. [O] Available

http://www.internet.org.za/convergence.html

Accessed on 2004-11-22

South African Department of Communications Annual Report 2003/04. Pretoria: Department of Communications.

South African Department of Education. 2005. *Education.* [O] Available
http://www.gov.za
Accessed on 2005-10-17

South African Department of Foreign Affairs. 2006. *Deputy President Mlambo-Ngcuka to visit Japan and Indonesia*.
Available
http://www.dfa.gov.za/docs/2006/japa0417.htm
Accessed on 2006-07-05

South African Electronic Commerce Green Paper. 1995. Pretoria: Government Printers.

[O] Available

http://docweb.pwv.gov.za/Ecomm-Debate/myweb/greenpaper/glossandref.html

Accessed on 2005-03-17

South African Electronic Communications and Transactions Act No 25 of 2002. Pretoria: Department of Communications and Government Printers.

South African Electronic Communications Act No 36. 2005. *Government Gazette No 28743*. Cape Town: South African Parliament.

South African Government Gazette No 20129 of 1999. Notice 1114. Pretoria: Government Printers.

South African Government Gazette No 22169. 2001. Pretoria: South African Government Printers.

South African Government Gazette No 229593. 2001. Proposed regulations which set out the manner and form for submission of applications for under-serviced area licenses by small businesses. Pretoria: South African Government Printers. [O] Available

http://docweb.pwv.gov.za/docs/policy/telpoldir.html

Accessed on 2001-09-30

South African Government Gazette No 3388 of 2003. Pretoria: Government Printers.

South African Government Gazette No 25806 of 2003. Pretoria: Government Printers.

South African Government Information. 2006. *Accelerated and Shared Growth Initiative for South Africa (ASGISA).*

Available
http://www.info.gov.za/asgisa/
Accessed on 2006-06-28

South African Green Paper on Telecommunications Policy. 1995. Pretoria: Government Printers.

South African Qualifications Authority Act No 58. 1995. Cape Town: South African Parliament.

South African Telecommunications Act No 103. 1996. Pretoria: Government Printers.

South African White Paper on Telecommunications Policy. 1996. Pretoria: Government Printers.

South African Institute for Distance Education. 2000. [O] Available

http://www.saide.org.za

Accessed on 2000-11-30

South African Independent Communications Authority Act No 13. 2000. Pretoria: Ministry of Communications.

South African Independent Communications Authority Annual Review July 2000 - March 2001. Johannesburg: Independent Communications Authority of South Africa.

South African Telecommunications Policy Directions. 2001. Government Notice of Intention to Issue Ministerial Policy Directions. Pretoria: Department of Communications.

[O] Available

http://docweb.pwv.gov.za/docs/policy/telpoldir.html

Accessed on 2001-09-30

South African Telecommunications Amendment Act No 64 of 2001. Pretoria: Department of Communications Government Printers.

South African National Assembly. 2007. *Report of the ad hoc committee on the Review of Chapter 9 and Associated Institutions.* Cape Town: South African Parliament.

South African Press Association/SAPA, Bonorchis, R., Bridge, S. and Khuzwayo, W. 2004. Telkom's BEE deal gets bank support. *Pretoria News Business Report*. November 11:19.

South African Presidential National Commission on Information Society and Development

[O] Available

http://www.pcn.gov.za

Accessed on 2003-07-28

South African Reconstruction and Development Programme. 1994. South African Government. Pretoria: Government Publishers. [O] Available

http://www.polity.org.za/govdocs/rdp/

Accessed on 1999-12-02

S*outh African Telecommunications Amendment Act No 64.* 2001. Pretoria: Government Printers.

Sowaga, D. 2005. New controls for communications: policymakers seek more control over technology. Media & Advertising, *City Press* March 6:7.

Soweto Digital Village. 1997. *Closing the Digital Divide in South Africa*. [O] Available

http://www.africare.org/at_work/sa-computers/

Accessed on 2006-06-30

Spackman, M. 2002. Public-Private Partnerships: lessons from the British approach. *Economic Systems* 26(3): 283-301.

Statistics South Africa. 2003. *Census 2001 Report*. Pretoria: Statistics South Africa.

Statistics South Africa. 2005. *Latest key indicators. Pretoria*: Statistics South Africa.

[O] Available

http://www.statssa.gov.za/keyindicators/keyindicators.asp

Accessed on 2007-05-21

Stones, L. 2002. Telkom and ICASA settle tariff fight out of court. The decision draws political flak and is slated by a consumer organisation. *Business Day* June 7:1.

Stones, L. 2008a. Complacent Telkom left behind in fast-changing telecoms scene. *Business Day*. June 03:1.

Stones, L. 2008b. South Africa: Vodacom-Telkom split "now inevitable". *Business Day*. June 10:1.

Strategy for Information and Communication Technology in Education. 2002. Pretoria: Department of Education and Department of Communications.

Straubhaar, J. and LaRose, R. 1995. *Communications Media in the Information Society.* Belmont, California: Wadsworth.

Sukazi, N. 2000. Telkom says it acted correctly. *Pretoria News Business Report*. April 3:6.

Sukazi, N. 2001. Special Survey: ITU Africa telecom review- bridging the digital divide in Africa: Telecoms market set for massive growth; A catalyst for Africa's renewal. E-continent in the making. A great time to join Africa. Telkom positions itself for challenges of

competition. Economic growth needs telecoms infrastructure. In *Pretoria News* Special Survey. *Business Report*. November 8: 1-5.

Sussman, G. 1999. The Information Society: discourses, fetishes and discontents. *Journal of International Communication* 6(1): 7-22.

Swanepoel, P. 2002. *Working with public policy documents: setting up an analytical toolbox*. In, Master of International Communication. Pretoria: University of South Africa.

Swinton, T. 2003. *New strategies old medium.* Rhodes Journalism Review 23. Special Edition: African Media in the Information Society. Grahamstown: Rhodes University.

Talyarkhan, S. 2005. *Connecting the first mile – investigating best practice for ICTs and information sharing for development*. [O] Available
http://www.livelihoods.org/static/stalyarkhan-NN357.htm
Accessed on 2007-02-22

Tardiff, T. J. 2006. *Changes in Industry Structure and Technological Convergence: Implications for Competition Policy and Regulation in Telecommunications.* Boston, MA: National Economic Research Associates.

Taylor, S. J. and Bodgan, R. 1984. *Introduction to Qualitative Research Methods: The Search for Meanings*. Ottawa: John Wiley & Sons.

Telkom price rise will bite users, says ICASA. 2001. *City Press*. November 18:13.

Telkom corporate profile. 2004. *Our Shareholders.*

[O] Available

http://www.telkom.co.za

Accessed on 2006-03-23

Telkom corporate profile. 2005. *The Face of Telkom*.

[O] Available

http://www.telkom.co.za

Accessed on 2006-03-23

Telkom Annual Report. 2008. *Changing the way we do business*. Pretoria: Telkom Head Office.

Thale, T. 2002. *Orange Farm: beauty and land of the poor*. July 11.
[O] Available
http://www.joburg.org.za/july_2002/ornage_farm2.stm
Accessed on 04/05/2005.

Thapisa, A. P. N. and Birabwa, E. 1998. Mapping Africa's initiative at building an information and communications infrastructure. *Internet Research: Electronic Networking Applications and Policy* 8(1): 49-58.

The Canadian Council for Public-Private Partnerships. 2008. *Definitions and Models of Public-Private Partnerships*. [O] Available

http://www.pppcouncil.ca/aboutPPP-definition.asp
Accessed on 2009-01-15

The Commonwealth of Learning. 2001. *Using Telecentres in support of education*.

[O] Available

http://www.col.org/Knowledge.lks_telecentres.htm

Accessed on 2004-11-12

The Communication Initiative. 2001. [O] Available

http://www.comminit.com/en/node/1556

Accessed on 2004-07-20

The Communication Initiative – Participatory Theories and Approaches. 2003.

http://www.comminit.com/en/node/1556

Accessed on 2004-07-20

The Commonwealth of Learning. 2001. *Telecentres: case studies and key recommendations*.

[O] Available

http://www.col.org/telecentres/

Accessed on 2004-11-14

The Digital Opportunity Initiative. 2001. *Project Summary: The Digital Opportunity Initiative (DOI)*. Cape Town: Digital Opportunity Task Force (DotForce).

The Digital Partnership. 2002.

[O] Available

http://www.digitalpartnership.org

Accessed on 2003-04-19 and 2005-03-11

2005. Mbeki Urges Cheaper Phone Tariffs. *The Namibian* September 6:1.
http://www.namibian.com.na/2005/September/marketplace/05D4BC226C.html
Accessed on 2006/07/18

Thornton, L. Carrim, Y., Mtshaulana, P. and Reburn, P. (eds.). 2006. *Telecommunications Law in South Africa*. Johannesburg: STE Publishers.

Tlabela, K.R.U. 2001. *Obtaining benefits through information and communication technology in South Africa, with specific reference to tele-education*. Pretoria: Human Sciences Research Council. Unpublished paper.

Tongia, R. 2006. *Connectivity and the digital divide – technology, policy and design tradeoffs for developing countries.* Washington D. C.: Paper delivered at the 34th Telecommunications Policy Regulatory Conference. George Mason University.

Tunisia National Telecentre site. *Tunisia Telecentres*.

[O] Available

http:///www.telecentres.tn

Accessed on 2000-12-12

Turner, S. D. 2006. *Universal Service Reform and Convergence: USF Policy for the 21st Century.* Washington D. C.: Paper delivered at the 34th Telecommunications Policy Regulatory Conference. George Mason University.

Twigwilizane Women's Foundation Community Telecentre. [Sa]. *Twigwilizane Women's Foundation Community Telecentre*. [O] Available

http://www.ugabytes.org/telecentretimes/?c=137&a=1115

Accessed on 2009-01-14

United Nations Development Programme. *Pilot telecentres*.

[O] Available

http://www.undp.org/info21/pilot/TACC.htm

Accessed on 2001-05-15

United Nations Development Programme Telecentres. *Pilot telecentres.*

[O] Available

http://www.undp.org/info21/pilot/TACC.htm

http://www.undp.org/info21/pilot/TACC.htm

Accessed on 2001-05-15

Universal Service Agency. 1997. *Telecentres.*

[O] Available

http://www.usa.org.za

Accessed on 1999-10-12 and other dates.

Universal Service Agency. 1999. Making our villages global. *Mail & Guardian Smart Technology*: A supplement to the *Mail & Guardian* May 14-20:5.

Universal Service Agency. 2002. *Putting the world within your reach: telecentre audit report.* Johannesburg: Universal Service Agency. Edited by Z. Lesame.

Universal Service Agency. 2004. *Information on telecentres operating in South Africa*. Johannesburg: Universal Service Agency.

Universal Service Agency. 2006a. *Community digital hub established at Presidential nodal point.* Braamfontein: Universal Service Agency.

[O] Available

http:www.usa.org.za/

Accessed on 2006-04-04

Universal Service Agency. 2006b. *Universal Service Agency 2005-2006 Annual Report.* Johannesburg: Universal Service Agency.

Universal Service and Access Agency of South Africa. 2008a. *Discussion document on the definitions of universal service, universal access, disadvantaged areas and needy persons.* Johannesburg: Universal Service and Access Agency of South Africa.

Universal Service and Access Agency of South Africa. 2008b. *Thusong Service Centres.* Universal Service and Access Agency of South Africa.

van Audenhove, L. 1999. South Africa's Information Society Policy: An Overview. *Communicatio: South African Journal for Communication Theory and Research* 25(1&2): 15-27.

van Audenhove, L. 2003. *Towards an Integrated Information Society Policy in South Africa: An Overview of Political Rhetoric and Policy Initiatives 1994-2000.* Pretoria: Human Sciences Research Council.

van Dijk, J. 1999. The *Network Society: Social Aspects of New Media*. London: Sage.

van Dijk, J. A. G. M. 2006. *The Network Society: Social Aspects of New Media*. London: Sage Publications.

van Dijk, J. A. G. M. 2006. *The Network Society: Social Aspects of New Media*. Second Edition. London, Thousand Oaks and New Delhi: Sage Publications.

van Rensburg, R. 2007. Freebies of the phone business: cell phone firms use big bait to get – and

keep – your Business. *You*. January 25:8-10.

van Rensburg, R. 2009. Cut these costs! *You*. August:16-17.

Vodacom Group Shareholders. 2005.

[O] Available

http://www.vodacom.co.za

Accessed on 2005-02-28

Vodaworld Magazine - Worldwide cellular communications Update. 2005. *Breaking Africa's mobile barriers: Africa's cellphone customer growth rate is the biggest in the world, comparing favourably with countries like China and India*. Autumn: 28-30.

Vodacom Group. 2006. *Company Information: Shareholders*.

[O] Available

http://www.vodacom.co.za/about/profile_overview.jsp

Accessed on 2006-04-10

Warf, B. 2003. Mergers and acquisitions in the telecommunications industry. *Growth and Change* 34(3):321-344.

Weigel, G. and Waldburger, D. (eds.). 2004. *Information and Communication Technology for Development (ICT4D): Connecting People for a Better World: Lessons, Innovations and Perspectives of Information and Communication Technologies in Development*. Berne: Swiss Agency for Development and Cooperation (SDC) and Global Knowledge Partnership (GKP).

Wessie, G. 2001. *Digital village launched in Emdeni*.

[O] Available

http://www.microsoft.com/southafrica/press/press-429.htm

Accessed on 2006-05-10

Western Australia Telecentre Network. 2001. *Telecentres in Western Australia*.

[O] Available

http://www.telecentres.wa.gov.au/support.htm

Accessed on 2002-03-13

Whyte, A. 2000. *Assessing community telecentres: guidelines for researchers*. Ottawa: Independent Development Research Centre.

[O] Available

http://www.idrc.org.sg/biodiversity/ev-28311-201-1-DO_TOPIC.html

Accessed on 2008-09-13 and 2009-01-15

Wikipedia – The Free Encyclopedia. 2006. *Triangulation (Social Science)*.
[O] Available.
http://en.wikipedia.org/wiki/Triangulation_%28social_science%29
Accessed on 21-11-2006

Willeme, H. 2004. *Analysis of IICDs telecentres pilot project in Mali*.

[O] Available

http://www.iicd.org/articles/iicdnews.2004-11-29.0041317677

Accessed on 2006-04-04

Wilson, R. 2006. *The relationship between South Africa's trade strategy and ASGISA*. [O] Available http://www.tralac.org/scripts/content.php?id=4539&print=1 Accessed on 2006-07-05

Wimmer, R.D. and Dominick, J.R. 1997. *Mass Media Research: An Introduction.* California: Wadsworth Publishing Company.

World Bank Study Groups. 2004. *Data and Statistics*.

[O] Available

http://www.worldbank.org/data/countryclass/countrygroups.htm

Accessed on 2004-12-07

Xia, J. and Lu, T-J. 2005. *Universal service policy in China: building digital divide bridge for rural community*. Arlington, Virginia: George Mason University Law School. Proceedings of the 33rd Telecommunications Policy Research Conference.

Xia, J. and Lu, T. J. 2008. Bridging the digital divide for rural communities: the case of China. *Telecommunications Policy* 32: 686 - 696.

World Bank. 2006. *Information and Communications for Development (IC4D) – Global Trends and Policies*. Washington D. C.: The World Bank.

Youtie, J., Shapira, P. and Laudeman, G. 2007. Supply, demand and ICT-based services: a local perspective. *Telecommunications Policy* 31(6-7):347-358.