CURRICULUM DEVELOPMENT FOR THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

by

DAVID LLEWELLYN THOMAS

submitted in accordance with the requirements
for the degree of

DOCTOR OF EDUCATION

in the subject

DIDACTICS

at the

UNIVERSITY OF SOUTH AFRICA

PROMOTER: PROF M P VAN ROOY

31 JANUARY 1999
SUMMARY

CURRICULUM DEVELOPMENT FOR THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

This study centres on curriculum development for a master craftsman level in the Printing, Newspaper and Packaging Industries which is didactically sound and takes cognisance of the dynamic vocational education and training milieu in which it occurs. Curriculum and curriculum development is viewed from a systems perspective and incorporates the specific andragogic didactic needs of the learner target group as well as the unique needs of an industrial sector.

Because the National Qualification Framework model advocates an outcomes-based approach to curriculum development this necessitated the identification of a suitable standards generating process to articulate the master craftsman unit standards into a qualification capable of being recognised by the National Qualification Framework. The nature and complexity of the underpinning knowledge, skills and competencies for the master craftsman level were quantified and qualified by means of skills and competency profiling and the development of a job outcome taxonomy of skills, knowledge and attributes which incorporated critical cross field and fundamental skills, and their underpinning knowledge requirements.

Using aspects of various vocational education and training models and empirical research course content was sourced, evaluated and developed into appropriate modules of learning that are congruent with the accepted competency based modular training system used in the Industries. Course maps that integrate theory and practice were developed with multi skilling milestones linked to learner certification.

Evaluation of resources for the delivery of the Master Craftsman Programme was facilitated by means of a provider quality assessment and accreditation system. The interactive teaching-learning situation and the evaluation processes and procedures were developed to enhance the assessment of applied competencies in the world of work. A pilot study and unit standards generating activities are to be used as a means of implementing and institutionalising the master craftsman curriculum.

The findings of this study revealed that by viewing the curriculum from a systems perspective and using a suitable curriculum development model a creative master craftsman curriculum development process could take place. The competency profiling technique and taxonomy of competencies, skills, knowledge and attributes enabled the curriculum process to be a top-down approach which is outcomes-based.
KEY TERMS

Accreditation of Prior Learning; Application-Orientated Objective; Benchmarking; Best Practices; Career Paths; Certification Practices; Content-Performance Matrix; Competency Profiling; Career Progression; Curriculum Development Model; Curriculum Continuum; Job Competence; Job/Function Profiling; Learning Outcome; Outcomes-Based Vocational Education and Training; Portfolio Development; Project Cycle Management; Performance Pyramid; Qualification for Position; Qualification for Purpose; Quality Assessment System; Qualified Worker Standard; Standards Generating; Systems Didactics; Transfer of Learning; Train the Trainer; Taxonomy of Competencies, Skills, Knowledge and Attributes; Unit Standards Acid Test.
# CURRICULUM DEVELOPMENT FOR THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

## CHAPTER 1: INTRODUCTION AND ORIENTATION

### 1.1 INTRODUCTION

### 1.2 THE FACTORS LEADING TO THE RESEARCH

1.2.1 The influence of the historical foundations of vocational education and training in the Printing, Newspaper and Packaging Industries of South Africa on curriculum and curriculum development in the Industries

1.2.2 Interpretation of the concept curriculum and curriculum development in the Printing, Newspaper and Packaging Industries

1.2.3 A scholastic perspective of the concept curriculum

1.2.4 A didactic perspective on the current South African thinking on the concept curriculum and curriculum development

1.2.4.1 The current debate on curriculum in South Africa

1.2.4.2 The impact of current thinking on curriculum and curriculum development for the Printing, Newspaper and Packaging Industries

1.2.4.3 The National Qualification Framework (NQF)

1.2.5 The position vs purpose dichotomy and the need for competence

1.2.6 Systems theory and the curriculum

1.2.7 The accepted training system within the Printing, Newspaper and Packaging Industries

1.2.8 Synthesis of the problem

### 1.3 STATEMENT OF THE PROBLEM

### 1.4 ANALYSIS OF THE PROBLEM

### 1.5 AIMS OF THE STUDY

### 1.6 CLARIFICATION OF TERMS
1.6.1 Curriculum and curriculum development
1.6.2 The master craftsman
1.6.3 The definition of the Industries

1.7 PROGRAMME OF STUDY OF THE THESIS
1.7.1 A systems perspective of curriculum and curriculum development
1.7.2 Competency profiling of the master craftsman
1.7.3 Standard setting for the units of learning of the master craftsman curriculum
1.7.4 International benchmarking of outcome standards for the master craftsman
1.7.5 Development of an outcomes-based curriculum for the master craftsman in the Printing, Newspaper and Packaging Industries
1.7.6 Implementation of the curriculum for the master craftsman in the Printing Newspaper and Packaging Industries
1.7.7 Conclusions and recommendations

CHAPTER 2: CURRICULUM AND CURRICULUM DEVELOPMENT FOR THE MASTER CRAFTSMAN

2.1 INTRODUCTION

2.2 FURTHER THOUGHTS ON CURRICULUM

2.3 THE VOCATIONAL EDUCATION AND TRAINING CURRICULUM

2.4 CURRICULUM DEVELOPMENT

2.5 CURRICULUM DESIGN MODELS

2.6 SYNTHESIS

CHAPTER 3: COMPETENCY PROFILING OF THE MASTER CRAFTSMAN

3.1 INTRODUCTION

3.2 PRACTICES IN COMPETENCY PROFILING
3.2.1 Spoornet
3.2.2 Rail transport sector
3.2.3 Selected techniques for competency profiling
   3.2.3.1 Nominal group analysis technique
   3.2.3.2 Search conference
   3.2.3.3 Functional analysis
   3.2.3.4 Competency interview and interviews
   3.2.3.5 The McBer technique
   3.2.3.6 Techniques suitable for the Printing, Newspaper and Packaging Industries
3.2.4 Graphic arts, print and paper sector

3.3 THE ADOPTED PRACTICE FOR COMPETENCY PROFILING OF THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES OF SOUTH AFRICA
3.3.1 The competency profiling technique adopted for the Printing, Newspaper and Packaging Industries
3.3.2 A skills profile of the master craftsman and its use to develop a competency profile
3.3.3 World class manufacturing needs
3.3.4 A competency profile of the master craftsman in the Printing, Newspaper and Packaging Industries

3.4 SYNTHESIS

CHAPTER 4: A TAXONOMY OF SKILLS, KNOWLEDGE AND ATTRIBUTES FOR THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

4.1 INTRODUCTION

4.2 JOB COMPETENCE IN AN INDUSTRIAL SETTING

4.3 COMPETENCE AND SKILLS IN RELATION TO THE MACRO REQUIREMENTS SET BY CENTRAL GOVERNMENT
4.4 A TAXONOMY OF COMPETENCIES, SKILLS, KNOWLEDGE AND ATTRIBUTES FOR THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

4.5 SYNTHESIS

CHAPTER 5: STANDARDS SETTING OF THE UNITS OF LEARNING FOR THE MASTER CRAFTSMAN CURRICULUM

5.1 INTRODUCTION

5.2 THE REQUIREMENTS OF THE NATIONAL QUALIFICATION FRAMEWORK

5.3 CAREER PROGRESSION REQUIREMENTS IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

5.4 STANDARDS SETTING PRACTICES IN SOUTH AFRICA

5.4.1 Project cycle management and goal orientated project planning

5.4.2 Standards setting process for the units of learning of the master craftsman curriculum

5.4.2.1 Participation analysis (PtA)

5.4.2.2 Stakeholder buy-in

5.4.2.3 Formulation of governance structures

5.4.2.4 Critical path and performance evaluation of the project

5.4.2.5 The project planning matrix

5.4.2.6 Operational plan (OP)

5.4.2.7 Cost estimates

5.5 INTERNATIONAL BENCHMARKING OF THE MASTER CRAFTSMAN CURRICULUM

5.6 SYNTHESIS
CHAPTER 6: DEVELOPMENT OF AN OUTCOMES-BASED CURRICULUM FOR THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES - PART 1

6.1 INTRODUCTION

6.2 THE INITIAL SITUATION OF THE LEARNER
6.2.1 The training systems from which the target learner group were certificated
6.2.2 Other certification practices which influence the initial situation of the potential learner target group
6.2.3 The influence of technology on the potential learner target group
6.2.4 Recognition of prior learning (RPL) as a mechanism for evaluating the potential learner target group

6.3 THE WORK SITUATION
6.3.1 The heterogeneous nature of the Printing, Newspaper and Packaging Industries and its impact on the potential learner for the master craftsman curriculum
6.3.2 Accreditation practices for companies and organisations who provide vocational education and training in the Printing, Newspaper and Packaging Industries
6.3.3 The andragogic didactic nuances that influence learning within the organisations and companies that make up the Printing, Newspaper and Packaging Industries

6.4 THE AIMS AND OBJECTIVES OF THE MASTER CRAFTSMAN CURRICULUM

6.5 THE PRE-INTERACTIVE PHASE OF COURSE CONTENT SEARCH AND EVALUATION FOR THE MASTER CRAFTSMAN CURRICULUM
6.5.1 Evaluation of course content for the underpinning skills and knowledge requirements for craft related technical competencies
6.5.2 Course content search and evaluation of the underpinning skills and knowledge requirements for other technical competencies
6.5.2.1 Quality assurance
6.5.2.2 Technical training
6.5.2.3 Productivity improvement
6.5.2.4 Costing and estimating
6.5.3 Course content evaluation for the underpinning skills and knowledge requirements for non-technical competencies

6.5.3.1 Change management
6.5.3.2 Production control
6.5.3.3 Team development competencies
6.5.3.4 Interpersonal competencies
6.5.3.5 Information systems
6.5.3.6 Recruitment and selection

6.6 SYNTHESIS

CHAPTER 7: DEVELOPMENT OF AN OUTCOMES-BASED CURRICULUM FOR THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES - PART 2

7.1 INTRODUCTION

7.2 COURSE DESIGN REQUIREMENTS

7.2.1 Competency based vocational education and training course design requirements
7.2.2 Modular course design requirements
7.2.3 The andragogic didactic course design requirement
7.2.4 Course design requirements according to the outcomes-based approach of the emerging National Qualification Framework model
7.2.5 A theoretical construct for course design requirements

7.3 COURSE MAPS FOR THE MASTER CRAFTSMAN CURRICULUM

7.3.1 Course map design for developing skills and competencies in the craft technical fields
7.3.2 Course map design for developing skills and competencies in the other technical fields
7.3.3 Course map design for developing skills and competencies in the non-technical fields
7.3.4 The course map for the Master Craftsman Programme (MCP)
7.4 THE INTERACTIVE TEACHING-LEARNING SITUATION FOR THE MASTER CRAFTSMAN PROGRAMME

7.4.1 Introduction 251

7.4.2 Teacher and instructor accreditation and registration 252

7.4.3 Andragogic didactic principles underlying sound instructional methods for the Master Craftsman Programme (MCP) 254

7.4.4 The teaching and training methods for the Master Craftsman Programme (MCP) 255

7.4.5 On-the-job instruction, practice and stamina building as a delivery mode for the Master Craftsman Programme 258

7.4.6 Block release options as a delivery mode for the Master Craftsman Programme 260

7.4.7 Distance learning and mentorship as a delivery mode for the Master Craftsman Programme 261

7.4.8 In-house presentation delivery mode for the Master Craftsman Programme 262

7.4.9 Organisation-performance awareness is necessary for learning in a decentralised delivery mode for the Master Craftsman Programme 263

7.4.10 On-the-job project control as an instructional technique for the Master Craftsman Programme 265

7.4.11 The vocational education and training management system for the master craftsman curriculum 266

7.5 EVALUATION SYSTEM FOR THE MASTER CRAFTSMAN CURRICULUM 270

7.5.1 Accreditation requirements as a means of evaluating vocational education and training resources 273

7.5.2 Strategies for evaluating outcomes of a practical nature 275

7.5.3 Strategies for evaluating learning outcomes of a theoretical nature 277

7.5.4 The evaluation management sub-system 277

7.5.5 Certification practices for the Master Craftsman Programme (MCP) 279

7.6 SYNTHESIS 280

CHAPTER 8: THE IMPLEMENTATION OF THE MASTER CRAFTSMAN CURRICULUM 282
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8.1 THE CURRICULUM CONTINUUM REVISITED</strong></td>
<td></td>
</tr>
<tr>
<td>8.1.1 The master craftsman curriculum package</td>
<td>282</td>
</tr>
<tr>
<td>8.1.2 Adoption of the master craftsman curriculum</td>
<td>284</td>
</tr>
<tr>
<td>8.1.3 Implementing the master craftsman curriculum</td>
<td>285</td>
</tr>
<tr>
<td><strong>8.2 CAPACITY BUILDING FOR CURRICULUM ADOPTION AND IMPLEMENTATION</strong></td>
<td>285</td>
</tr>
<tr>
<td>8.2.1 Resource evaluation and capacity building</td>
<td>286</td>
</tr>
<tr>
<td>8.2.2 An incremental implementation option and its implications</td>
<td>288</td>
</tr>
<tr>
<td>8.2.3 Creating structures and review mechanisms for implementation</td>
<td>289</td>
</tr>
<tr>
<td>8.2.4 A pilot study as a means of launching the master craftsman curriculum</td>
<td>291</td>
</tr>
<tr>
<td><strong>8.3 THE PILOT STUDY PROJECT</strong></td>
<td>292</td>
</tr>
<tr>
<td>8.3.1 The pilot study aims and objectives</td>
<td>292</td>
</tr>
<tr>
<td>8.3.2 The marketing plan for the pilot study</td>
<td>293</td>
</tr>
<tr>
<td>8.3.3 The plan and critical path of the pilot study</td>
<td>294</td>
</tr>
<tr>
<td>8.3.4 Evaluation requirements for the pilot study</td>
<td>296</td>
</tr>
<tr>
<td>8.3.5 Quality assurance and monitoring of the pilot study</td>
<td>296</td>
</tr>
<tr>
<td><strong>8.4 FROM IMPLEMENTATION TO INSTITUTIONALIZATION OF THE MASTER CRAFTSMAN CURRICULUM</strong></td>
<td>298</td>
</tr>
<tr>
<td>8.4.1 Further implementation strategies</td>
<td>298</td>
</tr>
<tr>
<td>8.4.2 Change and innovation as a means of renewal and further development of the curriculum</td>
<td>299</td>
</tr>
<tr>
<td>8.4.3 Unit standards and the outcomes-based macro needs in relation to the master craftsman curriculum</td>
<td>299</td>
</tr>
<tr>
<td><strong>8.5 SYNTHESIS</strong></td>
<td>301</td>
</tr>
<tr>
<td><strong>CHAPTER 9 : CONCLUSIONS AND RECOMMENDATIONS</strong></td>
<td>306</td>
</tr>
<tr>
<td><strong>9.1 INTRODUCTION</strong></td>
<td>306</td>
</tr>
<tr>
<td><strong>9.2 REVIEW OF THE FACTORS MOTIVATING THE STUDY</strong></td>
<td>306</td>
</tr>
<tr>
<td>9.3</td>
<td>SUMMARY OF FINDINGS</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>9.4</td>
<td>CONCLUSIONS</td>
</tr>
<tr>
<td>9.5</td>
<td>RECOMMENDATIONS</td>
</tr>
<tr>
<td>9.6</td>
<td>FINAL OVERVIEW</td>
</tr>
</tbody>
</table>

**BIBLIOGRAPHY**

**APPENDIX 1:** Techno-Economic Forecast Questionnaire 1996  
Page 333

**APPENDIX 2:** Project Planning Matrix  
Page 356

**APPENDIX 3:** Resource Planning Matrix  
Page 365

**APPENDIX 4:** Provider Quality Assessment & Accreditation System  
Page 372

**APPENDIX 5:** Questionnaire on Soft Skills Courses in the Printing, Newspaper and Packaging Industries  
Page 383

**APPENDIX 6:** Survey Results on Soft Skills Courses in the Printing, Newspaper and Packaging Industries  
Page 401
CHAPTER 1: INTRODUCTION AND ORIENTATION

1.1 INTRODUCTION

A study of this nature particularly in the field of vocational education and training is complex. Didactic Studies in the vocational education and training field, particularly in the Printing, Newspaper and Packaging Industries of South Africa has been non existent historically and only recently introduced in some measure to a select sector of the vocational education and training activities within the industry.

Curriculum and the process of curriculum development needs to be clearly articulated within the milieu in which it occurs. The dynamics of the milieu will influence the form and texture of the curriculum, how curriculum is developed, and the effectiveness of the curriculum is directly related to the problem of curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries of South Africa.

In the Printing, Newspaper and Packaging Industries of South Africa, the historical foundation of vocational education and training does and will influence the present and the future. The current problem of curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries of South Africa must also be viewed in the light of present education and training circumstances in the country and the requirements of the future.

1.2 THE FACTORS LEADING TO THE RESEARCH

The factors leading to the research are diverse yet all contribute in a dynamic manner to the complexities of the problem. The historical foundations of vocational education and training in the Printing, Newspaper and Packaging Industries of South Africa have impacted on how curriculum and curriculum development is perceived within the industries. Unfortunately this is a limited view where didactics and the didactic categories of curriculum and curriculum development are incidental and where concepts and terminology are confused and vague.

A sound theoretical conceptualisation of curriculum and curriculum development is needed upon which good practice can be built. In the Printing, Newspaper and Packaging Industry, the historical foundations of vocational education and training illustrates to what extent sound didactic theory was applied in the past especially in the field of curriculum development. This historical perspective also indicates the inherent problems associated with curriculum development in the Printing, Newspaper and Packaging Industries and
how these problems influenced this study.

1.2.1 THE INFLUENCE OF THE HISTORICAL FOUNDATIONS OF VOCATIONAL EDUCATION AND TRAINING IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES OF SOUTH AFRICA ON CURRICULUM AND CURRICULUM DEVELOPMENT IN THE INDUSTRIES

As has been stated, in order to make a study of this nature meaningful, it is necessary to examine the historical foundations of vocational education and training in the Printing, Newspaper and Packaging Industries of South Africa. A mere chronological description of past events would be of limited value unless some criticism and comment is made on whether didactics, in whatever form, occurred and more importantly if curriculum and curriculum development was ever an issue or for that matter pursued knowingly or unknowingly. It will be shown how the vocational education and training debate evolved over time, from an initial focus on artisan training to the present situation where the focus covers all skills levels within the Printing, Newspaper and Packaging Industries of South Africa.

At the time when the National Industrial Council of the Printing and Newspaper Industry of South Africa (NIC) was founded in 1920 the issue of vocational education and training of apprentices arose where special reference was made to the training of Linotype apprentices as well as the publishing of a rudimentary curriculum for the trade of Linotype (NIC, 1920:6-8). The Apprenticeship Act, Act No 20 of 1922 gave impetus to vocational education and training in the Printing and Newspaper Industries of the day by creating structures and formalising apprentices training in the Union of South Africa.

Over time, various substructures were created to facilitate apprentice training in the Printing, Newspaper and Packaging Industries, the most important of these in the early years was the National Printing Apprenticeship Committee (NPAC) which was formally constituted in June 1923 (NPAC, 1923:4). The work done by the National Printing Apprentice Committee (NPAC) centred about vocational education and training for artisans through the mechanism of the formal apprenticeship system. Not only were broad curriculum issues discussed but specific training schedules and syllabi were developed and prescribed (NPAC, 1950:6).

The impact of technology also had a dramatic effect on vocational education and training in the formative years. In 1956 recommendations were made to designate Rotary Machine Minding as a separate trade which would incorporate stereotyping and flat bed Rotary Machine Minding so as to accommodate the latest changes in technology (NPAC, 1956:15). Periodically more dramatic changes have occurred in the
vocational education and training field in the Printing, Newspaper and Packaging Industries due to technology encroaching on traditional areas of the industry. Machine Minding (Packaging) developed rapidly and courses of study were specifically developed to address the vocational education and training needs in this field (NPAC, 1959:2). As recently as 1992, a completely new specialised trade of Electronic Origination was developed and the syllabi for theoretical education and practical training programmes were published (PNPITB, 1992a:1).

The vocational education and training debate not only centred about apprenticeship training but also examined and put forward the notion of technician training as well as formalised training at the tertiary level in the form of National Diplomas in Printing Management and Packaging Management (NMTC, 1986a: 6-12). The current debate within the Printing, Newspaper and Packaging Industries with regards vocational education and training are centred about the existing needs of the industries for a master craftsman level. First mention of a master craftsman was made when new training methods were discussed for incorporating competency based modular training methodology within the industries (NMTC, 1986a:4). It was at that stage felt that the master craftsman level would be very much based on the German model in which training companies could only be accredited to train if they had a master craftsman.

Further discussions about the master craftsman indicated that the envisaged role would be that of a custodian of the craft of Printing and Packaging and the reference point for the introduction of new technology (NMTC, 1986b:4). The program of studies for the German 'Meister', the equivalent of the master craftsman was obtained and partly translated so as to evaluate the content with a view to adopting it for the South African situation. This exercise proved futile and was abandoned as it was felt that the programme was not suitable for the South African situation.

The industries saw the master craftsman being a natural extension of artisan vocational education and training. The HSRC/NTB report on the investigation into the training of artisans in South Africa indicated that further training of qualified artisans in specific areas of specialisation were a possibility and needed to be accommodated (HSRC, 1985:145). As recently as 1994 the Cape Chamber of the Printing Industries Federation of South Africa expressed the need to develop the qualified artisans further in the industries and proposed a master craftsman level without identifying what role and functions the master craftsman would fill in the industry (PIFSA, 1994:4). In 1995 the South African Institute of Printing identified that there should be a concerted effort to develop a vocational education and training programme for a master craftsman in the Printing, Newspaper and Packaging Industries, however, without identifying any roles or functions for such a master craftsman (SAIP, 1995:2).
The impact of the historical foundations of vocational education and training in the Printing, Newspaper and Packaging Industries of South Africa has and will shape how the vocational education and training debate will evolve in the industries now and in the future. It will be shown how these foundations have influenced curriculum development within the industries and will no doubt impact on curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries of South Africa. To critique the historical foundations of vocational education and training in the Printing, Newspaper and Packaging Industries against specific didactic categories such as curriculum and curriculum development requires an in-depth examination of these categories as well as clarification of certain terms and concepts. This process of examination and clarification of terms and concepts will also highlight the nature of the problem of curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries of South Africa.

1.2.2 INTERPRETATION OF THE CONCEPT CURRICULUM AND CURRICULUM DEVELOPMENT IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

Vocational education and training in the Printing, Newspaper and Packaging Industries has always been a deliberate intended action aimed at teaching very specific skills such as artisan training. The action has had a distinct educational and training goal notwithstanding a history of separating the education and training components. This historical education-training dichotomy has been well documented and has been a source of irritation to the Industry in the past where the education curriculum and training curriculum were so divergent that the integration of theory and practice was impossible to achieve (NMTC, 1986a:4-12; NMTC, 1986b:1-10).

Only as recently as 1992 when a Competency Based Modular Training system was introduced for artisan skills training within the industries was the integration of theory and practice achieved in a curriculum that was seen to be more outcome-oriented. Unfortunately within the Printing, Newspaper and Packaging Industries the concept curriculum, curriculum development and syllabus are vague and undefined. Curriculum is referred to in some instances as a course of practical training (NPAC, 1960; NMTC, 1986a). In other instances, curriculum is interchanged with syllabi and describes specific syllabi (NMTC, 1987). Clarification of the concept curriculum, curriculum development and syllabus is necessary in order to understand more fully the problems associated with curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries.
1.2.3 A SCHOLASTIC PERSPECTIVE OF THE CONCEPT CURRICULUM

The debate amongst scholars as to what curriculum is, is an ongoing one at times heated and very often confused. Zais (1976:6-11) examines the concept curriculum and concludes that some people see curriculum as a program of studies, others as course content, others as planned learning experiences, others as experiences had under the auspices of the school, others as a structured series of intended learning outcomes, and yet others as a written plan of action. He further states that the only inference that can be drawn from these various views on the concept curriculum seems to be that the end purpose that is desired actually influences how one defines curriculum. Quinn (1980:73) feels the concept curriculum has to be distinguished clearly from syllabus and timetable. She further casts light on how curriculum is viewed by some from a content point of view and others from a process point of view.

Duminy & Söhng (1994:244) define curriculum as:

' a systematic group of courses, studies or subjects planned deliberately for pupils or students, usually with a view to their certification or graduation in a specific field of study.'

Fraser, Loubser & Van Rooy (1993:92) define curriculum as:

' The subject curriculum is the interrelated totality of particular aims, selected and organised learning content, appropriate evaluation procedures and meaningful teaching-learning opportunities, experiences and activities as didactic guidelines and minimum requirements for the implementation of the didactic activities, as far as they relate to a particular subject, course or year of study.'

Expanding on the definition Fraser et al (1993:93-99) list five components of the curriculum, namely:

- The situation analysis: Here five important variables are interacting namely the learner, teacher/trainer, the actual learning content, the society in which the situation takes place and the didactic environment.

- The aims of curriculum which should articulate what the intended goals are, that is, the outcome expected from the implementation of the curriculum.

- The learning content which should be selected so as to achieve the aims of the curriculum and how such learning content is organised and presented.
- 6 -

- The instructional methods and events through which the learning content will be presented.

- The evaluation process which in essence should determine to what extent the original aims of the curriculum have been achieved.

Quinn simplifies curriculum as having four interrelated components namely, objectives, content, methods and evaluation (Quinn, 1980:74).

Quinn (1980:73) states that the concept curriculum has four different connotations in reality and these are:

The official curriculum - the one laid down by the policy of the school or delivery body.

The actual curriculum - the one that is actually taught at the school or delivery body.

The formal curriculum - the learning which has been officially planned at the school or delivery body.

The hidden curriculum - the attitudes and values which are transmitted by the physical environment in which the curriculum is taught.

To add to the debate on the concept curriculum, McNeil (1990:52) identifies the technological curriculum as distinct from the academic curriculum. He sees that technology in the technological curriculum appears to be concerned with how to teach rather that what to teach. The instructional sequences are concerned about what is learned or not learned. McNeil (1990:53-56) also gives examples of a technological curriculum namely systems technology, instructional alignment, personalised systematic instruction in higher education and mastery learning. Of particular interest in this debate on curriculum is that the Printing, Newspaper and Packaging Industries have made the decision that Competency Based Modular Training methodology for vocational education and training within the Industry will be the modus operandi in future (PNPITB, 1991:1-3). The Competency Based Modular methodology is by its very nature mastery learning and as such tends to fall within the guise of the technological curriculum. McNeil (1990:56-59) concludes that the technological approach is most effective when applied to easily measurable tasks. The general characteristics of classroom technological systems are objectives, methods, organisation and evaluation of results in a tightly structured package which allows for frequent feedback and permits for learner self pacing and more individualised programs to facilitate accelerated learning.
McNeil (1990:55-56) illustrates mastery learning as an example of a technological curriculum. Instructional objectives are arranged in an assumed hierarchy of tasks within an input-conversion-output system where lesson materials are built around this arrangement. Evaluators' criteria are clearly specified. The pattern of involving the learner in the system has three distinct parts. The first part is to determine the initial situation of the learner particularly to ascertain the learner's knowledge about the topic or subject and may include pre-testing. The second part involves giving the learner carefully designed learning material and activities and the final part is evaluating measurements to determine the learner's progress. Feedback loops exist so as to facilitate remedial action or changes to the syllabus if necessary.

According to McNeil (1990:70) the academic curriculum is in disarray. Notwithstanding the agreement that the academic curriculum has a primary objective of a rational mind, there still exists the debate on how best to achieve this primary objective. The approaches to the academic curriculum according to McNeil (1990:70-84) range from the forms of knowledge approach through the structured, the disciplines, the liberal arts, academic and to the cultural literacy approach. Once again the characteristic of the academic curriculum are purpose, method, organisation and evaluation (McNeil, 1990:84-89).

Interestingly Duminy and Söhne (1994:244) define curriculum development as a process aimed at constructing or providing a document that contains all the information about the teaching and learning interactive didactic situation. For the purposes of this study curriculum development viewed as a process is eminently suitable considering the dynamic milieu in which curriculum development will take place.

The semantic problems surrounding curriculum and curriculum development needs to be clarified and would have to be contextualised in such a manner so as to accommodate the needs for the curriculum for the master craftsman in the Printing, Newspaper and Packaging Industries. Curriculum and curriculum development for this study may possibly fall under the guise of vocational education and training. If this is so then a suitable theoretical construct of curriculum and a workable model for curriculum development would be necessary.

1.2.4 A DIDACTIC PERSPECTIVE ON THE CURRENT SOUTH AFRICAN THINKING ON THE CONCEPT CURRICULUM AND CURRICULUM DEVELOPMENT

It is necessary to illustrate what the current thinking in South Africa is on the concept curriculum and curriculum development. This thinking must be taken into consideration for the purpose of this study. Whatever curriculum is developed for the master craftsman in the Printing, Newspaper and Packaging Industries it should be in line with the national norms and criteria for curriculum. An enormous amount of
debate and energy have over the last few years been focused on the issue of education and training in South Africa. Many commissions, research projects and discussions have taken place, some parallel with each other, others in isolation. Nevertheless a pattern has emerged which sheds light on the latest developments in the education and training debate from the perspective of qualification and curriculum.

1.2.4.1 THE CURRENT DEBATE ON CURRICULUM IN SOUTH AFRICA

The discussion document on 'Lifelong Learning through a National Qualification Framework' published by the Department of Education in 1996 summarises the record of documents which led to the current debate on education and training. Accordingly the discussion document states that as far back as 1992 the 'National Education Policy Investigation' and 'The Education Renewal Strategy' made a strong case for integrating general education and vocational training into a single coherent system. Later in another document 'Policy Framework for Education and Training' published in January 1994 by the ANC Education Department, a National Qualification Framework was proposed (Department of Education, 1996:17-18). The National Training Board also put forward the notion that there was a need for a National Qualification Framework (NQF) for the vocational education and training environment in their report 'Discussion Document on a National Training Strategy Initiative'. The need for a National Qualification Framework continued to crop up in a variety of documents until finally towards the end of 1994 the Ministries of Education and Labour mandated an inter-ministerial working group to consider how to implement a National Qualification Framework. Out of the deliberations of this working group, the White Paper on Education and Training was published in March 1995 which detailed elements of the proposed NQF and on 2 June 1995 the 'Draft National Qualification Framework Bill' was published and this was then followed up in October 1995 with the passing of the 'South African Qualifications Authority Act', Act No 58 of 1995.

During this period of debate some important new directions were established which will impact on curriculum and curriculum development in the future and thus add to the problem of curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries.

The White Paper on Education and Training (Department of Education, 1995) was in fact proposing a major change in direction by making a serious attempt to address the education training dichotomy that had previously existed. Education saw their role as equipping learners with a 'learning to learn' ability, that is, it described the purpose. Training on the other hand saw their role as equipping learners with the 'learning to do' ability, that is, preparing them for a position in the world of work. The White Paper on Education and Training (Department of Education, 1995:26) specifically points to a convergence of the two schools
of thought on education and training where it states that integration of education and training will provide more meaningful learning experiences which will prepare learners more effectively for life's opportunities. This rejects the rigid divisions between academic and applied knowledge, theory and practice. The White Paper further spells out its aim as:

'An integrated approach to education and training will link one level of learning to another, and will enable successful learners to progress to higher levels without restriction, from any starting point in the education and training system.'

Bellis (1995:2) casts some light on the education training dichotomy stating that terms and concepts such as education, training, academic, vocational, technical, theoretical, practical are defined and applied in various ways and used carelessly to identify where the teaching-learning takes place instead of addressing the real issues of:

- the nature of the learning that actually takes place, or
- the scope and range of the capabilities that result from such learning, or
- the actual qualification achieved out of this learning process and, importantly, the level of such a qualification.

The 'National Training Strategy' report of the National Training Strategy Initiative, which was published in April 1994 sets out to achieve the vision of a human resource development system where an integrated approach to education and training links into and meets the economic and social needs of the country and addresses the learning and development needs of the individual (NTB, 1994: 6). This vision was supported by 12 underpinning principles. This report had as its central theme that a single national qualification framework should be developed for all learning. The support for an NQF has been given impetus by Central Government who, in June 1995, published the draft National Qualification Framework Bill.

The 'White Paper on Education and Training', published in March 1995, reiterates and reinforces the NQF by stating:

'An integrated approach to education and training, linked to the development of a new National Qualification Framework (NQF) based on a system of credits for learning outcomes achieved, will encourage creative work on the design of curricula and the recognition of learning attainments wherever education and training are offered. It will open doors of opportunity for people whose academic or career paths have been needlessly blocked because their prior knowledge (acquired informally or by work experience) has not been assessed and certified, or because their qualifications have not been recognised for administration to further learning, or employment purposes.'

This of course has direct implications for this study and indirectly forms part of the problem of curriculum development for a master craftsman in the Printing, Newspaper and Packaging Industries of South Africa. The White Paper on Education and Training (Department of Education, 1995:26) states that through the mechanism of integration of education and training a learner-led education and training system will evolve with competence as an outcome. The semantics at play in using the concept competence adds to the problem for this study. Moreover, competence evaluation as a didactic category will affect curriculum and curriculum development. The reference to a learner-led education and training system impacts directly on this study since the operative word 'system' is used indicating that systems theory is involved. There exists a need to identify what a system is and then to view curriculum and curriculum development from a didactic system's perspective. A systems orientation will impact on the curriculum for the master craftsman and should be accommodated which will influence how the curriculum development process takes place.

Van Dyk, Nel, Loedolff & Haasbroek (1997:237-238) trace how the systems approach as applied to the teaching and learning situation arose out of the needs of the American armed forces. These needs led to the development of a number of models which all contained the following basic components:

- Defining needs.
- Stating instructional objectives.
- Developing courses of training.
- Evaluating and evaluating systems
- Implementation of instruction.

The impact of systems theory on this study will necessitate the exploration of curriculum viewed from a systems perspective and establish whether this perspective will address the needs of the Printing, Newspaper and Packaging Industries as well as the macro needs of the emerging National Qualification Framework model. Viewing curriculum from a systems perspective will also influence how the curriculum development process would occur and would need a systematic approach which would be congruent with the systems perspective.

1.2.4.2 THE IMPACT OF CURRENT THINKING ON CURRICULUM AND CURRICULUM DEVELOPMENT FOR THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

Of particular interest to the problem addressed in this study is the reference to creative work on the design of curricula. This implies that the concepts curriculum and curriculum development would need a more
creative interpretation but nevertheless should have sound didactic foundations. If one examines the didactic foundation of evaluation, the recognition of prior learning raises a number of issues such as: who is the target group, what is the situation of that target group and what method of evaluation will be used? In the Printing, Newspaper and Packaging Industries, many of the potential candidates for vocational education and training to a master craftsman level have a mixture of formal qualifications, certified and recognised competences as well as valuable on-the-job experience in which knowledge and skills have been informally acquired.

The initial situation of the potential learner for a master craftsman vocational education and training intervention is complicated by the fact that there exist 30 trades from which a learner could emerge. Although the Printing, Newspaper and Packaging Industries is viewed as a homogeneous industrial sector in the macro-economic environment, in reality the sector is heterogeneous in nature where niche markets, products and manufacturing processes are so divergent that the sector can be divided into a number of sub-sectors each of which has its own technology and unique manufacturing processes.

The Printing, Newspaper and Packaging Industries Sectorial Study Report (Printing, Newspaper and Packaging Industries, 1997:6) identifies the following distinct sub-sectors:

- **Commercial Printers**
  - This sub-sector is primarily involved in printing on paper as a substrate for the general market.

- **Newspapers**
  - This sub-sector is distinct in that newspaper publishing is very specific with a defined reader market and advertising mix.

- **Magazines**
  - The magazine sub-sector has become highly specialised and is a stand alone sub-sector.

- **Packaging**
  - Packaging as a sub-sector is so diverse that even within this sub-sector production process, technology and products are so distinct and unrelated to each other that they need a separate classification. The packaging sub-sector has thus been categorised as follows:
    - Sack and Bag Manufacturing.
    - Carton Manufacturing and Printing.
    - Flexible Packaging Manufacturing.
The problem associated with a curriculum for a master craftsman is thus complicated by the question of whether there should be specific curricula for the various sub-sectors or a generic curricula for the sector as a whole.

Vocational education and training curriculum for a specific job or profession should take cognisance of the environment in which the job or profession occurs. Feinberg (1983:32) felt that the rapid changes in technology in the printing industries was impacting on how companies operate and forcing them to update the content of the education and training courses for their workforce so that they can use the new technologies efficiently. Gaige (1984:16) also supported the view that the curriculum for printers should be able to change rapidly in response to technology changes. Previdi (1984:82) expanded on the view that not only should the printing curriculum be able to change rapidly but should incorporate a more hands-on approach where the vocational education and training occurred on-the-job. According to the Graphic Arts Technical Foundation (GATF, 1985:12-15) the printing and graphic arts industries are becoming more service orientated operating as adaptive systems where it was imperative that vocational education and training for the industries adapt to this systems orientation so as to be able to provide the skills training for the workforce.

The master craftsman job in the Printing, Newspaper and Packaging Industries would be influenced by the environment in which it occurs. Likewise the potential adult learner for master craftsman vocational education would enter the learning encounter within a specific situation. Being an adult the learning would occur in the andragogic didactic mode. Fraser, Loubser & Van Rooy (1993:11) indicate that the andragogic didactic situation, when applied to apprentices, involves a triad involving the trainer, the learner and the learning content in a mutually inclusive process. Superimposed on this didactic triad Fraser et al (1993:21) also refer to systems theory didactics and conclude that those who use system theory didactics view the didactic situation as a complex system. Curriculum and curriculum development fall within this complex system and the requirements imposed by the current debate on education and training in South Africa makes it essential that systems theory didactics is adopted so that all the nuances, combinations and permutations of producing creative curricula are catered for. The triad put forward for apprentices is equally applicable to the learner undergoing master craft vocational education and training. Using the model put forward by Fraser et al but expanding it for the specific purposes of this study, a modified version is shown in Figure 1.
Systems theory when applied to the field of didactics and incorporated in outcomes-based curriculum, creates complexities in curriculum development where all the components of the curriculum are interdependent of each other and ideally should be concentrated on in equal measure. In the andragogic didactic situation one of the cornerstones is the lecturer/trainer. In terms of viewing vocational education and training from a systems perspective and incorporating the outcomes-based competence model put forward for South Africa, the availability and ability of the lecture/trainer to deliver a vocational education and training curriculum for the master craftsman in the Printing, Newspaper and Packaging Industries is problematic simply because the master craft level has never existed in the industries.

Curriculum development as a process operating in the current vocational education and training milieu will be impacted on by the following factors:
• The learner target group.

• The availability and capacity of the lecturer/trainer to operate in the andragogic didactic situation in which the curriculum occurs.

• In the Printing, Newspaper and Packaging Industries, the rapid changes in technology and the concomitant knowledge requirements is well recorded and is an ongoing problem. For instance, the advent of desk top publishing in the early 1990's has resulted in a decline in the number of apprentices in the trade of photolithography and a rapid increase in the number of electronic origination apprentices (PNPIETB, 1996a:4-5).

• At the macro national level the requirements of the National Qualification Framework will impact on the master craftsman curriculum and curriculum development process.

• On the meso-level, curriculum development when applied to this study will revolve about whether the actual curriculum should address the Printing, Newspaper and Packaging Industries as a homogeneous economic sector only or operate at the micro-level where curriculum for specific sub-sectors of the industries is catered for.

• How the actual vocational education and training is to be delivered to the learner has its own logistical problems because of the diversity of the sector and has to be accommodated.

1.2.4.3 THE NATIONAL QUALIFICATION FRAMEWORK (NQF)

The inter-ministerial discussion document 'Life Long Learning through a National Qualification Framework' (Department of Education, 1996) deals explicitly with an outcomes-based education and training system (OBET). According to the discussion document and using the work of Spady, they define outcomes-based very specifically as:

'An outcome is in fact a **culminating** demonstration of the entire range of learning experiences and capabilities that underlie it. It occurs in a **performance context** that directly influences what it is and how it is carried out. These defining elements clearly tell us that an outcome is not simply the name of the learning content, or the name of a concept, or the name of a competence, or a grade or test **score**, but an **actual demonstration** in an **authentic context**'.

Furthermore the term "based" is defined as:

'Based means to define, direct, derive, determine, focus and organise what we do according to the substance and nature of the learning result that we want to happen at the end of the learning process'.

What the above implies is that an outcomes-based education and training system (OBET) operates from the premise that if we were to base learning on outcomes we would need to start with the end product, that is, the intended outcome and then work backwards to define, derive, develop and organise all the processes that are necessary to arrive at a specific curriculum. This process of designing down affects curriculum and impacts directly on curriculum development.

Outcomes in essence focus on what the learner will be able to do and describes the results of learning. Emphasis is placed on how learning is used and less about the arrangements for acquiring learning. The need for flexible allocation of time to learning is essential for an outcomes-based approach to learning. According to the discussion document on 'Lifelong Learning through a National Qualification Framework' (Department of Education, 1996:28) learning should in future be described in terms of inputs and outputs. Furthermore outcomes-based learning allows for curricula innovation since outcomes can be assessed in different ways. An innovative approach to curricula contrast to the traditional prescriptive and descriptive type where knowledge was seen as being stereotyped and gave rise to static forms of learning and hence encourage rote learning.

The mechanism put forward for the integration of education and training by the White Paper on Education and Training is the National Qualification Framework. The White Paper on Education and Training (Department of Education, 1995:26) also refers to the issue of curricula by stating that:

'new, flexible and appropriate curricula are needed that cut across traditional divisions of skills and knowledge, with standards defined in terms of learning outcomes and appropriate assessment practices'.

The White Paper on Education and Training (Department of Education, 1995: 26-28) in fact develops further the aim of settling the education-training dichotomy by implying that an integrated approach to education and training means:
• The traditional perception of how people learn, how learning is organised and what knowledge is, is outdated and would need to change. The content-based curriculum where knowledge equals content is no longer applicable but must be linked to skills and attitudes all of which contribute to competence as an outcome. Where learning takes place, is no longer an issue, moreover it can and should take place anywhere, anytime and of course through any means as long as it meets the national standards with a view to being meaningful and recognised by both education and training fraternities. Integrating education and training would seem to move away from a provider-led to a learner-led focus and with competence as an outcome.

• A wider participation in defining and developing standards within the National Qualification Framework will by its very nature involved all social parties in setting such standards. This in many ways breaks down the isolationist's stance of academia and training, and facilitates integration which in no small measure resolves the education and training dichotomy.

This creative work on the National Qualification Framework is aligned to the entire process of establishing a model in which outcomes are paramount. Within the emerging NQF model and in line with the abovementioned requirements, integral and perhaps the king pin to achieving the vision of the National Training Strategy is the role of standard setting through National Standards Bodies (NSB’s). This function of standard setting and the establishment of NSB’s through the South African Qualifications Authority (SAQA) gives life to the National Qualification Framework.

The role of the National Standards Bodies (NSB’s), in essence, is to set national standards which will ensure portability and a progression of credits and qualifications within the National Qualification Framework. How the standard setting process will take place has not been articulated but the indications are that whatever the process is it would need to be an inclusive process involving all the stakeholders. The importance of standard setting cannot be overemphasised since the process is the starting point for an outcomes-based education and training system and as such will impact heavily on the didactic activities during the learner-teacher interaction.

The National Training Strategy report (see 1.2.4.1) had a vision which was underpinned by 12 principles. These principles when reviewed in juxtaposition to a standard setting process will have a great influence on curriculum and curriculum development. The principles are very neatly categorised by the Metal and Engineering Industries Education and Training Board (MEIETB) in the Proposed NTB Engineering and Manufacturing Processes Pilot Project and are as follows:
<table>
<thead>
<tr>
<th>Principle</th>
<th>Explanation: Education and Training Should</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration</td>
<td>form part of a system of human resources development which provides for the establishment of an integrated approach to education and training which is expressed in terms of nationally acceptable qualification.</td>
</tr>
<tr>
<td>Relevance</td>
<td>be and remain relevant to national development needs; industry and service sector needs; regional, local and community needs; individual development needs and needs relating to the advancement of knowledge, science and technology.</td>
</tr>
<tr>
<td>Credibility</td>
<td>have international credibility and credibility for industry and service sectors, providers and learners in its ability to achieve the nationally agreed aims for education and training. These aims should be consistent with economic and social development priorities.</td>
</tr>
<tr>
<td>Coherence and flexibility</td>
<td>adhere to a coherent framework of principles and certification which may be established at national level, but should permit the flexibility of interpretation required to meet the needs of industry and service sectors, providers and learners.</td>
</tr>
<tr>
<td>Standards</td>
<td>be expressed in terms of nationally agreed framework and nationally and internationally accepted outcomes which in turn will be separately defined.</td>
</tr>
<tr>
<td>Legitimacy</td>
<td>provide for the participation in planning and co-ordination of all significant stakeholders to ensure transparency.</td>
</tr>
<tr>
<td>Access</td>
<td>access to appropriate levels of education and training should be provided for all prospective learners in a manner which facilitates progression.</td>
</tr>
<tr>
<td>Articulation</td>
<td>provide for learners, on successful completion of accredited prerequisites, to move between components of the delivery system.</td>
</tr>
<tr>
<td>Progression</td>
<td>ensure that the framework of qualifications permits individuals to progress through the levels of national qualifications via different appropriate combinations of the components of the delivery system.</td>
</tr>
<tr>
<td>Portability</td>
<td>provide for learners to transfer their credits or qualifications from one learning institution and/or employer to another.</td>
</tr>
</tbody>
</table>
Recognition of prior learning through assessment give credit to prior learning obtained through formal, non-formal and informal learning and/or experience.

Guidance of learners provide for the guidance of learners by persons who meet nationally recognised standards for educators and trainers.'

(MEIETB, 1995: 4).

The National Qualification Framework in its conception embodies the above principles and some clarity in terms of definitions of concepts is needed. Definitions have crystallised and are articulated in the Discussion Document on 'Lifelong Learning through a National Qualification Framework' (Department of Education, 1996: 15-18). The definitions are pertinent to the direction and interpretation of Vocational Education and Training in South Africa and as such, they are essential to the understanding of the nature of the problem of curriculum development of the master craftsman in the Printing, Newspaper and Packaging Industries of South Africa.

The definitions put forward are:

- **The National Qualifications Framework (NQF)** is a framework for providing lifelong learning opportunities utilising nationally recognised levels.

- **Outcomes** are the results of a learning process whether formal, non-formal or informal. In outcomes-based education and training, curriculum developers work backwards from agreed desired outcomes within a particular context which clearly state what the learner should be able to demonstrate an understanding of and ability to apply appropriately. Programmes of learning are then designed to help the learners to achieve these outcomes. Outcomes are of two types: essential and specific.

- **Essential outcomes** are cross-curricular, broad generic outcomes that inform teaching and learning.

- **Specific outcomes** are contextually demonstrated knowledge, skills and values, reflecting essential outcomes.

- **Competence** involves the capacity for continuing performance within specified ranges and contexts resulting from the integration of a number of specific outcomes. The recognition of competence in this sense is the award of a qualification (eg. a learner’s Adult Basic Education and Training (ABET) level 3 of General Education and Training Certificate testifies to competence in that subject at that level).
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit standards</td>
<td>are nationally agreed and internationally comparable statements of specific outcomes and their associated performance/assessment criteria together with administrative and other necessary information. Unit standards are registered on the NQF at a defined level.</td>
</tr>
<tr>
<td>Credit</td>
<td>is the recognition that a learner has achieved a unit standard. Credits may be accumulated until conditions have been met for the award of a qualification.</td>
</tr>
<tr>
<td>Levels</td>
<td>are the positions on the NQF where national unit standards are registered and qualifications awarded. Eight levels are proposed for the NQF. They are arranged to signal increasing complexity in learning and to facilitate meaningful progression routes along career and learning pathways.</td>
</tr>
<tr>
<td>Bands</td>
<td>on the NQF three broader groupings of levels which have distinct characteristics similar to the notions of primary, secondary and tertiary, but integrating education and training.</td>
</tr>
<tr>
<td>Phases</td>
<td>within compulsory education represent developmental phases which are distinguished in order to accommodate the different learning needs of children at different stages of development.</td>
</tr>
<tr>
<td>Level descriptors</td>
<td>are statements which reflect desired achievements in terms of essential outcomes for each level of the NQF. They help designers of unit standards and designers of programmes of learning to achieve consistency in terms of the levels of complexity expected in each field of learning at the defined eight levels.</td>
</tr>
<tr>
<td>Rules of combination</td>
<td>set out how many credits from various categories or fields must be accumulated in order to award a particular qualification.</td>
</tr>
<tr>
<td>Assessment</td>
<td>consists of a task or series of tasks set in order to obtain information about a learner's competence. These tasks can be workplace/coursework/classroom/homework/project based or they can be set in an examination paper.</td>
</tr>
<tr>
<td>Evaluation</td>
<td>is the process whereby the information obtained through assessment is interpreted to make judgements about a learner's competence.</td>
</tr>
<tr>
<td>Assessment criteria</td>
<td>are the criteria attached to an assessment task designed to determine the achievement of specific outcomes.</td>
</tr>
</tbody>
</table>
Performance criteria are criteria by which the learner may demonstrate the achievement of specific outcomes.

Credit value is the value assigned to unit standards in order to facilitate comparisons between them, rules of combination for qualifications, and credit accumulation for learners.

Systemic evaluation is a process whereby an education and training system, (national, provincial, local) or an aspect of it is assessed and evaluated. This process may also be used to evaluate institutions, courses or particular policy inputs. It may be a routine event, repeated on a cycle (eg. quality audit by ETQAs every four years), or it may be commissioned for a specific purpose (improving the performance of girls in technology).

Education, training and development practitioners (ETDP) is a term used in this document to include the whole spectrum of educators and trainers: teachers, trainers, facilitators, tutors, markers, lecturers, development officers, etc., including those qualified only by their experience.

External assessment is an assessment (often in the form of an examination) designed, set and marked by a body which is separate from the organisation which delivers the learning programme. This function will be the responsibility of Education and Training Quality Assurers (ETQAs) or bodies accredited by ETQAs.

Internal assessment is administered and marked by ETD practitioners. It may be designed by teachers or trainers themselves, or follow guidelines produced by the national or provincial authorities. This will be monitored by ETQAs.

Moderation samples and compares assessment to ensure that ETD practitioners are assessing work according to agreed standards, and that there is consistency from year to year, and within districts, provinces and nationally. At higher levels international consistency is also sought.

A curriculum framework sets out the philosophical and organisational framework for a specific curriculum. Curriculum includes all aspects of teaching and learning.

Learning programmes consist of courses, modules or units of learning (learning materials combined with a methodology) by which learners can achieve agreed learning outcomes spelt out in unit standards.'

(Department of Education, 1996: 15-17).
An important point that can be made from the above definitions are that outcomes are described as essential or specific. Essential outcomes described as cross-curricula implies that they are broad generic in nature and are in many ways like core skills. According to Jessup (1991:27) core skills are not necessarily competences, however, they do underpin knowledge and skills in a job context and indirectly contribute to job competence.

The Guide to National Qualifications of the National Council for Vocational Qualifications (NCVQ) identify some essential core skills necessary in a job related context namely problem solving, communication and interpersonal skills. They also recognise that in certain job contexts additional core skills such as advanced literacy, numeracy, modern language usage and the ability to use modern information technology may be essential (NCVQ, 1991:10).

Specific outcomes are described as contextually demonstrated knowledge, skills and values and as such when viewed from a job context are essentially the performance outcomes of a position, job or profession. Both essential outcomes and specific outcomes as defined, will impact on curriculum and curriculum design and will create a challenge yet add to the problem of curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries.

1.2.5 THE POSITION VS PURPOSE DICHOTOMY AND THE NEED FOR COMPETENCE

Superimposed on this outcomes-based education and training debate is that of the expression of the outcomes in terms of competence and to identify the qualification that is achieved at the end of the process. The Concise Oxford Dictionary defines a qualification as 'an accomplishment fitting a person for a position or purpose' (The Concise Oxford Dictionary, 1990:977). Furthermore qualify is defined to 'make competent or fit for a position or purpose.' Position is defined as 'a place occupied by a person or thing' (The Concise Oxford Dictionary, 1990:929). Purpose on the other hand is defined as 'an object to be attained; a thing attained' (The Concise Oxford Dictionary, 1990:971).

The above definitions allude to a dichotomy which in reality does exist. The Human Sciences Research Council (HSRC) referred to this debate in their publication, 'Ways of Seeing the National Qualification Framework' (HSRC, 1995) and sited an example from the Australian National Board of Employment, Education and Training which quoted John Wolley who as far back as 1862 stated that a university is said to be twofold namely a school of liberal and general knowledge and a collection of special schools devoted to specific professions (HSRC, 1995:57).
This dichotomy of purpose, the learning to learn, and position, the learning to do is not resolved and is a subject of ongoing debate, however, both are intimately linked to how one describes performance. The question of competence enters the equation and it is interesting to note that the current thinking in South Africa is that the learner should at the end of the learning process display some form of competence, nationally recognised through the mechanism of the National Qualification Framework (NQF). The essential outcomes, in the writer's opinion, results from 'learning to learn', whilst the specific outcomes result from 'learning to do'.

According to the Human Sciences Research Council (HSRC, 1995:3), a competency-based approach to learning has outcomes that are explicit and measurable. Behaviour is measured against specific performance standards. It is conceded that not all outcomes are observable and measurable, this is because of the rapid changes in how work is performed, flexibility is seen as an essential competence, it is difficult to measure but is necessary for people in the world of work. Interestingly competence is also seen as consisting of four components (HSRC, 1995:40):

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task skills</td>
<td>are those skills identified as part of a specific job which have a distinct measurable outcome.</td>
</tr>
<tr>
<td>Task management skills</td>
<td>identified as planning in its widest senses where prioritising tasks, combining tasks and dealing with the specific demands of each task and the responsibilities related to a specific job are all components of planning.</td>
</tr>
<tr>
<td>Contingency management skills</td>
<td>are those skills deemed necessary to deal with unforseen, non routine and unpredictable events that may occur in the work situation.</td>
</tr>
<tr>
<td>Skills necessary to deal with role/job environment</td>
<td>are those skills which enable a person to perform his/her job competently in an unpredictable environment which may place constraints on the role or job.</td>
</tr>
</tbody>
</table>

The above four-part description is seen to contain implicit assumptions about change, where prioritising, risk assessment, judgement, decision making and flexibility are integral to competent performance of tasks.

According to Thomas (1994:101) a competent worker in the Printing, Newspaper and Packaging Industries of South Africa displays the following attributes:

1. Being in a state of adaptive fitness and ready to respond to the demands placed on them by their environment.
2. Having cores skills which enhance the transfer of competence between different contexts and occupations.

3. Have the necessary task skills demanded by the job.

4. Have the skills to identify and deal with changes and irregularities in the working situation.

5. Have the skills and ability to manage a group of tasks, to organise them and prioritise them effectively.

6. Have the interpersonal skills necessary to work with other people and cope with the world of work and the wider expectations in this world of work.'

This broad understanding of competence has implications for developing an outcomes-based curriculum for the master craftsman and will impact on the curriculum development process. It will also influence how the didactic activities take place. When cognisance is taken of all the current developments in education and training in South Africa a more dynamic and complex curriculum development process should emerge for developing a master craftsman curriculum.

1.2.6 SYSTEMS THEORY AND THE CURRICULUM

Fraser et al (1993:21-22) examines systems theory didactics and identify the interaction between specific elements of the didactic situation and explain the concept by presenting a systems theory didactic model as postulated by De Corte. This model is represented in Figure 2.

![Figure 2: A Systems Theory Didactic Model](image)
Expanding further on the systems approach and relating it to curriculum, Fraser et al (1993:89-102) clearly show that there is an interdependent relationship between the various components of the curriculum. They take pains to stress that a one-sided emphasis on a component is dangerous since all components influence each other. The components of the curriculum that they identify are the situation analysis, the aims, the selection and organisation of learning content, the teaching-learning opportunities, experiences and activities and evaluation. A model of the interrelationship between the components of the curriculum by Fraser et al (1993:102) is shown in Figure 3.

Figure 3: Model of the Interrelation of Components of the Curriculum (Fraser et al, 1993:102)
With the current South African debate on qualifications as an outcome of creative curricula, emphasis is placed on outcome which is a product of the curriculum and determined by the evaluation component of the curriculum. A change in one component of the curriculum affects all the others because of their interdependence. Thus the process of curriculum development which is to plan, design, implement and evaluate a functional curriculum could have as its starting point the desired end result, that is, competence proven through a meaningful evaluation sub-system. In essence the quantitative and qualitative parameters established for the evaluation of competence lend themselves to identifying a competence profile and working backwards to the aim, situation analysis, selection and organising learning content and all the other components of the curriculum.

Using the model in Figure 3 and examining the situation analysis component of the system, a factor to consider is the potential target group of learners for the master craft level. On a situation analysis of this potential target group, certain complexities exist. Some of the target group attained their artisanship by means of the present Competency Based Modular Training System which was first introduced in January 1992 and according to the data base of the PNPIETB as of January 1997, 440 have attained craft level artisanship via this training system. This represents only 5.7% of the present artisan population. Prior to 1992, a time based training system was used for artisan training. According to the National Industrial Council’s Conditions of Apprenticeship in the Printing and Newspaper Industry (NIC, 1986:3) voluntary trade tests could be undertaken provided that certain conditions relating to specific groups of candidates were applied, such as various levels of education and specified minimum times for practical training. As can be seen from Figure 4 an apprentice could pass a trade test and become an artisan with differing vocational education and training levels.

Compulsory trade testing was also enforced and unfortunately passing the trade test was not the only means of attaining artisanship, which could and was also attained merely because of effluxion of time after a contract of apprenticeship had been in operation for the maximum period of four years. Passing a trade test resulted in being awarded a Trade Diploma, attaining artisan status by effluxion of time precluded an apprentice from being awarded a Trade Diploma but he/she was recognised as an artisan and is now a de-facto part of the artisan population of the sector today.

The diversity of the sector in terms of its sub-sectors and niche markets create problems which are unique and potentially difficult to overcome. The morning newspapers require artisans to work night shift, some commercial printers, magazine manufacturers and corrugated packaging producers run a three-shift system. How vocational education and training is to be provided under these circumstances is problematic.
<table>
<thead>
<tr>
<th>Educational Qualifications attained prior to or during apprenticeship</th>
<th>Test may be taken voluntarily after the specified period of employment, i.e. apprenticeship contract period</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GROUP A</strong></td>
<td></td>
</tr>
<tr>
<td>(i) Standard 9 Certificate, with Mathematics as a subject of success.</td>
<td>After 3½ years of Apprenticeship.</td>
</tr>
<tr>
<td>(iii) Printers’ Trade Theory Certificate, Part II.</td>
<td></td>
</tr>
<tr>
<td><strong>GROUP B</strong></td>
<td></td>
</tr>
<tr>
<td>(i) Standard 10 Certificate, with Mathematics as a subject of success.</td>
<td>After 3½ years of Apprenticeship.</td>
</tr>
<tr>
<td>(ii) Printers’ Trade Theory Certificate, Part III.</td>
<td></td>
</tr>
<tr>
<td><strong>GROUP C</strong></td>
<td></td>
</tr>
<tr>
<td>(i) National Technical Certificate, Part I (N1).</td>
<td>After 3½ years of Apprenticeship.</td>
</tr>
<tr>
<td>(ii) National Printers’ Certificate, Part I.</td>
<td></td>
</tr>
<tr>
<td><strong>GROUP D</strong></td>
<td></td>
</tr>
<tr>
<td>(i) Standard 8 Certificate (Technical Field of Study), with Workshop Practice as a subject of success.</td>
<td>After 3 years of Apprenticeship.</td>
</tr>
<tr>
<td>(ii) National Technical Certificate, Part II (N2).</td>
<td></td>
</tr>
<tr>
<td>(iii) National Printers’ Certificate, Part II.</td>
<td></td>
</tr>
<tr>
<td><strong>GROUP E</strong></td>
<td></td>
</tr>
<tr>
<td>(i) Standard 10 Certificate (Technical Field of Study), without Workshop Practice as a subject of success.</td>
<td>After 2½ years of Apprenticeship</td>
</tr>
<tr>
<td>(ii) National Technical Certificate, Part III (N3) with 3 subjects.</td>
<td></td>
</tr>
<tr>
<td>(iii) National Printers’ Certificate, Part III with 3 subjects.</td>
<td></td>
</tr>
<tr>
<td><strong>GROUP F</strong></td>
<td></td>
</tr>
<tr>
<td>(i) Standard 10 Certificate (Technical Field of Study), with Workshop Practice as a subject of success.</td>
<td>After 2½ years of Apprenticeship.</td>
</tr>
<tr>
<td>(ii) National Technical Certificate, Part III (N3) with 4 subjects.</td>
<td></td>
</tr>
<tr>
<td>(iii) National Printers’ Certificate, Part III with 4 subjects.</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4: Trade Test readiness based on educational qualification and period of Apprenticeship
1.2.7 THE ACCEPTED TRAINING SYSTEM WITHIN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

The Printing, Newspaper and Packaging Industries have a Competency Based Modular Training (CBMT) system for artisan training. The definitive design model of the Competency Based Modular Training System by Thomas (1994:188) visualises the system having the necessary inputs conversions and outputs and includes:

- Training needs analysis.
- The aims and objectives of training.
- The learner initial situation.
- A code of practice for training within the industry.
- A pre-interactive phase which includes training course analysis, design and evaluation as well as resource evaluation, trainer training and external evaluator training.
- The interactive phase where the didactic andragogic situation takes place.
- Training outcomes in terms of competency to an industry standard.

The Printing, Newspaper and Packaging Industries have invested extensive resources in developing their Competency Based Modular Training system (CBMT) and have now extended the use of the CBMT system to include non-artisan vocational education and training as well. The CBMT system within the industries has a refined administration and management system which makes extensive use of a main frame computer to generate comprehensive information about the education and training taking place in the industries. This information system includes the progress and monitoring of learners, the accreditation status of provider companies and the entire CBMT evaluation system.

The delivery methods of the CBMT system are entrenched within the industries and have produced the skills that the industries require. Many of the potential learner target group for the master craftsman curriculum are familiar and confident with the CBMT system. It thus makes good sense for the master craftsman curriculum to adopt the important aspects of the CBMT system currently in use in the industries.
Extensive changes will, however, be needed because the present system does not address the following:

- Although job competences, skills and knowledge related to job tasks are benchmarked internationally, the present CBMT training system for artisan training has not as yet been articulated into the emerging National Qualification Framework although draft standards have been developed for the crafts in the industries.

- The determination of what fundamental and core skills are and whether they are of a generic nature or not, and what they would be for each qualification level has not taken place.

- The format and terminology of describing outcome standards are still in the development stage. The various structures for generating industry or sector standards are still being created and as of January 1998 the nominations for the twelve National Standards Bodies have not been finalised. Naturally the operating criteria for Standards Generating Bodies has not been formalised nor details of how they will be implemented.

1.2.8 SYNTHESIS OF THE PROBLEM

The Printing, Newspaper and Packaging Industries of South Africa have identified the need for a master craftsman level. The master craftsman has been identified at a level beyond that of an artisan. What has, however, not been articulated is the actual job the master craftsman is to do in the industries nor the output competencies expected from the master craftsman.

No competence profile of the master craftsman exists nor have any specific competencies being identified. The notion of the master craftsman being the custodian of the craft and the point of reference for the introduction of new technology does not shed much light on the role and functions of the job. What is evident is that the Printing, Newspaper and Packaging Industries understand that some form of vocational education and training program is necessary. Unfortunately the concepts curriculum and curriculum development are confused and ill-defined within the industries. Curriculum development of necessity requires careful planning and should be mindful of being based on established theory and good practice as well as being didactically sound. It should also take cognisance of the milieu in which the process takes place. The current debate on education and training in South Africa will have a profound effect on any vocational education and training intervention contemplated and will influence how curriculum is defined which in turn will influence the process of curriculum development and have an impact on all the associated didactic activities.
To develop a curriculum for the master craftsman in the Printing, Newspaper and Packaging Industries of South Africa in relation to the current debate in South Africa on education and training one would need to address the following:

- Where does the master craftsman qualification fall within the National Qualification Framework?
- What are the outcome standards applicable to a master craftsman and how would the standards relate to the National Qualification Framework?
- What are the international standard benchmarks for the master craftsman in the Printing, Newspaper and Packaging Industries?
- To identify and categorise outcomes in the light of the suggested grouping of essential outcomes and specific outcomes.
- The whole question of position versus purpose and competence needs to be addressed in the establishment of a suitable curriculum through a structured curriculum development process for the master craftsman in the Printing, Newspaper and Packaging Industries.
- An overriding consideration in curriculum development of the master craftsman in the Printing, Newspaper and Packaging Industries is the milieu in which the process will take place, a more creative approach is needed so as to satisfy the demands now being made by the current approaches to education and training at the macro level in South Africa.
- The development of a curriculum for the master craftsman must also consider how the actual education and training is to take place in the world of work in which the learner operates.

Considering the diversity of the Printing, Newspaper and Packaging sector and considering the potential target group for vocational education and training for the master craft level, a number of vexing problems arise which will have to be addressed such as a generic master craftsman curriculum or a number of specific curricula for identified sub-sectors.

1.3 STATEMENT OF THE PROBLEM

Curriculum development in the Printing, Newspaper and Packaging Industries is problematic especially for the master craftsman. The industries have not articulated what a master craftsman is nor the job outcomes expected from the position. Furthermore, no competency profile exists for the master craftsman other than the fact that there is a notion that the master craftsman is the custodian of the craft of printing and the point of entry for new technology. The target learner group for master craft vocational education and training are diverse with a wide range of acquired knowledge and skills operating in a dynamic world of work in a seemingly homogeneous economic industrial sector but with distinct sub-sectors and niche markets. The
vocational education and training for the master craftsman can only take place in the andragogic didactic mode and this factor creates its own unique problems in delivery of a didactically sound vocational education and training intervention within the industries. This requires an investigation into, and the development of, a curriculum development model for the master craftsman in the industries that is didactically sound and meets the generic education and training needs of the industries.

1.4 ANALYSIS OF THE PROBLEM

The problem of developing a curriculum for the master craftsman in the Printing, Newspaper and Packaging Industries has many facets.

- The Printing, Newspaper and Packaging Industries has not articulated what the job of a master craftsman is and has only a vague notion of the master craftsman as being the custodian of the craft of printing and the point of introduction for new technology.
- Coupled to the above and related to the needs for a competency-based approach to vocational education and training no competency profile exists for the master craftsman.
- An outcomes-based education and training system in line with the current thinking in South Africa, which takes cognisance of the National Qualification Framework creates new dimensions which have to be accommodated in the curriculum development process and be reflected in the curriculum.
- Using outcome standards via a standard setting process as a starting point in curriculum development centres about the problem of what the standard setting process is and how to implement it.
- The idea of curriculum development being an up-down process with outcomes as a starting point moves away from content-based curricula and as such will have a dramatic effect on syllabi and the entire andragogic didactic situation in which learning takes place.
- Adopting an outcomes-based education and training system and applying it to curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries is a paradigm shift to a more creative curriculum development process. As has been stated it is an up-down process where the starting point is the defined competence at a particular level.

Notwithstanding the above it is important to ensure that any envisaged curriculum for the master craftsman falls in line with the existing vocational education and training system in the Printing, Newspaper and Packaging Industries.
1.5 AIMS OF THE STUDY

The aim of this study is to develop a curriculum for the vocational education and training of the master craftsman in the Printing, Newspaper and Packaging Industries of South Africa which is didactically sound, meets the needs of the industry and is outcomes-based.

In the process of developing the curriculum for the master craftsman, the further objectives of the study will be to:

1. Identify the parameters of curriculum from a systems perspective and establish a suitable curriculum development model for use in developing the curriculum for the master craftsman in the Printing, Newspaper and Packaging Industries.
2. Developing a comprehensive competency profile for the master craftsman in which competency is seen in its broadest sense. During this process an investigation will establish whether a master craftsman curriculum for the entire Printing, Newspaper and Packaging economic sector is desirable or whether specific curriculum should be developed for the various sub-sectors.
3. Finding a suitable process for standard setting of units of learning for accreditation with the South African Qualifications Authority (SAQA) and which are consistent with the model proposed in the emerging National Qualification Framework so that the master craftsman trained in the industries will have a qualification that is nationally recognised.
4. Benchmark the standards for the master craftsman training internationally by means of the dual certification agreement between the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) and City and Guilds of London Institute (CGLI). This benchmarking will facilitate the continuity of a qualification award system which enjoys recognition in 85 countries of the world and enables greater worker mobility for the employees in the industries.
5. Develop a curriculum for the master craftsman which is outcomes-based and in line with the proposed integrated education and training system for South Africa.
6. Establishing didactic criteria to ensure that the curricula for the master craftsman is well founded, didactically sound and is systems bound.
7. Developing the institutional arrangements, structures and governance for the implementation of the curriculum in the world of work.
8. Evaluating the effectiveness of the curriculum by means of a pilot programme which will form part of an ongoing curriculum improvement research project.
1.6 CLARIFICATION OF TERMS

1.6.1 CURRICULUM AND CURRICULUM DEVELOPMENT

In order to arrive at an appropriate working definition of curriculum for the purposes of this study it is necessary to explore the concept curriculum within the specific needs of this study. Zais (1976:6-11) in discussing what curriculum is concludes that there are many interpretations of the concept curriculum and in most cases the end purpose that is desired actually influences how one defines curriculum. Adopting this approach of identifying the purpose for which the master craftsman curriculum is intended makes good senses and the point of departure is thus that the master craftsman curriculum when implemented should result in a cadre of competent master craftsman in the Printing, Newspaper and Packaging Industries.

The preferred Competency Based Modular Training System of the industries (see 1.2.7) is mastery learning and as such falls within the technological curriculum field. McNeil (1990:51) when discussing the technological approach to curriculum states that:

' Technology as a curriculum perspective focuses on the effectiveness of programmes, methods and materials in the achievement of specified ends or purposes.'

Within the technological curriculum McNeil (1990:53) discusses systems technology where the emphasis is placed on the actual specifications of learning outcomes against specific performance criteria within a directed controlled environment aimed at achieving the specified objectives. Curriculum in the context of this study would need to be inclusive of a systems perspective and justify the end purpose it is intended for and would thus have to be inclusive of all the components that make-up curriculum.

For the purpose of this study therefore curriculum is defined as follows:

' The curriculum is the interrelated totality of aims, learning content, evaluation procedures and teaching – learning activities, opportunities and expenses which guide and implement the didactic activities in a planned justified manner.' (Fraser et al, 1993:92).

Curriculum development in the light of the above definition of curriculum would need to be viewed as a process which is all inclusive of the components of the curriculum and is defined as follows for the purpose of this study:

' All the processes to plan, design, implement and evaluate a functional curriculum.' (Fraser et al 1993:210).
1.6.2 THE MASTER CRAFTSMAN

The master craftsman's job in the Printing, Newspaper and Packaging Industries is viewed as a specific post above that of an artisan and demands skills and competencies beyond those of an artisan. The artisan who through a vocational education and training intervention is being developed as a master craftsman for the purposes of this study, is a learner involved in the andragogic didactic situation.

1.6.3 THE DEFINITION OF THE INDUSTRIES

In order to establish the parameters in which this study was undertaken it is necessary to define the Printing, Newspaper and Packaging Industries in South Africa. In terms of Section 39 (5) of the Manpower Training Act, Act No. 56 of 1981 the definition of the industry is stated as:

'Printing, Newspaper and Packaging Industries or Industry means the industry in the broadest sense in which employers and their employees are associated for the purposes of producing printer matter and/or for the packaging of any nature whatsoever, and includes work commonly known as sub-contract work, reproduction houses and the like.' (RSA, 1981).

From the above definition one will note that the word 'Industry' and 'Industries' both collectively mean Printing, Newspaper and Packaging. This misnomer of using either the singular or plural is common practice within the industries to describe the three distinct but interrelated industries sub-sectors.

The industries as defined will for the purposes of this study constitute the andragogic didactic environment in which curriculum development will take place and in which the master craftsman curriculum will be implemented.

1.7 PROGRAMME OF STUDY OF THE THESIS

1.7.1 A SYSTEMS PERSPECTIVE OF CURRICULUM AND CURRICULUM DEVELOPMENT

In chapter 2 by means of literary surveys and reference to the present practices for vocational education and training in the Printing, Newspaper and Packaging Industries, the curriculum from a systems perspective will be investigated so as to establish a suitable curriculum development model for the master craftsman in the industries.

1.7.2 COMPETENCY PROFILING OF THE MASTER CRAFTSMAN

In chapter 3 by means of empirical research and literature surveys, competency profiling methods will be analysed and evaluated for their suitability for use in the Printing, Newspaper and Packaging Industries.
By using a suitable competency profile method or, developing a synthetic tailor-made method, the competency profile of the master craftsman in the Printing, Newspaper and Packaging Industries will be developed. It is envisaged that surveys, ideographic techniques and questionnaires will be necessary to identify what the industries perceive the job, functions and tasks of the master craftsman are. Moreover it will be necessary to determine by similar techniques what competency outcomes the industries expect from the master craftsman.

In chapter 4 the identified competencies will be clustered in groups so as to arrive at a taxonomy of competencies, skills, knowledge and attributes that are seen as being crucial for job success. The clustering of groups of competences will be in a taxonomy which encompass the Printing, Newspaper and Packaging Industries currently understanding and view of competency in its broadest sense.

1.7.3 STANDARD SETTING FOR THE UNITS OF LEARNING OF THE MASTER CRAFTSMAN CURRICULUM

In chapter 5 the all important standard setting process will be investigated. This will be achieved by means of empirical research and literature studies on standard setting methodology. The methodologies will be analysed and evaluated with a view to their suitability for the requirements of this study. A generic standard setting process flow chart will be developed.

In order to facilitate the above requirements it is intended to use an adaptation of the Project Cycle Management (PCM) system for the field of vocational education and training which entails questionnaires, conferences, workshops and comparative studies as the research techniques.

1.7.4 INTERNATIONAL BENCHMARKING OF OUTCOME STANDARDS FOR THE MASTER CRAFTSMAN

Outcome standards for the master craftsman in the Printing, Newspaper and Packaging Industries of South Africa would need to be evaluated against international standards. In chapter 5 by means of literature surveys, international networking and overseas visits the proposed outcome standards and curricula for the master craftsman in the Printing, Newspaper and Packaging Industries will be categorised and the appropriate international benchmarking mechanism will be established.
1.7.5 DEVELOPMENT OF AN OUTCOMES-BASED CURRICULUM FOR THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

In chapter 6 using empirical research, surveys and a literature study the development of a curriculum for the master craftsman with regards the initial situation of the learner, the work situation, the aims and objectives of the curriculum and course content search and evaluation will be undertaken.

In chapter 7 the structure of the courses of study for the master craftsman curriculum founded on sound didactic principles and competency modular based vocational education and training system will be developed as well as the teaching and training methods to be used for the Master Craftsman Programme: Chapter 7 will also examine the Evaluation System for the Master Craftsman Programme.

1.7.6 IMPLEMENTATION OF THE CURRICULUM FOR THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

The development of a programme of study of a vocational education and training nature for the master craftsman must have high utility value and be capable of being implemented.

Chapter 8 will propose how the curriculum for the master craftsman is to be adopted and implemented within the Printing, Newspaper and Packaging Industries.

1.7.7 CONCLUSIONS AND RECOMMENDATIONS

Chapter 9 will review the factors leading to the study, analyse and interpret the study findings, draw conclusions and make recommendations regarding the master craftsman curriculum development process as well as how the curriculum package can be implemented in the Printing, Newspaper and Packaging Industries.
CHAPTER 2: CURRICULUM AND CURRICULUM DEVELOPMENT FOR THE MASTER CRAFTSMAN

2.1 INTRODUCTION

Curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries is centred about addressing a specific need for an industrial sector which operates in a dynamic highly competitive environment. The curriculum for the master craftsman should take cognisance of the dynamics that are at play and enable the learner, an adult operating in the world of work, to master the learning content. For this to occur, curriculum and curriculum development as fields of study need to be explored and evaluated so that a suitable conceptual framework and possible model can be referred to, or used for developing a curriculum for the master craftsman that meets the needs of the Printing, Newspaper and Packaging Industries.

Marsh & Willis (1995:9) suggest that before one attempts to discuss curriculum three specific distinctions must be considered:

(1) Curriculum subsumes the term syllabus and course of study.

(2) Any curriculum must of necessity involve some conscious and systematic planning.

(3) It is not necessary, nor is it desirable to separate curriculum from instruction.

These distinctions by implication support the interrelationship of components of the curriculum. Marsh et al (1995:9) acknowledge that many writers contend that a curriculum should consist of well-structured series of intended learning outcomes in which instruction, in whatever form, is the means by which the intended learning outcomes are achieved. The actual process of curriculum planning and development is not regarded as inherently technical and by implication the systems approach is also not inherently technical.

The nature of the curriculum for the master craftsman which needs to be developed should be pragmatic and not esoteric since it is to be implemented in the world of work where job outcomes are usually clear and unambiguous and where instruction and learning would occur in diverse organisations and environments.
2.2 FURTHER THOUGHTS ON CURRICULUM

A more in-depth exploration of the concept curriculum is necessary in a study of this nature so that despite the pragmatic requirements for the master craftsman curriculum it should be contextualised and have a sound theoretical base. Husén & Postlethwaite (1994a:1263) describes the field of curriculum as representing a diverse divided and fractionated group of scholars who are exploring a very scattered and ill-defined territory. Conceptual confusion seems to be the norm which is further complicated by the fact that each inquirer has different things and images in mind of what they mean by 'curriculum'.

Tanner & Tanner (1995:187) list how various writers and scholars view and describe curriculum. Some examples are:

- The cumulative tradition of all organised knowledge.
- The course of study or the actual instructional plan.
- The technological production systems where instructional outcomes are evaluated.
- Classical cultural reproduction.
- The selection of knowledge/organisation from the culture in question.
- Actual modes of thought.
- Planned learning environment/guided living.

Moreover each of the above taken in isolation could reflect a particular perspective pertinent at the time yet fails to give the full meaning of curriculum. Tanner & Tanner (1995:187-188) furthermore acknowledge that because there are so many conflicting schools of thought it is highly unlikely that a universally accepted definition can be reached. D'Haunaut (1981:81) noted that at that time there were twenty-seven different ways of describing or characterising the word curriculum and advocated that if an attempt was made to define curriculum it should be in the broadest sense possible. His tentative definition is:

'A curriculum is an educational project defining:

(a) the aims, goals and objectives of an educational action;
(b) the ways, means and activities employed to achieve these goals; and
(c) the methods and instruments required to evaluate the success of the action.'
D’Haunaut furthermore points out that the term project used in the definition must be seen to include both a design and a plan. Perhaps to highlight the contrasts in definitions the tentative definition for curriculum put forward by Tanner & Tanner (1995:189) is as follows:

'\text{that reconstruction of knowledge and experience that enables the learner to grow in exercising intelligent control of subsequent knowledge and experience.}'

D’Haunaut’s definition is in essence usable for this study in that the curriculum for the master craftsman in the Printing, Newspaper and Packaging Industries requires both design and a plan and would of necessity include the aims, learning content, evaluation, instructional and learning strategies and opportunities necessary for the learner in the andragogic didactic situation.

It is interesting to note that Combleth (1990:31) states that education systems in which curriculum and curricula take place tend to be open systems and thus the context of curriculum is not necessarily solely structural. Educational systems are sensitive to environmental issues and react dynamically with them. Rowntree (1982:12) expanding upon educational systems thinking stated that education is clearly enmeshed in a vast net of systems. This net of systems influences education and curriculum in terms of context and influences all activities. Education he believes can be viewed as a system. A self-adjusting combination of people and things interacting dynamically but designed by people with an objective of accomplishing some pre-determined purpose. Systems thinking he believes allows one to look beyond the obvious and anticipate problems and discover opportunities. These systems views support the concepts of systems theory didactics put forward by Fraser et al (1993) to which previous reference was made (see 1.2.6). Moreover the model of the interrelationship of the components of the curriculum as shown by Fraser et al (1993) (see 1.2.6) supports a systems approach to curriculum and curriculum development.

2.3 THE VOCATIONAL EDUCATION AND TRAINING CURRICULUM

The curriculum for the master craftsman in the Printing, Newspaper and Packaging Industries fall into the guise of vocational education and training in its broadest sense. Squires (1987:62-64) in his discussion on vocational education and training stated that in principle vocational education and training can be derived directly from the labour market. The labour market as a source is not always reliable and can be dangerous because of the difficulties the labour market has in manpower planning. Moreover deriving curricula directly from job analysis is not as straightforward as it may seem due to any one of eight reasons. These are:
(1) Classification problems - Actual occupational classification and training classification may not necessarily coincide simply because they may have been devised for different uses. For instance, occupational classification may have been derived for demographic and economic purposes exclusively. Training classifications are usually derived from educational/accreditation purposes.

(2) Instruction - In time it is feasible and possible that the structure of vocational education and training and qualifications may affect the actual structure of occupations.

The above is very pertinent for the current South African debate on qualifications and the emerging National Qualifications Framework. It is going to be interesting to see whether the outcomes-based approach coupled to qualifications will or will not affect the actual structure of occupations in the future in South Africa.

(3) Diversity - The same job or occupation may involve different skills and emphasis in different organisations and environments.

(4) Change - Vocational curricula are aimed at equipping the learner for immediate employment as well as a means of underpinning work for the learners entire working life. To strike a balance between present needs and those of the future is very difficult.

(5) Substitution - Many people do not necessarily stay in the job that they were trained for, for their entire working life.

(6) Divergence - Vocational curricula may in time diverge from the actual job needs. Rapid technological changes in the workplace can and do make posts change and consequently the vocational curricula becomes out-of-date. Academic drift can also make vocational education and training become too abstract and theoretical and out of touch with the practical requirements in the workplace.

(7) Incompleteness - Most job analysis techniques cannot specify the actual intensity of the work or the actual approach or attitudes needed to deal with the intensity. In fact employment contracts also do not specify the intensity of the work or articulate adequately the approach or attitude needed for the job.
(8) Level - Pitching vocational education and training at the right level is very difficult. Pitching at a too low a level may not prepare the learners adequately whereas pitching vocational education and training at too high a level may create false expectations and could be very costly and time consuming.

The above reasons need to be noted when considering the curriculum and curriculum development process for the master craftsman in the Printing, Newspaper and Packaging Industries. Curriculum development stemming from job analysis is not necessarily the best route.

Jackson (1992:927) highlight some cardinal issues that are still facing vocational education and training each of which have certain curriculum implications namely:

- There is a need for a more intensive vocational education and training effort to meet the needs for the more advanced workplace responsibilities and duties of the workforce, long-term training, more intensive and continuous on-the-job experience opportunities and more active involvement of the employers in the actual curriculum planning.

- A more integrative approach which brings together the basics such as mathematics and science and the applied as occur in the workplace is needed.

- A more vigorous effort to raise the level of excellence in vocational education and training.

Marsh & Willis (1995:40) firmly believe that decisions about curriculum hinges about three points, namely the nature of the subject matter, the nature of society and the nature of the individual. In the field of vocational education and training the question to ask is whether the subject matter being taught or to be taught, will adequately represent to the learner the reality of the surrounding world especially the world of work. This question has particular importance for this study since the outcome of the learning for a master craftsman should be job competence in the work situation. The question to ask about the nature of society is whether the curriculum reflects a wide enough range of the political cultural and economic characteristics of the social context in which the actual curriculum exists. For the individual the question to ask is whether the curriculum will meet the interests and the developmental needs of the learner.

The curriculum for the master craftsman in the Printing, Newspaper and Packaging Industries would have specific boundaries and will be aimed at addressing very specific needs. Naturally the curriculum would take shape and be textured by the curriculum development process but the notion of a curriculum continuum as put forward by Marsh & Willis (1995:132-133) will be appropriate and applicable for this
study. This curriculum continuum is depicted in Figure 5.

2.4 CURRICULUM DEVELOPMENT

The stated aim of this study is to develop a curriculum for the master craftsman in the Printing, Newspaper and Packaging Industries. According to Barrow & Milburn (1990:88) curriculum development differs from curriculum change in that curriculum development is seen as being less technical and not as mechanistic. Curriculum development is seen as a formal or non-formal process for reshaping or designing curriculum. The process is goal directed and has usually got a practical end in view.

Many different approaches to curriculum development exists and according to Husén & Postlethwaite (1994a:1312) some of these approaches to curriculum development involve the use of design models. Design models are seen to be useful because they facilitate systematic problem solving and ensure that essential activities and elements take place and reduce the risk of them being overlooked. Design models increase the chance that the correct solutions are found, they facilitate and encourage research and evaluation of alternative solutions, increase efficiency and make the process transparent.

Models for curriculum development can also have a systems approach. Pratt (1980:8) states that systems theory actually shows that design is at the core of nature and drawing from nature these natural systems models are typified with unity and coherence and provide a model for the field of curriculum. Husén & Postlethwaite (1994b:5895) quoting, Thomas and Page, defines the systems approach in education as follows:
Conscious use of systems analysis and systems design techniques in an endeavour to identify and solve complex problems in learning or instructional systems. The components of the approach include the establishment of a systems boundary, the identification of all actual or possible inputs to the system and examination of their interaction.

The systems approach originated from general systems theory and cybernetics which is a more heuristic and creative approach to the improvement or understanding of complex systems. Furthermore the systems approach originally was a way of looking at complex reality, with of course an awareness that the complex reality was not completely controllable but did offer opportunities to predict outcomes more accurately.

The basic principles listed for the systems approach centres about the careful analysis and interpretation of interrelationships between the various sub-systems as well as interpreting the various interactions that may occur and then making some sort of prediction of the cause and effect on a part of the system if changes happen in other parts of the system. An important component of the systems approach and a vital principle is control by feedback. Romiszowski (1981:31) quotes Rowntree’s definition of the systems approach to curriculum and curriculum development or design as:

an overall approach which involves tackling problems in a disciplined manner keeping priorities in mind. The sub-systems making up the overall system can be designed, fitted, checked and operated so as to achieve the overall objective efficiently.

The properties of the systems approach are listed as inputs, outputs and process defined in relation to each other where any change in one will affect all the other parts. Systems models on the other hand are used to show how each part, phase or sub-system fits as well as indicated where the necessary feedback loops which are required are located. Feedback loops facilitate evaluation, review and possible revision of the sub-system. Romizowski comments further on the systems approach and believes that it is not necessarily a step-by-step process. Evaluation, analysis and synthesis are repeated throughout the process. This heuristic problem-solving process is seen to be superior to algorithmic procedures and allows for creative use of general principles rather than following rigid specific rules and procedures.

Husén & Postlethwaite (1994b:5895-5896) feel that a system exists because people have chosen to consider it as that. Each system has some boundary drawn which actually limits the extent of the system and defines the sub-systems or components that make up the system. This systems boundary concept is shown in Figure 6.
Once a system has been defined in this way, it then becomes easy to identify the connections between the system and its environment as well as identifying the environment inputs into the system. The actual outputs from the system to its environment are also identifiable. This wider system perspective is depicted in Figure 7.
Applying these systems concepts to curriculum and curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries offers a more pragmatic approach because it takes into consideration the environment of the wider system, which is the world-of work where job outcomes are usually clear and unambiguous and where instruction and learning will occur in diverse organisations and environments. These influences of the world of work impact on curriculum and curriculum development dynamically. Husén & Postlethwaite (1994b:5899-5900) believe that at the macro level the systems viewpoint can be considered for the overall planning of education curricula and courses. At a slightly lower level of systems resolution the actual integration of materials and activities into modules or lessons can be planned using the systems methodology. The systemic aspect of the systems approach can be implemented in curriculum planning at all levels.

A systems approach to curriculum and curriculum development has congruence with the way that organisations in the world-of-work operate. Rummler & Brache (1988:48-50) view business organisations as part of a larger economic environment and an individual part of a specific economic environment. A company operates as a processing system which adapts to and responds to such factors as the market forces, the competition and the technological advances and changes that take place. At the macro-level, every business exists in a larger system context. The concept of organisations behaving as adaptive systems is depicted in Figure 8.

![Figure 8: Organisations Behave as Adaptive Systems](image)

Rummler & Brache (1988:50) sum up their discussion by stating that organisation provide a product or service which is an output for a market or a receiving system. Organisations function as processing systems consisting of inputs such as materials, technology, capital and human resources converted into outputs of value to the market. Organisations exist in a larger environment (or system) consisting of, among other things, competitors who are competing for the organisation’s markets and resources, the general economic,
legislative, social and cultural environments all of which impact on the organisation dynamically. Human resources are part of the organisation and the human resource sub-system which includes such aspects as vocational education and training are systems bound. It is therefore appropriate that curriculum and curriculum development are approached from a systems viewpoint.

2.5 CURRICULUM DESIGN MODELS

In order to develop the master craftsman curriculum systematically it is necessary to evaluate existing curriculum development models to determine which model or aspects of the model provide suitable justified indicators for the purpose. Curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries has its best fit in the vocational education and training field. The preferred vocational education and training system that has been adopted by the Industries is a Competency Based Modular Training System (CBMT). Possible curriculum development models, or aspects of such models must therefore be considered against these two industry specific aspects.

Husén & Postlethwaite (1994a:1313-1314) discussed a curriculum design model called the Twente Model developed at the University of Twente in the Netherlands. This model was intended for the development of a modular curricula for vocational education and training purposes. As can be seen from Figure 9, the Twente Model begins with the analysis of a job or function profile. This is followed by defining the knowledge skills and attributes for each function. Interestingly the model also evaluates the initial situation of the student in terms of the entry level skills knowledge and attributes before deciding on a structure for the modular system. In phase four a novel approach is shown where an inventory is made of existing course material and evaluating the material adequacy against the requirements identified for the modular curricula. This would seem to be cost effective and very pragmatic avoiding the need to reinvent the wheel. The Twente Model for curriculum development also identifies distinct phases of the process.
Figure 9: Twente Model for Curriculum Development
Van Dyk, Nel, Loedolf & Haasbroek (1997:240-247) discussed and illustrate a number of open and closed models such as the Instructional Development Institute Model shown in Figure 10.

Another model they explore is Nadler’s Critical Events Model which is an open model specifically for the design of training programmes. This model is depicted in Figure 11.
Van Dyk et al also depict a model for course design after Romiszowski which is yet another example of a model and is depicted in Figure 12.

The Printing, Newspaper and Packaging Industries have adopted a Competency Based Modular Training (CBMT) system for the vocational education and training of artisans in the industries. This CBMT system was derived from a design model developed by Thomas (1994:181) and is depicted in Figure 13.
TRAINING NEEDS ANALYSIS

<table>
<thead>
<tr>
<th>DATA COLLECTION</th>
<th>DATA SOURCES</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>INVESTIGATION</td>
<td>1. INDUSTRY</td>
<td>OBJECTIVES</td>
</tr>
<tr>
<td>ANALYSIS</td>
<td>2. ORGANISATION</td>
<td>AVAILABILITY AND</td>
</tr>
<tr>
<td>SURVEILLANCE</td>
<td>3. OPERATION OR JOB</td>
<td>ACCEPTABILITY IN TERMS OF</td>
</tr>
<tr>
<td></td>
<td>4. PERSON OR INDIVIDUAL</td>
<td>COMPETENCE</td>
</tr>
</tbody>
</table>

AIMS AND OBJECTIVES OF TRAINING

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERALL AIMS AND OBJECTIVES</td>
<td>INDUSTRY</td>
</tr>
<tr>
<td>JOB COMPETENCE</td>
<td>BROADEST SENSE</td>
</tr>
<tr>
<td>JOB COMPETENCE IN BROADEST SENSE INCREASED PRODUCTIVITY LESS SUPERVISION EMPLOYEE LOYALTY AND ADAPTABILITY</td>
<td>ORGANISATION</td>
</tr>
<tr>
<td>JOB COMPETENCE IN BROADEST SENSE</td>
<td>OPERATION</td>
</tr>
<tr>
<td>CAREER PROGRESSION ASPECTS</td>
<td>PERSON</td>
</tr>
<tr>
<td>STATUS</td>
<td>FINANCIAL GAIN</td>
</tr>
</tbody>
</table>

SPECIFIC OBJECTIVE OF A COGNITIVE NATURE | SPECIFIC OBJECTIVES OF AN AFFECTIVE NATURE | SPECIFIC OBJECTIVES OF A PSYCHOMOTOR NATURE

THE LEARNER (Expanded View)

<table>
<thead>
<tr>
<th>INITIAL SITUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE-REQUISITES</td>
</tr>
<tr>
<td>• MINIMUM EDUCATIONAL REQUIREMENTS</td>
</tr>
<tr>
<td>• AGE RESTRICTIONS</td>
</tr>
<tr>
<td>AGE OVER 21 YEARS OF AGE</td>
</tr>
</tbody>
</table>

EVALUATION SYSTEM

• TRAINABILITY TESTING - MINIMUM CRITERIA
• PHYSIOLOGICAL TESTING - MINIMUM CRITERIA
• LEARNING STYLES TESTING - MINIMUM CRITERIA

CODE OF PRACTICE FOR TRAINING WITHIN THE INDUSTRY

PRE-INTERACTIVE PHASE

TRAINING COURSE AND EVALUATION DESIGN

<table>
<thead>
<tr>
<th>ANALYSIS OF JOB</th>
<th>COURSE DESIGN</th>
<th>COURSE MAP</th>
<th>COURSE EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>• JOB IDENTIFICATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• ADAPTIVE SKILLS ANALYSIS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• COGNITIVE SKILLS ANALYSIS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• TASK AND JOB SKILLS ANALYSIS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• INTERPERSONAL SKILLS ANALYSIS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• BASIC SKILLS ANALYSIS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OBJECTIVE CATEGORIES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• COGNITIVE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• AFFECTIVE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• PSYCHOMOTOR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRITERIA QUANTIFIABLE AND QUALIFIABLE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRITERIA IN COMPETENCE TERMS AT QUALIFIED WORKER STANDARD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBJECTIVES IN COMPETENCE TERMS AND SCOPE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CRITERIA IN COMPETENCE TERMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CRITERIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MODULE IDENTIFICATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UNDERPINNING MODULE IDENTIFICATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>KNOWLEDGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SEQUENCING OF MODULES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHASE AND SKILL IDENTIFICATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBJECTIVES IN COMPETENCE TERMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBJECTIVES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SUBDIVISION OF COURSE SKILLS - LEVELS PHASES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MODULE TESTING PROCEDURES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHECKLISTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TRAINER</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LEARNER</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EXTERNAL CRITERIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHASE TESTING</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FINAL COMPETENCE TESTING</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>COURSE MAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MODULE CODES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMPETENCE OBJECTIVES AND CRITERIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

INTER-ACTIVE PHASE

THE DIDACTIC ANDragogic SITUATION

APPRENTICE - LEARNER - TRAINEE

FORMAL CAREER

INDENTURESHIP TRAINER

PROGRESSION PATH

EVALUATION - INTERNAL AND EXTERNAL

TRAINING OUTCOMES

COMPETENCY INDUSTRY INDIVIDUAL

FIGURE 13: DESIGN MODEL OF THE COMPETENCY BASED MODULAR TRAINING SYSTEM
The various curriculum design models all exhibit the following distinct common features:

- The first step in the curriculum development process is generally some form of problem identification or needs analysis which is then articulated into a specific education or training requirement.
- The initial situation of the potential learner target group is identified and analysed.
- The aims and objectives for the intended education or training intervention are established.
- The courses of instruction as well as the methods or strategies for instruction are established.
- The evaluation of learning outcomes are compared through feedback to the original aims and objectives for the courses of instruction.

These features can be considered as generic to all or most scientifically justified curriculum development processes and will be adhered to in the curriculum design model and process suggested for the purposes of this study.

The Instructional Development Institute Model (see Figure 10) and Romiszowski’s Model for Course Design (see Figure 12) both include a pilot study to test if the developed courses of instruction deliver what they were intended to do. If the pilot study proved that deficiencies exist courses of instruction could be modified and adapted as needed.

Both the Twente Model and Thomas’ Model (see Figures 9 and 13) contain all the common features of the other models but also directly satisfy the industry specific needs for the preferred vocational education and training system used in the industries. The Twente Model is a distinct vocational education and training development model which incorporates a modular delivery system. It also describes how vocational education and training courses of instruction are articulated into qualifications. Thomas’ Model is the model which was used to develop the preferred Competency Based Modular Training system currently in use in the industries.

The Printing, Newspaper and Packaging Industries defined the master craftsman as the custodian of the craft of printing and the point of introduction of new technology. The actual skills and competencies needed by the master craftsman were not articulated nor were job functions and tasks identified. In phase 1 of the Twente Model (see Figure 9) a job/function profiling process is shown which can be used to establish the skills and competency profile of the master craftsman. The translation of the job/function profile into qualifications in the Twente Model is also applicable to this study because the needs of the National Qualifications Framework can be accommodated.
Phase 2 of the model which shows the process to be followed to determine the initial situation of the learner has merit for this study especially because the potential learner target group for the master craftsman curriculum have a wide range of entry qualifications and experience. Phase 3 of the model identifies how aims and objectives are to be developed and phase 5 shows processes to be used to determine instructional objectives, the production of course material and the selection of media and instructional strategies all of which are necessary for developing the master craftsman curriculum. The Printing, Newspaper and Packaging Industries have an accepted training system for artisan training (see 1.2.7) which is Competency Based Modular Training (CBMT) and based on Thomas' model (see Figure 13). This model also has application in this study especially where such aspects as course map development, resource evaluation, trainer training and external evaluation training is concerned.

Using aspects of the Twente Model (see Figure 9) and Thomas' Model (see Figure 13) as well as the systems approach to curriculum as put forward by Fraser et al (see 1.2.6, Figure 2) an adapted curriculum design model used for this study would provide an overview of how the process for curriculum development would take place. Identifying phases of the process and the interrelationship of the components of the curriculum in these phases offers a systematic logical plan for curriculum development. The phases and model components are as follows:

**Phase 1:** Using the job/function profile (JFP) aspects of the Twente Model, the process would involve the identification of a suitable competency profiling technique. The application of the technique so as to arrive at an agreed upon competency profile which would satisfy the needs of the Printing, Newspaper and Packaging Industries and accommodate the requirements of the emerging National Qualification Framework (NQF).

**Phase 2:** Using limited aspects of the Twente Model for translating JFP into qualifications is necessary if one takes cognisance of the present situation in South Africa where the qualification framework, including its structures and governance, are still in a formative stage. Coupled to the translating of JFP into the qualification structures the needs of the Printing, Newspaper and Packaging Industries with regards career progression and lifelong learning as well as benchmarking the qualifications internationally must be accommodated by means of a revised career path system. Translating the competences into qualifications would at this stage entail the identification of a process for standards generating as well as detail planning of such a process.
Phase 3: The curriculum development process can be achieved by integrating such aspects of the Twente Model as comparing the achieved qualification (entering behaviour) with aspects of Thomas' Model which centre about the initial situation of the learner as well as the pre-interactive phase. This pre-interactive phase is useful for training course and evaluation design as well as resource evaluation including the lecturer/trainer requirements and external evaluator needs. The design of courses of vocational education and training for the master craftsman will fall in line with the accepted vocational education and training system for the industries, that is, competency based and modular in nature.

Phase 4: This Phase will entail details of instructional objectives, syllabi and training courses as well as how the curriculum is planned to be implemented in a didactically sound manner.

Developing the master craftsman curriculum by viewing the curriculum from a systems perspective will be the basis of this study. Using systems thinking in the curriculum development process will allow for critical thinking and reflection and allow for looking beyond the obvious, anticipate problems and discover opportunities to accommodate the needs of the Printing, Newspaper and Packaging Industries and the emerging National Qualification Framework model. Developing the master craftsman curriculum must result in a curriculum that can be implemented and yet has the ability to change rapidly because of the rapid technology changes which are a feature of the Printing, Newspaper and Packaging Industries. The sequences of the curriculum continuum (see 2.3, Figure 5) are applicable to this study. The curriculum development process would result in a curriculum package which would need to be implemented, institutionalised and then pressure for change, innovation and curriculum renew would occur.

2.6 SYNTHESIS

The process of investigation and contextualising curriculum and curriculum development was important for this study and revealed that:

- The curriculum field is diverse and ill-defined with little chance of a universally accepted definition of curriculum. What is important for this study was adopting a suitable definition of curriculum (see 1.6.1) which is pragmatic and contextualises curriculum for the curriculum development process.
The master craftsman curriculum development process occurs within a specific industrial sector which revealed that companies and organisations are systems oriented and behave as adaptive systems. Viewing the curriculum from a systems perspective is therefore necessary for this study. It allows for the dynamics of the world of work to shape and influence the curriculum. When the master craftsman development process takes place all the system components of the curriculum have to be addressed and developed with the understanding that they are interrelated and interdependent (see 1.2.6, Figure 3).

The master craftsman curriculum is a vocational education and training curriculum and as such the curriculum development process must result in a curriculum that meets the specific needs of the Printing, Newspaper and Packaging Industries.

A wide variety of approaches to curriculum development exists, some of these approaches involve the use of design models. The possibility of using a design model for developing the master craftsman curriculum was explored and revealed that most models have a systems approach. Analysing and evaluating a number of these systems orientated design models showed that they offer a suitable systematic approach and framework for developing a curriculum. Using aspects of certain models a logical plan for developing the master craftsman curriculum was devised. This plan maps out how this study can proceed and identifies the first phase of the curriculum development process as establishing a comprehensive competency profile of the master craftsman by using a job/function profiling technique. This aspect will be dealt with in Chapter 3. Chapter 4 will refine the comprehensive competency profile so that more detail with regards underpinning skills and knowledge can be identified so that the master craftsman curriculum can result in a qualification that is nationally recognised and internationally benchmarked.
CHAPTER 3: COMPETENCY PROFILING OF THE MASTER CRAFTSMAN

3.1 INTRODUCTION

The Printing, Newspaper and Packaging Industries have not articulated what the job, functions or tasks of the master craftsman are except a vague notion of being the custodian of the craft of printing and the point of introducing new technology. The current outcomes-based approach to education and training that is being debated and adopted by South Africa as the preferred model, works from the premise of identifying competence outcomes first then developing creative curricula afterwards. If the competence outcomes of the job, functions, tasks and roles of the master craftsman are to be determined as the starting point for curriculum development and bearing in mind that the Printing, Newspaper and Packaging Industries have a competency based modular training system in place for artisan training, competency outcomes would need to be established for the master craftsman in line with the present practices within the industries.

Competency profiling has and is being used by many organisations and it is necessary for the Printing, Newspaper and Packaging Industries to adopt a suitable competency profiling technique that meets their specific needs. To determine which competency profiling technique is best suited for an industry would have to be investigated using extensive literature surveys and where possible first hand observation of techniques in practices. Best practices as a concept prompts the question of what makes a best practice and how does one identify such a practice. Unfortunately at present there does not seem to be a standard method in use for establishing best practice, nor for that matter are there any concrete published criteria for identifying and evaluating practices as being the 'best'. It would seem that the search for 'best practice' is in itself a new practice.

Overmeyer & Benson (1996:28) offer some sound advice when embarking on establishing best practice in a specific field by focusing on the criteria and context of the practice as it occurs. They suggest it is necessary to determine the following:

A. The purpose, aim and background of the practice.

B. The context in which the practice occurs.

C. The incident, which should include the description of the process, methods or techniques used.

D. A description of what makes the practice different from others.
E. The impact and outcomes of the practice including some indicators and measurement of the results as well as how and if the practice supports the original purpose.

Bearing the above in mind and using the ideas as a conceptual framework for focusing on creating and not necessarily evaluating a best practice, it offers an opportunity for the Printing, Newspaper and Packaging Industries to create a best practice in competency profiling. Naturally the impact and outcomes of the competency profiling practice for the master craftsman can only be measured over time and is thus beyond the scope of this study.

To evaluate best practices in competency profiling is beyond the scope of this study. However, evaluating examples of competency profiling techniques currently in use will enable the adoption of a technique which meets the unique needs of the envisaged competences of the master craftsman in the Printing, Newspaper and Packaging Industries.

The job/function profile (JFP) of the Twente Model (see 2.5) forms part of the first phase of developing the master craftsman curriculum. The need to establish a usable competency profile technique for this study is crucial and the outcome of such a profiling exercise will determine the texture and form of the master craftsman curriculum. The competencies generated by a suitable competency profiling technique would represent broad desired learning outcomes and would enable a more creative approach to further development of the master craftsman curriculum.

3.2 PRACTICES IN COMPETENCY PROFILING

Notwithstanding the number of competency profiling techniques available a point of departure will be to examine techniques currently in use and establish the practices in a particular sector which can be used effectively in the Printing, Newspaper and Packaging Industries. Two sectors will be examined in which competency profiling is currently being done. These are: the rail transport sector and the Graphic Arts, Print and Paper Industries.

3.2.1 SPOORNET

According to Spoornet (1994:2) their model for competency profiling is based on McClagan’s output model and adapted in terms of British and Australian approaches but takes cognisance of South African requirements. Their model creates a framework for a job profile which emphasises output and competence.
The output profile examines future forces which could create changes in required outputs and competences. The outputs would be determined by customer requirements and in order to achieve output requirements tasks would need to be performed to certain standards and within a range of variables. The Spoor net model for Competence Profiling is depicted in Figure 14.

![Diagram of Spoor net Model for Competence Profiling](image)

Figure 14: Spoor net Model for Competence Profiling

Interestingly Spoor net (1994:8) defines competency as being the minimum requirements a person must comply within order to deliver outputs at a specified level. Competencies are made up of knowledge, skills, attitudes/values and capabilities. Spoor net (1994:7) have conceptualised the application of competencies in a schematic which is shown in Figure 15.
According to SpoorNet Competency Profiling and Behaviour Indications for Service Management (1996:3) each competency is described in terms of:

- **A Category** - which is a group of competencies which have a common theme.
- **A Definition** - a detailed definition of the competence in question.
- **Factor** - designating the competence as either skill, attitude or knowledge or a combination of the three.
- **Element** - the actual central theme or themes in each competence.
- **Description** - the definition or description of the element.
- **Behaviour Indicators** - the evident behaviour that indicates evidence of competence.
An example of a competence in analytical ability presented in terms of Spoornet’s descriptive methodology is shown in Figure 16 (1996:6).

**COMPETENCE : ANALYTICAL ABILITY**  
**CATEGORY : DECISION MAKING**  
**DEFINITION : THE ABILITY TO ANALYSE ISSUES TO IDENTIFY CAUSE AND EFFECT RELATIONSHIPS**

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>ELEMENT</th>
<th>DESCRIPTION</th>
<th>BEHAVIOUR INDICATORS</th>
</tr>
</thead>
</table>
| Skill  | Asks the right questions. | The ability to ask the right questions, to test the present size of the issue and its immediate implications on the rest of the team and department. | COMPETENT: Asks penetrating questions.  
LESS COMPETENT: Asks some questions without getting to the core of the situation.  
Identiﬁes relevant information by asking questions.  
Checks own understanding of work problems by asking questions.  
Acks questions without any apparent direction or purpose.  
Does not ask questions to clarify situation? |

Figure 16 : Spoornet’s Competency in Analytical Ability

Spoornet Competency Profile and Behaviour Indicators (1994:7-8) also describes the relationship between performance outputs and management competencies. An example is shown in Figure 17.

<table>
<thead>
<tr>
<th>Output</th>
<th>Customer requirements</th>
<th>Category</th>
<th>Competency</th>
<th>Competency elements</th>
<th>Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job standards</td>
<td></td>
<td>Decision making</td>
<td>Analytical ability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Ask the right questions.  
- Identify cause and effect relationships/ making connections.  
- Information processing.  
- Spoonet understanding  
- Calculated risk taking.  
- Considers alternatives and select appropriate procedure out of a given range.  
Decisiveness.  
Open mindedness.  
Delivers a quality service.  
Service orientation.  
Basic business principles.  
Organising resources.  
Time management.  
Monitoring finances.  
Business orientation. |

Figure 17 : Relationship between Performance Outputs and Management Competencies at Service Management
Interestingly for ease of understanding Spoomet (1994:9) have articulated competency definitions for service management in a matrix. See Figure 18.

<table>
<thead>
<tr>
<th>RELATIONSHIPS</th>
<th>DECISION MAKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building External Relationships</td>
<td>Internal Networking</td>
</tr>
<tr>
<td>4</td>
<td>The ability to build and sustain relationships based on trust, which engender support at all levels within the organisation and its Internal stakeholder group.</td>
</tr>
<tr>
<td>Building External Relationships</td>
<td>Internal Networking</td>
</tr>
<tr>
<td>3</td>
<td>The ability to build and sustain relationships based on trust, which engender support at all levels within the organisation.</td>
</tr>
<tr>
<td>Service Focus</td>
<td>Building Relationships</td>
</tr>
<tr>
<td>2</td>
<td>The ability to render a service according to customer requirements and sustain customer satisfaction.</td>
</tr>
<tr>
<td>Quality Focus</td>
<td>Teamworking</td>
</tr>
<tr>
<td>1</td>
<td>The ability to deliver a service according to customer requirements.</td>
</tr>
</tbody>
</table>

**Figure 18 : Competency Definitions Matrix**

### 3.2.2 RAIL TRANSPORT SECTOR

The University of Technology Sydney (UTS) Australia prepared a specific programme for Queensland Rail for writing competency-based standards and assessments and proposed a competency profiling model. UTS (1993:4-8) define a competency standard as comprising the specification of knowledge and skill within a specific occupation to a predetermined performance standard. They go on to list the advantages and uses of competency-based standards as follows:

- Competency-based standards are useful in maintaining occupational standards.
- Competency-based standards provide for a more efficient labour market.
- Competency-based standards facilitate equity for employees and provide for national recognition.

An example of a list of the core competency standards for an employee categorised as an associate member of a working team according to UTS (1993:68) are:
- Follow established customer service practices.
- Plan and organise individual tasks or jobs.
- Be able to follow specified occupational health and safety practices.
- Work in a team.
- Solve problems.
- Reach and maintain agreed competency levels.
- Communicate with fellow workers, customers and supervision.
- Be able to follow established quality systems and practices.

Examining a unit of competence such as problem solving, the elements of the competence area listed together with their performance criteria within a specified range of variables. The unit of competence also describes the evidence which is in fact the underpinning knowledge and skills requirement. The examples of the unit of competence for problem solving is depicted in Figure 19.

<table>
<thead>
<tr>
<th>Unit of Competence : 6.0 Solve Problems</th>
<th>Performance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Elements</strong></td>
<td><strong>6.1.1</strong> The existence, cause and immediate effects of the problem are confirmed by investigation.</td>
</tr>
<tr>
<td>6.1 Define the problem.</td>
<td><strong>6.1.2</strong> A clear and accurate definition of the problem is identified.</td>
</tr>
<tr>
<td></td>
<td><strong>6.2.1</strong> Feasible options are identified from a preliminary analysis and comparison of needs, human, fiscal and material factors.</td>
</tr>
<tr>
<td></td>
<td><strong>6.2.2</strong> The preferred option is identified from a detailed analysis of team/enterprise requirements including the use of appropriate mathematical techniques.</td>
</tr>
<tr>
<td>6.2 Identify a solution.</td>
<td><strong>6.2.3</strong> Approval to proceed with the preferred option is gained from the appropriate party.</td>
</tr>
</tbody>
</table>

**Range of Variables:**

1. **General.** National Rail staff are employed under the Enterprise Agreement in varying capacities in one of the three business divisions or in the Corporate Head Office.
   - The work context is characterised by a multi-skilled team-based work organisation, together with individual empowerment and accountability.
   - Teams may vary in size, and composition depending on their purpose, functions and geographic locations.
   - The work environment is heavily dependent on computerised communications.

Core standards are universally applicable regardless of where and in what capacity staff are employed.

2. **Others.** Nil.
<table>
<thead>
<tr>
<th><strong>Evidence (Knowledge and Skills Underpinning)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge.</strong> A knowledge of:</td>
</tr>
<tr>
<td>• team goals.</td>
</tr>
<tr>
<td>• problem solving techniques.</td>
</tr>
<tr>
<td>• team resource availability.</td>
</tr>
<tr>
<td>• elementary analytical techniques.</td>
</tr>
<tr>
<td>• mathematical ideas and techniques (Mayer PL2).</td>
</tr>
<tr>
<td><strong>Skills.</strong> The ability to:</td>
</tr>
<tr>
<td>• clarify desired outcomes and processes (Mayer PL1).</td>
</tr>
<tr>
<td>• maintain focus through to appropriate completion. (Mayer PL1).</td>
</tr>
<tr>
<td>• select, sequence and apply the mathematical ideas and techniques reliably and efficiently (Mayer PL2).</td>
</tr>
<tr>
<td>• identify the mathematical ideas and techniques which are applicable to the problem (mayer PL2).</td>
</tr>
<tr>
<td>• analyse the options to identify resource requirements.</td>
</tr>
<tr>
<td>• identify the preferred option using elementary analytical techniques.</td>
</tr>
<tr>
<td>• obtain approval to proceed from the appropriate mentor/leader.</td>
</tr>
</tbody>
</table>

**Figure 19 : Unit of Competence for Problem Solving (UTS, 1993:63)**

The layout presentation of the information for a unit of competence is interesting and lends itself for use in this study. The layout is simple yet gives an overall view of what a unit of competence is. The language used, is unambiguous and should be easily understood by the providers of vocational education and training and the learner.

Interestingly the Australians have a nationally accepted format for writing national competency standards. According to UTS (1993:10-11) a standard at any level is expressed in units of competence where the unit is comprised of elements of competency and their associated performance criteria. A unit of competency consists of the following:

- **A Title** - this title should be written in output terms, be accurate and concise and should ideally refer to a general area of competency.

- **A Short Description** - the units purpose is sometimes necessary if the title is not descriptive enough.

- **Element Listing** - the actual elements of competence are listed together with their associated output performance criteria.

It is also noted that performance criteria in output terms should provide a guide to assessment and should also provide the essential link between competency and the required evidence of achievement.
Competency-based standards according to UTS (1993:17) has value and use in specific fields notably, in developing curriculum, specifying career paths, identifying training needs, providing a competency-based job description, selection of personnel, promoting safe working practices, job evaluation, as a means of comparing national standards and for benchmarking standards internationally.

UTS (1993:22) recommended that irrespective of the competency profiling model or system adopted the techniques used to develop competency-based standards should identify both job, tasks and roles and the attributes which produce occupational competence.

A number of techniques are examined by UTS to evaluate which techniques offer the opportunity of identifying both job, tasks/roles and competence. Their findings are summarised in Figure 20.

<table>
<thead>
<tr>
<th>TECHNIQUES</th>
<th>TASKS/ROLES</th>
<th>COMPETENCIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>DACUM</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Nominal Group</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Search Conference</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Functional Analysis</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Interview</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Competency Interview</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Critical Incident</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Surveys</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>DELPHI</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>CODAP</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Observation</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>McBer</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Figure 20: Techniques used for determining Occupational Competence (UTS, 1993:22)

The techniques listed above are not exhaustive but represent some of the more popular techniques available. All the techniques have specific advantages and disadvantages. UTS further suggest that a combination of techniques should be used for identifying competencies.

For Queensland Rail UTS recommend that the technique to be used in their competency profiling model are Nominal Group, Search Conference, Functional Analysis, Competency Interview, Critical Incident, Observation and McBer because these techniques identify tasks and roles as well as competencies.
The listing presented in Figure 20 identifies techniques in relation to their ability to reveal tasks/roles and the attributes that produce occupational competencies. Bearing in mind the recommendation made by UTS that a combination of techniques should be used in any envisaged competency profile model and taking cognisance of the needs of the Printing, Newspaper and Packaging for developing a curriculum for the master craftsman, a brief description of some of the techniques highlighting their advantages and disadvantages is necessary.

The techniques that address both task/roles and competencies namely Nominal Group, Search Conference, Functional Analysis, Competency Interview and Interviews, and McBer will be described and their suitability for use for competency profiling of the master craftsman in the Printing, Newspaper and Packaging Industries will be evaluated.

3.2.3 SELECTED TECHNIQUES FOR COMPETENCY PROFILING

A number of techniques for competency profiling exist. Naturally not all the techniques will be usable for a competency profiling exercise of the master craftsman in the Printing, Newspaper and Packaging Industries because no reference point other than a vague definition of the master craftsman is available.

3.2.3.1 NOMINAL GROUP ANALYSIS TECHNIQUE

Delbecq, Van De Ven & Gustafson (1975) developed the Nominal Group Analysis Technique. This technique has been widely used to solve problems in education, health and social services. The technique in essence involves the identification of experts who are then convened to attempt to provide answers to carefully framed research questions. The process is one of individual brainstorming in a group context under the guidance of a skilled facilitator. The advantages of the Nominal Group Analysis Technique is that it is fast, conflict free, permits equality of participation, generates many ideas, allows ideas to be ranked or evaluated after all ideas are generated and encourages full participation.

The Nominal Group Analysis Technique has great similarity to the Technical Committees in the Printing, Newspaper and Packaging Industries. These Technical Committees also consist of identified experts who regularly meet to provide answers to certain vexing questions including those concerning vocational education and training in the industries. Using the Nominal Group Technique to generate broad-based ideas on what the job, functions, tasks and roles for the master craftsman are in the Printing, Newspaper and Packaging Industries would be acceptable to the industries and can facilitate the competency profiling process.
3.2.3.2 SEARCH CONFERENCE

According to UTS the Search Conference has been widely used in Australia in both the private and public sectors to explore desirable future environments and devising strategies for achieving future goals. The Search Conference process moves from generating information and ideas through a process of analysis and synthesis towards defined action plans. UTS (1993:29) believe that the Search Conference can be adapted for developing competency standards in occupations especially for future educational and training needs. The typical steps in a Search Conference situation are:

Step 1: Future Scan: Brainstorming and divergent thinking sessions form part of a plenary so as to highlight future trends, forces and events that are shaping the environment in which an occupation will operate.

Step 2: Desirable and Probable Futures: Small groups develop and analyse the future scan and synthesise the most future environment in which an occupation may operate.

Step 3: Internal Scan: It sometimes becomes necessary to run brainstorming sessions in plenary sessions on trends and possible changes that may occur inside individual organisations in which an occupation under review occurs.

Step 4: Historical Reconstruction: It is also necessary in specific cases to review what has occurred so as to build on the past considering what should be preserved, modified or dropped.

Step 5: Issues and Priorities: A consolidation of all key issues needs to take place with some form of prioritising so that action plans are systemic.

Step 6: Action Planning: Final reports are made with clear-cut action plans where the implementation procedure is outlined.

The advantages of a search conference according to UTS (1993:31) are that it has low to medium costs and that it involves all the major shareholders. It is also future orientated and only takes a short period of time. The major disadvantage is that the process is highly speculative and can ignore the realities of occupational practice.
The search conference technique for competency profiling of the master craftsman’s job outputs does offer some possibility. However, because of the limited number of stakeholders in the industries, the actual artisan population in the Printing, Newspaper and Packaging Industries, the employers who instigated this study and one major employee organisation the technique would seem to be inappropriate. The civic society, providers of vocational education and training and all the other possible stakeholders are difficult to assess and locate at present. Moreover the issue at stake is confined to a specific industrial sector only and is technical in nature.

3.2.3.3 FUNCTIONAL ANALYSIS

Functional analysis is typically carried out by a group of experts in an industry and very often facilitated by a consultant. According to UTS (1993:32) functional analysis is intended to cut through traditional views of individual jobs so as to base standards which are seen in a wider job context and begins with considering the key purpose of jobs and roles in the whole occupational sector. Successful use of functional analysis is dependent on the participant’s expertise and capacity to identify occupational competence. The technique of functional analysis for determining the job, function, tasks and roles of the master craftsman in the Printing, Newspaper and Packaging Industries does not seem feasible because the master craftsman does not exist as yet in the industries.

3.2.3.4 COMPETENCY INTERVIEW AND INTERVIEWS

Interviews are widely used in many spheres of human activity where research is being conducted and can be of value in establishing job competency. According to UTS (1993:34) unstructured and semi-structured interviews are valuable if the interviewer is highly skilled and the sample of persons being interviewed are as representative as possible of the occupation under review. Unstructured and semi-structured interviews can be challenging and can uncover new and interesting areas of discussion, provided of course they lie within the broad research purpose.

Structured interviews are usually developed following the analysis of unstructured or semi-structured interviews and have great value in that large numbers can be interviewed. Naturally the composition of structured interviews required carefully worded questions and responses faithfully recorded by the interviewer with minimum prompting. The advantages of interviewing are that in-depth job related information can be gathered directly from job incumbents. However, the process is time consuming and expensive.
The use of competency interviews and interviews in general does have utility value in determining the competencies desired for the master craftsman in the Printing, Newspaper and Packaging Industries but needs to be coupled to other techniques which generate more basic skills profiles for the master craftsman. This is simply because at present there is no reference points for the master craftsman level because the post does not exist at present.

3.2.3.5 THE McBER TECHNIQUE

The McBer consulting firm from the United States uses a combination of techniques in determining competency for occupations. According to UTS (1993:53-54) the focus of the technique is 'to identify successful performers and to study these performers with a view to identifying what attributes and skills make them a success. The method is called Job Competence Assessment (JCA). The method has eight steps and these are:

Step 1: Define the criteria for effectiveness using such criteria as date on products, sales, profits, peer-ratings and superior ratings.

Step 2: Identify samples of superior and moderate performers based on the criteria defined in Step 1.

Step 3: Do a functional analysis so as to identify the job tasks.

Step 4: Develop some hypothesis about those people who have been identified as superior performers.

Step 5: Undertake a critical incident study with both groups that were identified in Step 2.

Step 6: Undertake a direct observation study to verify Steps 3, 4 and 5.

Step 7: Analysis and interpretations of all the data.

Step 8: Validation of Step 7 by critical incidents on a second sample or alternatively using tests to measure competitively that have been derived from the model.
The advantages of Job Competence Assessment is that it concentrates on the performance of a person and uses a combination of techniques such as observation, critical incident, functional analysis and expert panels. The disadvantages of the techniques is that it is time consuming and expensive. The McBer Technique presupposes that a suitable population of specific job incumbents exist from which data can be obtained. This factor alone makes the technique unsuitable for use in developing a competency profile for the master craftsman.

3.2.3.6 TECHNIQUES SUITABLE FOR THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

In order to evaluate the suitability of the suggested techniques for competency profiling of the master craftsman in the Printing, Newspaper and Packaging Industries, the following factors must be considered:

- The concept of a master craftsman and the need for such a skills level is evident but not articulated fully.

- The notion or perhaps generic definition put forward is that the master craftsman is the custodian of the craft and the point of reference for the introduction of new technology does not elude to job, functions, tasks and roles.

- No benchmark of the master craftsman as defined exists in the Printing, Newspaper and Packaging Industries. Internationally the level of master craftsman does exist but does not necessarily meet the needs of the industries and no comparison can be made with an international model until the job, functions, tasks and roles have been articulated.

The Nominal Group Analysis technique has distinct possibilities and can be of use for this study because it can generate broad-based ideas on what the tasks and competencies for the master craftsman should be. The search conference likewise can be of value as well as competency interviews. Functional analysis as well as the technique advocated by McBer presupposes that there is a population of master craftsman in the Printing, Newspaper and Packaging Industries and are thus not suitable techniques for the purposes of this study.

As has been shown, some of the techniques discussed have potential to be used by the Printing, Newspaper and Packaging Industries to develop a competency profile of the master craftsman. However, the original perception of what a master craftsman is must be borne in mind. As has been previously stated, the
Printing, Newspaper and Packaging Industries view the role of the master craftsman in the industries as the custodian of the craft of printing and packaging and the reference point for the introduction of new technology. Technology, particularly changing technology, is a fact of life in the Printing, Newspaper and Packaging Industries and any curriculum or curriculum development process contemplated should view technology change from a futurist stance so as to assist in identifying what skills and competency a master craftsman would need to cope with technology changes in the work situation.

3.2.4 GRAPHIC ARTS, PRINT AND PAPER SECTOR

The Graphic Arts Technical Foundation (GATF) of the United States periodically publish comprehensive Techno-Economic Forecasts which deal with a variety of topics including technology changes and education and training issues. Their approach is well structured and could be used as a means of identifying those competences needed by a master craftsman to deal with technology change, that is, in the role of being the reference point for the introduction of new technology.

The Graphic Arts Technical Foundation (GATF) published a Techno-Economic Forecast, No. 26, which had as its theme education and training in the Graphic Arts 1985-1990 (GATF, 1985). The scope of the forecast examined technological developments, vocational education and training issues in the graphic arts as well as population trends and articulated current practices and problems as well as future needs. The report explored the viewpoints of vocational educators and trainers, suppliers of equipment and printers and attempted to identify future trends in population demographics, productivity and wages.

The methodology used according to GATF (1985:1) involved interviewing printers, vocational educators and trainers, suppliers of equipment and materials. These interviews were backed up by questionnaires and by a forecasting committee drawn from the leaders in the American Graphic Arts Industries who analysed the data and developed future orientated scenarios where necessary.

On the subject of education and training needs in the graphic arts, GATF (1985:1) used structured interviews and questionnaires which posed six questions. The answers to these questions it was felt would provide guidance for vocational educators and trainers of how to meet the present and future skills needs of the industries. The six questions posed were:

- As a result of changes in technology, what new skills and competencies would be needed by employees in the industries?
• How can vocational education and training be used to increase the output of current plant and equipment?

• What regional differences exist in relation to products produced and technology used?

• What sources of vocational education and training are available to acquire skills and competencies?

• Who is responsible for vocational education and training?

• What strategy can be used to attract the right calibre people to the industries?

Interestingly a number of important assumptions were put forward by GATF (1985:1-15) and these were:

1. Printing is a service industry and will continue to become more service-orientated in terms of occupations of its employees.

2. There is a continuing trend towards dynamic change.

3. The employment of minorities and the implications for the printing industry in the United States.

4. Emphasis on service and convenience is a growing trend.

5. Assumption on the economic climate and rate of inflation were made.

6. Increased productivity is a given and quantifying what productivity gains are necessary.

7. The influence of government which will affect environmental control, energy consumption, cost of compliance with federal regulations and government funding of vocational education and training procedures.

8. Technological considerations such as accelerating development of technology and its influence on inadequate vocational education and training facilities.

In order to identify what skills will be required for the workforce because of new technology, GATF developed questionnaires which aimed at identifying what new technologies were contemplated being
introduced by printers. The analysis of the responses to the questionnaires identified the skills that would be necessary to use the new technology being introduced (GATF, 1985:15-20). Of interest GATF identified mental skills such as accepting change as a rule, analytical thinking and understanding of systems, understanding the relationships between people and technology, understanding contingency management, creative cognitive skills as opposed to physical craft skills, organisational communication skills, marketing and service skills and overall communication skills as being essential in the short to medium term. GATF (1985:20-24) felt that basic craft skills traditionally associated with the printing and graphic arts which involved physical rather than metal activity would need to be applied in a broader sense so as to minimise waste, improve and maintain quality, be able to control electronic devices and be able to use computer management systems and word processing packages.

The Techno-Economic Forecast, No. 26 (GATF, 1985:29-37) also surveyed the needs of the graphic arts by identifying the demographic composition of the industries as well as their future human resource needs and whether the capacity to train and develop human resource requirements for the graphic arts existed. The methodology used by GATF can be adapted by the Printing, Newspaper and Packaging Industries of South Africa. It is comprehensive and will if correctly used identify some of the competencies a master craftsman would need. It could be a valuable source of data for the curriculum development process.

A similar approach to that of the Graphic Arts Technical Foundation but confined to identifying the manpower and training needs of the paper and print industries in Ireland was commissioned by Foras Áiseanna Saothair (FÁS) the Irish Training and Employment Authority. The research was conducted by Colin McIver Associates and resulted in the Print & Paper Sectoral Study Report of April 1994.

According to this report (McIver, 1994:1-2) the study objectives were to define the paper and printing economic sector in Ireland by identifying its constituent sub-sectors and articulate the markets and demographics of the sub-sectors as well as present a detailed manpower picture of the entire sector. Furthermore, the study had an objective of assessing the current and future vocational education and training needs, assess the present and future technological environment and quantify how legislative and economic changes could affect the sector. The study also had to forecast both the demand and supply of labour for individual occupations and highlight areas of skills shortage.

The study was to make recommendations on manpower needs and future vocational education and training requirements. The methodology adopted and research process used for the study according to McIver (1994:2-3) was:
Step 1: Review all existing data and information on the paper and print industries in Ireland.
Step 2: Develop a comprehensive industry database.
Step 3: Develop and conduct a pilot survey.
Step 4: National postal survey.
Step 5: In-depth interviews with selected companies.
Step 6: Meeting all the necessary state agencies.
Step 7: Meetings with employer and employee organisations.
Step 8: Meetings with education and training bodies in Ireland, United Kingdom and Belgium.
Step 9: Presentations of preliminary findings to industry workshops.
Step 10: Development of alternative industry strategies and forecasts.
Step 11: Manpower projections and training needs analysis.

Using the McIver approach to develop a sectorial study report for the Printing, Newspaper and Packaging Industries is feasible. Past practices in the industries with regards national training needs analysis have incorporated many aspects of the methodology used by McIver. Extending the national training needs analysis to include the future vocational education and training for the master craftsman would facilitate the competency profiling process.

The current demographic data on the extent of the Printing, Newspaper and Packaging Industries in relation to its total employment is an unknown quantity. Data does exist for the number of artisans who are the potential target group for master craftsman training but only those who are weekly paid. The number of artisans who are in supervision and management is an unknown factor. Postal surveys to reach all the employers in the industries will be an essential tool in gathering data on the composition of the industries their economic forecasts and other essential information. The need to articulate the industries manpower projections and training needs will be useful data and could highlight short to medium trends and identify the nature and scope of future vocational education and training requirements.

3.3 THE ADOPTED PRACTICE FOR COMPETENCY PROFILING OF THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES OF SOUTH AFRICA

Competency profiling for an occupation or job is a complex process which requires a systematic approach using techniques which can identify and articulate job, functions, tasks and roles and their competencies. The approach elected for this study can be best illustrated by using a best practices conceptual framework which identifies the objective, that is, the aim, purpose and background of the intended practice. The
context in which the practice is to take place and the incident with a description of the process, methods or techniques to be used.

3.3.1 THE COMPETENCY PROFILING TECHNIQUE ADOPTED FOR THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

By means of semi-structured interviews backed up by examples of the work produced by the Graphic Arts Technical Foundation, McIver and the techniques such as the Nominal Group Analysis Technique, Search Conference, Functional Analysis, Competency Interview and Interviews and the McBer Technique, a cross section of the industries was interviewed with the objective of establishing a suitable competency profiling technique for the master craftsman.

In order to obtain the best representative sample for interviewing, those companies that were accredited to provide vocational education and training at the end of January 1995 were categorised into sub-sections according to the nature of their business namely, commercial printers, newspapers, magazines and packaging. A total of 346 companies had accreditation across all sub-sectors. A further classification was made based on the total labour force employed by the various companies, namely 0-25, 26-50, 51-100, 101-400, 401-600 and 601+ employees. Interestingly when the companies were approached with a view to interviewing only companies that employed in excess of 100 employees felt that they were able to make any sort of input into the debate. Of the 346 companies that were accredited to provide vocational educational and training in the industries fifty-five of these employed in excess of 100 employees. These fifty-five companies were approached to arrange interviews by the researcher. Thirty-two companies agreed to be interviewed. Using the database of the Printing, Newspaper and Packaging Industries Education and Training Board these thirty-two companies had at that time 476 indentured apprentices out of a total apprentice population of 821 for the industries.

The interviews that were conducted were semi-structured where the objective of the interview was clarified and overviews of the selected competency profiling techniques were presented (see 3.2.3). Open-ended questions were posed on how, when, where and by whom the competency profiling exercise should be conducted. The interviewees were also encouraged to raise issues such as technology changes, competition, new products and production process changes that they felt could influence the competency profiling of the master craftsman. The results of the interviews were analysed and indicated that:
• All companies interviewed identified the Nominal Group Analysis route as ideal and many referred to the technical committees under the defunct National Industrial Council for the Printing Industries as being very similar if not the same as a Nominal Group and which historically had driven the vocational education and training initiatives in the industry.

• The value of quantifying and qualifying the impact technology would have on the skills requirements in the future was seen as being vital for the survival of the industries.

• General agreement was reached that a well-planned systematic approach for developing a competency profile was essential and the idea of using a best practices conceptual framework was seen as a valuable tool to ensure that outcomes meet the stated objectives.

All interviewees insisted that the entire industry must be part of the process, and a structured questionnaire should be sent to every employer in the Printing, Newspaper and Packaging Industries in South Africa.

On the basis of the interview data obtained which indicated the industries preferences, a schematic for best practices for competency profiling was developed as well as a more detailed schematic of the aims steps and techniques to be used in the process. These schematics are depicted in Figures 21 and 22 respectively and identified in essence the process to be followed for competency profiling for the master craftsman in the Printing, Newspaper and Packaging Industries.
Objective
To quantify and qualify the future techno-economic parameters that will influence the Printing, Newspaper and Packaging sector

Objective
To identify an initial skills profile of the master craftsman in the Printing, Newspaper and Packaging Industries

Context
The world-of-work in a national and global economy where human resource development activities operate in an andragogic didactic mode

Incident
Competency profiling of a master craftsman in the Printing, Newspaper and Packaging Industries

Process
(See 2.5)

Techno-Economic Questionnaire Development

Skills Identification of the Master Craftsman

Outcome
Competence Profiling of the Master Craftsman

Figure 21: Schematic of a Best Practice for Competency Profiling
A competency profile of the master craftsman in the Printing, Newspaper and Packaging Industries

Step 1: Unstructured/semi-structured interviews with industry experts and other role players

Step 2: Nominal Group Analysis

Step 3: Develop a questionnaire

Step 4: Rudimentary skills listing

Step 5: National survey to the entire Printing, Newspaper and Packaging sector

Step 6: Data collection and analysis

Step 7: Publication of a sectorial study report in which a skills profile for the master craftsman is tabled

Figure 22: Schematic of the Aims, Steps and Techniques used for Competency Profiling
Nominal groups were identified for the areas of pre-press, transfer media, method of printing and finishing processes. Members of the various nominal groups were interviewed using a semi-structured interview method which sensitised them to the role they were to play in the nominal groups as well as what was expected from the processes in terms of developing a techno-economic questionnaire which would include what multi-skilled requirements would be required in order for the industries to meet the challenges of changing technology and increasing global competition as well as trying to establish what skills a master craftsman would need to operate in this changing environment. Any ideas or suggestions were encouraged and itemised accordingly.

The outcome of the process of developing a Techno-Economic questionnaire using unstructured and semi-structured interviews identified the scope of the forecast which was to establish, articulate and quantify the industries perception of its future growth in relation to the South African economy for the period 1997 to 1999. Specifically the following items were articulated:

- To establish what technological developments are taking place and those anticipated in the short to medium term and how these will impact on the vocational education and training needs of the industries.

- To quantify the immediate human resource development needs by identifying short and medium term skills shortages as well as identifying the vocational education and training needed for emerging technologies.

- To identify the multi-skilling needs of employees in the industries as well as the skills a master craftsman would require in the industries in the short to medium term.

The various nominal groups met in separate workshops and debated, brainstormed and articulated what they perceived as being the type of questions to be asked in a national techno-economic questionnaire. The various nominal groups also met in separate sessions to identify the tasks/roles and skills of a master craftsman in the Printing, Newspaper and Packaging Industries.

The results of the nominal group workshop was that a possible profile of skills and competences for a master craftsman could include the following:

- Qualified and competent craftsmen in a specific area of specialisation in one of the fields of Origination, Machine Minding Printing, Machine Minding Packaging, Finishing or the Maintenance Trades.
• Have working knowledge and basic competence in the fields other than their area of specialisation.

• Have skills and competence in related technical fields such as:
  • Quality Assurance in Printing, Newspaper and Packaging.
  • Technical Training Abilities.
  • Productivity Improvement.
  • Costing and Estimating.

• Have certain core skills and competences in fields such as:
  • Change Management.
  • Production Planning and Control.
  • Team Development.
  • Broad Interpersonal Competences.
  • Information Systems Usage.
  • Recruitment and Selection of Line Personnel.
  • Basic Business Management Skills.

A plenary of all the various nominal groups met to analyse all the inputs from the various specialists nominal groups and then developed the questions for a techno-economic questionnaire and a tentative skills listing of those skills the proposed master craftsman would need.

The nominal group in plenary articulated what items should be included in the questionnaire and developed the appropriate questions for inclusion in a national questionnaire namely:

(1) The demographic composition of the Printing, Newspaper and Packaging Industries as an economic sector identifying the following:
  - The size of a company in terms of their manning levels.
  - The nature of a company’s business.
  - The functions, processes, products that are used and produced, or the services provided.

(2) A forecast of present and future economic prospects using indicators such as labour utilisation, machine utilisation as well as projected sales forecasts.

(3) Quantify the future artisan craft skills needed in the industries.
(4) Forecast what technology changes in the origination, transfer media, methods of printing and finishing fields would occur.

(5) Identify multi-skilling needs for the master craftsman.

The process of specifying a rudimentary skills listing for the master craftsman resulted in a classification of technical trade relating skills covering origination, methods of printing, conversion methods and the maintenance trades of mechanician and electrician. The various specialist nominal groups by an iterative process reached consensus on this classification. The other technical related skills covering quality assurance, technical training, productivity improvement, costing and estimating were arrived at in a similar manner as were the non-technical skills covering change management, production control, team development, interpersonal, information systems, recruitment and selection and business management were arrived at by an interactive process as well. These classifications were incorporated into a questionnaire where the respondents were requested to indicate whether the skills identified for a master craftsman were deemed to be essential, nice-to-have or not necessary (see Appendix 1).

The techno-economic forecast questionnaire was posted to all the companies and organisations within the broad definition of the industries (see 1.6.3) which at that time numbered 1 273. These questionnaires were posted in September 1996 with a return date specified as 30 October 1996. The returns from the postal survey were from 350 companies and organisations. The surveys returned were answered in full or part by 312 companies, 38 were returned where the respondents indicated that because of the smallness of their enterprises and the limited scope of their operation they felt unable to make any form of reasonable accurate response. The 350 returns represented a 27.4% return. The details of the returns in terms of company size were analysed and are depicted in Figure 23.

<table>
<thead>
<tr>
<th>Size of Company in terms of No. of Employees</th>
<th>0-25</th>
<th>26-50</th>
<th>51-100</th>
<th>101-400</th>
<th>401-600</th>
<th>601+</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Surveys Returned with Full Response</td>
<td>138</td>
<td>62</td>
<td>38</td>
<td>34</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>No. of Surveys Returned with Partial Response</td>
<td>27</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Returned Incapable of Response (SME'S)</td>
<td>38</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>203</td>
<td>65</td>
<td>40</td>
<td>34</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

**Figure 23 : Survey Returns vs Company Size in Relation to Number of Employees**
The surveys returned were representative of approximately 38% of the total employee body of the Printing, Newspaper and Packaging Industries. Using the PNPIETB database of employee composition in the industries, the 350 companies and organisations that responded to the survey employed a total of 5,672 artisans and craftsmen out of the total artisan and craftsmen population of 7,743 for the industries at that time. Furthermore, 293 of the companies and organisations were accredited to provide artisan vocational education and training in the industries and were actively engaged in providing education and training to 692 apprentices.

The significance of the artisan composition and accreditation to provide artisan vocational education and training of those companies and organisations that returned the survey for this study is that the artisan and craftsman employed in the industries represent the entire potential learner target group for the master craftsman curriculum. Furthermore, because of the active involvement of these companies and organisations in providing accredited vocational education and training for artisans they are familiar with the competency based modular training system used within the industries and understand the needs of their artisan employees with regards career progression. The surveys were evaluated, analysed and where necessary additional information was obtained by means of literature surveys so that a comprehensive Sectorial Study Report on a Techno-Economic Forecast and Human Resource Development Requirements could be published.

The Printing, Newspaper and Packaging Industries Sectorial Study Report: Techno-Economic Forecast and Human Resource Development Requirements 1996 - 1999 was published in February 1997 for general consumption by the industries. The research methodology used to produce the report can be used for future surveys of the same or similar nature. The findings of the report are pertinent and of interest to this study because they quantify and qualify the following:

- The nature and extent of the Printing, Newspaper and Packaging Industries as an economic sector and how this sector relates to the South African Economy. The demographic composition of the sector is identified as well as indicating the economic prospects for the sector in the short to medium term.

- The vocational education and training needs of the Printing, Newspaper and Packaging sector are explored as well as the influences rapid technology changes will have on the skills profiles of employees in the sector.

- The actual sources of vocational education and training are identified as well as the human resource needs in the short to medium term for skilled artisans.
• The multi-skilling needs for employees in the sector as well as identifying the skills the sector perceives a master craftsman would need.

• The future vocational education and training needs of the sector viewed from the perspective of rapid technological changes articulating how skills profiles of the workforce will be influenced because of technology advances.

• Articulating the qualification requirements of the workforce of the sector within the emerging National Qualification Framework (NQF) model and revising the career progression system for the sector in line with these developments.

• Quantifying the future capabilities of the Printing, Newspaper and Packaging sector by establishing the type of technology usage in relation to size of company and identifying world class manufacturing requirements in a globally competitive market.

The process used to develop suitable questionnaires for a techno-economic forecast and a rudimentary skills listing proved to be of great value to this study in that it linked technology changes to human resource requirements and placed it in its economic context thus enabling curriculum development for the master craftsman to be a dynamic future orientated process taking cognisance of the complex world of work.

### 3.3.2 A SKILLS PROFILE OF THE MASTER CRAFTSMAN AND ITS USE TO DEVELOP A COMPETENCY PROFILE

A separate section of the techno-economic questionnaire referred to the multi-skilling needs for the workforce and in particular presented a rudimentary list of skills for a master craftsman (see Appendix 1 - Section 4). The respondents to the questionnaire were requested to indicate whether they viewed a particular skill to be essential, nice-to-have or not necessary for the master craftsman. Of the 350 questionnaires returned 328 responded in full to Section 4 of the questionnaire. An initial analysis was conducted by separating the respondents into sub-sectors and niche markets such as commercial printers, newspapers, magazines and packaging with a view to identifying if the specific skills requirements for a sub-sector or niche market were different. Large differences could indicate that different curricula may be required for the various sub-sectors or niche markets. Surprisingly all viewed the skills requirements for a master craftsman in a similar pattern across all skills categories. Combining the responses of the questionnaire and relating those that perceived a skill to be essential and nice-to-have these were tallied and expressed as a percentage of the total responses received. Figure 24 identifies the craft related skills and knowledge profile of the master craftsman.
<table>
<thead>
<tr>
<th>Field</th>
<th>Skill/Knowledge</th>
<th>% of Respondents who indicated the skill to be Essential</th>
<th>% of Respondents who deemed the skill Nice-To-Have</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origination</td>
<td>basic computer literacy</td>
<td>79.1%</td>
<td>14.9%</td>
</tr>
<tr>
<td></td>
<td>able to use a DTP packaging</td>
<td>75.4%</td>
<td>16.1%</td>
</tr>
<tr>
<td></td>
<td>understand imposition schemes for magazines, newspapers and book work</td>
<td>58.3%</td>
<td>22.0%</td>
</tr>
<tr>
<td></td>
<td>understand computer control equipment</td>
<td>57.8%</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>able to prepare different files, e.g. paste-up</td>
<td>53.5%</td>
<td>29.4%</td>
</tr>
<tr>
<td></td>
<td>understand use of colour and light in the industry</td>
<td>54.4%</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>familiar with Electronic proofing systems</td>
<td>49.6%</td>
<td>33.5%</td>
</tr>
<tr>
<td></td>
<td>understand camera operating systems</td>
<td>45.4%</td>
<td>35.4%</td>
</tr>
<tr>
<td></td>
<td>understand principles of sensitometry and densitometry</td>
<td>44.4%</td>
<td>39.8%</td>
</tr>
<tr>
<td></td>
<td>able to operate stop-and-repeat equipment</td>
<td>42.3%</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>able to operate a scanner</td>
<td>39.7%</td>
<td>43.4%</td>
</tr>
<tr>
<td></td>
<td>able to do colour corrections</td>
<td>39.4%</td>
<td>43.9%</td>
</tr>
<tr>
<td>Transfer Media</td>
<td>basic understanding of the operations of preparing transfer media for the different processors</td>
<td>45.0%</td>
<td>45.9%</td>
</tr>
<tr>
<td>Methods of Printing</td>
<td>skill in run 1, 2 and 4 colour process illustrations especially sheet fed</td>
<td>74.8%</td>
<td>17.1%</td>
</tr>
<tr>
<td></td>
<td>basic understanding of machine proofing</td>
<td>60.0%</td>
<td>29.6%</td>
</tr>
<tr>
<td></td>
<td>basic understanding of all preventative maintenance procedures of the above procedures</td>
<td>57.0%</td>
<td>35.5%</td>
</tr>
<tr>
<td></td>
<td>basic understanding of web press</td>
<td>31.5%</td>
<td>43.0%</td>
</tr>
<tr>
<td>Conversion Methods</td>
<td>basic understanding of converting paper to board, metal into cans and tubes, decorating, printing and finishing of the above</td>
<td>20.0%</td>
<td>34.3%</td>
</tr>
<tr>
<td></td>
<td>skill to convert paper into envelopes and stationery</td>
<td>10.7%</td>
<td>24.2%</td>
</tr>
<tr>
<td>Finishing</td>
<td>basic understanding of all Bindery methods, e.g. hard cover, soft cover lines</td>
<td>60.5%</td>
<td>21.9%</td>
</tr>
<tr>
<td></td>
<td>understanding of craft method of binding, e.g. library, flexible, stationery, etc.</td>
<td>25.5%</td>
<td>43.1%</td>
</tr>
<tr>
<td></td>
<td>know all legislative acts pertaining to safety and maintenance</td>
<td>63.7%</td>
<td>27.4%</td>
</tr>
<tr>
<td>Mechaniclan</td>
<td>basic hydraulic skills</td>
<td>34.9%</td>
<td>46.8%</td>
</tr>
<tr>
<td></td>
<td>basic pneumatic skills</td>
<td>34.9%</td>
<td>45.3%</td>
</tr>
<tr>
<td></td>
<td>skill to do workshop layout</td>
<td>31.1%</td>
<td>52.5%</td>
</tr>
<tr>
<td>Electrician</td>
<td>basic understanding of electrical safety</td>
<td>65.1%</td>
<td>24.7%</td>
</tr>
<tr>
<td></td>
<td>basic understanding of electronics used in machine control systems</td>
<td>54.3%</td>
<td>34.3%</td>
</tr>
</tbody>
</table>

Figure 24: Craft Related Technical Skills and Knowledge
(Printing, Newspaper and Packaging Industries, 1997:36)
From the profile depicted in Figure 24 and based on comments in the responses to the questionnaire on the skills and knowledge a master craftsman would ideally have, it is interesting to note that the skills and knowledge requirements in the origination and method of printing field are very much hands-on able-to-do skills. Having knowledge of and understanding principles, features in most other areas. Conversion methods, however, indicate that this area is seen as being of little value to the master craftsman. Other technical skills and knowledge requirements depicted in Figure 25 cast more light on the industries perception of what skills and knowledge a master craftsman would need in those areas that support the technical craft skills.

<table>
<thead>
<tr>
<th>Field</th>
<th>Skill/Knowledge</th>
<th>% of Respondents who Indicated the skill to be Essential</th>
<th>% of Respondents who Indicated the skill to be Nice-To-Have</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Assurance Skills</td>
<td>general knowledge of quality assurance principles</td>
<td>71.1%</td>
<td>21.1%</td>
</tr>
<tr>
<td></td>
<td>skill to implement a quality assurance system</td>
<td>39.6%</td>
<td>47.0%</td>
</tr>
<tr>
<td></td>
<td>knowledge of ISO 9002 type quality assurance systems</td>
<td>31.6%</td>
<td>45.1%</td>
</tr>
<tr>
<td></td>
<td>general knowledge of statistical quality assurance</td>
<td>26.7%</td>
<td>60.7%</td>
</tr>
<tr>
<td>Technical Training Skills</td>
<td>knowledge of competency based training systems</td>
<td>57.5%</td>
<td>33.6%</td>
</tr>
<tr>
<td></td>
<td>training needs analysis skills</td>
<td>39.0%</td>
<td>47.8%</td>
</tr>
<tr>
<td></td>
<td>evaluation skills</td>
<td>38.3%</td>
<td>46.1%</td>
</tr>
<tr>
<td></td>
<td>instructional design skills</td>
<td>33.6%</td>
<td>42.2%</td>
</tr>
<tr>
<td></td>
<td>presentation skills</td>
<td>31.3%</td>
<td>52.5%</td>
</tr>
<tr>
<td>Productivity Improvement Skills</td>
<td>basic method improvement skills</td>
<td>68.3%</td>
<td>28.5%</td>
</tr>
<tr>
<td></td>
<td>basic time measurement skills</td>
<td>60.1%</td>
<td>32.1%</td>
</tr>
<tr>
<td></td>
<td>integrated work study skills</td>
<td>35.4%</td>
<td>46.5%</td>
</tr>
<tr>
<td></td>
<td>advanced industrial engineering skills</td>
<td>15.6%</td>
<td>43.0%</td>
</tr>
<tr>
<td>Costing &amp; Estimating Skills</td>
<td>basic principles of costing</td>
<td>59.2%</td>
<td>31.5%</td>
</tr>
<tr>
<td></td>
<td>basic principles of estimating</td>
<td>55.2%</td>
<td>33.1%</td>
</tr>
<tr>
<td></td>
<td>printing estimating skills</td>
<td>59.5%</td>
<td>30.6%</td>
</tr>
</tbody>
</table>

Figure 25: Other Technical Skills and Knowledge
(Printing, Newspaper and Packaging Industries, 1997:38)

Quality assurance knowledge and skills are seen as being essential for the master craftsman followed closely by productivity improvement skills and knowledge. This confirms in many ways the need for organisations to become world class manufacturers and does give some insight into what competences a master craftsman should have. Knowledge of training methodologies such as competency based are seen as essential whereas presentation skills do not feature as being vital.
<table>
<thead>
<tr>
<th>Field</th>
<th>Skill/Knowledge</th>
<th>% of the Respondents who Indicated the skill to be Essential</th>
<th>% of Respondents who Indicated the skill to be Nice-To-Have</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change Management Skills</td>
<td>understand the impact of product changes on work process</td>
<td>53.0%</td>
<td>48.9%</td>
</tr>
<tr>
<td></td>
<td>skills to implement changes in product and work processes</td>
<td>49.3%</td>
<td>42.8%</td>
</tr>
<tr>
<td></td>
<td>understand the impact on process changes on work flow</td>
<td>45.4%</td>
<td>43.2%</td>
</tr>
<tr>
<td></td>
<td>understand the principles of change management</td>
<td>40.1%</td>
<td>48.9%</td>
</tr>
<tr>
<td>Production Control Skills</td>
<td>understand principles of production planning</td>
<td>70.9%</td>
<td>25.8%</td>
</tr>
<tr>
<td></td>
<td>able to monitor and control production through the use of production control systems</td>
<td>64.2%</td>
<td>29.1%</td>
</tr>
<tr>
<td></td>
<td>understand basic business budgetary systems</td>
<td>61.5%</td>
<td>29.5%</td>
</tr>
<tr>
<td></td>
<td>understand principles of production progress systems</td>
<td>54.3%</td>
<td>39.9%</td>
</tr>
<tr>
<td>Team Development Skills</td>
<td>team building skills</td>
<td>60.1%</td>
<td>34.3%</td>
</tr>
<tr>
<td></td>
<td>team maintenance skills</td>
<td>53.1%</td>
<td>40.6%</td>
</tr>
<tr>
<td></td>
<td>team activity planning skills</td>
<td>48.6%</td>
<td>45.7%</td>
</tr>
<tr>
<td>Interpersonal Skills</td>
<td>basic communication skills</td>
<td>73.3%</td>
<td>24.4%</td>
</tr>
<tr>
<td></td>
<td>customer care skills</td>
<td>72.5%</td>
<td>22.9%</td>
</tr>
<tr>
<td></td>
<td>discipline and grievance handling skills</td>
<td>66.9%</td>
<td>34.3%</td>
</tr>
<tr>
<td></td>
<td>negotiating skills</td>
<td>54.0%</td>
<td>39.4%</td>
</tr>
<tr>
<td></td>
<td>counselling skills (identify and minimise interpersonal conflict)</td>
<td>54.0%</td>
<td>37.2%</td>
</tr>
<tr>
<td></td>
<td>advanced multi-media communication skills</td>
<td>24.8%</td>
<td>37.4%</td>
</tr>
<tr>
<td>Information Systems Skills</td>
<td>effective meeting skills for problem solving and decision making</td>
<td>59.7%</td>
<td>32.1%</td>
</tr>
<tr>
<td></td>
<td>diagnostic/problem solving and decision making skills</td>
<td>58.0%</td>
<td>35.7%</td>
</tr>
<tr>
<td></td>
<td>basic knowledge of business information skills</td>
<td>40.3%</td>
<td>52.5%</td>
</tr>
<tr>
<td></td>
<td>information evaluation skills</td>
<td>29.7%</td>
<td>35.5%</td>
</tr>
<tr>
<td>Recruitment &amp; Selection</td>
<td>skills to define future personnel requirements</td>
<td>45.1%</td>
<td>47.2%</td>
</tr>
<tr>
<td></td>
<td>interviewing skills</td>
<td>42.7%</td>
<td>46.1%</td>
</tr>
<tr>
<td>Business Management Skills</td>
<td>basic principles of business management</td>
<td>59.4%</td>
<td>33.6%</td>
</tr>
<tr>
<td></td>
<td>basic principles of small business management</td>
<td>47.3%</td>
<td>42.0%</td>
</tr>
</tbody>
</table>

Figure 26: Non-Technical Skills and Knowledge
(Printing, Newspaper and Packaging Industries, 1997:38)
The non-technical skills and knowledge data in Figure 26 reveal that such interpersonal skills as basic communication and customer care is seen as critical for the master craftsman. Naturally this phenomena can be related to the impact of technology where the customer distance to the production floor is rapidly reducing. Production control skills and knowledge indicates also the industries perceived need to improve delivery and become more competitive. Figure 26 illustrates further that the master craftsman should also have knowledge and understanding of how a business is managed.

3.3.3 WORLD CLASS MANUFACTURING NEEDS

Of the surveys received 92% made specific comments and identified that as an economic sector the Printing, Newspaper and Packaging Industries in order to survive would need a skilled workforce capable of making companies globally competitive. All perceived that world class manufacturing was the ideal to which they were striving and endorsed multi-skilling and greater training as one of the routes to world class manufacturing capabilities. 83% of the surveys respondents made statements that the proposed master craftsman should have the necessary vocational education and training inputs and the multi-skilling abilities to be able to operate and perform within world class manufacturing environments and if possible be viewed as a catalyst in the process. Many of the respondents who perceived world class manufacturing capability as being crucial to their survival were however vague as to what the concept world class manufacturing meant. In order to clarify their perceptions of what world class manufacturing was, the concept was researched and formed part of the Sectorial Study Report (Printing, Newspaper and Packaging Industries, 1997:33-41).

3.3.4 A COMPETENCY PROFILE OF THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

The profile of skills and knowledge that emerged from the survey as well as any suggestions made by the respondents was analysed and through a plenary of the nominal groups certain decision rules were established from which a competency profile of the master craftsman could be developed. When the decision rules were made the significant links between the competency profile and the master craftsman curriculum were taken note of. These significant links are:

- Competency Profile and Standards for a Master Craftsman.
- Vocational Education and Training Curriculum for the Master Craftsman.
<table>
<thead>
<tr>
<th>Unit of Competence.</th>
<th>Module or Modules.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element of Competence.</td>
<td>Outcome of Learning which enables:</td>
</tr>
<tr>
<td>Performance Criteria.</td>
<td>(a) Assessment Criteria.</td>
</tr>
<tr>
<td></td>
<td>(b) Design of methodology for evaluation and evaluation system.</td>
</tr>
<tr>
<td>Range of Variables.</td>
<td>Conditions which will assist in determining the nature and range of adaptive, change management and core skills.</td>
</tr>
</tbody>
</table>

The decision rules arrived at were:

A. Competency profile for the master craftsman should cover all technical craft related skills and knowledge areas of origination, transfer media, methods of printing, finishing and the legislative acts pertaining to health and safety in the mechanician and electrical fields.

B. The competency profile for the master craftsman in the category of other technical skills and knowledge should cover quality assurance, costing and estimating and certain aspects of technical training and productivity improvement.

C. From the non-technical category, the various fields such as change management, production control, team development, interpersonal, information systems, recruitment and selection and business management should be part of the competency profile for the master craftsman.

D. The skills that were identified as essential should ideally be observable and have an outcome which lends itself to establish minimum acceptable performance criteria.
E. The current methodology in use within the Printing, Newspaper and Packaging Industries to establish units of competence derived from identified skills and knowledge requirements was to be used so as to maintain continuity and enable the process to be timeous and effectively completed.

In order to express competencies for a master craftsman in a form which lends itself for further development but which is in line with the present Competency Based Modular Training system for craft training currently in use in the Printing, Newspaper and Packaging Industries, the competency profile for the master craftsman would need to detail the following:

- The nature of the job, functions, tasks or roles namely craft technical, other technical and non-technical.

- The field in which competency units are identified.

- The unit of competency which should identify standalone functions, tasks or roles for which a competency can be described.

Once this process has been completed, a competency profile can be created. Once standards in terms of outcome performance and the entire curriculum development process has taken place, additional detail can be included such as:

- The elements of competency.
- The performance criteria: Quantifiable and qualifiable, where possible.
- Range of variables under which the unit or element of competency can occur in the work situation.

The eventual end product becomes a competence profile within a performance outcome-based competency model as shown in Figure 27.
Using the skills profiles and the decision rules for competency profiling a competency profile was developed for the master craftsman. Figure 28a identifies the craft related competencies in the field of origination. Figure 28b identifies the craft related competencies in the fields of transfer media, methods of printing, finishing and the maintenance crafts. Figure 29 identifies the other technical competencies a master craftsman would need in the fields of quality assurance, technical training, productivity improvement and costing and estimating.
Figure 30a and 30b identifies all the non-technical competencies a master craftsman would need in the fields of change management, production control, team development and interpersonal. The process of identifying the competencies from the identified skills profile entailed the standard practice used within the Printing, Newspaper and Packaging Industries where skills are seen as underpinning competencies. Competencies are described in terms of action verbs such as recall, comprehend, understand, produce, manufacture, make and describe the 'able to do' concept.

<table>
<thead>
<tr>
<th>Nature of the job functions tasks or roles</th>
<th>Field</th>
<th>Unit of Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Craft Technical Competencies</td>
<td>Origination</td>
<td>1. Be computer literate and be able to use a word processing package on a PC/Mac hardware configuration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Be able to use DTP packages such as Quark Express, Coreldraw, Freehand, etc. and upgrade as necessary to produce page layouts as specified.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Be able to work out imposition schemes for magazines, newspapers and book work.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Understand the computer controlled equipment used in production.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Be able to distinguish between and prepare the different flats that is on positive and negative film.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Understand the use of colour and light in the industry, particularly in the areas of additive and subtractive light applications as well as the filters and the results, application and the use of each filter.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Electronic proofing systems that are available and in use in the production environment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Recall and understand the various principles and techniques used in the operation of the camera and the type of screens to be used for the various colour printers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Understand and recall the principles of sensitometry and densitometry and know how and when to use them as a measuring tool.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Be able to operate the step-and-repeat machines that is both the vertical and horizontal models to do step and repeat jobs as they occur.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. Be able to set up and operate the scanner to do size for size, enlargements or reductions and transmission or reflection copies.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12. Be able to do colour correction so that the final product is enhanced to the customers specification.</td>
</tr>
</tbody>
</table>

Figure 28a : Craft related Technical Competencies of the Master Craftsman
<table>
<thead>
<tr>
<th>Nature of the job functions tasks or roles</th>
<th>Field</th>
<th>Unit of Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Craft Technical Competencies</td>
<td>Transfer Media</td>
<td>1. Understand and recall how to prepare transfer media for the different processes.</td>
</tr>
<tr>
<td></td>
<td>Methods of Printing</td>
<td>1(a) Able to prepare, make-ready and run a 1, 2 or 4 colour process illustrations on a lithographic sheet fed machine.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1(b) Able to prepare, make-ready and run a 1, 2 or 4 colour rotary lithographic offset press.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1(c) Able to prepare, make-ready and run a 1, 2 or 4 colour process illustration on a gravure rotary press.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1(d) Able to prepare, make-ready and run a 1, 2 or 4 colour flexography rotary press.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Basic understanding of machine colour proofing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Basic understanding of all safety and preventative requirements for printing press operations.</td>
</tr>
<tr>
<td></td>
<td>Finishing</td>
<td>1. Basic understanding and recall of all bindery methods, e.g. hard cover lines and soft cover lines as fully mechanical operations.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Able to prepare, make-ready and run a soft or hard cover production line to produce soft or hard covered books.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Basic understanding and recall of the craft method of binding that is library book restoration, flexible stationery, etc.</td>
</tr>
<tr>
<td></td>
<td>Maintenance Mechanician</td>
<td>1. Recall, know and apply the health and safety regulations pertaining to machinery and equipment in a factory.</td>
</tr>
<tr>
<td></td>
<td>Electrician</td>
<td>1. Recall, know and apply the health and safety regulations pertaining to electrical installations in a factory.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Understand and recall basic electronic controlled machinery and equipment used in the Printing, Newspaper and Packaging Industries.</td>
</tr>
</tbody>
</table>

**Figure 28b: Craft related Technical Competencies of the Master Craftsman**

Note that in the method of printing field, competence in only one method of printing is necessary, that is any one of sheet-fed lithography, rotary offset, lithography, gravure or flexography.
<table>
<thead>
<tr>
<th>Nature of the job functions tasks or roles</th>
<th>Field</th>
<th>Unit of Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Technical Competencies</td>
<td>Quality Assurance</td>
<td>1. Recall and understand quality assurance principles.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Implement an effective and efficient quality assurance system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Know and recall what ISO 9000 series quality assurance systems are.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Understand and recall what statistical quality assurance is.</td>
</tr>
<tr>
<td></td>
<td>Technical Training</td>
<td>1. Understand and recall what competency based training systems are.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Have basic knowledge of training needs analysis, training evaluation, instructional design and training presentation techniques.</td>
</tr>
<tr>
<td></td>
<td>Productivity Improvement</td>
<td>1. Using suitable method study techniques implement method improvements in the workplace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Using suitable time study techniques develop standard times for job related activities in the production environment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Know and recall more advance work study and industrial engineering techniques.</td>
</tr>
<tr>
<td></td>
<td>Costing and Estimating</td>
<td>1. Know and recall the basic principles of costing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Know and recall the basic principles of estimating.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Be able to do costing and estimating for potential orders for products and services in the Printing, Newspaper and Packaging Industries.</td>
</tr>
</tbody>
</table>

Figure 29: Other Technical related Competencies of a Master Craftsman
<table>
<thead>
<tr>
<th>Nature of the job functions tasks or roles</th>
<th>Field</th>
<th>Unit of Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Technical Competencies</td>
<td>Change Management</td>
<td>1. Analyse and evaluate the impact of product changes on work process from short run batch to long run in-line mass production systems.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Implement new product changes and where necessary new production process systems that may be necessary.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Determine and quantify the impact of production process changes on work flow.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Recall and understand the principles of change management.</td>
</tr>
<tr>
<td></td>
<td>Production Control</td>
<td>1. Recall and understand the principles of production planning.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Monitor and control production using suitable production control systems.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Understand and interpret business budgets.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Recall and understand principles of production progressing.</td>
</tr>
<tr>
<td></td>
<td>Team Development</td>
<td>1. Select, formulate and establish work teams.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Maintain work teams so that they remain efficient and effective.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Plan team activities efficiently for effective performance.</td>
</tr>
<tr>
<td></td>
<td>Interpersonal</td>
<td>1. Be able to communicate effectively in the work environment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Handle customer requirements and complaints effectively and efficiently.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Implement disciplinary codes and grievance handling procedures effectively so as to minimise industrial relations problems.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Be able to negotiate within the business and industrial relations arenas as demanded by the work situation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Identify and minimise interpersonal conflict in the workplace by effective and empathic counselling of the parties co-named in the interpersonal conflict.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Have basic knowledge of multi-media communication systems.</td>
</tr>
</tbody>
</table>

Figure 30a: Non-Technical Competency Profile for the Master Craftsman
A prime factor leading to this study was that the Printing, Newspaper and Packaging Industries expressed the need for a master craftsman level in the industries and a suitable curriculum to develop the existing artisan and craftsman cadre to become master craftsmen. Unfortunately the industries had only a generic definition of the master craftsman and could not articulate the actual job, functions, tasks and competencies that were required. This problem was addressed by identifying as part of the first phase of the curriculum development process a suitable job/function profile (JFP) technique and applying it to determine the competencies for the master craftsman. The arrived at competency profile for the master craftsman has particular significance for curriculum development particularly when the curriculum is viewed from a systems perspective. The competencies can be viewed as desired learning outcomes which can be used as the starting point of a top-down approach to creative curriculum development and be delivered in modular form. The competencies can be viewed as the kernel of units of learning as advocated by the outcomes-based approach of the emerging National Qualification Framework model.

3.4 SYNTHESIS

Developing a competency profile for a job, function, task or role is easily facilitated if the job, function, task or role actually exists in the workplace. However, if the job, function, task or role does not exist in the workplace then the process becomes more difficult since no job reference point is available. The master craftsman in the Printing, Newspaper and Packaging Industries does not exist and at present the vague generic definition of the master craftsman as the custodian of the craft of printing and packaging and the point of introduction of new technology does not allude to any skills or competencies a master craftsman may require. Because the master craftsman is viewed as a point of introduction of new technology, it is necessary that the skills and competences a master craftsman would need, should include a broad range of
skills. Notwithstanding the influences new technology would have on identifying the skills and competencies of the master craftsman in the Printing, Newspaper and Packaging Industries it was also identified that the master craftsman would be a crucial agent in the industries strive for World Class Manufacturing (WCM) capabilities. This goal in itself identifies an additional range of skills and competencies the master craftsman should have. Curriculum and curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries should be systemic and take cognisance of the interrelationship of the various components of the curriculum. By developing a competency profile for the master craftsman through a structured methodology facilitates the curriculum development process. The competence profile is a starting point from which course content can be identified and organised.

In order to establish the master craftsman competencies it was necessary to identify what competency profiling is and establish how competency profiling is done in practice. This revealed that a variety of techniques are available that can be used to identify job, tasks/roles and competencies. Evaluating the suitability of these profiling techniques for establishing the master craftsman competency profile resulted in the development of a best practices technique for the Printing, Newspaper and Packaging Industries (see 3.3.1). Applying this best practices technique for establishing the competency profile of the master craftsman demonstrated that the technique is pragmatic and resulted in the following:

- A detailed skills profile of the master craftsman which identified the craft related technical, other technical and non-technical skills (see 3.3.2).
- A set of decision rules for converting the skills profile into a competency profile expressed as units of competence for the master craftsman (see 3.3.4).
- The significant links between the competency profile and the master craftsman curriculum (see 3.3.4).

It will also be shown that the derived competence profile of the master craftsman is of such a nature that units of competence and their concomitant elements can be clustered in groups which fall within the broad understanding of competence for the Printing, Newspaper and Packaging Industries as postulated by Thomas (1994). The clustering of the units and their concomitant elements will also be of aid in identifying areas of underpinning knowledge and core skills which will enable job competence to occur in the world of work.

Chapter 4 will explore how the identified competencies for the master craftsman can be refined to include the core (critical cross field) and fundamental skills and knowledge. These refined competencies can then be used for producing unit standards which meet the requirements of the National Qualification Framework so that the master craftsman qualification can be nationally recognised and internationally benchmarked.
CHAPTER 4:  A TAXONOMY OF SKILLS, KNOWLEDGE AND ATTRIBUTES FOR THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

4.1 INTRODUCTION

The competency profile for the master craftsman that was established through the best practices profiling technique (see 3.3.1) established skills and competencies in the craft technical, other technical and non-technical fields. The underpinning knowledge that is needed to support these skills and competencies have not been fully articulated. Furthermore the core (critical cross field) and fundamental skills and underpinning knowledge components that are specified as essential by the emerging National Qualification Framework model have not been established. A process of refining the established master craftsman competencies is necessary so as to enable the master craftsman qualifications to be nationally recognised by the National Qualifications Framework. The refining of the competencies to include all the skills and underpinning knowledge is useful and essential for sourcing and evaluating course content when the systems component of the curriculum dealing with selection and organisation of learning content is addressed.

4.2 JOB COMPETENCE IN AN INDUSTRIAL SETTING

The master craftsman for the Printing, Newspaper and Packaging Industries will operate in the world of work. The world of work takes place within organisations and job competence must be seen in the context of an organisation behaving as an adaptive system.

Parry (1996:49) defines competency as:

'A cluster of related knowledge, skills and attributes (K.S.A.) that affects a major part of ones job (a role or responsibility), that correlates with performance on-the-job, that can be improved against well-accepted standards, and that can be improved via training and development.'

This definition establishes a relationship between the job and performance on-the-job. Parry (1996:56) also suggests certain guidelines for identifying and describing competencies, namely:

• The focus should be on generic competencies rather than specific and situational.

• Avoid the obvious where some competencies taken in the right context can be ignored.
• Competencies should be illustrated wherever possible with behaviour examples.

• Use familiar language in describing competencies and keep the description as short as possible.

• Focus on future needs.

• Work backwards, from results to behaviour to competencies.

• Define levels of excellence using quantitative and qualitative criteria wherever possible.

• Avoid personality traits. If, however, certain personality traits are critical to success on-the-job they should be included separately and listed as values, traits and qualities needed for the job.

• Cluster similar competencies.

Esque & Gilbert (1995:44) contend that even if lists of competencies have been well-researched and clearly stated they may not necessarily be of benefit to an organisation who has a job incumbent performing within the requirements of the competencies. They suggest that for competencies to have an impact on the organisation’s performance four specific requirements need to be met:

1. The information that competencies convey should describe accurately how individuals can be educated and trained to succeed at their current or future jobs.

2. The individuals should by whatever means possible, acquire the competencies deemed necessary so as to succeed at their jobs.

3. Those competencies acquired by job incumbents actually require the individuals to use the competencies at the right time and in the appropriate sequence.

4. An individual’s success on-the-job should be defined by the requirements for success of the organisation.

The Printing, Newspaper and Packaging Industries as an economic sector have articulated that for the sector and the organisations in the sector to be successful they would need to have a world class manufacturing capability. To develop a taxonomy of skills, knowledge and abilities for the master
craftsmen’s cognisance must be taken of some of the requirements an organisation needs to be successful as a world class manufacturer, namely improved productivity, reduced production costs, high quality and good customer service.

4.3 COMPETENCE AND SKILLS IN RELATION TO THE MACRO REQUIREMENTS SET BY CENTRAL GOVERNMENT

The Green Paper on the Skills Development Strategy for Economic and Employment Growth in South Africa (Department of Labour, 1997) describes in the preview to the actual contents of the Green Paper the meaning of the term 'skills' as used in the Green Paper. The Green Paper in the preview defines applied competence as the way skills should be understood.

Applied competence is the overarching term for three kinds of competence:

Practical competence: Our demonstrated ability to perform a set of tasks.

Foundational competence: Our demonstrated understanding of what we or others are doing and why.

Reflective competence: Our demonstrated ability to integrate or connect our performances with our understanding of those performances so that we learn from our actions and are able to adapt to changes and unforeseen circumstance.

This broad understanding of applied competence or skills is essential in a rapidly changing world where tasks seldom stay the same and where the adaptability of people to new demands and opportunities is as fundamental to employment or income security as it is to growth. A learning nation, just as any learning organisation, has to be made up of people with all three kinds of competence, capable of reflecting on their current performance in order to continually improve it.

(Department of Labour, 1997 - Preview to Green Paper).

The notion of skills and competence being of the same genre as well as competence being viewed as what is applied in the world of work can be problematic in that it views competence being more than being able to perform defined tasks. An applied competence as alluded to could in practice only be described in terms of a job or task outcome, assuming that any job or task even though routine could take place under a range of circumstances or variables thus displaying adaptability and identifying that certain skills such as core skills enabled competence to take place.

Interestingly, Thomas (1994) identified in his taxonomy of skills, adaptive skills which support together
with his described core, change management, interpersonal and intrapersonal skills the notion of applied competence or skills as put forward by the Green Paper. The Green Paper (Department of Labour, 1997:28) identifies that within a learnership the structured learning component should contain fundamental, core/contextual and specialised skills with their concomitant body of underpinning knowledge.

Some examples of fundamental skills are given such as language, mathematics and communication. Core skills are stated as scientific, social, entrepreneurial, industrial relations and so on. According to the Scottish Vocational Education Council system (Scotvec, 1996:4-8) core skills are identified as communication skills, application of number, use of information technology, personal skills related to improving ones own learning and performance and personal skills related to working with others. Problem solving skills are also viewed as core skills.

The unit summaries for the core skills of National Vocational Qualifications (NVQs) in Britain according to City and Guilds International (CGLI, 1995c:6-14) are at various levels but contain the following at each level:

<table>
<thead>
<tr>
<th>Communication:</th>
<th>Element</th>
<th>1. Take part in discussion.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2. Produce written material.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Use images.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Read and respond to within materials.</td>
</tr>
<tr>
<td>Application of Numbers:</td>
<td>Element</td>
<td>1. Collect and record data.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Tackle problems.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Interpret and present data.</td>
</tr>
<tr>
<td>Information Technology:</td>
<td>Element</td>
<td>1. Prepare information.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Present information.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Evaluate the use of information technology.</td>
</tr>
<tr>
<td>Personal skills - Improving own learning performance:</td>
<td>Element</td>
<td>1. Identify targets.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Follow schedules to meet targets.</td>
</tr>
<tr>
<td>Personal skills - Working with others:</td>
<td>Element</td>
<td>1. Identify collective goals and responsibilities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Work to collective goals.</td>
</tr>
</tbody>
</table>

Interestingly, the Irish identify that within a job family there are core skills, specialist skills within a specific job area, common skills for the job family and personal skills. According to Foras Áiseanna Saothair (FÁS) the Irish Training and Employment Authority (FÁS, 1994:3), core skills are purely job related and can be
compared to the basic tasks in a job. Personal skills are stated as being initiative, verbal communication, team work, problem solving, adaptability, planning and organising, information gathering, customer relations, report writing and environmental issues. UTS identified for the National Rail Corporation of South Australia (UTS, 1993:8) core skills and core competences and describe core competencies at various levels. At each level core competencies include customer service, planning and organising, occupational health and safety, individual and team competency, team work, problem solving, quality systems and communications.

From the examples shown it is evident that the categorisation of what constitutes a core, fundamental and specialised skill is open to debate and could well impact on the issue of benchmarking a qualification internationally. What is apparent from the examples shown is that the concept of specific core and fundamental skills being essential for overall job competence is accepted practice internationally. However, for the purposes of this study it is necessary to accept the categorisation for the core and fundamental skills as being those articulated in the emerging National Qualification Framework. Bearing the above in mind the competencies that were developed for the master craftsman would need to reflect the fundamental and core skills required by the National Qualification Framework. A sound basis for accommodating these skills already exists in the identified other technical competencies (see 3.3, Figure 29) and the non-technical competencies (see 3.3, Figures 30a and 30b) where core skills such as communication, working effectively with others and problem solving are addressed. In order to facilitate effective curriculum development for the master craftsman some form of model or taxonomy of skills and competencies needs to be developed which incorporates the core and fundamental skills and all the other requirements of the emerging National Qualification Framework model as well as being outcomes-based. A taxonomy incorporating these requirements will ensure that the master craftsman qualification can be articulated onto the National Qualification Framework. In the refining process it will be necessary to identify as must detail as possible, including all the underpinning knowledge for the skills and competencies. This detail is essential for curriculum development purposes especially when the sourcing and evaluating of course content takes place.

4.4 A TAXONOMY OF COMPETENCIES, SKILLS, KNOWLEDGE AND ATTRIBUTES FOR THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

In order to develop a suitable taxonomy of skills knowledge and attributes for the master craftsman in the Printing, Newspaper and Packaging Industries cognisance must be taken of the need to incorporate the required fundamental and core skills.
When describing a skill UTS (1993:10) referred it to a unit of competence and identified for each unit its constituent elements. Details of the performance criteria for each element, the range of variables and the evidence which they describe in terms of knowledge and the underpinning skills within the skills components was also described. It is interesting to note that job and task skills, core and fundamental skills are not categorised separately but built into each unit. Examining their various units of competence it is evident that repetition of core and fundamental skills with their concomitant knowledge component do take place and makes it difficult to envisage how vocational education and training in the interactive didactic situation can take place without course content repetition. This is of course understandable since the process of developing competency standards was undertaken with a view to expressing standards at various levels in a descriptive qualitative and quantitative manner for the purposes of evaluation and qualification and not curriculum development.

To describe the applied competences for the master craftsman in the Printing, Newspaper and Packaging Industries a clustering of competencies in a taxonomy of task or competence elements with the underpinning skills and knowledge would be at the first level, followed by underpinning core skills and knowledge and finally fundamental skills and knowledge. A hierarchical taxonomy is unpractical since for different competencies or elements, repetition of selected core and fundamental skills could occur, making the process of curriculum development cumbersome and difficult. If the competencies, specialised skills and concomitant underpinning knowledge together with the core and fundamental skills and their concomitant underpinning knowledge were described by a model where core and fundamental skills orbit about the competencies and specialised skills and are applied where and when necessary then repetition of core and fundamental skills would not occur. The model shown in Figure 31 identifies how through the rotation of core skills and their underpinning knowledge it is possible to match specialised skills and knowledge which may require such core skills. Likewise the same is applicable to fundamental skills and their concomitant underpinning knowledge.

By describing the competencies and skills taxonomy in this manner it enables a visual model which lends itself for curriculum development. The model integrates practical training with skills development and underpinning knowledge of a specialist nature and meets the requirements for the core and fundamental skills components. Provided that the correct balance is obtained between the various components of the model, it can describe the skills and knowledge necessary for success expressed in terms of elements or units of competence.
Figure 31: A Model of a Taxonomy of Skills and Knowledge
Applying the taxonomy as a means of identifying the components of a unit of competence of the master craftsman competence profile, such as handling customer requirements and complaints effectively and efficiently (see 3.3.4, Figure 30a), an element of the unit of competence could be: to provide effective customer service.

Each element of competence would require its performance criteria, range of variables and underpinning knowledge and skills. An example of these components for providing effective customer service is listed below.

**Element of Competence : Provide Effective Customer Service**

<table>
<thead>
<tr>
<th>Sub-Elements</th>
<th>Performance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Plan and prepare for customer services. (a specific set of skills subsumes this sub-element and these skills are supported with specific underpinning knowledge).</td>
<td>1.1.1 Customers, both internal and external, are identified.</td>
</tr>
<tr>
<td></td>
<td>1.1.2 Needs and expectations of customers are identified and documented.</td>
</tr>
<tr>
<td></td>
<td>1.1.3 Products/services to meet customer needs are identified from available range or design as recommended.</td>
</tr>
<tr>
<td></td>
<td>1.1.4 Product/service information is provided to customers in the agreed enterprise format.</td>
</tr>
<tr>
<td></td>
<td>1.1.5 Resources required to support the guaranteed level of customer service are forecasted or requested.</td>
</tr>
<tr>
<td>1.2 Provide effective customer services. (a specific set of skills subsumes this element and these skills are supported with specific underpinning knowledge).</td>
<td>1.2.1 Communications with the customer are established and maintained in a manner which reflects positively on the individual, the team and enterprise.</td>
</tr>
<tr>
<td></td>
<td>1.2.2 Guidelines provided in the product or service information documents are positively reinforced.</td>
</tr>
<tr>
<td></td>
<td>1.2.3 Integration of customer service activities is negotiated and co-ordinated with the appropriate team members in the enterprise.</td>
</tr>
<tr>
<td></td>
<td>1.2.4 Customer concerns are dealt with promptly and every possible action is taken to correct situations.</td>
</tr>
<tr>
<td></td>
<td>1.2.5 Enterprise or site policy &quot;on admission of liability&quot; is applied in dealings with customers.</td>
</tr>
<tr>
<td>1.3 Initiate improvements in customer services. (a specific set of skills subsumes this element and these skills are supported with specific underpinning knowledge).</td>
<td>1.3.1 Quality of service and customer satisfaction is assessed on the basis of systematic liaison with customers.</td>
</tr>
<tr>
<td></td>
<td>1.3.2 Service improvement proposals are formulated and progressed through established team processes.</td>
</tr>
<tr>
<td></td>
<td>1.3.3 Regular clients are contacted and made aware of new/alternative/modified products or services.</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES

1. General: The Printing, Newspaper and Packaging Industries are by nature:
   - Service driven.
   - Multi process oriented with high technology and high skills base relying on team-based work.
   - The work environment is heavily dependant on short lead times and competitive pricing.

2. Other: Customers may be external or internal to the enterprise. Every process, product or service has a customer.

KNOWLEDGE AND SKILLS UNDERPINNING COMPETENCE

Skills. The ability to:

- Interpret and apply enterprise and team customer service policies and procedures including those relating to supplier service contracts and other special conditions.

- Identify, forecast and apply resources required to support customer services.

- Positively represent the desired corporate/team image to customers.

- Establish effective communications with difficult customers.

- Advise customers of the range of available products and services and clarify issues related to product/service, costs, documentation, enquiries and complaints.

- Modify products/services, within authorised parameters, in order to match customers' needs.

- Satisfy customers or refer them to alternative suppliers whose products/services complement the enterprises range.

- Analyse products/services and formulate improvements/enhancements.

- Conduct less complex customer satisfaction surveys.

Knowledge. A knowledge of:

- Enterprise and team customer services, policies and practices.

- Team resource acquisition processes and procedures.

- Theory of marketing and sales as applying to:
  - identification and promotion of enterprise images.
  - establishing a rapport with customers.
  - dealing with difficult customers.
  - opening and closing sales.
  - customer satisfaction surveying.
  - product/service improvement processes.
Enterprise products and services and organisational responsibilities in relation to these.

Products and services which complement those offered by the enterprise.

Special 'supplier service contracts' and other trade options which may be used to vary or modify standard conditions.

The Core and Fundamental skills required for this element are:

**Core Skills.** The ability to:

- Communication at interpersonal and intrapersonal levels.
- Problem solving.

**Fundamental Skills.** The ability to:

- Read and comprehend English as a commercial language.
- Speak and articulate thoughts into the English language medium.
- Calculate resource requirements using basic mathematics of addition, subtraction, multiplication and division to two decimal points.

**Knowledge.** A knowledge of:

- English grammar, equivalent to Standard eight schooling.
- Verbal, oral and written communication techniques.

**Knowledge.** A knowledge of:

- The communication process at the interpersonal and intrapersonal levels.
- The problem solving process.

The model is of course incomplete in that it does not describe itself in terms of learning outcomes as prescribed in the White Paper on Education and Training, which states:

> An integrated approach to education and training, linked to the development of a new National Qualification Framework (NQF) based on a system of credits for learning outcomes achieved ....

(Department of Education, 1995:3).

Building on the model by including the learning outcome, which in the case of the master craftsman in the Printing, Newspaper and Packaging Industries would be a job outcome which meets the prescribed criteria for the job, the model should be all inclusive encompassing the competencies, skills knowledge and attributes for success.
This model is represented in Figure 32 where the job outcome is the starting point. Units of competence (or major job tasks or functions) orbit around the job outcome. The elements of competence, their underpinning skills and knowledge cluster around the various units of competence.

Some of the units of competence and their elements of competence rely on the skills and underpinning knowledge peculiar to them as well as certain core (critical cross field) skills and underpinning knowledge that are necessary to enable the competence expressed in the unit to occur in the real world. Likewise certain fundamental skills and underpinning knowledge may also be essential so that the competence expressed in the unit can be achieved.
Figure 32: A Job Outcomes Taxonomy of Skills Knowledge and Attributes
For purposes of this study the taxonomy of competencies, skill, knowledge and attributes represented by the model will enable the process of curriculum development to proceed. The application of the taxonomy to the master craftsman curriculum development process will enable core (critical cross field) and fundamental skills required by the National Qualification Framework to be accommodated. Viewing the curriculum from a systems perspective, the taxonomy will be of value in sourcing and evaluating learning content. The taxonomy will also be of value in the evaluation sub-system of the curriculum by giving direction to the development of assessment instruments. Formative assessment will also be facilitated by the fact that the competencies describe underpinning skills and knowledge and can be assessed as they occur.

4.5 SYNTHESIS

The requirements of the National Qualification Framework for an outcomes-based demand-led education and training system, advocates a top-down approach to curriculum development. This top-down approach is seen as an opportunity to engage in more creative curricula being developed. Because of the unique circumstances and problems surrounding the development of the master craftsman curriculum a top-down approach is the only option available. The establishment in the first phase of the curriculum development process of a job/function profiling exercise (see 2.5, Figure 9) has led to the articulation of a comprehensive competency profile for the master craftsman.

For the master craftsman curriculum to lead to a qualification that would be recognised by the National Qualification Framework (NQF) the master craftsman competencies expressed as units of learning outcome should reflect the core (critical cross field) and fundamental learning outcomes as well. The competency profiling technique that was used (see 3.3.4) resulted in competencies that did not reflect the NQF requirements. Despite the confusion that exists in defining what core and fundamental skills and competencies are, a taxonomy of competencies, skills, knowledge and attributes was developed so that the identified master craftsman competencies could be expanded and refined to include all the competencies skills and underpinning knowledge required by the NQF (see 4.4). The practical implication of applying this taxonomy is that a great deal of detail with regards competencies, skills and underpinning knowledge can be obtained. This detail is useful and necessary when standards generating takes place for articulating the master craftsman qualification onto the NQF. How the actual master craftsman qualification will be articulated onto the NQF will be discussed in Chapter 5. The refined competencies with all their detail (see 6.5.1, Figure 50) is useful and essential for phase 3 of the curriculum development process (see 2.5) when the component of selecting and organising learning content is addressed.
CHAPTER 5: STANDARDS SETTING OF THE UNITS OF LEARNING FOR THE MASTER CRAFTSMAN CURRICULUM

5.1 INTRODUCTION

Among the specific aims of this study was that the master craftsman curriculum should lead to a nationally recognised qualification that is also internationally benchmarked (see 1.5). Coupled to these aims was that the master craftsman qualification and level was seen as a natural extension of the artisan qualification and level. Furthermore the master craftsman level should be a viable career progression option for the artisan.

Articulating the master craftsman curriculum onto the National Qualification Framework (NQF) involves more than identifying what elective, critical cross field and fundamental learning outcomes need to be embodied in a unit of learning. It is necessary to identify what the NQF requirements are for generating standards and which process can be used to ensure that the standards generating activities lead to acceptable standards. It is also necessary to establish where the master craftsman qualifications fits in the Printing, Newspaper and Packaging Industries career path system and how the qualification can be internationally benchmarked.

5.2 THE REQUIREMENTS OF THE NATIONAL QUALIFICATION FRAMEWORK

The potential master craftsman learner will come from a very specific target group in the Printing, Newspaper and Packaging Industries. This target group is the artisan or craftsman in the industries who traditionally have obtained a nationally recognised artisan qualification. Since 1992 the qualification has been internationally benchmarked. Furthermore the tertiary studies that were and still are an option to the qualified craftsmen in the industries have been the National Diplomas in Printing Management and Packaging Management offered by the Technikons. Again certification for the qualifications have been nationally recognised. Any envisaged master craftsman curriculum would naturally have to result in a nationally recognised qualification. With the advent of the National Qualification Framework (NQF) the master craftsman curriculum would have to be integrated within the NQF as far as recognised units of learning for a particular level are concerned.

According to Isaacs (1997a:1-3) the development of the South African Qualification Authority (SAQA) Act had its origins in certain recommendations which felt that an integrated approach to education and training could be achieved through a national qualification framework and a qualification authority. The underlying principles for a national qualification framework are:
• The rights of individuals to access lifelong learning.

• The integration of the education and training system to ensure maximum flexibility for the learner for both vertical and horizontal movement between different levels of the education and training system. The education and training systems are seen in their broadest definition and include both formal and non-formal education and training.

• Any learner must have a mechanism that will enable the learner to accumulate credits earned in the same or different learning contexts. All credits accumulated are taken into consideration and taken into account towards the achievement of a national qualification.

• Recognition of prior learning and experience.

• Career paths within all economic sectors are an aid to mobility within all sectors.

• Development of a national curriculum based on the integration of academic and vocational skills.

• Democratic participation of all stakeholders in the education and training system.

The South African Qualification Authority (SAQA) Act was published on 4 October 1995 in Government Gazette No. 16725 and according to Section 5 of the Act SAQA's function are to oversee the development of the NQF by formulating policies and criteria for registration of bodies responsible for establishing standards, as well as for accrediting bodies responsible for monitoring achievements in terms of such standards. Furthermore SAQA is charged with implementation of the NQF by means of registration of standards setting and accreditation bodies, the registration of national standards and qualifications and comparing qualifications internationally.

The SAQA Bulletin (1997a:8) identified National Standards Bodies (NSBs) as an integral part, or sub-structure of SAQA, with one NSB being established per field and registered by SAQA. In 'Ways of seeing the National Qualifications Framework' (HSRC, 1995:60-61) the twelve fields are:

• Agriculture and Nature Conservation
• Culture and Arts
• Communication Studies and Language
• Business, Commerce and Management Studies
• Education, Training and Development
• Manufacturing, Engineering and Technology
• Human and Social Studies
• Law, Military Science and Security
• Health Sciences and Social Services
• Physical, Mathematical, Computer and Life Sciences
• Services (including aspects such as hospitality and tourism, and postal and informal services, etc.)
• Physical Planning and Construction

National Standards Bodies (NSBs) are to be composed of national stakeholders comprising key interest groups operating in the field and according to the South African Qualifications Authority Bulletin (SAQA, 1997a:11) NSBs are to perform the following functions:

• Recommend a framework of sub-fields which are to be used as a guide for the establishment or recognition of Standards Generating Bodies (SGBs).

• Actually establish or recognise Standards Generating Bodies (SGBs).

• Ensure that SGBs operate within the SAQA requirements for the registration of unit standards and qualifications.

• Recommend unit standards and qualifications to SAQA for registration with the NQF system.

• Define requirements and mechanisms of moderation to be applied by all training and education quality assurers.

The Human Sciences Research Council (HSRC) published a book on the National Qualification Framework and it is interesting to note (HSRC, 1995:60-61) that twelve fields were also identified and under utility services, publishing and bookbinding were identified as a sub-field. If one examines the Printing, Newspaper and Packaging Industries as an economic sector, it is feasible that the master craftsman curriculum could fall under three fields namely communication, engineering and manufacturing processes and services. This factor alone complicates any contemplated standard setting process by increasing the number of potential stakeholders well beyond those directly involved in the Printing, Newspaper and Packaging Industries. The National Standards Bodies (NSBs) in turn will be empowered to recognise Standards Generating Bodies (SGBs). These SGBs will generate standards in whichever field or sub-field
applicable. According to SAQA (SAQA, 1997a:11-12) Standards Generating Bodies (SGBs) will be recognised by National Standards Bodies (NSBs) in clearly established sub-fields. The composition of Standards Generating Bodies will include key education and training stakeholders, drawn from interest groups who have been identified by the NSB in accordance with the requirements of SAQA.

The functions of Standards Generating Bodies will be to generate unit standards and qualifications according to SAQA requirements, update and review qualifications and recommend unit standards and qualifications to NSBs. Of importance to this study is that the stakeholders for a Standards Generating Body for developing unit standards and the end qualification for the master craftsman in the Printing, Newspaper and Packaging Industries would conceivably involve far more stakeholders than the employer/employee body corporate that makes up the industries. How a Standards Generating Body is to achieve its function has not as yet been articulated. However, whatever form a Standards Generating Body takes it would of necessity have to include all the stakeholders in the vocational education system and be democratic in nature as well as whilst in operation.

The requirements of the National Qualification Framework for articulating qualifications onto the framework has significant implications for this study. The Printing, Newspaper and Packaging Industries viewed the master craftsman as a national extension of artisan vocational education and training. Traditionally the industries have addressed their own needs and have set qualification standards according to their requirements (see 1.2.1) without involving a broader stakeholder participation as advocated by the National Qualification Framework.

The broader stakeholder involvement in unit standards generating for qualification articulation onto the National Qualification Framework implies that interest groups such as providers of vocational education and training would need to be part of the Standards Generating Body. Currently there are no providers for the master craftsman curriculum simply because the curriculum does not exist.

Notwithstanding this problem the curriculum development for the master craftsman curriculum should result in a curriculum that leads to a qualification that is articulated onto the National Qualification Framework.
5.3 CAREER PROGRESSION REQUIREMENTS IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

Irrespective how unit standards and qualifications for the master craftsman are to be generated and described it is necessary to accommodate the Printing, Newspaper and Packaging Industries view that the master craftsman level is necessary and a national extension of artisan vocational education and training. Within the industries a history exists of very clear career paths for its employees in which progress can be made by appropriate vocational education and training intervention.

The current career path for the employees in the industries is described in terms of a career path which was introduced by means of a training agreement reached in 1987 (PIFSA, 1987:2). The career progression path system depicted in Figure 33 has thus been in operation since 1987 and has the feature of integrating technical training and education by means of an apprenticeship or a trainee system. In 1991 an agreement was signed between the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) and City and Guilds of London Institute (CGLI) where the competency based modular programmes for artisan training were internationally benchmarked and accredited as being equivalent to the British NVQ 3 level. This agreement resulted in a close working relationship between the Printing, Newspaper and Packaging Industries and City and Guilds of London Institute where such issues as ongoing review of standards, assessment procedures and certification practices are being constantly addressed. Regular overseas visits by the researcher to City and Guilds of London Institute and their international network proved valuable especially with regards this study where the sourcing of literature and examination of current practices in further vocational education and training of artisans was concerned. The researcher attended two GTZ workshops on The Project Cycle management approach and was involved in developing projects within this framework.

Currently 28 trades have been internationally benchmarked through City and Guilds of London Institute at a certificate level 3. According to City and Guilds of London Institute (CGLI, 1995a:11) the certificate at level 3 denotes skilled work of a complex nature with the ability to undertake a supervisory role. Moreover, this level is recognised at the British National Vocational Qualification (NVQ) level 3 within their level 5 system. Figure 33 equates the City and Guilds (CGLI) level with the skills level 6 of the Career Progression Path system. The seven skills levels arrived at for the Career Progression Path system were arrived at through consensus between the employer and employee groupings (PIFSA, 1987:3).
Figure 33: The Career Progression Path System

- Std 8 minimum educational requirement
- Raw Entrance Barrier

- The qualifications listed here and above are recommended only and not mandatory
City and Guilds of London Institute (CGLI, 1995b:11) describe the level 4 awards as Full Technological Certificate (FTC), Full Technological Diploma (FTD) and Licentiateship (LCGI) and identifies that at this level the qualification recognises specialist or technical expertise and the ability to undertake professional work at the level of master craftsman in Europe.

The existing career progression system in the Printing, Newspaper and Packaging Industries as shown in Figure 33 is flawed in that it does not equate qualification within the emerging National Qualification structures for South Africa nor does it relate to the international benchmark offered by City and Guilds of London Institute. Furthermore, the career progression system indicates a path and skills level but does not articulate how the learner can proceed via some sort of learning system such as an apprenticeship. As part of the process of developing the Sectorial Study Report (Printing, Newspaper and Packaging Industries, 1997) lengthy discussions were held with the South African Typographical Union (SATU) and employers to propose a new career path system for the industry as well as articulate this proposed career path into the emerging National Qualification Framework model and identify what sort of learning agreement can be developed for the various levels. Out of these discussions, a new proposed career path was developed as shown in Figure 34. In developing the proposed career progression path integration into the NQF model cognisance was taken of the developments for learnerships as identified in the Green Paper: Skills Development Strategy for Economic and Employment Growth in South Africa (Department of Labour, 1997). The Green Paper (Department of Labour, 1997:25) identified learnerships as a major vehicle for addressing skills development needs in South Africa. Learnerships are to be a mechanism for facilitating the linkage between structured learning and work experience so as to obtain a registered qualification which indicates that the person is equipped to enter the world of work, i.e. he or she has work readiness.
Figure 34: Proposed New Career Path in the Printing, Newspaper and Packaging Industries

The Green Paper (Department of Labour, 1997:25-38) dedicates Section 4 to learnerships where the principle of learnerships are explained. The composition of learnerships are discussed as well as learnerships and the National Qualification Framework. How the new learnership system is to evolve is outlined as well as such details of design and preparation for implementation. The delivery of learnerships is discussed in some detail as well as how a person would enter a learnership system. Interestingly the Green Paper (Department of Labour, 1997:36) advocates learnership contracts. The contract is described in terms of an official document which identifies the contracting parties and contracts would need to be registered with a Sector Education and Training Organisation. The system of contracts of learning in practice in the Printing, Newspaper and Packaging Industries for apprentices and career progression trainees is similar in concept to the proposed learnership contracts. The Green Paper further indicates how learning could be delivered with learnerships as well as how learnerships are to be assessed. The learnership concepts proposed in the Green Paper were combined with the proposed new career path for the Printing, Newspaper and Packaging Industries and the resultant proposed career path and learnership system as depicted in Figure 35 was developed and published in the Sectorial Study Report (Printing, Newspaper and Packaging Industries, 1997).
Figure 35: Career Paths and Learnership
5.4 STANDARDS SETTING PRACTICES IN SOUTH AFRICA

Standards setting practices in South Africa are in their infancy. However, ground breaking work has been made by the pilot project on standards setting for education, training and development (ETD) practices in South Africa. According to Tyers (1997:1-2) the ETD Practices Project had its beginnings in 1993 when a task team of four main stakeholder groupings namely employers, trade unions, the state and providers of education and training was established under the National Training Board. The pilot study for ETD Practices was jointly funded by the German donor body GTZ and the South African Government through the National Training Board.

Of particular interest to this study is how the ETD Practices Project accommodated all the stakeholders and what methodology was used to plan the project. The German donor agency GTZ funds project of this nature provided the Goal Oriented Project Planning (GOPP) methodology is used. The GOPP process is essentially based on Project Cycle Management (PCM) methodology and the writer was fortunate to attend workshops held under the auspices of the National Training Board on the GOPP process. The Project Cycle Management methodology has relevance for a standard setting process and because of its structure and instruments is ideally suited for planning standards setting for units of learning for the master craftsman curriculum. A more detailed explanation of the Project Cycle Management (PCM) methodology is necessary so as to effectively use the methodology for standards setting for the master craftsman qualifications.

5.4.1 PROJECT CYCLE MANAGEMENT AND GOAL ORIENTATED PROJECT PLANNING

Project Cycle Management is an orientation framework for the management of target-group-oriented projects. It is based on a professional, future orientated management concept. According to Kijne (1995:3) Project Cycle Management (PCM) is based on six principles, namely:

1. The project cycle. The PCM methodology identifies and clearly distinguishes the phases in the project cycle. In all these phases the stakeholders and their roles are clearly defined.

2. Beneficiary focus and ownership (client orientation). This is enhanced by means of detailed problem analysis made during the actual identification of the project and deciding on what intervention action is required to meet the needs of the parties involved.
3. Logical framework planning based on thorough analysis. PCM methodology enables the creation of a transparent project design based on the logical framework approach. The logical framework approach or matrix focuses on the project purpose and identifies the resources required for such a project. The logical framework approach clearly identifies and notes all assumptions and pre-conditions required before activities commence.

4. Sustainability. From the onset the activities and results derived from the logical framework plan are tested for sustainability and where gaps appear additional results, activities, pre-conditions and assumptions are incorporated.

5. Transparent, standardised documentation. The PCM methodology introduces standardised formats for all documents providing a clear set of quality criteria.

6. Framework for learning and decision making. PCM provides a systematic framework for learning from experience. This is achieved by means of monitoring and evaluating practices as they evolve.

As has been previously stated the process of developing standards for units of learning to be registered with SAQA for qualification purposes within the NQF would have to be through Standards Generating Bodies (SGBs). Notwithstanding the need to identify who the stakeholders are for a Standards Generating Body, the issue is further complicated by the defined fields that National Standards Bodies have been categorised into.

According to Kijne (1995:4) the first phase of a project cycle is known as project identification in which the situation of the stakeholders is analysed as well as the identification and analysis of the problem. The steps involved are:

Step 1: Identification of stakeholders. This is achieved by means of a participation analysis exercise.

Step 2: Problem identification and analysis. The problems must be identified and analysed and then linked together so as to establish cause-effect relationships to produce a problem tree.

Step 3: Objective analysis. This process is achieved by reformulating the problems into objectives.

Once the above steps have been completed the project design then takes place following the logical framework approach. The logical framework approach is viewed as a tool to aid dialogue.
Project cycle management according to GTZ (1995:86) views planning as being dynamic and acknowledges that perfect planning is almost impossible. Plans are seen to provide orientation for action. This inherent dynamic nature of project cycle management when applied to standards setting has distinct advantages for this study. The curriculum for the master craftsman viewed from a systems perspective is by its very nature dynamic. A small change in any of the curriculum sub-systems has an affect on all the other sub-systems. When unit standards are being set learning outcomes are described as well as assessment requirements. These requirements are linked to the evaluation sub-system and should these change or emphasise certain areas more than others, it would impact on the curriculum as a whole. The functions and tasks of project management in the PCM methodology are represented in Figure 36.
Figure 36: Functions and Tasks of Project Management in the PCM Methodology

- **Identification Phase**
  - **project idea**
  - inform - plan - motivate - steer
  - set objectives
  - decide
  - organize
  - control
  - understand actual situation
  - problems, actors, views
  - objectives, visions
  - potentials
  - establish system of objectives

- **Design Phase**
  - **project objectives**
  - inform - plan - motivate - steer
  - set objectives
  - decide
  - organize
  - establish project strategy
  - agree on structural set-up
  - organisational
  - financial
  - prepare decision to implement the project

- **Phases of Implementation**
  - **project plan**
  - inform - plan - motivate - steer
  - set objectives
  - decide
  - organize
  - operationalise planning
  - through M&E
  - steer
  - make required adjustments
  - report
  - replan
  - terminate project

- **end of project**
Kijne (1995:196) sums up the advantages of using PCM as: improved analysis, demand driven solutions, objective oriented, verifiable impact, emphasis on quality, sustainability and standardised formats.

GTZ (1995:20-35) identifies various instruments that are used in PCM namely:

1. Participation analysis (P+A). This stakeholder analysis has as its objective to identify who has an interest in the project and define their stake in the project as well as to identify who will be affected by the project.

2. Problem analysis. Problem analysis is aimed at identifying problems and organise them into cause-effect relationships.

3. Objective analysis.

4. Evaluation of alternative.

GTZ (1995:49) establishes a number of rules for planning a project planning matrix and states that 'the project planning matrix shows what project activities are intended to produce what results/outputs and what project purpose is to be achieved in this way. It also indicates how this project purpose is relevant to a national overall goal which are relevant for achievement of the results/outputs and objectives'.

The overview of the instruments used is depicted in Figure 37.
Problem Analysis (consisting of):
- Objectives/Vision-Analysis
- Analysis of Deficiencies (=problems experienced)
- Analysis of Constraints (=causes to these experienced problem)
- Analysis of Deficiencies (=unused possibilities to overcome the constraints)

Participants' Analysis or Analysis of Actor Constellation or (synonymous) Role Players' Analysis

Analysis of and Decision on Alternatives or (synonymous) Options

Project Planning Matrix (PPM)
- Project Strategy (Goal (= Benefits))
  - Purpose (=Changed Practices)
  - Outputs (=Deliverables)
  - Activities (=Measurements)
- Objectively Verifiable Indicators (measurements for achievement of objectives)
- Means of Verification (=hints for monitoring indicators)
- Assumptions/Risks (=important conditions outside the project which may endanger the project success)

Inputs / Cost (=Personpower, Equipment, Budget)

Plan of Operations/Action Plan/Business Plan

Figure 37: Instruments used by GTZ (1995:100)
GTZ made its own acronym in German 'Zielorientierte Project Planning' (ZOPP) for objective oriented project planning (GTZ, 1995:93). This methodology stemmed out of management by objectives and project cycle management techniques. The ZOPP process recognises that problems and their cause do not exist independently of people, groups or organisations and they must all be taken into consideration. A systems approach counter balances the problem-focus aspects.

5.4.2 STANDARDS SETTING PROCESS FOR THE UNITS OF LEARNING OF THE MASTER CRAFTSMAN CURRICULUM

Standard unit statements for learning outcomes for the master craftsman in the Printing, Newspaper and Packaging Industries will result in a qualification that has national acceptance not only within the industries but will be recognised by the South African Qualifications Authority (SAQA) and be registered in the National Qualification Framework (NQF). Credits for units of learning will facilitate career path progression and enable portability of skills as well as vertical and horizontal mobility to different levels in the education and training system, thus facilitating lifelong learning and accumulation of credits towards different qualifications for the learner.

Standards setting for units of learning outcomes for the master craftsman curriculum would have to be via the mechanism of a Standards Generating Body (SGB). This SGB would operate under a National Standards Body in one of the twelve fields and would have to ensure that it operates within the criteria set by the NSB.

Project cycle management (PCM) offers a realistic and all inclusive solution for a Standards Generating Body that would generate standards for a master craftsman level. The proposed standards setting project via a Standards Generating Body would require a conceptual framework as well as a distinct plan within predetermined time frames. Unfortunately because of the infancy of the structures and newness of the National Qualification Framework, a tentative plan for a standards generating project can only be put forward. The project plan can nevertheless be of value in that it should offer fertile ground for development and implementation at the appropriate time.

5.4.2.1 PARTICIPATION ANALYSIS (PtA)

In order for the master craftsman standard setting project to be a success and contribute significantly to the NQF a need exists to ensure that the process is legitimate.
Legitimacy, as an underlining principle of the vision of an integrated approach to education and training, is an explicit need in the project for master craftsman standard setting. This principle reiterates that the project is 'to provide for the participation in planning and co-ordination thereof of all the significant stakeholders'. This principle dictates that a very deliberate and consequent participation analysis is essential before the standard setting process can commence.

The Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) has already done a great amount of work in this regard and eight generic groupings of participants have been identified. From these eight groupings further detailed participation analysis will proceed where more specific groups, organisations, bodies and institutions can be identified.

From a systems perspective the pilot project for standard setting of the master craftsman learning outcome has inputs, a conversion process and outputs with important feedback loops and specific checks and balances exercised by the governance structures for the project.

A flow process chart in a systems orientation format offers a pictorial overview of the entire standard setting project. This is depicted in Figure 38.
Figure 38: Flow Diagram of Standard Setting Process for the Master Craftsman
5.4.2.2 STAKEHOLDER BUY-IN

In order to ensure consensus, legitimacy, wide participation and meaningful standard setting, the process of participation analysis only reveals the ideal desired participation groupings. The gap between identification of an ideal list of participants in the standard setting process and the willingness of the listed participants to buy into the process, needs to be carefully addressed.

The buy-in strategy should include the following deliberate activities:

(a) PNPIETB to design a suitable buy-in survey which would clarify the goals of the master craftsman standard setting project, identify the benefits and spin-offs of participation and conceptualise for the potential participants the envisaged process, their involvement, time frames for the project as well as attempting to tease out any perceived pitfalls and obstacles.

(b) To conduct the actual survey professionally so as to reach as wide an audience as possible. The survey must ensure comprehensive samples of major stakeholder groupings, be readable, understandable and easily validated.

(c) The data from the buy-in survey to be analysed by the PNPIETB so as to identify and articulate stakeholder interests, perceptions and fears in order to develop a buy-in strategy.

(d) A national conference of stakeholders to be convened at which the buy-in strategy is to be implemented. The details of the buy-in strategy are:

(i) stakeholders invited to a national conference which must be representative of the eight major stakeholder groupings.

(ii) stakeholders define the selection criteria of a steering committee which will be an integral part of the governance structure as well as articulating guidelines for the steering committee.

(iii) stakeholders will identify standard setting experts amongst their ranks who will design a model in an understandable language with clearly defined concepts.
(e) The stakeholders, at the buy-in conference, will establish a task team co-ordinating body for the selection and setting of operational procedures for the standard setting task teams as well as establishing and confirming the training requirements of the standard setting task teams.

5.4.2.3 FORMULATION OF GOVERNANCE STRUCTURES

The governance structure proposed for the master craftsman standard setting project should be carefully considered so as to ensure it is democratic and transparent yet, efficient and effective, non-bureaucratic and with due consideration to cost curtailment.

The proposed Governance Structure is depicted in Figure 39.
As indicated in Figure 39, the National Standards Body, a co-ordinating structure for the Standards Generating Bodies, will be the ultimate controlling body. All the means of verification, be they models, lists, guidelines, minutes or any other document will be fed into the NSB.
The costs for the project facilitator, for which a job specification would have to be developed, should be included in the cost analysis, together with the PNPIETB sponsored secretarial services which would drive the project once the main governance structure has been established. It is envisaged that the project facilitator would be involved on a full/part-time basis for a maximum of nine months.

The functional profiles of the master craftsman standard setting steering committee, task team co-ordinating body and project management team within the governance structures need to be briefly illustrated so as to identify what the bodies are and who the persons will be. These are:

- The master craftsman standard setting steering committee has the functional responsibility to act as an executive committee which co-ordinates and manages the activities of the task team co-ordinating body, the project management team and the project management process as a whole.

The functional responsibilities should include the following:
- finance control
- integrity of the process in terms of project brief
- deadline management and quality assurance
- transparency issues through regular feedback, communication, inclusiveness, visibility and approachability

- The task team co-ordinating body (TTCB) should have the functional responsibility for developing, controlling and directing the training and actual operational phase of the standard setting task teams.

The functional responsibilities should include the following:
- training course development for standards setting
- standards setting training course presentation
- co-ordination and integration of task team outputs and feedback to steering committee

- The project facilitator’s responsibilities should be as follows:

Planning, organising and controlling the day to day activities of the project which include:
- logistic arrangements for all conferences, workshops and the like
- attending all meetings of steering committee and standards setting committees
- act as chief financial officer for the project, drawing up budgets for approval and executing project costs within budgeted requirements
- act as public relations officer for the project
5.4.2.4 CRITICAL PATH AND PERFORMANCE EVALUATION OF THE PROJECT

The critical path in the project is those events which animate the project and so to say breathe life into it. The Buy-in Conference of Stakeholders is by far the most critical event and provided this process is handled with sensitivity and detailed planning, the subsequent activities and events are assured.

Naturally, the work done by the task team co-ordinating body and the standard setting task teams would be the main thrust of the project. In essence, the standard setting task teams would have to ensure that:

- agreement is reached on a common list of master craftsman capabilities, which can then form the basis for portability and coherence in the appropriate field in which the Printing, Newspaper and Packaging Industries would fall.

- ensure that the framework developed includes all potential learners and take cognisance of the level at which the learners enter and what process would enable them to progress successfully - assuming that the necessary interest, motivation, support and other resources are available.

- identify, for progressive levels of learning, the characteristics of those capabilities which will enhance the quality of learning undertaken and enable master craftsman learning outcomes to be mapped onto the National Qualification Framework.

- ensure that the standards developed are relevant, legitimate and credible to stakeholders and articulated into the various NQF levels.

- ensure that the standards developed facilitate lifelong learning and career progression.

The evaluation of the project in relation to its outcomes would be via continuous feedback to the stakeholders and the appropriate National Standards Body. It is envisaged that over and above the means of verification, and any other documentation, in whatever form they may be, should be reported back to the stakeholders and appropriate National Standards Body. Frequent and detailed discussions on an informal basis should also take place.

The curtailment of costs and verification of all expenditure should be strictly controlled and budgets should be adhered to. A sound business approach will be used in all matters related to the project.
5.4.2.5 THE PROJECT PLANNING MATRIX

The project planning matrix is represented sequentially and an example of the matrix is shown in Figure 40. The full planning matrix is shown in Appendix 2.

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>OBJECTIVELY VERIFIABLE INDICATORS</th>
<th>MEANS OF VERIFICATION</th>
<th>ASSUMPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PROJECT GOAL: A contribution is made to the formalisation of a National Qualification Framework which ensures access, legitimacy, progression, portability and recognition of prior learning within the national qualification system.</td>
<td>Master craftsman standards are compatible and integrated into the NQF.</td>
<td>Standards are documented, available and integrated into the various NQF levels.</td>
<td></td>
</tr>
<tr>
<td>2. PROJECT OBJECTIVE: Master craftsman standards and level descriptor is available for a qualification system/framework.</td>
<td>Nationally accepted master craftsman standards are available within thirteen months after the start up of the project.</td>
<td>• Standards are documented. • Delivery date of the final standards document. • Signatures of approval by eight major groups of stakeholders.</td>
<td>• Organised business and organised labour will buy into the need for national master craftsman standards. • A nationally accepted model that has defined level descriptors, is in place.</td>
</tr>
</tbody>
</table>

Figure 40: Project Planning Matrix Objectives 1 & 2

5.4.2.6 OPERATIONAL PLAN (OP)

The operational plan attempts to clarify not only the duration of activities on a bar chart but attempts to identify clearly who is responsible for an operational activity.

The operational activities indicate some distinct phases:

**PHASE 1:** Activities 1.1 to 1.6 involve the PNPIETB in extensive work to establish buy-in of stakeholders to the project. This series of activities will take three months to achieve.
PHASE 2: Activities 2.1 to 2.4.2 involve the formation of the following organisational structures for the project:

- Project management team (operational within three months from the start of the project)
- Steering committee (operational within four months from the start of the project)
- Task team co-ordinating body (operational within four months from the start of the project)
- Task teams (trained and operational within seven months from the start of the project)

PHASE 3: Activities 3.1 to 3.3 are aimed at establishing a standard setting model and this activity is scheduled to be completed within six months from the start of the project.

PHASE 4: Activities 4.1 to 5.2 are the actual standard setting processes and within thirteen months after the start of the project national agreed master craftsman standards should be established.

The actual planning charts are depicted in Figures 41a and 41b.
<table>
<thead>
<tr>
<th>OPERATIONAL PLAN</th>
<th>MONTHS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPERATIONAL ACTIVITIES</strong></td>
<td><strong>RESPONSIBLE PERSON</strong></td>
</tr>
<tr>
<td>REGARDING BUY-IN</td>
<td></td>
</tr>
<tr>
<td>1.1 Do participation analysis.</td>
<td>PNPIETB.</td>
</tr>
<tr>
<td>1.2 Design buy-in survey structure.</td>
<td>PNPIETB.</td>
</tr>
<tr>
<td>1.3 Conduct a survey to clarify management and organisation paradigms.</td>
<td>PNPIETB.</td>
</tr>
<tr>
<td>1.4 Identify stakeholders interests and fears.</td>
<td>PNPIETB.</td>
</tr>
<tr>
<td>1.5 Utilise buy-in survey findings to design buy-in strategy.</td>
<td>PNPIETB.</td>
</tr>
<tr>
<td>1.6 Obtain buy-in by:</td>
<td>PNPIETB.</td>
</tr>
<tr>
<td>1.6.1 Inviting stakeholders to master craftsman standard setting conference.</td>
<td></td>
</tr>
<tr>
<td>1.6.2 Setting concepts and benefits.</td>
<td></td>
</tr>
<tr>
<td>1.6.3 Outlining potential stakeholders.</td>
<td></td>
</tr>
<tr>
<td>REGARDING ORGANISATIONAL INFRASTRUCTURE</td>
<td></td>
</tr>
<tr>
<td>2.1 Select project management team</td>
<td>PNPIETB.</td>
</tr>
<tr>
<td>2.1.1 Project team define job specifications.</td>
<td></td>
</tr>
<tr>
<td>2.1.2 Project team appoint project facilitator.</td>
<td></td>
</tr>
<tr>
<td>2.1.3 PNPIETB provides secretariat facility.</td>
<td></td>
</tr>
<tr>
<td>2.2 Democratically select a steering committee</td>
<td>Stakeholders.</td>
</tr>
<tr>
<td>2.2.1 Stakeholders define selection criteria for steering committee.</td>
<td>Stakeholders.</td>
</tr>
<tr>
<td>2.2.2 Stakeholders nominate and select members for the steering committee</td>
<td>Stakeholders.</td>
</tr>
<tr>
<td>2.2.3 Steering committee to define operating criteria and guidelines.</td>
<td>Chairman of the steering committee.</td>
</tr>
<tr>
<td>2.3 Select task team co-ordinating body.</td>
<td></td>
</tr>
<tr>
<td>2.3.1 Convene stakeholders to select task team co-ordinating body.</td>
<td></td>
</tr>
<tr>
<td>2.3.2 Task team co-ordinating body to articulate own criteria and guidelines.</td>
<td>Steering committee.</td>
</tr>
<tr>
<td>2.3.3 Stakeholders define criteria for selection of task team members.</td>
<td>Steering committee.</td>
</tr>
</tbody>
</table>

Figure 41a: Operational Planning of Activities
<table>
<thead>
<tr>
<th>OPERATIONAL ACTIVITIES</th>
<th>RESPONSIBLE PERSON</th>
<th>MONTHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3.4 Decide on format and content of task team member training.</td>
<td>• Task team coordinating body/project facilitator.</td>
<td>1 2 3</td>
</tr>
<tr>
<td>2.3.5 Define operating criteria/guidelines for task teams.</td>
<td>• Steering committee.</td>
<td>4 5 6</td>
</tr>
<tr>
<td>2.4 Select task teams and ensure that they are operational</td>
<td>• Steering committee.</td>
<td>7 8 9</td>
</tr>
<tr>
<td>2.4.1 Stakeholders to identify representative task team members according to set criteria.</td>
<td>• Steering committee.</td>
<td>10 11</td>
</tr>
<tr>
<td>2.4.2 Training of task team members in the model and guidelines.</td>
<td>• Task team coordinating body.</td>
<td>12 13</td>
</tr>
<tr>
<td>REGARDING STANDARD SETTING MODEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 Key stakeholders to identify standard setting experts in their industries/disciplines, etc.</td>
<td>• Steering committee.</td>
<td></td>
</tr>
<tr>
<td>3.2 Standard setting experts to design model language concepts.</td>
<td>• Steering committee.</td>
<td></td>
</tr>
<tr>
<td>3.3 Achieve wider consensus in terms of model.</td>
<td>• Steering committee.</td>
<td></td>
</tr>
<tr>
<td>REGARDING MASTER CRAFTSMAN STANDARDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 Obtain and integrate master craftsman standards from stakeholders.</td>
<td>• Task team coordinating body.</td>
<td></td>
</tr>
<tr>
<td>4.2 Compare local and international information concepts.</td>
<td>• Task team coordinating body.</td>
<td></td>
</tr>
<tr>
<td>4.3 Task teams produce draft standards documents.</td>
<td>• Task team coordinating body.</td>
<td></td>
</tr>
<tr>
<td>4.4 Integrate various task team documents into single draft.</td>
<td>• Task team coordinating body.</td>
<td></td>
</tr>
<tr>
<td>REGARDING ACCEPTANCE OF STANDARDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1 Circulate draft standards to all stakeholders for evaluation to contribute to the final standards.</td>
<td>• Task team coordinating body.</td>
<td></td>
</tr>
<tr>
<td>5.2 Gain stakeholder acceptance of draft master craftsman standards.</td>
<td>• Task team coordinating body.</td>
<td></td>
</tr>
</tbody>
</table>

Figure 41b: Operational Planning of Activities
5.4.2.7 COST ESTIMATES

In order to keep costs at a minimum and make the project viable, certain assumptions have been made with regards to resource requirements and costs. The cost estimates are based on 1997 costs and therefore cost escalations must be taken into consideration so as to coincide when the project takes place. Assumptions are made that certain operational activities, personnel and administrative requirements would be funded by the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB). Cost estimates are consolidated in a resource planning matrix which relates the activities of the standards setting project with the manpower and material requirements and the costs. The resource planning matrix also quantifies non-monetary inputs for each activity, an example of which is shown in Figure 42. The full resource planning matrix is depicted in Appendix 3.

<table>
<thead>
<tr>
<th>ACTIVITY NO</th>
<th>TABLE OF ACTIVITY</th>
<th>NEED FOR PERSONNEL (NATURE &amp; QUANTITY)</th>
<th>MATERIAL NEEDS (INCLUDING CONFERENCE VENUES, OFFICE, ACCOMMODATION, ETC.)</th>
<th>COST ASSUMPTIONS (RANDS)</th>
<th>NON-MONETARY INPUT OF PROJECT PARTICIPANTS (ORGANISATION, TRANSPORT, TIME, ETC.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Participation analysis.</td>
<td>4 people from the PNPIETB @ 10 days work.</td>
<td>Sensitising programme for attracting as many stakeholders to buy into the project and associated costs for surveys</td>
<td>R6 000</td>
<td>Transport to venue, organisation and logistic arrangements and incidental consumables.</td>
</tr>
<tr>
<td>1.2</td>
<td>Design of buy-in survey.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Conduct survey.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>Identify stakeholders.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>Utilise buy-in surveys to design buy-in strategy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-Total 1.1 to 1.5</td>
<td></td>
<td>4</td>
<td></td>
<td>R6 000</td>
<td></td>
</tr>
</tbody>
</table>

Figure 42: Resource Planning Matrix Activities 1.1 to 1.5
5.5 INTERNATIONAL BENCHMARKING OF THE MASTER CRAFTSMAN QUALIFICATION

The Printing, Newspaper and Packaging Industries have an agreement with City and Guilds of London Institute for benchmarking qualifications as well as a dual qualification system with the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB). Furthermore through an association with Zentral-Fuwausschuß Für die Drukindustrie (ZFD) in Germany, a further base exists through which the Printing, Newspaper and Packaging Industries can benchmark the master craftsman qualification. ZFD currently have a curriculum for an Industrie Meister Druck (ZFD, 1988) which identifies syllabi and outlines course objectives and criteria.

City and Guilds of London Institute identified their level 4 qualification (CGLI, 1995a:11) as equivalent to the master craftsman level in Europe and according to them Full Technological Certificates are only recognised for Mechanical Engineering Technician, Telecommunications Technician, Motor Vehicle Technician, Information Technology and Electrical and Electronic Engineering Technicians. The Full Technological Diploma, an alternative option at level 4, is only available in Telecommunications and Electronic Engineer (new scheme) and Electrical and Electronic Engineering Technician (new scheme). The Licentiateship (LCGI) qualification according to City and Guilds of London Institute (CGLI, 1995b:12) is awarded to recognise achievement in industry, commerce and public service. The industry routes through which the LCGI qualification can be obtained includes paper and printing. Moreover, the licentiateship qualification has been integrated into the British vocational qualification framework as an NVQ four qualification.

Discussions held with the sector liaison persons for senior awards resulted in an agreement for the extension of the present City and Guilds of London Institute and South African Printing, Newspaper and Packaging Industries dual certification and qualification benchmarking agreement to be extended so as to accommodate the master craftsman at NVQ four qualification level. The most appropriate route for the master craftsman in the Printing, Newspaper and Packaging Industries is via the licentiateship route since paper and print qualifications already exist with City and Guilds of London Institute at this level. According to City and Guilds of London Institute (CGLI, 1995b:3) the licentiateship denotes that the holder of the qualification has the ability and competence to understand and practice the principles of a technical subject or professional activity. The level of competence needed is that which is expected of a person who holds the National Vocational Qualification at level 4. Furthermore for a person to meet the requirements for a licentiateship it would be expected that the person has certain personal skills and competences such as self management and development, managing tasks, communicating clearly and effectively, as well as working
and relating to others, applying knowledge and applying initiative in solving work related problems of a high level. The routes to the licentiateship qualification are through a combination of learning and practice through a number of options. According to CGLI (1995b:3-4) the first option is through vocational education and experience where a candidate has already achieved a vocational qualification at level 2 and 3 and a career extension qualification or experience as well as an agreed form of recognition of industrial achievement a proof of at least five years relevant work experience in industry.

The second option is through advanced education and training via successfully completing at least four semesters or their equivalent of a full-time undergraduate degree course or an equivalent course such as a Higher National Diploma. The third option is by means of specified levels of national vocational qualifications at the NVQ 4 level and have evidence of appropriate employment at the standard of competence required for the NVQ. Viewing the situation of the learner for a master craftsman qualification in the Printing, Newspaper and Packaging Industries objectively the learner is operating in the world of work and the master craftsman route is a career progression path and career extension qualification coupled to experience it is evident that the first option for obtaining the licentiateship would seem to be the most appropriate.

The process of benchmarking the competence or learning outcomes for the master craftsman curriculum internationally through the mechanism of the PNPIETB-CGLI joint certification agreement would need to follow the standard practices already established within the Printing, Newspaper and Packaging Industries. These standard practices pre-supposes that the curriculum has been developed and entail supplying evidence that such details as actual subject syllabi, practical training programmes, candidate selection, trainer/lecturer selection and training, resource evaluation, accreditation of providers as well as the entire evaluation system exist and are documented.

5.6 SYNTHESIS

The process of standards setting for units of learning in the emerging National Qualification Framework is still in its formative stage in South Africa. Notwithstanding the embryonic state it is necessary to explore and develop plans and process for integrating the master craftsman qualification that will emerge out of the curriculum development process into the National Qualification Framework.

The international benchmarking of the qualification is also a necessary process since there is a need for continuity with the present practices for international benchmarking in the Printing, Newspaper and Packaging Industries. What the units of learning will look like will only emerge once the master craftsman
curriculum has been established. The curriculum development process seen from a system perspective will by its very nature clarify what outcome competences will be expected of the master craftsman and will identify what mixture of skills and underpinning knowledge will need to be mastered by the learner.

Standards setting using the project cycle management methodology will ensure that the master craftsman curriculum developed in this study can be articulated as a qualification onto the National Qualification Framework. A nationally recognised master craftsman qualification would also ensure that the continuity of the vocational education and training practices in the Printing, Newspaper and Packaging Industries are maintained. Viewing the master craftsman level as a natural extension for the artisan in the industries facilitates career progression and will encourage lifelong learning. The standards setting process will verify whether the competencies that were developed through the job/function profile (JFP) process (see 3.3) and refined using the taxonomy of competencies, skills, knowledge and attributes (see 4.4) are valid and truly reflect the notion of applied competence as advocated by the National Qualification Framework.

Curriculum development for the master craftsman falls under the guise of vocational education and training and views the curriculum from a systems perspective. The first phase of the curriculum development process of competency profiling (see 2.5) and standard setting described broadly the learning outcomes that will result from the master craftsman curriculum and identifies some of the aims and objectives of the curriculum. Using the refined competencies as learning outcomes it is possible to source learning content for the curriculum in conjunction with the other sub-systems of the curriculum. Learning content selection and organisation impacts in turn on all the other sub-systems of the curriculum and occurs in phase 3 of the curriculum development model used for this study (see 2.5).

The curriculum development model that was developed for this study incorporated a systems perspective of the curriculum and satisfied the specific needs of the Printing, Newspaper and Packaging Industries (see 2.5). This curriculum development model has enabled the master craftsman curriculum development process to proceed in a structured and logical manner. Phase 1 of the process has resulted in the development and application of a best practices competency profiling technique (see 3.3) which established a comprehensive skills and competency profile of the master craftsman.

A taxonomy of skills, knowledge and attributes was developed and applied to refine the identified competencies so that they included elective, critical cross field and fundamental competencies. This was done to satisfy the requirements of the National Qualification Framework so that the master craftsman curriculum could be articulated as a qualification onto the NQF (see 4.4).
CHAPTER 6: DEVELOPMENT OF AN OUTCOMES-BASED CURRICULUM FOR THE
MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND
PACKAGING INDUSTRIES – PART ONE

6.1 INTRODUCTION

The curriculum development process used for this study establishes that in phase 1 of the adopted model (see 2.5) a suitable job/function profiling technique was used to identify a comprehensive competency profile for the master craftsman (see 3.3). The identified competencies were refined so as to include all the necessary skills and underpinning knowledge as well as the core and fundamental skills with their appropriate underpinning knowledge by using a suitable taxonomy of competencies, skills, knowledge and attributes (see 4.4). Developing a suitable master craftsman curriculum from these refined competencies which represent broad learning outcomes is a top-down approach. Viewing the curriculum from a systems perspective allows for a more creative approach in developing the master craftsman curriculum. The sub-systems of the curriculum being interrelated and mutually inclusive do not prescribe which of the sub-systems need to be addressed first. The adopted curriculum development model and process selected for this study identify that in phase 3 of the curriculum developed process the initial situation of the learner would be the starting point of the process (see 2.5). Once the initial situation of the learner has been established the other components of the curriculum can be developed. Therefore, it is necessary to identify who the potential learner target group is and establish what qualifications and experience they have in order to determine a suitable entrance criteria for the learner to enter the Master Craftsman Programme. The Master Craftsman Programme for the purposes of this study is viewed as the tangible outcome of the curriculum development process such as a prospectus, documented course maps, course outline, entrance criteria and other general information articulated into a coherent package. Coupled to this situation analysis is an investigation into the nature of the companies and organisations in the industries and their capacity to provide the Master Craftsman Programme on-site. Identifying the entrance criteria and the capacity of companies and organisations to provide the Master Craftsman Programme on-site will influence the curriculum development process when the selection and organisation of learning content is addressed. Because the various components of the curriculum are interrelated the situational analysis component will also influence the aims and objectives of the master craftsman curriculum which would have to be established.
6.2 THE INITIAL SITUATION OF THE LEARNER

Following the guidelines of the Twente Model for vocational education and training (see 2.5, Figure 9) where the entry qualifications of the potential learner needs to be assessed, and coupling this aspect to the initial situation of the learner in the situation analysis sub-sector of the systems approach to curriculum as put forward by Fraser et al (see 1.2.6) the learner target group for the master craftsman curriculum needs to be qualified and quantified. The learner target group for the master craftsman curriculum will come from the ranks of the present artisan population in the Printing, Newspaper and Packaging Industries. The Sectorial Study Report (Printing, Newspaper and Packaging Industries 1997:6) indicated that there were 7 743 qualified artisans in the industries at the time of the survey. As has been alluded to previously, these artisans or craftsman attained their craft status under various conditions and different apprenticeship systems, which create problems in evaluating qualifications and setting a base level from which the curriculum for the master craftsman can be developed.

6.2.1 THE TRAINING SYSTEMS FROM WHICH THE TARGET LEARNER GROUP WERE CERTIFICATED

The time based training system for artisan training which was operational until 1992 enabled a learner to obtain artisan status by means of trade testing with a variety of technical theoretical requirements or simple by the effluxion of time. This latter route in fact meant that either no testing was done or that the candidate had not passed the compulsory trade test.

Within the time based training system both the National Industrial Council for the Printing Industries (NIC) and the National Manpower Technical Committee (NMTC) had expressed continuous dissatisfaction with the technical theoretical educational component and viewed this technical theoretical education and the practical training component in the form of on-the-job practical learning as being two opposites. An education-training dichotomy existed and both the NIC and NMTC voiced their dissatisfaction via a series of common complaints such as:

- The technical education syllabi were not relevant to the actual practical training (NMTC, 1986a:5).
- As technology advanced the technical education syllabi was not keeping abreast with technology changes thus resulting in underpinning knowledge being taught which was in many instances obsolete (NMTC, 1986a:5).
Because the needs of a national education department were addressed rather than the requirements of an industrial sector the actual subjects included at the various levels of technical educational studies contained ‘filler’ subjects which were irrelevant and of no benefit to the learner in the work situation (NMTC, 1986a:9).

Any changes in syllabi, especially because of technology changes always led to protracted debate on modifying the syllabi and could take up to four years to implement at the various technical colleges that offered technical education to the Printing, Newspaper and Packaging Industries (NMTC, 1986b:6).

Racially separated technical colleges at that time made the logistical arrangements for learners cumbersome and very expensive to the industries (PIFSA, 1986:6).

The above historical factors still impact on a large portion of the present target learner group for the master craftsman curriculum. The level of underpinning knowledge for the technical job related skills are thus unknown for the target learner group. The nature and extent of the core and fundamental skills that have been acquired are also difficult to determine for the learner target group.

Those artisans who obtained their craft qualifications via the Competency Based Modular Training system do not pose the same problems as the time based craft qualification artisans. The Competency Based Modular Training (CBMT) system by its very nature ensures that all modules are mastered before final competence evaluation is undertaken thus ensuring that the required skills and the correct level of underpinning knowledge of a technical, core and fundamental nature are in place. As a point of departure for establishing a level from which to develop the master craftsman curriculum the artisan who obtained their craft qualification via the CBMT system would be the ideal starting point. However, out of a potential learner target group of 7743 only 440 obtained their craft qualification via the CBMT system and if one were to use the CBMT system with regards the acquired learning outcomes as the level from which the entry criteria with regards skills and underpinning knowledge of a learner undertaking the master craftsman curriculum were to be established, a large proportion of the potential learner target group would be severely disadvantaged.

6.2.2 OTHER CERTIFICATION PRACTICES WHICH INFLUENCE THE INITIAL SITUATION OF THE POTENTIAL LEARNER TARGET GROUP

Aligned to the problem of evaluating levels of training that were achieved from the various training systems that have been operational within the Printing, Newspaper and Packaging Industries are a number of alternate methods by which craft/artisan certification have been achieved.
The Manpower Training Act, Act No. 56 of 1981 has the provision of a Section 28 Trade Test which offers a person who was not indentured as an apprentice under any system an opportunity to undergo a trade test. Specifically the Manpower Training Act states:

' Trade tests.

28. Whenever in the opinion of a training board adequate provision has been made in the industry and area in respect of which it has been accredited, for a trade test to be undergone in any trade in accordance with standards recognized by the registrar and the training board concerned, that training board may on the application of any person who has been trained as a trainee in terms of this Act or the Training of Artisans Act, 1951 (Act No. 38 of 1951), or any other person who has not passed a trade test as contemplated in section 13 (2) (h) of this Act or section 26 (2) (h) of the Apprenticeship Act, 1944 (Act No. 37 of 1944), but who satisfies the training board that he has undergone training or gained experience in the trade in question of a nature and for a period which reasonably concurs with the conditions of apprenticeship for the trade in question and in the opinion of the training board is adequate, and on payment by such person of the prescribed fee, admit him to a trade test in accordance with the said standards.

(2) A trade test referred to in subsection (1) shall be undergone at such time and place as the training board concerned may determine.

(3) If any such trade test is passed by the applicant, a certificate to that effect shall be issued to him by the registrar in collaboration with the training board concerned.'

(Manpower Training Act, Act 56 of 1981: Section 28).

Bearing the above in mind, and according to the PNPIETB data base for the period 1990 to 1997, 215 Section 28 Trade Tests have been applied for of which 192 were successful. The Trade Tests up until 1992 were purely practical in nature without any means of evaluating underpinning knowledge. Since 1992 the evaluation method for Section 28 Trade Test has been via the competency based phase four-test method. Again this methodology consists of a practical test only. Underpinning knowledge of a technical nature as well as core and fundamental underpinning knowledge, which form part of compulsory Technical Theoretical modules, is not evaluated. The underpinning knowledge because of the nature of the purely practical test is thus not known.

Another method of certification practice emerged because of a system termed 'red card' holders. During the rapid changes in technology in the late 60's and early 70's agreement was reached by the National Industrial Council for the Printing Industries (NIC, 1970:2-4) that because of acute skills shortages non indentured persons with practical experience were allowed to do the work of a journeyman and they would consequently
enjoy special status including remuneration at the level of journeyman. This practice persisted up to the time of the demise of the National Industrial Council for the Printing Industry in 1989. A collective decision was made by the newly constituted Printing, Newspaper and Packaging Industries Training Board (PNPITB, 1990a:4-6) to allow red card holders the opportunity of applying for and undergoing trade tests under the auspices of the Joint Board system and the section 28 clause of the Manpower Training Act, Act No. 56 of 1981.

Again the test was of a practical nature and excluded any form of evaluation of underpinning knowledge of a technical, core or fundamental nature. These certification practices referred to above have resulted in 316 persons being tested and 262 certificated as skilled artisans since 1990. These skilled artisans also form part of the potential learner target for the master craftsman curriculum and some mechanisms is necessary to evaluate them against a minimum entry criteria for the master craftsman curriculum so as to enable them to progress in their careers if they so desire.

6.2.3 THE INFLUENCE OF TECHNOLOGY ON THE POTENTIAL LEARNER TARGET GROUP

Coupled to the problems associated with the two training systems that have historically existed in the industries, technology has also influenced all aspects of the industries including the vocational education and training requirements. Artisans who obtained their craft qualification in specific trades have seen in the past and the present how technology has not only eroded their craft but in some instances made the craft obsolete in a short period of time.

An example of the impact technology has had on two selected trades will illustrate the dramatic short-term effects technology has on trades in the industries. The trade of Letterpress machine minder became obsolete over a very short period where Lithographic, Gravure and Flexographic printing process became more competitive and produced better quality at lower costs.

According to the PNPIETB database the demise of the craft of letterpress machine minding is best illustrated by the rapid decline in the number of artisans who qualified in Letterpress. The table illustrated in Figure 43 shows the actual number of persons who qualified in selected machine minding printing trades from 1980 to 1996.
<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Letterpress m/m who qualified</th>
<th>No. of Lithography m/m who qualified</th>
<th>No. of Gravure m/m who qualified</th>
<th>No. of Flexography m/m who qualified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>26</td>
<td>43</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>1981</td>
<td>9</td>
<td>47</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>1982</td>
<td>6</td>
<td>32</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>1983</td>
<td>3</td>
<td>72</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>1984</td>
<td>-</td>
<td>16</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>1985</td>
<td>3</td>
<td>56</td>
<td>22</td>
<td>1</td>
</tr>
<tr>
<td>1986</td>
<td>4</td>
<td>58</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>1987</td>
<td>-</td>
<td>65</td>
<td>21</td>
<td>3</td>
</tr>
<tr>
<td>1988</td>
<td>1</td>
<td>66</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>1989</td>
<td>1</td>
<td>54</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>1990</td>
<td>-</td>
<td>51</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>1991</td>
<td>-</td>
<td>78</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>1992</td>
<td>-</td>
<td>90</td>
<td>31</td>
<td>7</td>
</tr>
<tr>
<td>1993</td>
<td>1</td>
<td>91</td>
<td>27</td>
<td>6</td>
</tr>
<tr>
<td>1994</td>
<td>-</td>
<td>28</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>1995</td>
<td>-</td>
<td>51</td>
<td>21</td>
<td>2</td>
</tr>
<tr>
<td>1996</td>
<td>-</td>
<td>47</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>

**Figure 43: Comparison of Number of Artisans who Qualified in Selected Machine Minding Printing Trades**

As the technology in printing changed many of the Letterpress craftsman were retrained formally and informally and converted their skills into the Lithographic, Gravure and Flexographic Machine Minding crafts. This re-skilling was done in an ad-hoc manner. The re-skilled craftsmen have and are still part of the learner target group for the master craftsman curriculum and need to be accommodated.

A more dramatic change in the skills structure has occurred in the pre-press field. Computer technology especially desktop publishing with direct computer to plate processing has resulted in the trade of Photo-Lithography becoming almost obsolete overnight. According to the PNPIETB database the demise of the craft of Photo-Lithography is a phenomena of the nineties. The table illustrated in Figure 44 indicates how Photo-Lithography craft qualifications are rapidly diminishing annually against the increase in the new craft of Electronic Origination which incorporates desktop publishing. Superimposed on the actual craft qualifications awarded over the period illustrated is the actual number of training contracts in operation over the same period. The data shows the trend of rapid changes taking place and indicates a dramatic rise in the field of Electronic Origination as a new emerging craft. As part of these changes many existing Photo-Lithographers have converted to the craftsmen have and are still part of the learner target group for the master craftsman curriculum and need to be accommodated.
<table>
<thead>
<tr>
<th>Year</th>
<th>Photo-Lithography</th>
<th></th>
<th>Electronic Origination</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Artisans</td>
<td>No. of Apprenticeship Contracts in operation</td>
<td>No. of Artisans</td>
<td>No. of Apprenticeship Contracts in operation</td>
</tr>
<tr>
<td></td>
<td>Who Qualified</td>
<td>who qualified</td>
<td>who qualified</td>
<td>who qualified</td>
</tr>
<tr>
<td>1987</td>
<td>124</td>
<td>243</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1988</td>
<td>104</td>
<td>272</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1989</td>
<td>69</td>
<td>336</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1990</td>
<td>102</td>
<td>372</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1991</td>
<td>107</td>
<td>313</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1992</td>
<td>142</td>
<td>247</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1993</td>
<td>108</td>
<td>120</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1994</td>
<td>27</td>
<td>82</td>
<td>6</td>
<td>25</td>
</tr>
<tr>
<td>1995</td>
<td>44</td>
<td>41</td>
<td>6</td>
<td>64</td>
</tr>
<tr>
<td>1996</td>
<td>9</td>
<td>23</td>
<td>13</td>
<td>74</td>
</tr>
</tbody>
</table>

Figure 44: Comparison of the Growth in Electronic Origination Apprenticeship Contracts and Artisan Qualifications versus the corresponding decline in Photo-Lithography

6.2.4 RECOGNITION OF PRIOR LEARNING (RPL) AS A MECHANISM FOR EVALUATING THE POTENTIAL LEARNER TARGET GROUP

Because of the various combinations and permutations of the way in which evaluation practices for artisans in the Printing, Newspaper and Packaging Industries have been implemented in the past, the existing certificated artisans within the industries are not all at the same level with regard theoretical underpinning knowledge nor in many cases at the same practical skills level. A pre-screening method to evaluate the potential learner for the master craftsman curriculum is necessary not only to establish a starting point from which practical training and theoretical study can commence but also to identify what remedial vocational education and training intervention may be necessary to upgrade skills and knowledge to enable the potential learner to become a candidate for the master craftsman vocational education and training programmes.

The National Qualification Framework (NQF) model that is in place in South Africa advocates that prior learning even of an informal and experiential nature should be recognised and any vocational education and training system envisaged should have Recognition of Prior Learning (RPL) as a means of assessment in some formal structured process. RPL should ideally be available for all potential learners or for people wanting to obtain certification for a national qualification.

Recognition of Prior Learning as a concept is not new. Jessup (1990:4) illustrates how the British arrived at their system for Accreditation of Prior Learning by a major pilot study conducted during 1988-1989 to test the feasibility of instituting Accreditation of Prior Learning (APL). The project had five primary objectives:
1. To establish the feasibility of using tangible evidence in whatever form of learning and experience gained to recognise current competence.

2. To work with qualification awarding bodies to develop procedures, guidelines and supporting infrastructure for the assessment and accreditation of prior learning.

3. To run training workshops locally and centrally for purposes of accreditation of prior learning.

4. To examine and comment about:
   - The monitoring of processes used by awarding bodies.
   - The potential demand from the different client groups.
   - The actual costs of implementation.

5. To determining what the impact of accreditation of prior learning on organisation change within the participating centers. The model of the Accreditation of Prior Learning (RPL) is depicted in Figure 45.

The assessment process of the model is interesting because it offers essential a two pronged approach – assessment via submission of a portfolio of written documents, products and certification or the candidate undertakes some form of performance skills test, interview, simulation or written examination.

The detailed assessment model of the British system, which links to the National Vocational Qualification (NVQ) system, is shown in Figure 46.
Candidate contacts centre for additional written information

Decides NO Decides YES

Candidate receives information about APL in relation to a vocational qualification

Candidate sets up initial interview at centre

Counsellor does initial screening of candidate using competence statements of qualification and explain process, fees, time-line

Candidate decides

Candidate begins assessment process

Candidate works with:
1) Counsellor/Teacher (Not assessor)
2) Self-instructional written materials
3) APL workshop(s)

Yes

No

Counsellor does initial screening of candidate using competence statements of qualification and explains process, fees, time-line

Candidate decides

Candidate begins assessment process

Candidate works with:
1) Counsellor/Teacher (Not assessor)
2) Self-instructional written materials
3) APL workshop(s)

- Identifies all relevant learning experiences
- Identifies all relevant achievements
- Matches APL achievements with elements of competence within qualification
- Prepares narrative and/or evidence and/or prepares for interview, performance or written exam, etc., with assessor(s)

Candidate undergoes assessment process

Candidate submits evidence of achievements via portfolio (written documentation, products certification, etc)

Assessor evaluates evidence

Record created at centre and with awarding body

Candidate receives authentication from awarding body, e.g., certificate of achievement, record of achievement or NCVQ record of competence

Candidate is assessed

Candidate at end of APL process and does not seek new learning

Candidate advised on new learning opportunities to complete desired qualification or extend achievement

Figure 45: Model of the APL Process
ELEMENTS OF COMPETENCE WITH PERFORMANCE CRITERIA AND RANGE STATEMENT

Determine form and amount of evidence to be collected

Through a combination of the following methods

PERFORMANCE EVIDENCE from
- natural observation in the workplace
- extracted examples within the workplace
- simulations (competency tests, skills tests, proficiency tests, projects/assignments, etc)

SUPPLEMENTARY EVIDENCE from
- oral questioning
- open written answers (short, long, essays, etc)
- multiple-choice tests

Evidence from prior achievements reports, designs, computer programmes, certificates from other sources, etc.

Figure 46: The NVQ Assessment Model
Harris & Saddington (1995:3) stated that there is a sound theoretical underpinning base for Recognition of Prior Learning (RPL) and contend that RPL is based on the accepted adult learning principles of learner centredness, life-long learning continuum, learning occurring through a wide range of methods, styles and contexts, learning is personal and all new learning can be integrated by an individual so as to form new and creative outcomes. Furthermore, Harris & Saddington (1995:3) trace the origins of the experiential learning movement in the United States from the 1960's with the underpinning theoretical base of Kolb’s learning cycle of growth and development namely, concrete experience, observation and reflection on what was observed, abstract conceptualisation and active experimentation.

The assessment practices and methods used for Recognition of Prior Learning generally fall into four categories:

The challenge test process
Standardised exams.
Portfolio development.
Programme and course evaluation or credit transfer.

According to Harris & Saddington (1995:10) the challenge test process or challenge exams are designed to test the candidates learning in specific subjects or areas of learning. The advantages of challenge tests are that they are generally expedient and relatively inexpensive to develop. Standardised examinations or tests are mainly psychometric in nature and of a multiple-choice form. According to Harris & Saddington (1995:12) the process of ensuring that the examination is standardised is achieved by providing manuals which prescribe strict administrative procedures. Standardised examination assessment is primarily norm-referenced in nature.

Portfolio Development is a dossier or collection of material or evidence, which identifies what an individual has achieved. Harris & Saddington (1995:13) highlight the fact that portfolio development in some context is used solely for the documentation of informal, experiential learning. In another context the term is used to signify gathering evidence and presenting all prior learning. Generally assessment via portfolio tends to be individually orientated and differs from challenge and standardised assessment techniques in that the exact nature of the evidence put forward is not defined in advance. The key stages in portfolio development are:
• An advice and information guidance stage where learners are given advice and guidelines on how to develop a portfolio.

• Documenting learning from experience, where the learners are guided to reflect on their experiences and be able to identify what learning in whatever form took place. This process of documentary learning is usually difficult for the learner since clear distinctions must be made in differentiate between experience and learning and how to describe the actual level of learning.

• Relating learning to criteria which enables a possible comparison to education and training programmes or qualifications or career and employment routes.

• Gathering and organising evidence is the stage during which the learner generates adequate evidence of the competence he or she claims.

• The assessment stage is normally done by portfolio assessment being carried out by people who are earmarked for this role. Portfolio assessment staff cannot be those people who have assisted and guided the learner in his or her portfolio development. Supplementary evidence could be called for in the assessment process which could include oral or written projects, discussions, interviews, performance observation and skills demonstration.

• Recording of the recognised prior learning for the learner on a record of achievement to the final stage of this process.

Interestingly City and Guilds of London Institute (CGLI, 1994:7-8) emphasise the evaluation process and identify certain rules of evidence an assessor need to ask namely:

• Validity – Does the evidence in the portfolio relate to specific standards?

• Authenticity – Is the portfolio that is presented by a candidate in fact an accurate and true reflection on the candidates own activities and competence.

• Currency – Does the portfolio provide evidence that the skills and competence demonstrated by the candidate are still currently used by the candidate in the work situation.
Sufficiency – Does the portfolio evidence reflect the right quality and consistent competence and different contexts specified in the standards for the job?

The Printing, Newspaper and Packaging Industries developed its own Recognition of Prior Learning (RPL) system in 1996. This system according to the PNPIETB Training Quarterly (PNPIETB, 1996b:1-2) adopted the selected definition of Recognition of Prior Learning as:

A way of recognising what individuals know and can do, before undertaking a task, job or course of study. It may include testing or various other techniques of assessment including compiling a profile or portfolio of learning and/or experience.

The entry criteria for evaluation by means of recognition of prior learning is as follows:

(a) If the candidate desires to have an RPL assessment in a specific craft in the Printing, Newspaper and Packaging Industries then the candidate is required to undergo and pass the relevant physiological test applicable for the craft.

(b) A portfolio must be developed and submitted with the application to undergo a challenge competence test.

(c) The challenge test must be done at the place of work and the equipment requirements for such a test must be available.

(d) The challenge test is identical to the present final competence test for artisan certification and will include both a practical test and an oral questionnaire to establish the level of understanding and application of underpinning knowledge.

In the Training Quarterly of June (PNPIETB, 1996c:2-3) Recognition of Prior Learning was further expanded upon so as to facilitate remedial training and career progression for the employees in the Printing, Newspaper and Packaging Industries. The process was explained by means of a flow chart, which is shown in Figure 47.
Building on the established practices of Recognition of Prior Learning in the Printing, Newspaper and Packaging Industries and adapting it to become an instrument to evaluate the prior learning of potential learners for the master craftsman vocational education and training programmes is a flexible and feasible approach. The approach also could establish a minimum entrance criteria for learners for the various programmes and can identify additional pre-entry training and remedial interventions that may be necessary.

The nature of the instruments for RPL are challenge tests that have been developed to evaluate the competencies identified for the master craftsman in the craft related fields of origination, method of printing and finishing. Essentially these instruments are based on the final competence tests used to evaluate apprentices for artisan/craftsman status within the Competency Based Modular Training system of the Printing, Newspaper and Packaging industries.
The instruments consists of a practical test supported by an oral or written test which is aimed at evaluating underpinning knowledge of a technical nature. The practical challenge test has the following essential components:

1. Company requirement for the RPL test, which specifies the equipment and machinery, materials and any other information, deemed necessary.

2. An external assessor instruction sheet, which identifies what must be submitted with the mark sheets, which includes specimens as well as special instructions, deemed necessary for the challenge test.

3. An external assessor guideline document which identifies the necessary procedures and documentation.

4. The question paper for the practical component for the candidate.

5. The assessors mark sheet, which includes the summary of the marks obtained as well as any further comments, the external assessor wishes to make.

6. A declaration document on which the external assessor and candidate affirm that a recognition of prior learning practical challenge test was undertaken and duly signed by both the candidate and external assessor.

Naturally the oral or written component of the practical challenge test is to be conducted after the practical test is completed and is carried out by the external assessor.

Other than the craft related competencies for which RPL would be necessary for the potential learner target group for the master craftsman curriculum other technical competencies also lend themselves for RPL type assessment. A questionnaire sent to the industry revealed that ninety percent of the estimators and production planners within the Printing, Newspaper and Packaging Industries started their careers in the industries as apprentices then qualified as artisans and after either ad-hoc training or experience became estimators or production planners. From the established competence profile for a master craftsman costing and estimating as well as production control are seen as being necessary components of the master craftsman job functions and tasks. Recognition of Prior Learning challenge instruments of a similar nature have been developed for
these competencies except that the variation is that they are of a more generic and cognitive nature where written tests predominate. The evaluation process is also to be conducted by an external assessor.

To implement meaningful challenge tests for Recognition of Prior Learning for the potential learner target group for the master craftsman curriculum, a RPL system needs to be in place where external assessors interact with the candidate for a challenge test in such a manner that wherever possible subjectivity is minimised. To achieve objective testing the RPL system envisages that all external assessors are not only qualified in the field in which they are to access candidates but need training in assessment of challenge tests and be registered as assessors by the PNPIETB. Moreover all tests need to be submitted to a national examiner, a recognised expert in the field who examines the submitted specimens, or written scripts for scrutiny against accepted industry standards. The national examiner not only maintains standards but acts in the capacity of a moderator when necessary. This strict objective system of testing is currently in practice for all testing within the Printing, Newspaper and Packaging Industries and existing external assessor training programmes and registration requirements are applicable for the external assessors to be used for RPL challenge tests of candidates for the master craftsman vocational education and training programmes.

The identification of who the potential learner target group for the master craftsman is and what experiences and qualifications they have revealed a wide range of experience and a disjointed unmanageable set of past qualification certification practices. To accommodate this diverse potential learner target group a standardised challenge test mechanism was developed. The standardised challenge test not only assesses the existing competencies and knowledge of the potential learner target group but sets a minimum entrance criteria for the potential learner target group. The situational analysis component of the curriculum especially the initial situation of the learner aspect will directly influence all the other components of the curriculum. The most important influence the entrance criteria for the learner will have is when the selection and organisation of learning content is considered. The minimum entrance criteria will establish a base from which learning content can be developed and set the initial pitching level for such course content.

6.3 THE WORK SITUATION

To expand further on the situational analysis viewed as an integral sub-system in the curriculum for the master craftsman in the Printing, Newspaper and Packaging Industries it is necessary to examine and analyse the complexities of the industries as well as establish the nature of the andragogic didactic mode in which the learner target group would operate in.
6.3.1 THE HETEROGENEOUS NATURE OF THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES AND ITS IMPACT ON THE POTENTIAL LEARNER FOR THE MASTER CRAFTSMAN CURRICULUM

The Printing, Newspaper and Packaging Industries as an economic sector has an annual turnover estimated at sixteen billion rand for 1997 making the sector the sixth largest contributor to the gross domestic product in South Africa. As an economic sector the Printing, Newspaper and Packaging sector would seem to be homogeneous in nature, however, as has been previously stated (see 1.2.4.2) the sector has distinct niche markets and sub-sectors which in reality makes the sector heterogeneous in composition. This heterogeneity raises the question of whether a common curriculum for the master craftsman for the sector is appropriate.

The corrugated packaging sub-sector has the generic fields of origination, conversion and finishing, however, the finishing component does not include bookbinding which is common to commercial printing, magazine and book publishing. Likewise the newspaper sub-sector also has the generic fields of origination, printing and to a lesser extent finishing. The finishing component also does not include bookbinding in whatever form. Carton Making also poses unique problems as a sub-sector where the origination field does not only include origination of a printing nature but involves the design of cartons in whatever form they may take. The carton packaging manufacturing process does not only include printing of cartons but also the important aspect of die cutting. The finishing area of carton making in fact is to do with gluing and forming of cartons. Similar problems exist in the flexible packaging and the bag and sack making sub-sectors where the finishing processes are in no way related to bookbinding.

The question of what competencies were desirable for a master craftsman were debated within the substructures of the Technical Liaison Committees which exist within the Printing, Newspaper and Packaging Industries as well as through the appropriate associations namely:

South African Screen Printers Association (SASPA).
Roll Label Converters Association (RLCA).
Corrugating & Paper Board Industries Association of South Africa (CPBIASA).
Flexographic Technical Association of South Africa.

The views of these various sub-structures revealed that a master craftsman should in all cases have the following competencies as revealed by the competency profile for the master craftsman namely:
The craft technical competencies of origination, transfer media, method of printing, maintenance mechanician and electrician. The finishing aspects in the case of commercial printers and magazines would include bookbinding as revealed in the original competency profile (see 3.3.4, Figures 28a, 28b). However, in the case of newspapers and packaging the finishing aspects should include such competencies as are needed in the particular sub-sector. These required competencies were determined by applying the model and processes used to determine the original competency profile for the master craftsman (see 3.3). The finishing competencies for the newspaper and packaging sub-sector is shown below.

<table>
<thead>
<tr>
<th>Nature of the job functions, tasks or roles</th>
<th>Field</th>
<th>Unit of Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Craft Technical Competencies</td>
<td>Finishing</td>
<td>1. Understand the principles of warehousing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Understand the principles and procedures for product dispatching.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Implement safe warehousing and dispatch operations.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Understand the principles of stock control and the procedures for stocktaking.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Analyse and evaluate returns and the costs of under and over runs.</td>
</tr>
</tbody>
</table>

In all instances, agreement was reached that a master craftsman would have the competencies in all the other technical competencies of quality assurance, technical training, productivity improvement, costing and estimating. Moreover, consensus was reached that the non-technical competencies of change management, production control, team development and interpersonal were necessary for the master craftsman.

### 6.3.2 ACCREDITATION PRACTICES FOR COMPANIES AND ORGANISATIONS WHO PROVIDE VOCATIONAL EDUCATION AND TRAINING IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

The size of companies within the Printing, Newspaper and Packaging Industries is an important factor to consider when doing a situation analysis since the potential learner target group for the master craftsman is spread throughout the sector in small and large companies. These large and small companies would in many instances provide the master craftsman vocational education and training for learners.
Not only are there differences in size of companies but there exists within these companies differences in technology, machinery, equipment and production sophistication. In order for companies to be registered as vocational education and training establishments for specific courses or skills levels development an existing accreditation system is already in place. This accreditation system combines a code of practice with an accreditation process, which evaluates and classifies the company according to strict criteria. The criteria are set for the technology, machinery and equipment, the actual training course and the requirements and registration of the trainer/teacher. Training companies can receive accreditation within four categories namely:

**Category 1: Training Company:** Accredited to train in the full spectrum of a designated trade or craft or both, practical and theoretical.

**Category 2:**
- **Practical:** Accredited to train only the practical modules of a designated trade or craft.
- **Technical Theoretical:** Accredited to train only the in-house technical theoretical modules.

**Category 3:**
- **Part Practical:** Accredited to train only certain practical modules of a designated trade or craft.
- **Part Technical Theoretical:** Accredited to train only certain in-house technical theoretical modules.

**Category 4: Non-Designated:** Accredited to train in all areas other than designated trades or crafts, practical, theoretical or both.

The accreditation system not only accredits companies to provide vocational education and training but also includes a progress system which monitors the progress of the learners. Optimum time frames for accredited vocational education and training inventories are set and investigation into lack of progress do occur when these time frames are not met. Adapting this system of accreditation for use in accrediting companies to do the training in the technical competencies identified for the master craftsman would appear to be the easy solution. However, bearing in mind that the master craftsman qualification needs to be integrated into the National Qualification Framework, any company or institution which would want to provide aspects of the master craftsman vocational education and training would need to meet the requirements set out by the South African Qualifications Authority (SAQA). The Draft Regulations published in the Government Gazette of August 1997 states that a provider may be accredited by an Education and Training Qualification Authority (ETQA) if their primary focus coincides with the focus of the ETQA on condition that:
31.1 it is registered as a provider in terms of the relevant legislation, if applicable;

31.2 it has a quality management system which includes at least the following:

31.2.1 quality management policies which define that which the provider wishes to achieve;

31.2.2 quality management procedures which enable the provider to practice its defined quality management policies;

31.2.3 review mechanisms which ensure that the quality management policies and procedures defined are applied and remain effective;

31.3 it can demonstrate through its quality management system:

31.3.1 the capacity and ability to develop, deliver and evaluate learning programmes which culminate in specified National Qualifications Framework standards and/or qualifications;

31.3.2 adequate financial administrative and physical resources;

31.3.3 appropriate policies and practices for staff selection, appraisal and development;

31.3.4 appropriate policies and practices for student entry, guidance and support systems;

31.3.5 appropriate policies and practices for the management of off-site practical/work-site components where applicable;

31.3.6 appropriate policies and practices for the management of assessment;

31.3.7 the capacity and ability to produce appropriate reports;

31.3.8 the capacity and ability to ensure the achievement of desired outcomes, using their available resources and procedures.

(SAQA, 1997b:52).

The draft regulations for provider accreditation do not allude to what the quality management system is or how to implement it. Spanbauer (1992) describes in great detail the pioneering work done at the Fox Valley Technical College where the use of quality and productivity techniques started in 1985 resulted in a quality system for vocational education and training. The quality process model at Fox Valley Technical College according to Spanbauer (1992:73-74) uses seven quality elements namely, human resources, curriculum and instruction, goal setting, use of technology, marketing, customer service and management.

An example of the quality elements established for human resources written in measurement terms was established for:
• Qualifications and certification requirements for teaching staff and faculty.
• Development requirements for professional and career needs of each faculty member.
• Recruitment and related requirements.
• Some form of recognition system for teachers who meet or exceed goals.
• The actual physical facility requirements for both teachers and students.
• The articulation of flexibility and creativity of teachers in the actual learning process.
• A profile of the characteristics of enthusiastic and caring teachers.
• The teamwork requirements for faculty.

Charts were developed which expressed the quality elements in detail and reflected conforming requirements, measurement strategies and cost of non-conformance. Spanbauer (1996) revisits how education has been re-engineered with quality improvement. This re-engineering has being based on using quality concepts, techniques and tools in various forms and combinations to achieve education excellence in a number of institutions such as Fox Valley Technical College and many others.

In order for providers in the Printing, Newspaper and Packaging Industries to comply with the established accreditation practices for the industry set by the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) and SAQA requirements, concepts put forward by Spanbauer were incorporated in a quality assessment and accreditation system for the industries. The assessment and accreditation systems address the following:

• The facilities and human resources of the provider.
• The education or training courses.
• The lecturer/trainer and student/learner interaction during instruction.
• The business capacity of the provider with regards marketing, customer service, goal setting and quality-based management.

Of particular importance to this study is the quality element concerned with curriculum and instruction as shown in Figure 48. The quality conforming requirement that curriculum is based on applied competencies which enable a person to perform successful in the world of work is linked to the first phase of the master craftsman curriculum development process. The first phase of the curriculum development process involved developing and using a job/function profile technique to develop a competency profile for the master craftsman (see 3.3). The refinement of the competencies by applying the taxonomy of competencies, skills
and attributes to include a wide range of skills and underpinning knowledge ensured that the point of
departure of the master craftsman curriculum is applied competence which is a quality conforming
requirement (see 4.4).

Many of the conforming requirements shown in Figure 48 relate to sound didactic principles and practices
such as:

- Clearly stated minimum learning entrance criteria for a course of study.
- Proper lesson planning with clearly defined aims and objectives and evaluation practices that directly
  relate assessment to the original aims and objectives of the lesson.
- The methods and strategies to be used when instruction takes place.

The conforming requirements identify what the minimum criteria for accreditation are for a provider of
vocational education and training in the Printing, Newspaper and Packaging Industries. Once a provider is
accredited the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB)
monitors the quality of the provision of vocational education and training by a provider. The measurement
strategies used by the PNPIETB when it monitors the quality of provision either confirms that the provider
meets the minimum requirements of its accreditation or identifies problem areas and relates these to a cost of
non-conformance. The provider would need to rectify the shortcoming or stand the change of losing its
accreditation status.

The conforming requirement to have course prerequisites clearly defined implies that careful examination of
the initial situation of the potential learner target group is necessary so as to establish specific entrance
criteria. In the master craftsman curriculum development process this has been accommodated through
recognition of prior learning challenge tests as an evaluation instrument for the potential learner target group
(see 6.2.4). The recognition of prior learning instruments also enable the potential learner to receive credits
for courses or modules in the master craftsman curriculum. The quality conforming requirement of
curriculum and course requirements being consistent for content, text books, materials and tools coupled with
examinations having criteria linked to performance objectives has implications for the master craftsman
curriculum. The conforming requirements imply that the aims and objectives, the selection and organisation
of learning content and evaluation are interlinked and need to be addressed in the master craftsman
curriculum development process.
<table>
<thead>
<tr>
<th>Conforming Requirements</th>
<th>Measurement Strategy</th>
<th>Cost of Non-conformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. There is a complete plan for learning for each course or module in a program.</td>
<td>Instructional Audit by PNPIETB.</td>
<td>Learner costs. Rework when revising curriculum.</td>
</tr>
<tr>
<td>a. Curriculum is based on competencies needed for the person to perform successfully on the job.</td>
<td>Instructional Audit by PNPIETB.</td>
<td>Learner and employer costs.</td>
</tr>
<tr>
<td>b. Course prerequisites are clearly defined.</td>
<td>Program Development as per CBMT.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>c. Curriculum and course requirements are consistent for content, textbook, materials/tools.</td>
<td>Learner Satisfaction Survey.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>d. Learners may receive advanced standing and/or credit for past experiences in education in occupations related to the program.</td>
<td>PNPIETB Evaluation. Learner Satisfaction Survey. Counsellor Survey.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>e. An optimum class size is established for each course.</td>
<td>Instructional Audit by PNPIETB. Learner Satisfaction Survey.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>f. Examinations have criteria with a direct link to the performance objectives.</td>
<td>Instructional Audit by PNPIETB. External Exam by PNPIETB.</td>
<td>Employer costs.</td>
</tr>
<tr>
<td>2. Programs are structured to permit multiple-entry and multiple-exit.</td>
<td>Certification on Skill Lines.</td>
<td>Irrelevant Training costs.</td>
</tr>
<tr>
<td>3. Instructors use industry standard technology placing emphasis on leading edge technology as identified.</td>
<td>Instructional Audit by PNPIETB. Employer Survey. Placement Records.</td>
<td>Learner and employer costs.</td>
</tr>
<tr>
<td>4. Each program will provide some type of work experience related to the learner’s training.</td>
<td>Instructional Audit by PNPIETB. Evaluation by PNPIETB.</td>
<td>Learner and employer costs.</td>
</tr>
<tr>
<td>5. Instructors use a variety of teaching techniques to meet the unique needs of the learner.</td>
<td>Instructional Audit by PNPIETB. Learner Satisfaction Survey.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>6. Services to support learner success are accessible and effective.</td>
<td>Learner Satisfaction Survey.</td>
<td>Learner costs. Loss of funding.</td>
</tr>
<tr>
<td>7. Curriculum and instruction is customised for individual businesses to assist them with their productivity and profitability.</td>
<td>Requirements of customer contract by Marketing Instructional Audit by PNPIETB.</td>
<td>Employer costs. Retraining costs.</td>
</tr>
<tr>
<td>8. There are formal articulation and/or transfer credit agreements.</td>
<td>Instructional Audit by PNPIETB. Evaluation by PNPIETB.</td>
<td>Learner costs. Employer costs.</td>
</tr>
<tr>
<td>9. Learners are aware of expectations for each course through a syllabus, attendance and safety requirements.</td>
<td>Vocational Education and Training System.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>10. Instructors conform to establish time lines.</td>
<td>Learner Satisfaction Survey. PNPIETB Accreditation.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>a. Classes start and end on time.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Grades are submitted promptly.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Records are updated daily.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 48: Quality Element: Curriculum & Instruction
The quality elements for human resource, goal setting, use of technology, marketing, customer service and quality based manager as well as their conforming requirements, measurement strategies and costs of non-conformance are shown in Appendix 4.

The quality assessment and accreditation criteria of the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) will directly impact on the companies, organisations and institutions who would provide the master craftsman vocational education and training. The important didactic aspects highlighted in the quality element concerning curriculum and instruction has to be accommodated in the curriculum development process so as to enable the curriculum to be implemented and meet the conforming requirements.

6.3.3 THE ANDRAGOGIC DIDACTIC NUANCES THAT INFLUENCE LEARNING WITHIN THE ORGANISATIONS AND COMPANIES THAT MAKE UP THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

The potential learner target group for the master craftsman curriculum is from the ranks of the artisan population within the industries. These artisans have by and large many years of work experience and many hold responsible positions within their specific organisations or companies.

Many are married with families and their situation is further complicated by the nature of the business they are in which may well entail shift work. It is necessary to consider in the curriculum development process for the master craftsman the initial situation of the learner especially the adult learner. Knowles (1987:170-173) feels it necessary to make certain assumptions about adults as learners, which are different from the assumptions, made for the child as a learner. The assumptions made about the adult learner are:

- Adults have a need to know why they should learn something. Adults generally spend time and energy on finding out the benefits they would gain from learning as well as weighing up the costs for such learning.

- Adults have a deep need to be self-directed. If one uses the psychological definition of 'adult' as a person who has achieved a self-concept of being in charge of their own life then self-directness is a feature of this condition.
• Adults carry vast volumes and different quality of experiences into the learning situation.

• When adults perceive a need in this life situation to know or to be able to perform more effectively and satisfyingly then they are more easily motivated and ready to learn.

• Adults enter into a learning situation with a task-centred, life-centred or problem-centred orientation rather than experimental.

The implications of these assumptions about adults as learners need to be considered when curriculum is being designed or contemplated. Knowles (1987:173-176) believes that it is essential to create a correct climate setting for adult learning. Within a training institution or organisation mutual respect, collaborativeness rather than competitiveness, supportive rather than judgemental, mutual trust and an element of fun and humanness are the correct climate settings for an adult learner. Creating mechanism for mutual planning of learning is deemed essential when dealing with the adult as a learner. The correct learning needs assessment and concise articulation of the needs into learning aims and objectives are crucial for the adult learning situation.

Broad & Newstrom (1992:10) link certain characteristics of the adult as learner to specific conditions in the work environment that are deemed essential if the transfer of learning into job competence is to be achieved. For the learner, the ability and aptitude should be ascertained as well as certain personality traits, which centre about achievement needs and locus of control as well as motivation levels. In the work environment there should be a supportive organisational climate, adequate opportunities to use new or acquired skills and knowledge as well as effective post-training goal setting and meaningful feedback on performance. To ensure that the curriculum for the master craftsman takes cognisance of the needs of adults as learners it is vital that such essential items as clearly stated aims and objectives for any vocational education and training intervention need to be articulated as well as a flexible, transparent delivery mechanism that accommodates the adult as learner.

The interactive teaching/learning andragogic didactic situation needs to be well structured and concise where learning objectives and measurement criteria are clearly stated for the learner. For the learner to be able to transfer learning to job competence performed constantly and at the same level is dependent on certain factors in the workplace.
Graham (1997:5) postulates a performance pyramid, which examines performance in terms of accomplishments and activities and is dependent on organisation factors such as tools and environment, expectations feedback and rewards and incentives. This demands an understanding of what is happening, what ought to happen and what actions are necessary to improve the situation. Each component of the performance pyramid are deemed essential as well as being combined in the right way so as to ensure best performance. The modified performance pyramid is shown in Figure 49 where aspects of the curriculum from a system's perspective for the master craftsman are linked to the pyramid so as to enable not only an effective and efficient curriculum to be in place but to create where possible the climate for on-the-job transfer of learning into job competence. The foundation for the performance pyramid are expectations and feedback, tools and equipment, rewards and incentives. In the curriculum development process this equates with aims and objectives of the vocational education and training syllabi and courses, the accreditation requirements for providers of such vocational education and training as well as evaluation of outcomes and certification of qualifications.

The potential learner target group for the master curriculum and the companies and organisations in which they are employed will in many instances be where the master craftsman vocational education and training takes place. A company or organisation in this situation will be both an employer of the potential learner target group and the provider of the vocational education and training for the master craftsman curriculum. As a provider of vocational education and training the companies and organisations would need to know what the aims and objectives of the curriculum are. Moreover the specific aims and objectives of modules or courses should articulate what competencies will result from the learning as well as describe what practical on-the-job components are necessary to ensure transfer of learning into applied competence. The evaluation of such learning outcomes against specific objectives and criteria will inform the provider company or organisation that the learner has more competencies and skills and appropriate rewards such as payment for skills can be negotiated. Provider companies and organisations will also have a viable career progression path option for their artisans and craftsmen. This career progression option will satisfy one of the needs expressed by the Printing, Newspaper Industries for a level above that of an artisan or craftsman (see 5.3).

The potential learner target group for the master craftsman curriculum represent a highly skilled adult employee grouping in the Printing, Newspaper and Packaging Industries who directly influence the performance of the companies and organisations in which they work. This potential learner target group also influence the performance pyramid with their existing knowledge and skills, desire to perform and physical and mental capacity. The aims and objectives of the master craftsman curriculum would have to be
articulated in such a way that it answers why artisans and craftsman should undertake the master craftsman curriculum. Modules and courses would need to identify a more practical hands-on approach where learning objectives identify applied competencies more than theoretically based learning outcomes.

The performance pyramid in relation to the curriculum behaving as a system must be read in conjunction with the potential learner target grouping who would be operating in the andragogic didactic mode. This interrelationship impacts directly on the master craftsman development process where the aims and objectives must be articulated to address the needs of learners, providers and companies and organisations in the industries. Furthermore, the selection and structuring of learning content, the interactive teaching-learning situation and evaluation of learning outcomes will also be impacted on by the performance enhancing factors and this needs to be taken cognisance of in the curriculum development process.

Figure 49: The Performance Pyramid in relation to the Curriculum behaving as a System
6.4 THE AIMS AND OBJECTIVES OF THE MASTER CRAFTSMAN CURRICULUM

When the curriculum is viewed from a systems perspective the articulation of the aims and objectives of the curriculum within the curriculum development process impacts on all the sub-systems of the curriculum. Aims and objectives should address the initial situation where needs were identified. Aims and objectives influence the selection and ordering of learning content and the andragogic didactic interactive teaching-learning situation in the master craftsman curriculum. The aims and objectives should also relate directly with the evaluation sub-system where once learning has taken place the learning outcomes can be assessed to determine if they are congruent with the aims and objectives.

The aims and objectives of the master craftsman curriculum should be articulated in such a manner that they address the needs of the learner, the companies and organisations within the Printing, Newspaper and Packaging Industries, the national priorities with regards skills development and the integration of education and training by means of the emerging qualification structures of the National Qualification Framework model (see 1.4). The potential learner target group for the master craftsman are adults and the needs of the adult learner have to be taken into consideration when developing the aims and objectives for the master craftsman curriculum (see 6.3.3).

For the adult learner the aims and objectives for the master craftsman curriculum should articulate the following:

- The learning outcomes of the curriculum and courses, which would indicate what new competencies, skills and knowledge would be acquired.

- The learning outcomes should also be supported by objectives and concomitant criteria against which performance can be measured thus enabling the learner at the onset to evaluate what is expected of him or her.

- The career progression opportunities offered by successfully completing the master craftsman curriculum.

- The recognition attached to the qualification as means of securing greater jobs status, job mobility and income.
- 166 -

• The intrinsic value of lifelong learning as a goal in itself.

For the companies and organisations within the Printing, Newspaper and Packaging Industries the aims and objectives should articulate the learning outcomes in terms of on-the-job competence at a specified performance level. The International Labour Organisation (ILO, 1986:240) defines a qualified worker standard as being:

'standard performance is the rate of output which qualified workers will naturally achieve without over exertion as an average over the working day or shift, provided that they know and adhere to the specified method and provided that they are motivated to apply themselves to their work'.

By expressing performance levels in qualifiable and quantifiable terms the company or organisation will have a benchmark and a direct means of determining the productivity benefit to be derived from an employee who undergoes the master craftsman vocational educational education and training. Furthermore the aims and objectives should indicate to the companies and organisations within the Printing, Newspaper and Packaging Industries that:

• An employee who attains master craftsman certification indicates that the employee has the capacity and capability of maintaining the craft of Printing, Newspaper and Packaging Industries and is the point of introduction of new technology.

• The master craftsman curriculum adds to an organisation or company’s options for upgrading skills and satisfying worker aspiration for career progression.

For the national priorities of skills development and the integration of education and training the aims and objectives of the master craftsman curriculum should articulate.

• The level of qualification and its integration into the National Qualification Framework.
• The career progression and lifelong learning aspects related to skills enhancement.
• The tangible contributions to the national skills development objectives.

Deriving the broad-based aims and objectives for the master craftsman directly from the needs of the Printing, Newspaper and Packaging Industries (see 1.2.1) they are articulated as follows:
• The master craftsman curriculum is aimed at further developing the competencies and skills of the artisan and craftsman in the Printing, Newspaper and Packaging Industries to have the capacity and capability to operate effectively and efficiently in a globally competitive environment. The skills and competencies go beyond the technical craft level and include production planning, quality assurance, costing and estimating, productivity improvement and the vital soft skills and competencies needed for world class manufacturing.

The general aims and objectives of the master craftsman curriculum for the potential learner target group based on the needs of the adult learner (see 6.2) are:

• The master craftsman curriculum will further develop the competencies and skills in origination, machining and finishing as well as production planning, quality assurance, costing and estimating, productivity improvement and such soft skills and competencies as team building, budgeting, managing change, technical training, customer care and interviewing techniques.

• The master craftsman curriculum will lead to a qualification that will be recognised national and integrated onto the National Qualification Framework.

• The master craftsman curriculum will be internationally benchmarked and the Licentiate of City and Guilds of London (LCGI) will be awarded as a qualification.

The general aims and objectives of the master craftsman curriculum for meeting national priorities based on their specific needs (see 1.2.4.3) are:

• The master craftsman curriculum will enhance the skills in an important economic sector where learning outcomes and the master craftsman qualification is integrated onto the National Qualification Framework.

• The master craftsman curriculum facilitates lifelong learning, multiple entrance and exit points through a competency based modular structure.

Developing the aims and objectives for the master craftsman curriculum at the levels which address the needs of the Printing, Newspaper and Packaging Industries, the potential learner target group and the National Qualification Framework is only the starting point in the process. In order to ensure that these aims and
objectives are achievable aims and objectives for each module or course of learning would need to be developed. Module objectives and criteria would in time have to be usable so that assessment and evaluation are possible. Once the master craftsman curriculum has been developed, the aims and objectives of the master craftsman curriculum could be incorporated into a prospectus for the Master Craftsman Programme (MCP). Such a prospectus would form part of an advocacy campaign aimed at the adoption, implementation and institutionalisation of the master craftsman curriculum.

6.5 THE PRE-INTERACTIVE PHASE OF COURSE CONTENT SEARCH AND EVALUATION FOR THE MASTER CRAFTSMAN CURRICULUM

As has been previously stated the third phase of this study (see 2.5) is aimed at not only evaluating the situation analysis component of the curriculum but also is very much centred about course and evaluation design. According to Thomas (1994:188) the pre-interactive phase includes course and evaluation design as well as evaluation of resources of the provider, the training of trainers and external evaluators (assessors). The training course design involves job analysis, actual course design, course maps and course evaluation.

The broad based skills and competencies for the master craftsman have been identified through the mechanism of competency profiling (see 3.3.4). Job analysis was not a viable option to establish skills and competencies simply because no master craftsman exists in the Printing, Newspaper and Packaging Industries in South Africa. In order to develop courses and evaluation systems and the other infrastructure requirements for delivering vocational education and training a mere listing of competencies and units of competence is insufficient. Underpinning skills and knowledge will have to be established as well as the critical core and fundamental skills and underpinning knowledge for the macro requirements of the emerging National Qualification Framework.

The skills profiles for the master craftsman that was arrived at offered a ready source of the underpinning skills for the master craftsman competencies. Developing these skills with their concomitant underpinning knowledge for the master craftsman is the main objective of the master craftsman curriculum. As part of the curriculum development process actual course content including the practical skill building components and the syllabi for the theoretical underpinning knowledge would need to be established.
The Twente Model (see 2.5, Figure 9) recommends a search process for suitable existing curricula and criteria for evaluating the existing curricula so as to adopt or adapt the curricula. This process was a multi-faceted one where different routes were followed for the craft technical competencies, other technical competencies and the non-technical competencies.

6.5.1 EVALUATION OF COURSE CONTENT FOR THE UNDERPINNING SKILLS AND KNOWLEDGE REQUIREMENTS FOR CRAFT RELATED TECHNICAL COMPETENCIES

To evaluate the course content for craft related technical competencies of origination, transfer media, method of printing, finishing, mechanical and electrical a ready source of information was available from the existing Competency Based Modular Training programmes for artisan and craftsman vocational education and training currently in use within the Printing, Newspaper and Packaging Industries. Using the competency profiling process (see 3.3.4) these were refined by means of the taxonomy of competencies, skills, knowledge and attributes (see 4.4). These refined competencies, skills and underpinning knowledge as well as the core and fundamental skills and underpinning knowledge were compared to the existing Competency Based Modular Training programmes. The various technical liaison committees that currently exist in the industries evaluated the content and after consensus was reached applicable course content was selected.

As an example, the craft related technical competencies of the master craftsman (see 3.3.4, Figure 28b) of being able to prepare, make-ready and run a 1, 2 or 4 colour process illustration on a lithographic web-fed machine (off-set) through the process of investigation, comparison and consensus resulted in a taxonomy of skills and underpinning knowledge for a unit of competence representing a major job task or learning outcome for the master craftsman and identified the course content.

The elements of competence relating to the tasks identified for the lithographic web-fed machine were:

- The orientation and understanding of web offset printing. A module of learning which by its very nature represents course content of a theoretical nature.

The following modules of learning of the remaining elements of competence by their very nature represent course content of a practical nature:
• Able to effectively and efficiently prepare and operate paper in-feed system.
• Able to effectively and efficiently prepare and operate blanket and plate cylinders.
• Able to effectively and efficiently prepare and operate the inking system.
• Able to effectively and efficiently prepare and operate the dampening system.
• Able to effectively and efficiently prepare and operate the dyer and chill rolls.
• Able to effectively and efficiently prepare and operate the delivery system.
• Able to effectively and efficiently do timeous make-ready for printing.
• Able to effectively and efficiently run a press under normal production conditions.
• Able to effectively and efficiently do preventative maintenance and ensure safety requirements.

Each of the above elements represent a specific practical learning module with a tangible learning outcome which needs to be sequenced correctly in a course map. The actual skills and underpinning knowledge for the above identified competence elements and course content were also arrived through investigation, comparison and consensus by the appropriate technical liaison committee and an example for an element of a competence is as follows:

Competence Element: Paper In-feed System

Skills: Be able to effectively and efficiently and safely:
(1) Do paper roll handling for the web-fed machine.
(2) Prepare the in-feed to the web-fed machine.
(3) Web the paper through the machine.
(4) Set the correct web tension for the machine and paper substrate.

Underpinning Technical Skills knowledge component for the above which would be taught whilst practical training takes place so as to integrate theory and practices consists of:

Knowledge and understanding of:
(1) In-feed systems and configurations.
(2) Basic paper manufacturing process and paper characteristics.
(3) Paper specifications for different types of work.
(4) Paper roll ordering and handling procedures.
(6) Causes and remedies for paper wastage.

(7) Paper tension requirements.

(8) The operation of web guides, cut-off controls and break detectors.

(9) In-feed problems and solutions.

A more useful illustration of the job outcomes taxonomy of skills, knowledge and attributes for the craft related technical unit of competence for Lithographic web-offset printing is depicted in Figure 50. The taxonomy only illustrates and identifies job related tasks, skills and underpinning knowledge. The requirements of the macro needs of the emerging National Qualification Framework (NQF) needs to be included in the taxonomy as well.

According to the draft regulations for Education and Training Quality Assurance bodies (ETQA's) (SAQA, 1997b:60) the fundamental, core and elective learning for qualifications at the NQF levels 5 to 8 are subject to more flexible rules of combination in terms of credits. Since one of the aims of this study is for the master craftsman curriculum to result in a qualification that would meet the requirements for an NQF 5 level, the extent of what the prescribed credits requirements are for the core and fundamental are vague and as yet subject to conjecture and subjective interpretation.

The critical cross-field education and training outcomes according to the SAQA Draft Regulations (SAQA, 1997b:57-58) are given a short title of 'critical outcomes' and would include the following:

- Problem solving which displays decision making, is responsible and involves critical and creative thinking.

- Being able to work effectively with others in a team, group, organisation or community contest.

- Being able to effectively and responsibly plan, prioritise and organise ones activities.

- Being able to source, analyse and critically evaluate information.

- Being able to communicate effectively using visual, oral, written, numeric and where applicable multi media communications systems.
• Being able to use science and technology effectively with due regard for the environment and health and safety of others.

• Being able to understand that the world consists of interrelated systems that are interdependent, and rely on problem solving that acknowledges these interdependencies.

• Any programme of learning should also enable a person to be able to learn how to learn, participate responsibly within the society as a whole, be culturally and aesthetically aware of the diversity in society and be able to constructively explore career opportunities and entrepreneurial opportunities.
Figure 50: Taxonomy of the unit outcome for producing a 4 colour lithographic web-offset process illustration
Interestingly the Draft Machining Unit Standards of the Metal and Engineering Industries Education and Training Board (MEIETB, 1997:2) merely identify critical cross-field outcomes as:

- Identify and solve problems.
- Work effectively with others.
- Organise and manage oneself.
- Communicate.
- Use Science and Technology.
- Understand the world as a set of related systems.

For each unit the above listing is applied and by means of cross-referencing, the appropriate critical cross-field outcome that is incorporated in the unit is identified. For instance, for the unit titled 'prepare materials, tools and components for mechanical assembly' the critical cross field outcomes of identify and solve problems as well as work effectively with others are identified (MEIETB, 1997:5-6). For the unit titled 'perform tool and cutter grinding operations' the critical cross fields of identify and solve problems, organise and manage oneself, use science and technology and understand the world as a set of related systems are identified (MEIETB, 1997:102-103). In all cases no elaboration is made.

The Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) on the other hand do not only identify in their draft unit standards what the critical cross field outcome are but elaborate them in detail. According to the PNPIETB draft unit standards for Lithography Web-Fed (PNPIETB, 1997:35-36) the critical cross field outcome for problem solving skills for the unit of running a lithographic press is as follows:

- Identify and apply corrective action to solve print related problems such as incorrect ink/water balance, print registration, paper feed problems and mechanical problems. Will be able to synthesise new data, evaluate and make comparisons to establish a set of control standards for future reference. The problem solving skills are characteristic of a systems approach to fault finding where questions on possible fault information goes beyond production problems and involves the internal and external customer as well. Root causes are identified which cross both process and departmental boundaries and even moves into the external environment. Solutions are widely communicated and commented on. The fault diagnosis is related to costs and customer satisfaction and compared to other possible solutions to evaluate effectiveness and instil flexibility in diagnostic fault finding and problem solving.
On the basis of available information 'critical outcomes' for the elements of competency for the master craftsman will include those identified by SAQA. The mix of fundamental core and elective learning skills for the NQF level 5 and above is even more vague and unspecified. The SAQA Draft Regulations (SAQA, 1997b:60) accordingly states:

'More flexible rules of combination in terms of credits for Fundamental, Core and Elective learning may be applied at these levels, providing that the requirements of paragraphs 7.1 and 7.4.2 above are met.'

The identified underpinning skills and knowledge for the technical craft competencies for the master craftsman lend themselves to course development particularly with regards course content and course structure in terms of practical training and theoretical syllabi as well as the existing competency based evaluation system. Nevertheless, fundamental skills and the underpinning knowledge applicable especially with regards mathematics and science usage for the craft technical units of competence are necessary to be identified and included in the courses for the master craftsman. This is already facilitated by the Technical Theoretical modules for the existing trade or craft competency based modular vocational education and training system within the industries.

The recommendations of the Twente Model (see 2.5, Figure 9) of evaluating existing courses for use in a new curriculum indicate that the existing competency based modular craft technical courses used within the Printing, Newspaper and Packaging Industries are easily adaptable for the requirements of the master craftsman curriculum in the craft technical fields.

6.5.2 COURSE CONTENT SEARCH AND EVALUATION OF THE UNDERPINNING SKILLS AND KNOWLEDGE REQUIREMENTS FOR OTHER TECHNICAL COMPETENCIES

The identified competencies for the master craftsman of quality assurance, technical training, productivity improvement, costing and estimating are competencies that exist within the Printing, Newspaper and Packaging Industries but the level of the competencies is unknown. A variety of courses exist which do in some measure aim at increasing job skills and competencies in areas such as costing and estimating productivity improvement and technical training. Several Printing, Newspaper and Packaging companies have also embarked on their own initiative to obtain ISO 9000 series certification and have naturally undertaken intensive in-house training in this regard, however, no industry wide standard exists for quality assurance.
Following the recommendation of the Twente Model (see 2.5, Figure 9) a search procedure for evaluating existing courses was undertaken so as to ascertain their suitability for the master craftsman curriculum.

6.5.2.1 QUALITY ASSURANCE

The identified units of competence for quality assurance for the master craftsman in the Printing, Newspaper and Packaging Industries were:

- Recall and understand quality assurance principles.
- Implement an effective and efficient quality assurance system.
- Know and recall what ISO 9000 series quality assurance systems are.
- Understand and recall what statistical quality assurance is.

The units of competence of recalling and understanding quality assurance principles, know and recall what ISO 9000 series quality assurance systems are and understand and recall what statistical quality assurance is, have a bias toward a knowledge base for the competence units. This indicates that the courses of vocational education and training could be of a theoretical nature and conducted in a classroom situation.

The Graphic Arts Technical Foundation (GATF) of the USA indicated that excellent programmes in quality assurance were offered by Fox Valley Technical College as well as the USA Group/National Quality Academy. Visits to the two organisations as well as the Fox Valley Technical College campus in Wisconsin in the United States proved valuable in accessing the suitability of their Quality Assurance vocational education and training programmes for the competencies identified for the master craftsman.

Fox Valley Technical College have a Quality Improvement Process Specialist course which is accredited as an Associate Degree programme and takes two years to complete. According to the Fox Valley Technical College Prospectus for the course (Fox Valley Technical College, 1994:1) the course consists of the following:
### Associate Degree Program: Approximately 2 Years

**Graduation Requirement: 65 Credit**

#### General Studies Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>801-195</td>
<td>Communication, Written</td>
<td>3</td>
</tr>
<tr>
<td>801-196</td>
<td>Oral Communication</td>
<td>3</td>
</tr>
<tr>
<td>801-197</td>
<td>Technical Reporting</td>
<td>3</td>
</tr>
<tr>
<td>809-195</td>
<td>Economics</td>
<td>3</td>
</tr>
<tr>
<td>809-197</td>
<td>Contemporary American Society</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Technical Core Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>185-110</td>
<td>Quality as an Organisational Strategy</td>
<td>3</td>
</tr>
<tr>
<td>185-111</td>
<td>Organisations, Paradigms and Change</td>
<td>3</td>
</tr>
<tr>
<td>185-112</td>
<td>Customer Focus in Quality Improvement</td>
<td>3</td>
</tr>
<tr>
<td>185-113</td>
<td>Process Improvement</td>
<td>3</td>
</tr>
<tr>
<td>185-116</td>
<td>Internal/External Quality Standards</td>
<td>3</td>
</tr>
<tr>
<td>185-118</td>
<td>Project Management</td>
<td>3</td>
</tr>
<tr>
<td>185-120</td>
<td>Quality Improvement Process- Applied</td>
<td>3</td>
</tr>
<tr>
<td>185-121</td>
<td>Scientific Method 1</td>
<td>3</td>
</tr>
<tr>
<td>185-122</td>
<td>Scientific Method 2</td>
<td>3</td>
</tr>
<tr>
<td>185-123</td>
<td>Leadership for Quality</td>
<td>3</td>
</tr>
<tr>
<td>196-139</td>
<td>Employee Training and Development</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Technical Support Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>101-145</td>
<td>Spreadsheets, Beginning</td>
<td>1</td>
</tr>
<tr>
<td>102-112</td>
<td>Business, Introduction to</td>
<td>3</td>
</tr>
<tr>
<td>107-177</td>
<td>Microcomputers, Introduction to</td>
<td>1</td>
</tr>
<tr>
<td>196-110</td>
<td>Cost Controls and Budgeting</td>
<td>3</td>
</tr>
<tr>
<td>804-125</td>
<td>Math-Technical Basic</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

Course material and supporting documentation revealed that much value can be obtained by adapting components of the course to meet the needs of the master craftsman curriculum.

The USA Group/National Quality Academy offer a very comprehensive Quality Improvement Process Specialist Degree Program. According to the USA Group/National Quality Academy (1997:4) the Quality Improvement Specialist Degree Program is offered as a college-level degree. The Program consists of ten three-credit core courses combined with technical support, elective courses and liberal studies that meet the requirements for an associate of applied science or an associate of liberal arts, or a baccalaureate degree. The courses in the program offer the students the following:
• Receive experience in current quality process methodology.
• Have the ability to facilitate work teams.
• Focus on quality and customer service.
• Acquire real world experience and application of statistical process control.
• Experience in using the techniques, tools and concepts of quality planning and management.

The programme core course descriptions according to USA Group/National Quality Academy (1997:7-15) for Quality as an Organisational Strategy is an overview of the history and evolution of the origin of quality improvement and the trends in the field and is identical to that offered by Fox Valley Technical College in their Associate Degree Program. A very useful and innovating way of illustrating the course content in the form of a flow chart is shown in Figure 51.

Figure 51 : Quality as an Organisational Strategy Flowchart
The course content offered is ideally suited to address the unit of competence for the master craftsman, which deals with recalling, and understanding quality assurance principles. The actual competencies and activities according to the Quality Improvement Specialist Program (USA Group/National Quality Academy, 1997: 2-9) are illustrated in the form of competency listing matched to a specific cognitive level using Bloom's taxonomy (Figure 52) and an activity chart relating the competencies to specific activities (Figure 53). The actual course timetable for quality as an organisational strategy indicates that the course is a standalone module and is spread over a six month period representing 3 credits and 54 hours of classroom interaction between lecturer and student. The course is divided into specific lessons, namely:

- Overview of Course
- The History of Quality
- Philip Crosby
- Second Wave
- Baler, Scherleinbach, Fergenbaum
- Malcolm Baldrige Award
- Hoskin Planning
- Why Quality?
- Quality Gurus
- Ishikaira, Imai, Taguchi
- Conway, Scholtes, Joiner
- Trends
- Deming Prize
- Approaches to Quality: Guru Approach
  Integrated Approach
  TQM Element Approach
  Company Model Approach
  Prize Criteria Approach
  Consultant Approach
- Where have we Come?
- Where are we Going?
<table>
<thead>
<tr>
<th>Competency</th>
<th>Information</th>
<th>Comprehension</th>
<th>Application</th>
<th>Analysis</th>
<th>Synthesis</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition of Quality</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of Quality Movement</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W. Edward Deming</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deming's 14 Point of Management</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deming's Chain Reaction</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deming's Flow Diagram</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>The Red Bead Experiment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>The 7 Deadly Diseases</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profound Knowledge (TTL)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kossoff</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principles of Total Quality</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Four Waves of Quality</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juran</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breakthrough Sequence</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Pareto Principle</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Juran Trilogy</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crosby</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Four Absolutes</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cost of Quality</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Baldrige Criteria (TTL)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality Practitioners (TTL)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feigenbaum</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scherkenback</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joiner</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scholtes</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conway</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senge</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 52: Quality as an Organisational Strategy
Figure 53: Quality as an Organizational Strategy Activity Chart

QUALITY AS AN ORGANISATIONAL STRATEGY

Understand the history of the quality movement. Become familiar with the gurus and their theories from Japan and the U.S. who have had lasting influence on the quality movement.
- Baker (Ford)
- Why quality?
- Quality Timeline - who, what, when?
- Culture
- Shewhart
- Deming
- Juran
- Ishikawa
- Imai
- Taguchi

Develop an understanding of and be able to identify the trends in the quality movement and identify the second generation practitioners and their contributions to quality.
- Baker (Ford)
- Conway
- Crosby
- Feigenbaum
- Haqueboard
- King (GOAL/QPC)
- Joiner
- Scholtes
- Schirkenbach
- Baldridge Award
- Deming Prize
- Hoshin Planning

Examine and develop a working knowledge of the various approaches which organisations choose for the implementation of TQM. Compare/contrast the approaches - discuss strengths and weaknesses.
- Guru approach
- Integrated approach
- TQM element approach
- Company model approach
- Prize criteria approach
- Consultant approach

* ACTIVITY

* Analyse the differences/similarities of the gurus

* Develop a visual model that places practitioners and/or their theories

* Create a matrix of theories/beliefs for all practitioners to show where they agree and disagree

* Develop criteria for a quality award

* Which approach would be most appropriate in your organisation and why?
Which approach would you choose and why?
The unit of competence of knowing and recalling what ISO 9000 series quality assurance systems are for the master craftsman in the Printing, Newspaper and Packaging Industries is similarly well catered for by the module titled 'Internal and External Quality Standards.' This module according to USA Group/National Quality Academy (1997:14) earns a candidate 3 credits and entails 54 hours classroom interaction between lecturer and student.

The Internal and External Quality Standards module Flowchart is shown in Figure 54 and the Activity chart for the module is depicted in Figure 55.
INTERNAL AND EXTERNAL QUALITY STANDARDS

ISO 9000 Supplier Standards
- Certification and Registration
- TAGs and TC
- Common Elements
- 9001 - Design and Production
- 9002 - Production and Installation
- 9003 - Final Inspection
- 9004 - Management

Relationship to Other Standard

Hierarchy of Quality Documentation
- Quality Manual

Documented Procedures

Work Instruction

Forms

Records

An Effective System of Measurement

Certification

The Quality Audit
- Why Audit?
- Potential Benefits
- Negative Aspects

An Effective System of Auditing

Figure 54: Internal and External Quality Standards module Flowchart
ISO 9000
Develop a working knowledge of the various ISO 9000 standards and their relationships

INTERNAL AND EXTERNAL QUALITY STANDARDS

SUPPLIER CERTIFICATION
Use the ISO 9000 standards to build a system for certifying suppliers

AUDITING
Develop a system for auditing to the ISO 9000 standards

* ACTIVITY

* Write a policy manual
* Write a procedures manual

* Design an audit format

Figure 55: Internal and External Quality Standards Activity Chart
The Unit of Competence of understanding and recalling what statistical quality assurance is for the master craftsman is adequately covered by the Quality Improvement Process Specialist Program and is dealt with in two modules. According to the Quality Improvement Process Specialist Program (USA Group/National Quality Academy, 1997:42-52) the modules on scientific methods 1 and 2 adequately cover all aspects of statistical quality assurance. In fact Scientific Methods 2 goes beyond the needs of the master craftsman curriculum in the Printing, Newspaper and Packaging Industries.

Scientific Methods 1 module introduces learners to two processes: Problem Solving and Hoskin Planning. The Problem Solving skills developed by the course enables the learner to work on problems rather than symptoms and ties the problem solving to the Plan-Do-Check-Act (PDCA) cycle and is a diagnostic approach. This lends itself for further use in the unit of competence that refers to the master craftsman being able to use diagnostic methods to solve problems and make decisions in the workplace (see 3.3.4, Figure 30b). The Hoskin Planning skills developed by the course enables the learner to make use of seven management and planning tools to determine mission, vision and key objectives for an organisation or functional area. The Scientific Methods 1 module has a 3 credit rating and entails 54 hours of classroom interaction between lecturer and student. The Scientific Methods 1 Flow Chart is shown in Figure 56 and the Activity Chart for the module is depicted in Figure 57.
Develop a Working Knowledge and Apply the Shewhart Cycle (Doming Cycle -PDCA). Understand the importance of Doing it With Data

Learn a Problem-Solving Process and Demonstrate Proficiency in the use of That Process. Develop a Repertoire of Tools for use in the Problem-Solving Process

Become Familiar With a Team-Facilitated Planning Process

Tools for Collecting Input and Generating Ideas
- PDCA
- Data Collection
- Minute Paper
- Plus/Delta
- Focus Group
- Needs Survey
- Affinity Diagram
- Crawford Slip

Tools for Decision Making and Critical Thinking
- Fist to Five
- 10-4 Voting
- Nominal Group Technique
- Consensus 1-3-6
- Cause and Effect Diagram
- Interrelationship Digraph
- Johari’s Window
- L-Shaped Matrix

Tools for Data Collection and Analysis
- Force Field Analysis
- SWOT Analysis
- Pareto Chart
- Spider/Radar Diagram
- Process Flowchart
- Run Chart
- Check Sheet
- Tree Diagram
- Histogram
- Scatter Diagram
- Control Charts

- Brainstorming Process
- Team Meeting Cycle
- Team Definition
- Stages of Team Development
- Productive Meetings Criteria

Gather Input to Make Effective Decisions Evaluation

Figure 56: Scientific Methods 1 Flowchart
Develop a working knowledge and apply the Shewhart Cycle (Deming Cycle) PDCA. Understand the importance of ‘doing it’ with data.

Learn a problem solving process and demonstrate proficiency in the use of that process. Develop a repertoire of tools for use in the problem solving process.

Become familiar with a broad planning process for use outside of the problem solving process. Develop a repertoire of tools for use in the planning process.

Figure 57: Scientific Methods 1 Activity Chart

According to the Quality Improvement Process Specialist Program (USA Group/National Quality Academy, 1997:42-52) the Scientific Method 2 module consists of 7 units:

Unit 1 - deals with fundamentals, namely the four rules of variation, histograms and variations and probabilities.

Unit 2 - deals with basic statistics such as mean, median, mode, range, tolerances and specifications.

Unit 3 - introduces the basic tools for statistical quality assurance such as histograms, fishbones, pareto charts, scatter diagrams, run charts and check sheets.
Unit 4 - deals with variable charts and includes variable data, average/range charts, median/range charts, individual/range charts and variable control charts.

Unit 5 - deals with attribute charts such as P charts, NP charts and C charts.

These five units adequately cover the needs for the unit of competence for the master craftsman of understanding and recalling what statistical quality assurance is (see 3.3.4, Figure 29).

By adapting the Scientific Method 2 module of the Quality Improvement Process Specialist Program to include only units 1-5, the adapted module represents 35 hours of classroom interaction between lecture and student. A modified version of the Scientific Methods 2 Flowchart incorporating units 1-5 only is shown in Figure 58. Likewise a modified Activity Chart for the module is depicted in Figure 59.
The final unit of competence for the Quality Assurance competencies of the master craftsman is to implement an effective quality assurance system. This competence can only be achieved by an on-the-job project and would represent the culmination of the above mentioned quality assurance vocational education and training modules.

In summary the Quality Assurance competencies would entail 4 modules of a theoretical nature and one module of a practical project nature. As part of the prospectus each competence will have a module listing and a flowchart to illustrate the various modules. An example of the vocational education and training courses for developing the Quality Assurance competencies is given below.

**Quality Assurance Course Modules and Flowcharts**

<table>
<thead>
<tr>
<th>Module</th>
<th>Code</th>
<th>Quality Assurance</th>
<th>Nature of Course</th>
<th>Course Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1</td>
<td>Q1</td>
<td>Quality as an Organizational Strategy</td>
<td>Theoretical</td>
<td>54 hours</td>
</tr>
<tr>
<td>Module 2</td>
<td>Q2</td>
<td>Internal and External Quality Standards</td>
<td>Theoretical</td>
<td>54 hours</td>
</tr>
<tr>
<td>Module 3</td>
<td>Q3</td>
<td>Scientific Problem Solving</td>
<td>Theoretical</td>
<td>54 hours</td>
</tr>
<tr>
<td>Module 4</td>
<td>Q4</td>
<td>Statistical Methods</td>
<td>Theoretical</td>
<td>30 hours</td>
</tr>
<tr>
<td>Module 5</td>
<td>Q5</td>
<td>Implementing a Quality Assurance System</td>
<td>On-the-job Project</td>
<td>6 weeks on-the-job</td>
</tr>
</tbody>
</table>
The flowcharts will be modified where necessary, however, the flowchart for module 1 – Quality as an Organizational Strategy will be the same as shown in Figure 51. The scientific problem solving module also satisfies the critical outcome listed by the SAQA Draft Regulations (SAQA, 1997b:57-58) of problem solving which displays decision making, is responsible and involves critical and creative thinking. The course content for quality assurance modules that have been sourced would still need to be structured into a coherent course map, be competency based with an appropriate evaluation sub-system. This process is discussed in chapter 7.

6.5.2.2 TECHNICAL TRAINING

The competency units for the master craftsman that were identified for technical training of understanding and recalling what competency based training systems are, have basic knowledge of training needs analysis, training evaluation, instructional design and training presentation techniques are theoretical in nature (see 3.3.4, Figure 29).

Vocational education and training programmes and courses are currently in use within the Printing, Newspaper and Packaging Industries. The 'Instructing the Modular Way' (IMW) course (PNPITB, 1992b) is a compulsory requirement for any person within the industries who wishes to become a training instructor, training evaluator or training officer. The course is of an introductory nature and has a duration of 24 hours face to face interaction between lecturer and learner. The course is competency based and requires an on-the-job project to be submitted for evaluation six weeks after the course has been completed. The course covers the following topics:

- A holistic view of the Competency Based Modular Training System used with the Printing, Newspaper and Packaging Industries.

- Analysis of tasks.

- Developing learning guides.

- Developing evaluation check lists.

- Demonstrating tasks.
• Practical testing of the CBMT training system.

A second programme on assessment training 'Evaluation Practices for Assessors' is a compulsory requirement for assessors who wish to be registered by the Printing, Newspaper and Packaging Industries as technical craft assessors for apprentices, trainees and Recognition of Prior Learning tests. An assessor within the Printing, Newspaper and Packaging Industries is furthermore required to also have completed the 'Instructing the Modular Way' (IMW) course (PNPITB, 1993).

The 'Evaluation Practices for Assessors' course is a 24-hour face to face interaction between the lecturer and the learner as a candidate assessor. The candidate assessor is evaluated whilst doing and assessment in the field under the supervision of a qualified assessor.

Another structured course offered by the Printing, Newspaper and Packaging Industries Training Board (PNPITB) is the Training Officer Development Programme (PNPITB, 1991). This programme consists of three modules:

• Module 1: Training Needs Analysis.
• Module 2: Job Analysis.
• Module 3: Advance Instructional Design and Presentation Techniques.

The detailed syllabus for Module 1: Training Needs Analysis is as follows:

• The Role and Function of a Training Officer.

• A suggested Training Model for the Printing, Newspaper and Packaging Industries.

• Training Needs Analysis  - Labour turnover.
  - Analysis of Company Needs.
  - Procedures for calculating Manpower Planning Requirements.
  - Job analysis and job description and man specifications.
  - Identification of Operational Problems.
  - The Business based Approach to Evaluation.
  - Assessing Supervisor Training needs as a practical example using activity sampling, critical incident and appraisals.
- 192 -

- Other techniques used for determining Training Needs Analysis.

- Work Related Project.

This module has a duration of 24 hours face to face interaction between the lecturer and the learner. The Advanced Instructional Design and Presentation Techniques module has a similar structure and time frame to the Training Needs Analysis Module.

Using the recommendations of the Twente Model (see 2.5, Figure 9) for evaluating existing curricula against the identified needs of a new curriculum, the programmes currently in use within the Printing, Newspaper and Packaging Industries being modular and competency based adequately cover the needs for the technical training competency of the master craftsman (see 3.3.4, Figure 29). The course outline for Technical Training is as follows:

<table>
<thead>
<tr>
<th>Module</th>
<th>Code</th>
<th>Technical Training</th>
<th>Nature of Course</th>
<th>Course Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1</td>
<td>TEC1</td>
<td>Competency Based Modular Training Systems &amp; Training Needs Analysis</td>
<td>Theoretical/Practical</td>
<td>32 hours</td>
</tr>
<tr>
<td>Module 2</td>
<td>TEC2</td>
<td>Training Evaluation</td>
<td>Theoretical/Practical</td>
<td>16 hours</td>
</tr>
<tr>
<td>Module 3</td>
<td>TEC3</td>
<td>Instructional Design and Presentation Techniques</td>
<td>Theoretical/Practical</td>
<td>32 hours</td>
</tr>
<tr>
<td>Module 4</td>
<td>TEC4</td>
<td>Conduct a Training Needs Analysis in a selected department</td>
<td>On-the-job Project</td>
<td>6 weeks on-the-job</td>
</tr>
</tbody>
</table>

The course flow chart and activity chart for Technical Training are shown in Figures 60 and 61 respectively.
Figure 60: Technical Training Flowchart
Understand what Competency Based Modular Training Systems are and their value

Understand and apply Training Needs Analysis in a work situation

Demonstrate the ability to do training evaluation as an accessor for Competency Based Modular programmes and/or courses

Demonstrate the ability to do instructional Design and lesson presentation

Competency Based Training versus other Training Systems. Module objectives and their criteria

Evaluating and calculating labour turnover and use other indices to indicate a training need

Access a Competency Based Modular course of a theoretical and practical nature

Design a lesson including lesson guides, visual notes and any other requirements. Demonstrate a task correctly. Present a lesson of a practical and theoretical nature

Figure 61: Technical Training Activity Chart
6.5.2.3 PRODUCTIVITY IMPROVEMENT

The units of competency in the field of productivity improvement that were deemed necessary (see 3.3.4, Figure 29) for the master craftsman were as follows:

- Implement new or improved work methods by applying suitable method study techniques.
- Develop standard times for job related activities using suitable time study techniques.
- Know and recall more advanced work study and industrial engineering techniques.

These identified units of competency by and large have a practical application component and a knowledge base of a theoretical nature. Within the Printing, Newspaper and Packaging Industries a number of excellent courses which address the desired units of competency for productivity improvement do exist. The Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) have accredited a course titled 'Integrated Work Study for the Printing, Newspaper and Packaging Industries'. Moreover, courses in Work Study form part of the Curriculum for the National Diplomas in Printing Management and Packaging Management presented through various Technikons in South Africa. These courses were compared with each other as well as the publication by the International Labour Organisations titled 'Introduction to Work Study' (ILO: 1986). The similarities in content was remarkable except that the 'Integrated Work Study for the Printing, Newspaper and Packaging Industries' was more industry orientated and was aimed at producing practical competencies in method improvement and time measurement and is competency based.

The 'Integrated Work Study' course lends itself to be modularised and as such would consist of three modules covering productivity and industrial engineering techniques, method study and time measurement techniques. Each module would have a duration of 24 hours face to face lecturer and learner interaction followed up by appropriate on-the-job projects. The syllabus for the Integrated Work Study course for the Printing, Newspaper and Packaging Industries is as follows:

1. PRODUCTIVITY
   1.1 The Standard of Living
   1.2 Requirements for a minimum satisfactory standard of living
   1.3 What is Productivity?
   1.4 Productivity in Industry
   1.5 The Background of Productivity
   1.6 The attitude of the workers
2. WORK STUDY
   2.1 Why work study?
   2.2 Historical background
   2.3 Co-ordinated procedure

3. METHOD STUDY
   3.1 Definition and objectives
   3.2 General approach to method study
   3.3 The functions of method study
   3.4 Basic procedure for method study
   3.5 Recording the facts – the available techniques
      3.5.1 Recording – Flow Process Charts
      3.5.2 Recording – The String Diagram

4. TIME STUDY/WORK MEASUREMENT
   4.1 Definition
   4.2 Rating
   4.3 Taking a time study
   4.4 Standard Time

The unit of competency of know and recall more advanced work study and industrial engineering techniques proved to be more problematic. A vast array of techniques, which may be useful within the Printing, Newspaper and Packaging Industries, is available but which are applicable and of value for inclusion in a course of study for the master craftsman was unknown. Via the mechanism of personal structured interviews with eleven of the large companies who employ industrial engineers the valued opinion was that the master craftsman should know, understand and be able to do an activity sample, as well as applying a critical incident investigation into a selected area of work. Ideally the master craftsman should also have the knowledge and understanding of value analysis as a useful technique to complement method study and work measurement. Certain aspects of ergonomics was also felt to be of value for inclusion in a course of study for the master craftsman. These ergonomic aspects were those concerned with the man and machine interface dealing with monotony, fatigue and shift work. The technical liaison committee analysed and evaluated the existing curricula and took cognisance of the structured interview results and identified the appropriate course content. The course modules are as follows:
<table>
<thead>
<tr>
<th>Module</th>
<th>Code</th>
<th>Productivity Improvement</th>
<th>Nature of Course</th>
<th>Course Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1</td>
<td>P11</td>
<td>Productivity and I.E. Techniques</td>
<td>Theoretical</td>
<td>24 hours</td>
</tr>
<tr>
<td>Module 2</td>
<td>P12</td>
<td>Method Study</td>
<td>Theoretical/Practical</td>
<td>24 hours</td>
</tr>
<tr>
<td>Module 3</td>
<td>P13</td>
<td>Time Study</td>
<td>Theoretical/Practical</td>
<td>24 hours</td>
</tr>
<tr>
<td>Module 4</td>
<td>P14</td>
<td>Conduct a detailed work study on a selected work method</td>
<td>On-the-job Project</td>
<td>6 weeks on-the-job</td>
</tr>
</tbody>
</table>

Figures 62 and 63 represent the Productivity Improvement Flowchart and Activity Chart respectively.

**PRODUCTIVITY IMPROVEMENT**

- Work study and Industrial Engineering techniques
  - Productivity
  - Historical background
  - F W Taylor
  - F Gilbreth
  - B C Bedaux
  - L Gantt
  - Co-ordinating process
  - Plant layout and work optimisation
  - Activity sampling
  - Critical incident technique
  - Value analysis
  - Monotony, fatigue and the effects of shift work on human performance

- Method study
  - General approach to method study
  - Basic procedure for method study
  - select
  - record
  - Examine
  - Develop
  - Install
  - Maintain
  - Process charts
  - String diagrams

- Time study
  - Objectives of time measurement
  - Standard unit of work
  - Rating
  - Time measurement procedure
  - preparation
  - timing and time recording charts
  - effective and ineffective time
  - standard minute value calculations

- Method Improvement
- Material flow improvement
- Layout Improvement

- Standard minute values for production operations/ processes

**Figure 62 : Productivity Improvement Flowchart**
6.5.2.4 COSTING AND ESTIMATING

The identified units of competence for costing and estimating (see 3.3.4, Figure 29) for the master craftsman in the Printing, Newspaper and Packaging Industries were:

- Know and recall the basic principles of costing.

- Know and recall the basic principles of estimating.

- Be able to do costing and estimating for potential orders for products and services in the Printing, Newspaper and Packaging Industries.
In a sample survey of 350 medium to large companies from all sub-sectors and niche markets of the Printing, Newspaper and Packaging Industries the job of estimating in eighty percent of the companies surveyed was a dedicated job of a person or persons. The estimators in eighty two percent of all cases were qualified artisans who had undergone some form of formal training in printing, estimating and costing. The estimator professional status is seen as being an upward career option for the artisans and a vital stepping stone to sales and marketing.

The smaller micro enterprise, which consists of small print on demand copy operations, are in many instances franchise businesses. Discussions with the franchise holders indicated that in all cases estimating training was a vital component for a potential franchise partner. The most popular course identified by the industries for training estimators was the course offered by the Printing Industries Federation of South Africa (PIFSA) at their various regional chambers. The course was designed and in many instances presented by Allan Roberts who wrote the definitive work 'Estimating for South African Printers' in 1995. The 'Estimating for Printers' course syllabus offered by PIFSA is:

- Introduction to Estimating
- Paper Calculations
- Ink Calculations

- Practical estimating such as:
  - magazine production
  - labels
  - books
  - simple jobbing work
  - carton work
  - 'quarter-bound' work.

- Computers and Computer-assisted estimating
- Type Calculations
- Imposition Schemes

The duration of the course is 80 hours face to face lecturer and learner interaction. Another popular series of courses offered through the Printing Industries Federation of South Africa (PIFSA) is 'Production Planning and Estimating'. The course syllabus is as follows:
The duration of the course is 60 hours face to face lecturer and learner interaction. Interestingly the quality of the courses offered by the Printing Industries Federation of South Africa (PIFSA) namely 'Estimating for Printers' and 'Production Planning and Estimating' are of such a high standard that the Cape Technikon in their prospectus for the National Diploma in Packaging and Printing Technology (1997:2) give credit for these courses for the National Diploma. Drawing from the available course material and meeting the units of competence in costing and estimating for the master craftsman the syllabus would be as follows:

- Introduction to estimating. The role of the estimator and the inter-relationship of estimating to other departments.
- What the estimator needs to know dealing with the environmental in which the estimator operates, the tools and equipment used and computer assisted estimating (CAE).
- General procedure for estimating from sales requests to pricing and estimates.
- Paper and board estimating.
- Envelope and pocket estimating.
- Type calculations and imposition schemes.
- Reproduction and platemaking estimating.
- Lithographic sheet-fed dealing with wash-up and make-ready as well as press running speeds.
- Blocking, covering all aspects of costs and estimating for foils, including blocking discs.
- Coating and finishing operations and costs.
- Practical estimating for sheet-fed offset, web offset, screen printing and packaging and despatch.
- Calculation of hourly costs rates.

This syllabus was analysed and evaluated by the technical liaison committee and the agreed upon course would be in the form of two modules. The first module covering all the theoretical input and the second module covering the practical estimating and calculation of hourly costs rates. Each module would have a 54-hour duration. The course modules are as follows:
The flowcharts and activity charts are depicted in Figures 64 and 65 respectively.

<table>
<thead>
<tr>
<th>Module</th>
<th>Code</th>
<th>Costing and Estimating</th>
<th>Nature of Course</th>
<th>Course Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1</td>
<td>CE1</td>
<td>Costing and Estimating</td>
<td>Theoretical</td>
<td>54 hours</td>
</tr>
<tr>
<td>Module 2</td>
<td>CE2</td>
<td>Practical Estimating</td>
<td>Theoretical/Practical</td>
<td>54 hours</td>
</tr>
</tbody>
</table>

Figure 64 : Costing and Estimating Flowchart
Understand the function and roles of an Estimator and recall and understand estimating procedures.

Recall and understand the procedures and calculations required for estimating products and services.

Be able to produce accurate estimates.

The necessity for estimating
- The Estimators position in the organisation
- The environment in which the estimator operates
- The basic procedure for estimating from sales enquiry to estimate

Able to calculate and prepare Paper and Board requirements and estimates
- Able to calculate Envelope and Pocket requirements and estimates
- Able to estimate for Imposition schemes and types calculations
- Able to calculate and produce estimates for reproduction and platemaking
- Able to calculate and produce wash-up and make-ready estimates

Produce accurate and timeous sheet-fed offset estimates
- Produce accurate and timeous web offset estimates
- Produce accurate and timeous screen printing estimates
- Produce accurate and timeous packaging estimates
- Produce accurate and timeous dispatching estimates

Figure 65: Costing & Estimating Activity Chart
6.5.3 COURSE CONTENT EVALUATION FOR THE UNDERPINNING SKILLS AND KNOWLEDGE REQUIREMENTS FOR NON-TECHNICAL COMPETENCIES

The non-technical competencies of change management, production control, team development, interpersonal, information systems and recruitment and selection, represent a broad range of skills with their concomitant underpinning knowledge. Many of the non-technical competencies or units of competence are currently being developed by training interventions in the Printing, Newspaper and Packaging Industries. A wide range of short medium and long-term courses and programmes are available. Some are in-house programmes especially those to do with company disciplinary codes and grievance procedures. Negotiating skills development also receives high priority especially in the labour relations field. Other programmes are either in-house or provided by outside vendors. Production control forms part and parcel of the production planning component of the popular Printing Industries Federation of South Africa (PIFSA) course 'Production Planning and Estimating' (see 6.5.2.4). Team building and customer satisfaction training appears to be high on the desired training courses for employees in the industries.

The Twente Model for curriculum development identified a cost effective and pragmatic search procedure for suitable existing curricula (see 2.5, Figure 9). The search procedure involves an inventory being made of existing course material and evaluating the material adequacy against the requirements for the modular curricula. Using the search procedure for sourcing course material for the non-technical competencies for the master craftsman a questionnaire was sent to the companies and organisations in the industries where the following questions were asked:

- What vocational education and training was undertaken in the various non-technical competencies and units of competencies which could be applicable to the master craftsman.
- If vocational education and training was undertaken, details of the duration of the course, course content and syllabus, method of evaluation, course title, in-house or vendor provided and any other information on the course.
- How the course was evaluated as well as the general opinion of the value of the course.

The questionnaire and survey results are given in Appendices 5 and 6, respectively. At the time of the survey there were 1 215 companies and organisations in the Printing, Newspaper and Packaging Industries. A total of 275 responses were received and the tabulated results in Appendix 6 represents the information obtained from the survey. Only those competencies or units of competence in which respondents training was or is
given are included in the results. It is interesting to note that in the courses dealing with change management these courses were part of a diversity training intervention. The principles of production management were well catered for in existing competency based courses accredited by the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB).

Courses dealing with effective communication showed that of the 235 companies that offered these courses 90 of these were adult literacy whilst a further 92 courses were so basic that they too could be classified as adult literacy training. The disciplinary codes and grievance handling courses offered in the industries were centred about a companies' own disciplinary codes and procedures. Naturally they were very similar in content if not in emphasis because all companies operate under the same labour law dispensation. Closely aligned with disciplinary and grievance handling training was interpersonal conflict handling skills training. Many of the courses formed part of a battery of courses aimed at improving skills in the industrial relations arena.

The survey proved valuable in exposing and unearthing some of the vocational education and training priorities in the industries. Customer care skills development proved interesting in that customer care training is presently part of sales training. 62% of the respondent companies who have customer care training interventions indicate that they foresee this form of training to be extended to employees other than sales personnel. This was especially true where companies indicated that they are converting to new technology aimed at on demand printing where they realised that the customer and the operative on the production floor will in future be point of contact rather than through a sales person as an intermediary. The non-technical liaison committee by applying the taxonomy of competencies, skills knowledge and attributes (see 4.4) to the non-technical competencies articulated the skills and underpinning knowledge requirements in detail. The information gathered from the survey with regards existing course content was compared and evaluated by the non-technical liaison committee using the detailed taxonomy as a benchmark. The findings of the survey were analysed and the existing course content was compared and evaluated by a non-technical liaison committee against the required non-technical competencies for the master craftsman for suitable content. Where existing course content was inadequate or non-existent for the non-technical competencies further research for course content was necessary through literature research. International sourcing of course content by the researcher through City and Guilds of London Institute and visits to the United Kingdom and United States. The course content that was sourced from these initiatives were again evaluated by the non-technical liaison committee for suitability using the detailed taxonomy of skills and underpinning knowledge that was developed for the non-technical competencies.
6.5.3.1 CHANGE MANAGEMENT

The units of competency identified for change management falls into two distinct categories. One deals with product and production changes, the other with more generic principles of change management (see 3.3.4, Figure 30a). The survey on non-technical courses revealed that all the courses currently in use for change management include some re-engineering principles and process. Evaluating the various course syllabi supplied one can generalise and formulate generic course content for the unit of competence of recalling and understanding the principles of change management for the master craftsman which is as follows:

- Introduction to planned change theory.
- Types of change that can occur.
- Change agents and their role.
- Models for designing and implement change.
- The change process with special emphasis on re-engineering strategies.

There are of course many theories of change. Schein (1980:243-247) describes these theories as ranging from revolution to evolution and illustrates the three stages of planned change namely unfreezing, changing and re-freezing. The re-freezing stage involves the creation of the motivation to change. The changing stage involves the development of new attitudes and behaviours based on new information and redefinition of old ideas. The re-freezing stage involves the stabilisation of change. The types of change that can occur as emphasised in most of the courses is paradigm change. This is to be expected particularly when read in conjunction with the recent and ongoing changes in the South African society on the political and economic front.

Concentration on one type of change does not necessary fulfil the requirements for the master craftsman. Ferguson (1980) in the 'Aquarian Conspiracy' suggested that there are four varieties of change: change by exception, incremental change, pendulum change and paradigm change. The role and function of change agents reflected in the survey of the content of courses supplied concentrated on identifying persons and groups of people in an organisation and the roles that they can play in a change process. These ranged from facilitator to a process stabiliser as well as emphasising change leadership and teamwork.

Pfeiffer (1991:227-233) referring to the work of Chartier describes in detail the roles of change agents and the five primary modes through which the change agents can operate. These modes are as a catalyser, a process helper, a solution giver, a resource linker and a process stabiliser.
The models for designing and implementing change in the survey of content of courses were diverse and in many instances related to the business of the course designer or course vendor. Many of the courses were part and parcel of a consulting intervention and represented a very focussed specific approach. One can generalise that most of the models centred about assessing a current scenario by means of SWOT analysis create a preferred scenario and finally design a plan of action for reaching the preferred scenario.

Closely linked to the models for designing and implementing change was the process by which change can take place. Majority of the courses emphasised as a starting point the articulation of an organisation's core mission, creation of a mission statement and a vision of the future. Beckhard & Harris (1987) explore organisational change in terms of a change-stability dilemma and illustrate that the essential elements necessary to balance the change-stability dilemma are vision, sense of organisational identity, sense of interdependence, a scenario of the future, a more flexible organisational structure, utilisation of advanced technology and reward systems.

The re-engineering focus in many of the courses emphasise that if the environment changes people have to change and the process of change is to do with changing structure, have a task and technical skills orientation and be rational in its approach.

The units of competence of analysing and evaluating the impact of product changes on work process, implementing new product changes and where necessary new production systems, and determining and quantifying the impact of production process changes on work flow are by their very nature to do with printing production systems, company organisation, equipment planning, cost structures, changeover point analysis plant layout and work optimisation. There are no courses currently offered in the Printing, Newspaper and Packaging Industries in South Africa that deal with developing these units of competence for the master craftsman curriculum.

Extensive literature surveys and contact with a number of overseas graphic arts and print related umbrella organisations sourced a definitive work on printing production processes and related topics. The publication 'Printing Production Management' (Field, 1996) describes in the preface to the work that the book is intended primarily as an introductory text in printing production management for students at printing colleges and should also prove a valuable reference for all those in the industry who are interested in printing processes and printing administration.
Extracting the contents which are applicable for the development of the competencies for the master craftsman including the underpinning knowledge (see 3.3.4, Figure 30a) a syllabus would cover the following:

- Manufacturing Systems and Strategy
- Printing Company Organisations
- Equipment Planning
- Break-even Point Analysis
- Change-over Point Analysis
- Plant Layout and Work Optimisation

Naturally part of the courses for the units of competence on change management would entail on-the-job project work. Comparing the content of Field’s work, its degree of difficulty, range and complexity with known course content for the crafts as well as costing and estimating in the Printing, Newspaper and Packaging Industries, showed the content to be at the same pitching level. The non-technical liaison committee analysed and evaluated the various course options by comparing them to the desired competencies and then agreed upon the course content for change management. The change management competency for the master craftsman would entail three modules each with a duration of 24 hours face to face lecturer and learner interaction and appropriate on-the-job projects.

The Change Management course modules are as follows:

<table>
<thead>
<tr>
<th>Module</th>
<th>Code</th>
<th>Change Management</th>
<th>Nature of Course</th>
<th>Course Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1</td>
<td>CM1</td>
<td>Principles of Change Management</td>
<td>Theoretical</td>
<td>24 hours</td>
</tr>
<tr>
<td>Module 2</td>
<td>CM2</td>
<td>Manufacturing Systems &amp; Company Organisations</td>
<td>Theoretical/Practical</td>
<td>24 hours</td>
</tr>
<tr>
<td>Module 3</td>
<td>CM3</td>
<td>Cost Analysis Instruments &amp; Plant Layout</td>
<td>Theoretical/Practical</td>
<td>24 hours</td>
</tr>
</tbody>
</table>

The Course Flow Chart for Change Management is shown in Figure 66 and the Activity chart in Figure 67.
Figure 66: Change Management flowchart
Understand and recall the principles and process involved in change management

Analyse and evaluate the impact of product and process changes in manufacturing on production systems and company organisation

Analyse and evaluate the cost implications of product and process changes and its impact on plant layout and work flow

- Planned change
- Change by exception
- Instrumental change
- Pendulum change
- Paradigm change
- Function roles of change agents
- Change process

- Determine impact of product and process changes
- Calculate equipment costs
- Calculate break-even point for changes in products/equipment and processes
- Calculate cash break-even for products/equipment and processes
- Determine operating leverage
- Determine non-linear break-even

- Evaluate equipment replacement and substitution requirements
- Determine cost structures such as setup costs and variable costs
- Use the indifference or COP equation to evaluate product and process changes
- Recall the factors that influence plant location
- Conduct a plant layout evaluation

Figure 67: Change Management Activity Chart
6.5.3.2 PRODUCTION CONTROL

For Production Control the units of competency of recalling and understanding the principles of production planning, monitor and control production using suitable production control systems and recalling and understanding principles of production progressing (see 3.3.4, Figure 30a) are currently covered by vocational education and training courses in the industries.

The course accredited by the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) on Production Planning and Estimating covered certain aspects of production control. The majority of the other production control courses offered within the Printing, Newspaper and Packaging Industries were either part of Costing and Estimating courses or Production Planning courses. All the courses that were evaluated dealt with the principles of Production Planning in great detail and a typical syllabus would cover the following:

1. Introduction to Production Planning: Definition of production planning
   Production scheduling
   Production control
   Materials purchasing
   Inventory control
   Quality control

2. Multiple Image Layout Planning: Equipment & material usage and optimisation
   Calculation optimal layouts

3. Prepress Origination Planning: The assignment techniques

4. Multi Sheet Product Planning: Two-sided (perfected) product requirements
   Two-sided (perfected) product planning

5. Carton and Other Products Planning

   SPT, EDD and modified EDD decision rules
7. Two Machine Scheduling Rule

8. Multi Product Scheduling: The Gantt chart

   Printing & packaging scheduling strategies & application

   Scheduling dynamics


   Work progress reports, status reports, cost performance,
   evaluation and information systems dealing with production
   control systems.

A natural extension of 90% of the courses dealing with production planning included in-depth course work on
production control systems where company production control systems were taught. The duration of the
production control and progressing component of the courses were on average of 30 hours face to face
lecturer and learner interaction in a predominant workshop type presentation. Interestingly the evaluation
strategies used were based on successful implementation of on-the-job projects of the knowledge and skills
taught including such strategies as designing job-tickets, work progress sheets and doing cost analysis of
actual orders for products or services.

The unit of competency of understanding and interpreting business budgets (see 3.3.4, Figure 30a) and the
course content survey revealed that many companies viewed budgeting skills for non-financial employees
important. The typical items in the course syllabi for understanding and interpreting business budgets was as
follows:

- Definitions of budgets
- Budgeting process
- Sales forecast
- Sales budget
- Purchasing budget
- Production budget
- Capital expenditure
- Budget control
- Variance analysis and dynamic budgeting
- Practical application within an organisation
The average duration of the courses offered were 30 hours and were predominantly presented in the form of lecturers or seminars. The various courses were analysed and evaluated for suitability by the non-technical liaison committee and the agreed content for production control would consist of two modules.

The Production Control course modules are as follows:

<table>
<thead>
<tr>
<th>Module</th>
<th>Code</th>
<th>Production Control</th>
<th>Nature of Course</th>
<th>Course Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1</td>
<td>PC1</td>
<td>Production Planning and Control</td>
<td>Theoretical/Practical</td>
<td>30 hours</td>
</tr>
<tr>
<td>Module 2</td>
<td>PC2</td>
<td>Budgeting</td>
<td>Theoretical</td>
<td>30 hours</td>
</tr>
</tbody>
</table>

The Production Control flowchart and activity chart are shown in Figure 68 and 69 respectively. The Production Planning and Control module also contributes to the requirements of the National Qualification Framework in that it develops the critical outcome of being able to effectively and responsibly plan priorities and organise ones activities (SAQA, 1997b:57-58).
Figure 68: Production Control Flowchart
Understand, recall and apply principles and procedures for production planning

Definition of production planning, scheduling, production control, materials, purchasing, inventory control and quality control

Production planning procedures for multi image layout, prepress, carton and other products

Single, two machine and multi product scheduling

Gantt

P & P scheduling strategies

Scheduling dynamics

Understand, recall and apply principles and procedures for production control

Work initialising procedures, work progress reports, design status reports and their uses

Cost performance evaluation

Information systems usage

Understand and recall the principles of budgeting

Budget definitions

The budgeting principles and procedures

Budget control principles

Calculation of budget variances

* ACTIVITY

Figure 69: Production Control Activity Chart
6.5.3.3 TEAM DEVELOPMENT COMPETENCIES

The team development units of competency for the master craftsman of select, formulate and establish work teams, maintain work teams so that they remain efficient and effective and plan team activities for performance are being addressed within the Printing, Newspaper and Packaging Industries by a large number of team building courses and interventions. It is interesting to note that in many instances the team building skills development activities went hand in hand with workplace democratisation and affirmative action strategies. A typical syllabus for a Team Building course is as follows:

- Why have teams?
- The difference between traditional management and more progressive leadership.
- The desirable characteristics of an ideal team leader.
- The definition of a team and the roles and functions of its members.
- The characteristics of effective teams.
- The types of teams and their uses.
- The team development process from forming to performing and eventually to self-management.
- The differences in roles of team members, team leaders, and team facilitators.
- Operating plans and procedures to make teams more effective.
- How to cope with disruptive behaviour of team members.
- How to make team meetings more effective.

Majority of the courses on team building are of an interactive workshop with written tests and an on-the-job project and follow up. The average duration of a team building course is 40 hours face to face lecturer and learner interaction. The similarity of course content of the course surveyed indicated that the unit of competency of team development for the master craftsman is adequately catered for. The non-technical liaison committee analysed and evaluated the various courses and compared them to the required competencies for team development. The agreed course outline will consist of one module of a theoretical/practical nature and a duration of 54 hours. The module code for team development will be TD.

The team development modules for the master craftsman also meet the requirements of the 'critical outcome' described by SAQA (SAQA, 1997b:57-58) of being able to work effectively with others in a team. The Flowchart and Activity Chart for the Team Development course is shown in Figures 70 and 71 respectively.
Select and form work teams

- Why have teams?
- Types of teams
- Definition of a team
- Characteristics of efficient teams
- The ideal team leader
- Team development process: forming - storming - norming - performing cycle

Plan work team activities

- The different roles of team members
- Operating plans
- Procedures to improve team effectiveness

Maintain work teams

- Maintain teams for efficiency
- Coping with disruptive team members
- Making team meetings more effective

Focus on the value of work teams and how to form them

Proper team planning for effectiveness

Maintaining work teams for effective performance

Figure 70: Team Development Flowchart
Why have teams
Types of teams
Team members
The forming - storming - norming - performance cycle
Select and form a work team

Understanding the value of work teams. Know how a team forms and how to select team members

Team members and their roles
Team leadership
Team activity planning

Understand the importance of team planning and the allocation of duties to team members. Know the roles and function of team members

How to maintain a team
How to deal with descriptive team members
Making team meetings more effective

TEAM DEVELOPMENT

* ACTIVITY

Figure 71: Team Development Activity Chart
6.5.3.4 INTERPERSONAL COMPETENCIES

The interpersonal competency requirements of the master craftsman curriculum represent a wide range of soft skills with concomitant underpinning knowledge. The unit of competence of effective communication in the workplace is being addressed by the companies and organisations in the Printing, Newspaper and Packaging Industries. The majority of communication courses are of an adult literacy nature and although the course contents are suitable for their needs they are basic and unsuitable for the needs of the master craftsman. Other communications courses ranged from teaching telephone techniques to writing technical reports.

Clustering the units of competency of being able to communicate effectively in the work environment, handle customer requirements and complaints and have basic knowledge of multi-media communication is a more logical step in that all three units essential are to do with communication skills and abilities. As has been stated previously (see 3.3.2) the impact of rapid technology changes has resulted in the distance between the customer and the shop floor being reduced. In fact the customer and shop floor employee interface has already occurred particularly in the on-demand printing market. Multi-media communication systems particularly CD-ROM have already impacted in the Electronic Origination field.

The entrance criteria for the learner target group for the master craftsman curriculum has been established as a qualified artisan or craftsman. Part of this entry criteria is that the potential learner for the master craftsman curriculum would have successfully completed the practical and theoretical vocational education and training requirements and have been duly certificated. Communication studies form an integral part of the vocational education and training courses for a trade or craft in the industries.

The communications studies module according to the PNPITB (PNPITB, 1994) is aimed at developing skills and competencies in communication and covers the following:

- Explain and identify barriers to effective communication, types of non-verbal communication and types of conflict management.

- Understand, explain and demonstrate competent use of the conventions of technical writing for memos, formal letters, covering letters and CV writing.

- Understand, explain and demonstrate competence in oral presentation techniques and telephone techniques.
• Identify and explain group communication skills for informal and formal groups.

• Identify and explain the purpose and typical content requirements of agendas and minutes of meetings.

In order to build on this foundation and incorporate the units of competence of handling customer requirements and complaints and have basic knowledge of multi-media communication the course content of these courses dealing with customer care skills development together with courses that covered multi-media communications which are part of Origination craft vocational education and training were compared and evaluated for suitability by a non-technical liaison committee against the required non-technical competencies for the master craftsman.

The unit of competence of basic knowledge of multi-media communication is covered in the Origination craft technical competencies for the master craftsman under the following units of competence:

• Be computer literate and be able to use a word processing package on PC/Mac hardware configuration.

• Be able to use DTP packages such as Quark Express, CorelDraw, Freehand and other software packages which would include CD-ROM.

• Understand the computer controlled equipment used in production.

Fortunately competency based modular programmes accredited by the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) exist and are part of the vocational education and training for the Electronic Origination craft.

Customer care competencies and skills development courses offered at present within the Printing, Newspaper and Packaging Industries are all part of Sales Training courses. The content of the Sales Training courses varies from sales administrative systems training, through pricing and discount policies and practices to customer care. Distilling the contents of the various courses so as to meet the unit of competence of handling customer requirements and complaints a module on customer care of a 54-hour lecturer and learner interface of a theoretical/practical nature is necessary to meet the communication competencies for the master craftsman curriculum.
The unit of competence of implementing disciplinary codes and grievance handling procedures effectively so as to minimise industrial relations problems as well as identifying and minimising interpersonal conflict in the workplace by effective and emphatic counselling are competencies that the Printing, Newspaper and Packaging Industries are addressing by way of a variety of courses. The evidence from the respondents to the survey on courses offered in the industries was that most courses were tailor-made for the individual company. This is understandable since within the Printing, Newspaper and Packaging Industries plant level bargaining has been a feature of industrial relations since 1990. Prior to 1990 a National Industrial Council (NIC) for the Printing Industries had a centralised structure but after the Industrial Council was dissolved in 1989 and an agreement was reached between the employer organisations and employee organisations that all bargaining in the industrial relations area would be at plant level. The features of the typical company courses emphasised in-depth understanding of the disciplinary codes and all the procedures for grievance handling, appeal procedures and in-plant strategies to avoid interpersonal conflict including counselling and remedial interventions. In order to cater for the needs of the master craftsman and bearing in mind the industrial relations milieu in which the units of competence of implementing disciplinary codes and grievance handling procedures, identifying and reducing interpersonal conflict in the workplace by effective and emphatic counselling, it is difficult to prescribe a generic course of study.

However, for the master craftsman curriculum a module on disciplinary codes, grievance handling and interpersonal conflict handling and counselling will be specified in the course map for the Master Craftsman Programme (MCP). The interpersonal competency vocational education and training for the master craftsman will be implemented through two modules. The one module will deal with customer care and the other with company disciplinary procedures.

The Interpersonal Competency course modules are as follows:

<table>
<thead>
<tr>
<th>Module</th>
<th>Code</th>
<th>Interpersonal Competency</th>
<th>Nature of Course</th>
<th>Course Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1</td>
<td>CC1</td>
<td>Customer Care</td>
<td>Theoretical</td>
<td>54 hours</td>
</tr>
<tr>
<td>Module 2</td>
<td>CC2</td>
<td>Company Disciplinary Procedures</td>
<td>Theoretical/Practical</td>
<td>Company specified</td>
</tr>
</tbody>
</table>

The Flowchart and Activity Chart for the module on Customer Care is shown in Figure 72 and 73 respectively.
CUSTOMER CARE

Define customers and identify needs
- External and Internal customers
- Market research
- Needs analysis
- Basic needs
- Benchmarking

Set system and processes in place to meet and exceed customer needs
- Customer service considerations
- Processes to handle complaints
- Customer integration
- Selling pyramid
- Partnerships with customers

Feedback mechanism to check results
- Evaluation of customer satisfaction
- Guarantees
- Failure analysis
- Cost of errors
- Awareness of business cycle

Focus on customer
- Process management
- Problem identification
- Problem elimination

Cost benefits
- Survey results
- Profits and losses

Figure 72: Customer Care Flowchart
CUSTOMER CARE

Define customers and identify customer needs

- Identify customer of an internal and external nature
- Do a customer needs analysis
- Satisfy the basic customer needs
- Benchmark customer service of own organisation

Recall, understand and identify customer care principles and processes

- Customer care systems design
- Complaints handling system design and implementation
- Integrating groups of customers into product service needs
- Identify and explain the selling pyramid
- Establish processes to create company/customer partnerships

Identify and understand what customer care feedback systems are

- Use and value of customers satisfaction reports
- Use and value of guarantees
- Calculation of costs of errors
- The changing customer needs as the business cycle changes

* ACTIVITY

Figure 73: Customer Care Activity Chart
6.5.3.5 INFORMATION SYSTEMS

The information systems units of competence of running effective meetings designed to solve problems and make decisions, using diagnostic methods to solve problems and make decisions in the workplace and know and understand basic business information systems (see 3.3.4, Figure 30b) are being catered for within the Printing, Newspaper and Packaging Industries through a variety of vocational education and training courses. The course content for these units of competence have already been developed (see 6.5.2.1 and 6.5.3.3) in this study through the proposed modules of learning for the master craftsman programme in the following manner:

- The unit of competence of running effective meetings designed to solve problems and make decisions is covered in the course content for Team Development Competencies (see 6.5.3.3, Figures 70 and 71).

- The unit of competence of using diagnostic methods to solve problems and make decisions in the workplace is covered in the course content for Module 3 of Quality Assurance Competencies which deals with scientific problem solving (see 6.5.2.1, Figures 56 and 57).

- The unit of competence of knowing and understanding basic business information systems is covered in the course content for Productivity Improvement (see 6.5.2.3, Figures 62 and 63), Costing and Estimating (see 6.5.2.4, Figures 64 and 65), Production Control (see 6.5.3.2, Figures 68 and 69) and to a lesser extent in Change Management (see 6.5.3.1, Figures 66 and 67).

6.5.3.6 RECRUITMENT AND SELECTION

The units of competence for the master craftsman of being able to identify and define future personnel requirements (see 3.3.4, Figure 30b) has been addressed in this study in various proposed modules for the master craftsman curriculum. In Module 1 for the Technical Training Competencies for the master craftsman the course content includes a detailed section on identifying future personnel requirements via labour turnover calculations, analysis of company needs, job analysis, job descriptions and man specifications (see 6.5.2.2).

The unit of competence of being able to conduct a structured interview effectively and efficiently for the master craftsman according to the survey of courses (Appendix 6) revealed that a number of courses are in use within the Printing, Newspaper and Packaging Industries. The majority of the courses have a duration between 8 and 24 hours and are presented as seminars or workshops. The non-technical liaison committee compared and evaluated the course content against the units of competence and determined which course
content was applicable. The agreed on course outline would cover the following:

- The definition of an interview

- Types of interviews and their uses

- The value of the interview as a key selection device

- Sources of errors in interviews

- Basic interviewing skills

- Structured interviews

- The Interviews Report Form

- Interviewer accuracy and reliability

- Interviewing as information processing

The module for being able to conduct a structured interview would have a duration of 16 hours of face to face lecturer and learner interaction and would be titled Interviewing Techniques with a module code IT. The course would be theoretical in nature. The Interviewing Techniques module Flowchart and Activity Chart are shown in Figures 74 and 75 respectively.
INTERVIEWING TECHNIQUES

Recruitment and selection of personnel

- Definition of an interview
- Types of interviews
- Value of the interview
- Sources of error in interviewing
- Basic interview processes

The structured interview

- The nature of a structured interview
- The content of a structured interview
- The interview report
- Accuracy and reliability of interviews
- Information process of an interview

Understand the used and value of the interview

Understand and apply a structured interview

Figure 74: Interviewing Techniques Flowchart
Understand that recruitment and selection is a process.

Recall various selection value of the instruments, interview as a tool for recruitment and selection.

Understand what an tool for interview is recruitment and selection.

Understand and recall the selection steps in the interviewing process.

- Job information
- Main specification
- Planning the interview
- Giving information
- Personal impact
- Respond to applicant
- Information processing

Understand the sources of error in interviewing.

- Overemphasis on negative interview stereotypes
- Differential cues by visual cues
- Similarity to interview techniques
- Contrast effects

Recall the principles and processes used in structured interviews.

- Draw up a typical structured interview form
- Prepare the design and understanding uses of the interview report
- Conduct a structured interview

Understand the structured interview form principles and processes and be able to conduct a structured interview.

Understand the value of the interview as a tool for recruitment and selection.

Recall the principles and processes and be able to conduct a structured interview.

Understand the structured interview form principles and processes and be able to conduct a structured interview.

Conduct a structured interview.

Figure 75: Interviewing Techniques Activity Chart
The skills and competency profile for the master craftsman that was established through a competency profiling technique (see 3.3.4) represented the starting point of the curriculum development process. A mere listing of the competencies, units of competence, the skills and underpinning knowledge that support the units is insufficient. Using the taxonomy of competencies, skills, knowledge and attributes (see 4.3) to refine the craft technical, other technical and non-technical competencies has resulted in a comprehensive detailed framework which includes all the competencies, skills and underpinning knowledge requirements for the master craftsman. Applying the refined competency framework as a benchmark and a point of reference for evaluating existing course material for the craft related technical requirements showed the suitability of the existing course material used in artisan vocational education and training in the industries (see 6.5.1). Applying the refined competency framework as a point of reference for the other technical (see 6.5.2) and non-technical (see 6.5.3) requirements of the master craftsman curriculum suitable course content could be sourced and developed accordingly.

Refining the competencies to include the core and fundamental skills and knowledge is also insufficient because the refinement does not indicate how the competencies were learned and mastered nor what course content was used for learning. The search procedure of the Twente Model for curriculum development (see 2.5, Figure 9) proved to be cost effective and pragmatic. The inventories of existing course material that were obtained through the search procedure involved industry and literature surveys. The evaluation of the existing course material by comparing the suitability of the material against the refined competencies of the master craftsman enabled the curriculum development process to proceed by establishing suitable course content. How this course content is to be structured and organised will be dealt with in Chapter 7.

6.6 SYNTHEISIS

The situation analysis sub-system of the curriculum in the curriculum development process involved examining the initial situation of the learner as part of the analysis process. This analysis of the initial situation of the potential learner target group for the master craftsman curriculum revealed the following:

- The training systems and qualifications certification practices from which the potential learner target group would emerge indicated that the range and scope of the competencies, skills and experience were too wide and disjointed. This breath of range mitigated against establishing a minimum entrant criteria for the potential learner target group for the master craftsman curriculum. However, using recognition of prior learning standardised challenge tests as a learner entrant criteria, a workable and acceptable solution for establishing learner readiness to undertake the master craftsman curriculum has been achieved (see 6.2.4).
• The potential learner target group are adults and the assumptions about adult learners indicate that sound andragogic principles need to permeate the curriculum development process and the subsystems of the curriculum (see 6.3.3).

• The potential learner target group would receive their vocational education and training in an industrial setting within the companies and organisations in the Printing, Newspaper and Packaging Industries. The outcome of the master craftsman curriculum are applied competencies and can only occur in the world of work. Performance in the world of work is dependent on the organisational climate that exists in companies and organisations. Likewise the transfer of learning into applied competencies would depend on a favourable organisational climate. Applying a performance pyramid in relation to the curriculum viewed from a systems perspective and linking the performance pyramid to such issues as the articulation of the aims and objectives of the master craftsman curriculum, course content, evaluation and certification practices will ensure that the master craftsman curriculum meets the needs of the Printing, Newspaper and Packaging Industries (see 1.2.4.2 and 6.3.3).

The aims and objectives of the master craftsman curriculum were articulated to address the specific need of the Printing, Newspaper and Packaging Industries, the potential learner target group and the national needs of the emerging National Qualification Framework model (see 6.4). The process of evaluating existing curricula against the needs of the master craftsman curriculum using the identified competencies, their underpinning skills and knowledge as well as the necessary critical cross field and fundamental skills and underpinning knowledge is only a part of selecting and organising learning content (see 6.5).

The factors leading to this study and the complexities of the problem (see 1.2 and 1.4) indicated that curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries would be a top-down approach. Articulating the competencies of the master craftsman (see 3.3.4) and expanding these competencies to included the critical cross field and fundamental skills and knowledge (see 4.4) enabled the curriculum development process to proceed. The articulation of the competencies also satisfied the need to establish what the master craftsman job, functions and tasks were.

Positioning the master craftsman curriculum under the guise of vocational education and training and viewing the curriculum from a systems perspective has proven to be informative and valuable. Suitable vocational education and training models exist and were easily adapted for the needs of this study (see 2.5). Viewing the curriculum from a systems perspective has shown to be of value in the curriculum development process.
The sub-systems of the situation analysis, aims and objectives and selection and organisation of learning content have illustrated that these crucial components of the curriculum cannot be addressed in isolation and need to consider the impact they have on the other sub-systems of the curriculum.

The aims of this study for articulating the competencies of the master craftsman and developing a process for the articulation of the master craftsman qualification onto the National Qualification Framework (see 5.4.2) have been achieved. The evaluation and selection of learning content has only addressed part of the curriculum sub-system of content selection and organisation. The course content needs to be organised and this process will be discussed in Chapter 7.
CHAPTER 7: DEVELOPMENT OF AN OUTCOMES-BASED CURRICULUM FOR THE MASTER CRAFTSMAN IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES – PART 2

7.1 INTRODUCTION

Using the refined competencies as a framework and benchmark to source and evaluate the suitability of existing course content and develop additional content as needed, is only part of the selection and organisation of learning content component of the curriculum. The organisation of learning content into programmes of learning will involve establishing what the course design requirements are for the following:

- The Competency Based Modular Training system (CBMT) used in the Printing, Newspaper and Packaging Industries (see 1.2.7).
- The outcomes-based requirements of the emerging National Qualification Framework (NQF) (see 1.2.4.1).
- The unique andragogic didactic needs of the potential learner target group.

Once these requirements are established the identified learning content can be developed into a detailed Master Craftsman Programme. How this Master Craftsman Programme is to be delivered as a vocational education and training intervention will entail establishing what the requirements are for delivery and develop suitable education and training methods and strategies. Coupled to this aspect the entire evaluation component of the master craftsman curriculum would need to be developed.

7.2 COURSE DESIGN REQUIREMENTS

Evaluating the suitability of existing curricula for the master craftsman curriculum against the criteria of the identified units of competence, their underpinning skills and knowledge as well as the necessary critical cross field and fundamental skills and appropriate underpinning knowledge, is only part of selecting and organising learning content. Supplementing the existing curricula with additional course content through literature research only adds volume to the content but does not give it structure and texture.

The preferred vocational education and training system of the Printing, Newspaper and Packaging Industries is competency based and modular. According to Thomas (1994:143-144) when the detail of course design for a competency based modular training system takes place during the pre-interactive phase it is necessary to
have appropriate course content which has structure and is didactically sound. The courses of learning should ideally have a visual representation in the form of a course map which identifies modules and the hierarchical sequencing of modules for learning and teaching. Each course map would need to be supported with brief module identification, the module description, objective and the criteria for the stated objective. Thomas (1994: 147) also concludes that the criteria for the objectives of a module or element of a module should be so articulated that they lend themselves for developing an evaluation instrument as well as an evaluation system. Notwithstanding the preferred vocational education and training system of the Printing, Newspaper and Packaging Industries curriculum development for the master craftsman would not only need to be competency based and modular but should also be didactically sound meeting the needs of the adult learner and satisfy the outcomes-based approach advocated by the emerging National Qualification Framework model.

The selection and organisation of learning content in curriculum development implies not only content selection but also course design activities. Instructional design is distinct from course design yet it does offer some valuable insights for course design. Gagne, Briggs & Wager (1992: 4-5) believe the following assumptions should be adopted when designing instruction:

- Instructional design must be aimed at aiding the learning of the individual.
- Instructional design has phases that are both immediate and long-term. The immediate phase is what the teacher does in preparing a lesson a few hours prior to instruction. The long range phase is more complex and more related to set of lessons organised into sets of topics for a course or course sequence.
- Systematically designed instruction can have a great effect on human development.
- Instructional design should be conducted by means of a systems approach.
- Designed instruction must be based on knowledge of how human beings learn.

7.2.1 COMPETENCY BASED VOCATIONAL EDUCATION AND TRAINING COURSE DESIGN REQUIREMENTS

As has been stated the preferred vocational education and training system of the Printing, Newspaper and Packaging Industries is competency based and modular. The Employment Commission of Queensland (1981: 17) describes competency based vocational education and training as:
A way of approaching vocational training that places primary emphasis on what a person can do as a result of training (the outcome), and as such represents a shift away from an emphasis on the process involved in training (the inputs). It is concerned with training to industry standards rather than an individuals' achievement relative to others in a group.

Blank (1982:4) states that what is learned, how and when it is learned and the standards to which it is learned are characteristic of a competency based training programme. According to Blank (1982:26) twelve specific tasks need to be accomplished when developing a competency based programme. The twelve tasks are:

1. Identify and describe the specific job or occupation.
2. Identify what the entry criteria for the learner target group should be so as to be able to undertake the learning content of the course.
3. Identify the job tasks.
4. Conduct a detailed job analysis.
5. Determine the outcome objectives for the proposed course.
6. Identify the logical sequence of learning content and learning tasks as well as the terminal performance objectives.
7. Develop the outcome performance tests so as to have an evaluation instrument which will indicate whether learning objectives have been met.
8. Develop the tests of a practical and written nature as required.
9. Develop draft learning guides.
10. Pilot test programmes or courses and review and revise if necessary.
11. Develop a system to manage the learning.
12. Implement and evaluate the competency based training programme.

Blank's approach to competency based training is a task competence approach. The White Paper on Education and Training (Department of Education, 1995) tends to view competence as an outcome being dependent on skills and attitudes including personal competence. This implies not only a task competence approach but also a personal competence approach where behaviours are also evidence of competence. For a competency based approach to be used for designing course structure for the master craftsman it will be necessary to incorporate both the task competence and personal competence approaches. These two approaches have different emphasis and can be summed up as follows:
7.2.2 MODULAR COURSE DESIGN REQUIREMENTS

The learner target group for the master craftsman being adults and employed in an industry that has diverse sub-sectors and niche markets often means that the learner cannot necessarily be released or undertake a continuous one-off vocational education and training programme. Moreover, because of shift work and the individual learners unique personal circumstances and experience any envisaged master craftsman vocational education and training programme must be so structured that the learner can elect specific modules of learning that are necessary to meet the requirements for the programme and the resultant qualification.

Russell (1974:3-6) believes that modular instruction offers individualisation, flexibility, freedom, active participation and if correctly applied can enhance the teachers role and the student or learner interaction. The general characteristics of modular instruction according to Russell (1974:13-30) are that any given module or instruction should feature some if not all of the following:

- Be self-contained instructional packages that deal with a single concept or subject matter unit.
- Facilitate for individual differences where the rate of learning can be adjusted to suit an individual’s needs.
- The statement of objectives for a module should be articulated in such a manner that it gives direction and focus for both the teacher and the learner.
- Utilisation of a variety of media including direct human interaction.
- Active participation by the learner.
- Immediate reinforcement of responses.
- A mastery evaluation strategy.
- Correct logical association, structure and sequencing of knowledge is necessary in the construction of a module.
Fraser, Loubser & Van Rooy (1993:129-130) reiterate that the aim of teaching or instruction is the realisation of given aims and objectives. This can be facilitated through the use of appropriate subject content. Thus even for a single module the following criteria should be used when selecting learning content: applicability, validity and significance, learnability, a durable life span, viability, a balance between depth and superficiality, a relationship between the actual learning content and other sub-disciplines of reality, a relationship between facts and principal ideas and have intrinsic interest.

The actual ordering or arrangement of subject content is an important didactic principle. Fraser et al (1993:133) support Glaser’s three principles for sequencing subject matter namely: regularity of structure, readiness of the learner to cope with the subject content and skills, and similarity and dissimilarity of stimuli. Fraser et al (1993:134-138) discuss a variety of methods for ordering learning content and for the purposes of this study linear ordering and ordering according to objectives would seem to be the best fit for the master craftsman curriculum.

Linear ordering has the characteristic of learning tasks following a series of consecutive activities. The completion of one activity usually leads to the beginning of the next activity. Mastery learning as in competency based vocational education and training systems is by its nature linear. Fraser et al (1993) further state that ordering of learning content according to objectives is not strictly a true ordering principle. However, it does serve a useful purpose especially the point of having objectives in hierarchical order. This offers the learner the opportunity to master learning content by firstly becoming acquainted with primary concepts and facts and only after mastery of these primary concepts and facts can the information then be used by the learner for application, analysis and synthesis.

Clark (1994:22-46) advocates a content-performance matrix which is useful to select information methods and design courses. The content-performance matrix is a classification tool that contains five kinds of content and two levels of performance. In most learning situations a learner could be exposed to new facts, concepts, processes, procedures and principles.

- Facts are defined as unique specific one-of-a-kind information each one is either unique or like every other one. Facts can be concrete or abstract and can be remembered and recalled but have no application.
• Concepts are defined as a group of objects, symbols, ideas which are designated by a single word, share a common feature and vary or have irrelevant features. Concepts can be concrete or abstract. The application or use level for concepts is whether the learner can classify the concept. Concepts have to be recalled and recognised.

• Procedures are defined as a series of steps to be followed by a learner to accomplish a task or make a decision. The learning outcome of a procedure is action or a decision. The application or use level for procedures is for the learner to do the procedure. Procedures have to be recalled and recognised.

• Processes are defined as a flow of events that describe how something works. The content of processes is related to things mechanical, scientific or of business. The application or use level for processes is solving problems by applying processes. Processes need to be recalled and recognised.

• Principles are defined as a series of guidelines that help a learner to complete a task that require judgement. Principles need to be recalled and recognised.

The principle of teaching facts and concepts first also applies to the content-performance matrix and offers a useful approach for ordering learning content.

7.2.3 THE ANDRAGOGIC DIDACTIC COURSE DESIGN REQUIREMENT

The master craftsman curriculum is aimed at a learner target group who are adults and it is appropriate to incorporate the assumptions about adults as learners when considering the adult in the learning situation (see 6.3.3). Coupled to these assumptions about the adult learner, it is necessary to consider which of the didactic principles are appropriate for the purpose.

Duminy & Söhne (1994:17-49) list a series of general didactic principles ranging from the principle of totality, individualisation, motivation, perception to the principle of experience, mastering, discovery and self-activity. Fraser, Loubser & Van Rooy (1993:59-87) refer to the range of didactic principles put forward by various writers and expand on the principles of motivation, individualisation, perception, active participation, totality and globalisation, scientism, control, planning and socialisation.

For the adult learner the more important didactic principles that need to be considered when designing a course of study are motivation, individualisation, perception, active participation, totality and globalisation, control, planning and socialisation.
The didactic principle of motivation has congruence with the assumptions that adults have a need to know when they should learn something and that adults become ready to learn when they perceive a tangible benefit from their learning efforts. Coupled to this is the assumption that adults have a greater volume and different quality of experience and in many instances would have their own timetable for achieving their learning goals. These factors imply that for the master craftsman curriculum the actual prospectus for the Master Craftsman Programme (MCP) although stating the broad aims and objectives of the programme and a general outline of the modules of learning both practical and theoretical is not enough. A more detailed description of the actual module content in the form of elements of learning, their aims, objectives and their criteria would be necessary. This would not only answer why they should learn but what is to be learned and to what level of proficiency it will be learned.

The needs of the adult for involvement and active participation in the learning situation also needs to be taken into consideration when designing courses for adults. Adult learners pursue learning with a need to apply what they have learned as soon as possible after learning. They have a problem-centred orientation to learning. Course content and design should, therefore, also take a problem-centred approach around which the theory principles and practice are sequenced.

7.2.4 COURSE DESIGN REQUIREMENTS ACCORDING TO THE OUTCOMES-BASED APPROACH OF THE EMERGING NATIONAL QUALIFICATION FRAMEWORK MODEL

Olivier (1997:15) states that outcome-based learning programmes differ from content based programmes by focusing on the achievement of outcomes and not on the interactive teaching and learning process. Outcomes-based learning programmes are aimed at developing critical thinking and reasoning, are learner centred and capable of dynamic change. Outcome-based learning according to Olivier (1997:46-49) draws on all five categories of tuition approaches ranging from trainer centred to learner centred, sitting by Nellie, criterion reference instruction and competency based training. Outcomes-based learning goes beyond learners merely mastering skills and knowledge since in outcomes-based learning the contents and processes for learning, actual performance during learning, completion and the assessment of learning become part of the actual learning process and thus consequently part of what will be assessed. Olivier (1997:20) states that an outcome always results in a product, service or decision. The achievement of an outcome is the result of a process, actual performance supported by underpinning knowledge and competencies and processes, a clearly defined product, service or decision which is achieved and terminal objective.
Olivier (1997:41-45) over simplifies his discussion on competency based training where he states that the competency based approach although close to outcomes-based, is still flawed because it uses tuition as well as learning processes to describe outcomes. Competency based approaches when confined to a narrow definition of competence tend to concentrate on processes rather than outcomes. However, if the definition of competence is seen in its widest sense then the result of a competency based approach becomes more like the outcomes approach.

The Printing, Newspaper and Packaging Industries in South Africa ascribe to a wider view and definition of competence and it is well to reiterate Thomas' (1994:101) view of competence developed for the industry which states:

1. Competence when applied to a person performing a job of work in an organisation can imply that that person exhibits the following:

   1. Being in a state of adaptive fitness and ready to respond to the demands placed on them by their environment.
   2. Having core skills which enhance the transfer of competence between different contexts and occupations.
   3. Have the necessary task skills demanded by the job.
   4. Have the skills to identify and deal with changes and irregularities in the working situation.
   5. Have the skills and ability to manage a group of tasks, to organise them and prioritise them effectively.
   6. Have the interpersonal skills necessary to work with other people and cope with the world of work and the wider expectations in this world of work.

This broad definition of competence is not solely confined to job and task skills but encompasses behavioural outcomes as well as learning outcomes, which are tangible and relevant and includes critical cross field skills and knowledge outcomes.

Breir (1997:74) pointedly believes that with the emerging National Qualification Framework a number of ironic semantic twists have emerged. Competence has been transmuted to outcomes so as to avoid connotations of behaviourism. Essential competencies have also been transmuted to critical cross field outcomes to avoid being associated with the very characteristics that the advocates of competence were keen to attach to essential competencies. Breir furthermore hesitates to suggest that the South African Qualifications Authority (SAQA) call in professional editors or embark on a plain English campaign.
The semantic confusion with regards competence and outcomes is clouding the issue. It is contended that irrespective of the line one adopts in the debate, the focus on the learner as the target for the master craftsman curriculum must be about the way in which that learner learns, remembers and reacts in the world of work. Learning content and the entire andragogic didactic situation should be aimed at enhancing the learning process so as to enable the required learning or competence outcome to occur.

A theoretical construct is necessary for the ordering of learning content and the evaluation of that learning content so that the terminology and language used to express objectives and criteria for competencies or learning outcomes are consistent and will enable an effective and efficient evaluation system to emerge which will satisfy the outcomes-based approach of the emerging National Qualification Framework.

7.2.5 A THEORETICAL CONSTRUCT FOR COURSE DESIGN REQUIREMENTS

In order for the courses of study for the master craftsman to be well-structured and ordered so as to produce the learning outcomes needed by the Printing, Newspaper and Packaging Industries a common thread is needed which will sew the patchwork requirements of sound didactic principles, the needs of the adult learner, the competency based modular requirements and the outcomes-based approach advocated by the emerging National Qualification Framework model.

The current debate and semantic morass with regards competencies, learning outcomes, critical cross field outcomes and the like should not distract from the important issue of creating a curriculum for the master craftsman that is workable and meets the needs of the industries. The target group for the master craftsman is an adult who once engaged in the learning process for the Master Craftsman Programme (MCP) becomes a learner.

Gagne et al (1992:5) believe that when designing instruction cognisance must be taken of how human beings learn. How human beings learn is the magic thread that will create well-structured courses of learning capable of satisfying the diverse needs and conflicting debates in which the master craftsman curriculum is to be developed.

Because the potential learner target group for the Master Craftsman Programme are adults there is a need to consider the andragogic didactic principles in the design of the curriculum. These principles should permeate the entire curriculum and be the theoretical construct on which the process is built including the interactive
teaching-learning situation. By applying these principles when analysing the initial situation of the potential learning target group it was apparent that the minimum entrance criteria for a learner to undertake modules or courses of the Master Craftsman Programme (MCP) had to recognise the prior experience and learning achievements of the learner (see 6.2.4). The articulation of the aims and objectives for the master craftsman likewise had to address the specific needs of the adult potential learner group. (see 6.3.3). Interwoven in this theoretical construct is that learning should also be linked to proven learning taxonomies and have utility value in devising suitable performance criteria, evaluation instruments, evaluation systems and for the writing of unit standards for integration into the National Qualification Framework.

Sourcing and selecting suitable course content for the master craftsman curriculum is only part of the selection and organisation of learning content component of the curriculum. How this learning content is to be organised into well-structured courses of instruction has to be established. This process involved establishing the course design requirements of the Printing, Newspaper and Packaging Industries preferred Competency Based Modular Training system (CBMT) (see 1.2.7), the outcomes-based education and training requirements of the National Qualification Framework (NQF) (see 1.2.4) and the andragogic didactic education and training requirements for the learner target group (see 6.2). These requirements are to be incorporated in the competency based modular format of the Master Craftsman Programme (MCP).

7.3 COURSE MAPS FOR THE MASTER CRAFTSMAN CURRICULUM

The development of the master craftsman curriculum, especially the selection and organisation of learning content into the preferred competency based modular vocational education and training system for the Printing, Newspaper and Packaging Industries, is a necessary process. The learner target group being adults who would operate in the andragogic didactic mode need to know what they are to learn and importantly when and how they will progress in the learning encounter. Some form of documentation is necessary so as visualise and articulate what the courses of study for the Master Craftsman Programme (MCP) are.

7.3.1 COURSE MAP DESIGN FOR DEVELOPING SKILLS AND COMPETENCIES IN THE CRAFT TECHNICAL FIELDS

The competencies for the master craftsman in the craft technical fields are origination, transfer media, methods of printing, finishing including the mechanical maintenance and electrical competencies. The learner target group for the master craftsman being qualified artisans or craftsman will have the necessary production process stages in the Printing, Newspaper and Packaging Industries is origination, printing and
conversion, and finishing. These stages would be logical to follow in developing the course map for the craft technical fields as well as in the fields for other technical and non-technical competencies. The course map would need to encompass a structure which will encourage learning by being flexible and accommodate for job performance where knowledge and skills, the desire to perform, expectations and feedback, tools and environment, physical and mental capacity and rewards and incentives are addressed.

The problem of integrating theory and practice can be addressed through the mechanism of theoretical modules being clustered together and sequenced with the practical courses in the overall course map for the Master Craftsman Programme (MCP). The present practice within the competency based modular vocational education and training system for artisan and craftsman in the Printing, Newspaper and Packaging Industries clusters the theoretical courses into three broad based modules of learning titled Technical Theoretical Modules (TT's) at a TT1, TT2 and TT3 level equivalent to the National Technical Certificate at the NTC1, NTC2 and NTC3 levels. These Technical Theoretical Modules are sequenced so as to underpin the practical skills and competencies that are acquired during the interactive learning situation of the vocational education and training intervention. Building on this practice theoretical modules for the master craftsman curriculum will also contain underpinning knowledge deemed essential for the identified skills and competencies for the master craftsman (see 6.5.1).

The learner target group for the master craftsman curriculum will have an entry criteria which specifies that the prospective learner will be a qualified artisan or craftsman, for example, a qualified sheet fed lithographer or a craft bookbinder. The entry qualification will indicate a specific trade or craft in a specialised division of either origination, printing and conversion and finishing including the maintenance trades. In order to sequence the practical course of study logically and in line with the stages in the production processes in the Printing, Newspaper and Packaging Industries irrespective of the trade or craft qualification the prospective learner may have, the first series of courses will be either the competencies in the origination or the method of printing field (see 3.3.4, Figure 28a and 28b). Part one or the first phase of the course map would consist of the practical modules sequenced in relation to progressive skills and competencies and supported by underpinning theoretical knowledge offered in a broad based 'technical theoretical module' at a TT4 level. In order to maintain consistency with the stages in the production processes the theoretical knowledge requirements for the unit of competency for the transfer media field will also be included at the TT4 level (see 3.3.4, Figure 28b).
Included in phase one of the course map for the Master Craftsman Programme (MCP) will be the appropriate practical and theoretical modules from the other technical fields and non-technical fields. The second phase of the course map for the MCP will consist of the practical craft technical courses for either method of printing or finishing and again supported by the underpinning technical knowledge offered in the form of a broad based Technical Theoretical Module at a TT5 level. The courses for the development of the skills and competencies for the maintenance mechanician and electrician being of a theoretical knowledge nature would be included at the TT5 level. A schematic of the course map outline for the craft technical courses is shown in Figure 76. Naturally the appropriate other technical and non-technical courses designed to develop the required competencies will be sequenced logically in line with the appropriate stages in the production processes in the Printing, Newspaper and Packaging Industries.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Practical Vocational Education and Training Modules</th>
<th>Technical Theoretical Vocational Education and Training Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHASE TWO</td>
<td>• Finishing Practical Modules</td>
<td>• Finishing Theory or Method of Printing Theory Modules (underpinning knowledge)</td>
</tr>
<tr>
<td></td>
<td>Or</td>
<td>• Mechanician and Electrician modules (underpinning knowledge)</td>
</tr>
<tr>
<td></td>
<td>• Method of Printing Practical Modules</td>
<td>• Appropriate modules for other technical and non-technical fields (TT5 LEVEL)</td>
</tr>
<tr>
<td>PHASE ONE</td>
<td>• Method of Printing Practical Modules</td>
<td>• Origination Theory or Method of Printing Theory Modules (underpinning knowledge)</td>
</tr>
<tr>
<td></td>
<td>Or</td>
<td>• Transfer Media Module</td>
</tr>
<tr>
<td></td>
<td>• Origination Practical Modules</td>
<td>• Appropriate modules for other Technical and Non-Technical fields (TT4 LEVEL)</td>
</tr>
</tbody>
</table>

MASTER CRAFTSMAN PROGRAMME (MCP) COURSE MAP OUTLINE

LEARNER TARGET GROUP

Entrance Criteria: Qualified Artisan or Craftsman in a designated trade or craft of the Printing, Newspaper and Packaging Industries

Figure 76: Course Map Outline for the Craft Technical Courses
7.3.2 COURSE MAP DESIGN FOR DEVELOPING SKILLS AND COMPETENCIES IN OTHER TECHNICAL FIELDS

Following the stages of the production processes within the Printing, Newspaper and Packaging Industries it is necessary to view not only the stages of origination, method of printing and converting and finishing but what proceeds the origination process and what occurs after the product or service has been completed.

Prior to processes commencing within a printing company are the functions to do with sales and marketing. The estimate for a potential order in essence forms the starting point for the entire production process (see 6.5.2.4). This indicates that the modules for estimating should be included in phase one of the course map for the Master Craftsman Programme (MCP).

Once the production process commences a crucial element is the quality assurance aspects, which occurs from proofing to end product or service. This factor indicates that the modules of quality as an organizational strategy, internal and external quality standards and scientific problem solving should be included in phase two of the course map for the Master Craftsman Programme (MCP) (see 6.5.2.1). Phase three of the course map for the master craftsman would ideally centre about change in products, production process, production procedures and productivity improvement. The modules, which cover statistical methods (see 6.5.2.1), productivity improvement (see 6.5.2.3) and technical training (see 6.5.2.2), would be appropriate in phase three together with their concomitant practical components in the form of on-the-job projects. The course map outline for both craft technical and other technical, practical and theoretical modules, are shown in Figure 77.
<table>
<thead>
<tr>
<th>Phase</th>
<th>Practical Vocational Education and Training Modules and On-the-job Projects</th>
<th>Technical Theoretical Vocational Education and Training Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHASE THREE</td>
<td>• Implementing Quality Assurance Systems (Project)</td>
<td>• Statistical Methods Module</td>
</tr>
<tr>
<td></td>
<td>• Method Improvement and Time Standard (Project)</td>
<td>• Technical Training Modules</td>
</tr>
<tr>
<td></td>
<td>• Training Needs Analysis (Project)</td>
<td>• Productivity Improvement Modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(TT6 LEVEL)</td>
</tr>
<tr>
<td>PHASE TWO</td>
<td>• Finishing Practical Modules Or</td>
<td>• Finishing Theory or Printing Methods Theory Modules</td>
</tr>
<tr>
<td></td>
<td>• Methods of Printing Practical Modules</td>
<td>• Mechanical and Electrician Modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Quality as an Organizational Strategy Module</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Internal and External Quality Standards Module</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Scientific Problem Solving Module</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(TT5 LEVEL)</td>
</tr>
<tr>
<td>PHASE ONE</td>
<td>• Method of Printing Practical Modules Or</td>
<td>• Origination Theory or Method of Printing Theory Modules</td>
</tr>
<tr>
<td></td>
<td>• Origination Practical Modules</td>
<td>• Transfer Theory Modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Costing and Estimating Modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(TT4 LEVEL)</td>
</tr>
</tbody>
</table>

MASTER CRAFTSMAN PROGRAMME (MCP) COURSE MAP OUTLINE

LEARNER TARGET GROUP

Entrance Criteria: Qualified Artisan or Craftsman in a designated trade or craft of the Printing, Newspaper and Packaging Industries

Figure 77: Course Map Outline for the Craft and Other Technical Courses and on-the-job Projects
7.3.3 COURSE MAP DESIGN FOR DEVELOPING SKILLS AND COMPETENCIES IN THE NON-TECHNICAL FIELDS

Certain of the modules for developing the skills and competencies in the non-technical fields for the master craftsman are easy to align with the process stages in the Printing, Newspaper and Packaging Industries. Production planning and control is easily aligned with pre production and production activities and therefore should fall into phase one of the course map for the master craftsman.

Productivity improvement (see 6.5.2.3) and change management modules (see 6.5.3.1) one can identify as improving or changing the present production processes and or product mix and as such would emphasise that the learner would have the necessary skills and competencies in the craft and other technical fields in the Printing, Newspaper and Packaging Industries. This fact indicates that these complimentary modules should form part of the third phase of the course map. Coupled to productivity improvement or new processes or new products that are introduced there could well be increasing manpower needs or training of existing employees thus recruiting of new staff (see 6.5.3.6) and training (see 6.5.2.2) is important. It is logical to include the technical training modules and the complimentary interviewing technique module in phase three of the course map.

The customer care module by the very nature of its content indicates that customer care is an after sales activity therefore it should be included in phase three of the course map (see 6.5.3.4). The team development module is an anomaly in that one could argue that before meaningful work can commence a suitably trained and motivated workforce including work teams or groups need to be in place. In order to at least obtain a balance in terms of the contact hours for lecturer and learner interaction for the theoretical modules (TT's) the team development modules (see 6.5.3.3) are placed in phase one of the course map. Also included in phase one of the course map is the important module on company disciplinary procedures (see 6.5.3.4). This falls in line with present practices in the Printing, Newspaper and Packaging Industries where company disciplinary codes and procedures form part of an induction programme for new employees. Figure 78 depicts the course map outline for craft, other technical and non-technical courses of a practical and theoretical nature.
<table>
<thead>
<tr>
<th>Phase</th>
<th>Practical Vocational Education and Training Modules and On-the-job Projects</th>
<th>Technical Theoretical Vocational Education and Training Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase Three</td>
<td>• Implementing Quality Assurance Systems (Project)</td>
<td>• Statistical Methods Module</td>
</tr>
<tr>
<td></td>
<td>• Method Improvement and Time Standard (Project)</td>
<td>• Technical Training Modules</td>
</tr>
<tr>
<td></td>
<td>• Training Needs Analysis (Project)</td>
<td>• Customer Care Modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Productivity Improvement Modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Change Management Modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Interviewing Techniques Modules</td>
</tr>
<tr>
<td>Phase Two</td>
<td>• Finishing Practical Modules</td>
<td>• Finishing Theory or Printing Methods Theory Modules</td>
</tr>
<tr>
<td></td>
<td>• Methods of Printing Practical Modules</td>
<td>• Mechanical and Electrician Modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Quality as an Organizational Strategy Module</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Internal and External Quality Standards Module</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Scientific Problem Solving Module</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Budgeting Module</td>
</tr>
<tr>
<td>Phase One</td>
<td>• Method of Printing Practical Modules</td>
<td>• Origination Theory or Printing Methods Theory Modules</td>
</tr>
<tr>
<td></td>
<td>• Origination Practical Modules</td>
<td>• Transfer Theory Module</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Costing and Estimating Modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Production Planning and Control Modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Team Development Modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• In-house Disciplinary Procedure Module</td>
</tr>
</tbody>
</table>

**MASTER CRAFTSMAN PROGRAMME (MCP) COURSE MAP OUTLINE**

**LEARNER TARGET GROUP**

Entrance Criteria: Qualified Artisan or Craftsman in a designated trade or craft of the Printing, Newspaper and Packaging Industries

**Figure 78**: Course Map Outline for the Craft, Other Technical and Non-Technical Courses and On-the-Job Projects
Expanding on the structure of theoretical modules the envisaged broad based 'Technical Theoretical Modules' at the TT4, TT5 and TT6 level would include the specific modules and the duration of the modules in terms of face to face lecturer-learner interaction hours. The balance achieved in terms of total lecture hours is shown below.

<table>
<thead>
<tr>
<th>Course Duration in Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TT4</strong></td>
</tr>
<tr>
<td>1. Origination or Printing Methods Theory</td>
</tr>
<tr>
<td>2. Transfer Media Theory</td>
</tr>
<tr>
<td>3. Costing and Estimating Theory</td>
</tr>
<tr>
<td>4. Practical Estimating Module</td>
</tr>
<tr>
<td>5. Production Planning and Control Module</td>
</tr>
<tr>
<td>6. Team Development Module</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

| **TT5**                  |
| 1. Printing Methods Theory or Finishing Theory | 116 |
| 2. Mechanician and Electrician Theory | 16 |
| 3. Budgeting Module | 30 |
| 4. Quality as an Organizational Strategy Module | 54 |
| 5. Internal and External Quality Standards Module | 54 |
| 6. Scientific Problem Solving Module | 54 |
| **Total** | **324** |

| **TT6**                  |
| 1. Statistical Methods Module | 30 |
| 2. Customer Care Module | 54 |
| 3. Technical Training Module | 30 |
| 4. Productivity Improvement Module | 72 |
| 5. Change Management Module | 72 |
| 6. Interviewing Techniques Module | 16 |
| **Total** | **324** |
The course content and time duration for origination theory, method of printing theory and finishing theory are directly related to the current situation that exists for artisan and craft vocational education and training in the industries. Being competency based and modular the practical craft technical vocational education and training for the master craftsman can be directly related to the existing practical modules currently in use in the Printing, Newspaper and Packaging Industries for artisan and craftsman training. Since 1992 a large database has been established for determining the optimal time duration for this training. Being competency based and modular naturally implies that learners proceed at their own pace and only progress to the next module after mastery has been exhibited for the previous module. Extracting data based on 2 900 learners (PNPIETB AS400 database) the optimum time duration for achieving the craft technical competencies in origination, method of printing and finishing is approximately 476 hours for each of the three.

Thus the Master Craftsman Programme (MCP) would in essence be a programme that could have a duration in nominal hours of practical and theoretical lecturing and training consisting of the following for the first two phases:

Phase 1: 476 hours practical + 324 hours theory = 800 hours
Phase 2: 476 hours practical + 324 hours theory = 800 hours

Phase 3 of the programme consists of 324 hours theory and certain practical on-the-job projects. The projects are estimated as requiring ± 6 weeks for completion. A pilot study for implementing the Master Craftsman Programme (MCP) would be needed to verify the time requirements for the on-the-job programme. In summary the Master Craftsman Programme (MCP) would consist of 952 hours practical, 972 hours theory and three on-the-job projects.

The course map outline merely gives a broad overview of the structure of the Master Craftsman Programme (MCP) in terms of where the programme starts, what distinct phases it is divided into and what specific modules for skills building will take in each phase. The phase divisions are not arbitrary in nature but are designed so as to enable outcomes for specific craft technical and other technical competencies to be evaluated against industry standards especially for origination, method of printing, finishing, costing and estimating and production planning and control. As part of the evaluation system mechanisms for certification at each phase level should be catered for in order to facilitate lifelong learning and multi-exit points from the Master Craftsman Programme.
7.3.4 THE COURSE MAP FOR THE MASTER CRAFTSMAN PROGRAMME (MCP)

The detailed course map for the Master Craftsman Programme (MCP) would need to indicate the following:

- The starting point for the programme.
- The identification of modules by a coding system.
- The arrangement of modules in sequence as well as an indication of the optional routes that can be taken.
- The various exit points linked to the evaluation and certification system.
- The phases of the programme.
- The nature of module content in terms of being predominately of a practical or theoretical nature.
- The evaluation phases, testing and certification points as well as other evaluation data.

An example of the course map for the third phase of the Master Craftsman Programme (MCP) is depicted in Figure 79.

The course maps would have an addendum, which would identify the module by code, the module elements with objectives, criteria, outcomes and the evaluation strategy to be used as shown in Figure 80.
## THE MASTER CRAFTSMAN PROGRAMME (MCP) COURSE MAP

<table>
<thead>
<tr>
<th>Phase</th>
<th>Evaluation</th>
<th>Practical Modules/On-the-job Projects (O-J-P)</th>
<th>Theoretical Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PNPIETB (ETQA) controlled Final Phase Evaluation &amp; Certification</td>
<td>O-J-P PI4 TT6 LEVEL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• National Master Craftsman Diploma</td>
<td>O-J-P TEC4 PI3 PI2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Licentiate City &amp; Guilds of London Institute</td>
<td>PT1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Individual Module Evaluation against Criteria evaluates by an Internal Assessor and/or External Assessor and/or Project Assessment</td>
<td>CM3 CM2 CM1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- credits for unit standards on the NQF</td>
<td>TEC3</td>
<td>CD1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TEC2</td>
<td>CC1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TEC1</td>
<td>Q4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q5</td>
<td>O-J-P</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 79**: Course Map for the Third Phase of the Master Craftsman Programme (MCP)
<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Title</th>
<th>Module Element</th>
<th>Module Element</th>
<th>Module Element</th>
<th>Evaluation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP4</td>
<td>Plate Making</td>
<td>MP4a</td>
<td>Interpretation of Job Card requirements and prioritising jobs.</td>
<td>From the given job cards identify the priority listing for plates against latest production schedule.</td>
<td>Job cards presented in random order, observation of process of prioritising against latest production schedule.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MP4b</td>
<td>To punch a plate for registration which conforms to the machine specification on which the plate, is to be mounted.</td>
<td>Select the correct punching system, e.g. Protocol or Bucher systems or specialised machine specific system.</td>
<td>Select from a number of punching systems the correct one for the machine in question.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MP4c</td>
<td>To position the positive or negative onto the plate correctly with due regard for the facing being according to the correct emulsion surface side. (Emulsion to Emulsion).</td>
<td>Select the correct pin register system for positioning the positive or negative onto the plate.</td>
<td>The exposure frame should not be correctly cleaned and calibrated. Direct observation of learner correcting the above to within acceptable industry standards.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>From a variety of film punches the correct pin register system for the job specification is selected.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The step wedge should be positioned outside the working area. End product examination against industry standard.</td>
</tr>
</tbody>
</table>
7.4 THE INTERACTIVE TEACHING-LEARNING SITUATION FOR THE MASTER CRAFTSMAN PROGRAMME

7.4.1 INTRODUCTION

The interactive teaching-learning component of Thomas’ model (see 2.5, Figure 13) is where the didactic androgogic interaction takes place and involves methods, delivery modes, instructional strategies and techniques. For the teacher or instructor teaching as a practice or an art is meant to help people to learn. Learning can be facilitated in a variety of ways and effective and efficient teaching is enhanced if the teacher has an understanding of the learning process and has specific skills and abilities to deliver effective instruction in a variety of situations. For the master craftsman curriculum those persons who are to deliver instruction are dealing with adults who have their own special needs. There is a need for the teacher to know and understand the special circumstances of the adult as learner. The source of teaching principles are derived from the principles of learning and are dependent on the situation in which the instruction-learning encounter occurs. Teaching is enhanced by the methods employed and the instructional strategies used. The teacher as instructor involved in the delivery of teaching or instruction for the master craftsman would need to have specific skills and competencies.

How this interactive teaching-learning situation is to be developed and structured will involve the following:

- Identifying who the teacher or instructor would be and what qualifications and skills they would need to ensure that effective instruction can take place.

- What andragogic didactic principles and practices need to be considered and incorporated in the teaching-learning situation.

- Identify and establish the appropriate teaching-training methods, modes of delivery and instructional techniques for the effective provision of instruction to the learner.

- Identifying the requirements and develop an appropriate vocational education and training management system to control and monitor the interactive teaching-learning situation.
7.4.2 TEACHER AND INSTRUCTOR ACCREDITATION AND REGISTRATION

Notwithstanding the present accreditation and registration practices within the Printing, Newspaper and Packaging Industries where the teacher, trainer or instructor within the industries needs to have completed the 'Instructing the Modular Way' course and the 'Evaluation Practices for Assessors' course. The content and structures of these programmes are not of sufficient depth nor do they address the outcomes-based approach to education and training as advocated by the emerging National Qualification Framework model (see 6.5.2.2), they need to be further developed to be of value for teachers and instructors who are to provide modules of the Master Craftsman Programme (MCP).

The course of study for the teachers and instructors for the Master Craftsman Programme would need to develop the capacity of teachers and instructors to be able to teach and instruct and facilitate learning effectively within the unique situation in which the MCP occurs in the Printing, Newspaper and Packaging Industries. The course content would need to cover the following:

- Introduction and orientation to teaching and instruction within the Printing, Newspaper and Packaging Industries.
- Adult learners and their needs.
- The outcomes-based approach to education and training and the competency based modular system of the Printing, Newspaper and Packaging Industries.
- The Master Craftsman Programme, course maps and evaluation strategies.
- Evaluation and assessment requirements and practices.
- Lesson plan development including lesson guides.
- Instructional techniques and practices.
- The daily, weekly and phase instruction management system.
- On-the-job projects which would entail the development of a lesson plan, selection of appropriate instructional media, design of a lesson guide and assessment instrument such as a check list, standardised product example, knowledge and comprehension paper and pencil test and applicable portfolio evidence.
- The accreditation and quality assurance requirements for providers of vocational education and training in the Printing, Newspaper and Packaging Industries.
Drawing from the course content of the 'Instructing the Modular Way' course and the 'Training Officer Development Programme' that exist in the industry and the appropriate new material, the new course will be titled 'Outcomes-Based Train the Trainer', and will be the pre-requisite for instructor accreditation and registration.

The course will have a duration of 40 hours followed by an on-the-job project which has to be completed over a six-week period. To support the teacher and instructor who will provide modules of the Master Craftsman Programme the management system as well as the accreditation and quality assurance system for the industries is designed to provide the necessary checks and balances to ensure that the vocational education and training interventions are effectively and efficiently carried out.

Coupled to the 'Outcomes-Based Train the Trainer' course potential teachers, trainers and instructors, for courses in the Master Craftsman Programme will need to have completed the 'Evaluation Practices for Assessors' course. The course would have a duration of 32 hours as well as an on-the-job project. Fortunately the present course content in the existing 'Evaluation Practices for Assessors' course lend itself to further development and the new course content will cover the following:

- The role and functions of the assessor in the Printing, Newspaper and Packaging Industries.
- The levels of assessors in the Printing, Newspaper and Packaging Industries namely an internal assessor, internal verifier, external assessor and external verifier.
- Module testing procedures and check lists.
- Assessing work related performance in the work situation.
- Assessing via challenge tests.
- How to conduct challenge tests and ongoing mini tests.
- How to administrate challenge tests.
- How to design suitable tests for internal assessment.
• How to design suitable tests for external assessment.

An on-the-job project which has to be completed over a six-week period is included where suitable tests and assessment strategies have to be developed for specific modules of learning from the Master Craftsman Programme. This will be usually confined to the craft and other technical modules of the Master Craftsman Programme.

7.4.3 ANDRAGOGIC DIDACTIC PRINCIPLES UNDERLYING SOUND INSTRUCTIONAL METHODS FOR THE MASTER CRAFTSMAN PROGRAMME (MCP)

The opportunities for teaching and learning in the Printing, Newspaper and Packaging Industries are boundless when one considers the size of the industrial sector and its diverse nature, which is more heterogeneous than homogenous when sub-sectors and niche markets are considered. The very milieu which exists and in which teaching and learning may take place is dependent on the learner, the teacher or trainer and how the teaching-learning situation occurs in the sector.

Learning will depend upon the learner who brings to the learning situation his or her own physical, mental, emotional development and different experiences. Moreover, there are different kinds of learning at the cognitive, affective and psychomotor level and a variety of strategies to teach at these levels. What must be borne in mind when planning the teaching-learning interaction is that it is not always possible to tell immediately if teaching has been successful or if learning has taken place. In order to structure and facilitate for effective teaching-learning opportunities in the Printing, Newspaper and Packaging Industries cognisance must be taken of the andragogic didactic principles that feature in the interactive teaching-learning encounter especially for the master craftsman curriculum.

Fraser et al (1993:59-60) analysed various sources to show the number of different didactic principles that exist and discussed some of these didactic principles. The didactic principles that have application to the adult learner and which can be facilitated for in the master craftsman curriculum are the principles of perception, motivation, active participation, individualisation, the process of trial-and-error as a way of learning, problem solving as a way of learning, new learning based on previous knowledge and experience and planning and control. Naturally all the other principles are taken into consideration and are catered for in the overall design of the master craftsman curriculum.
7.4.4 THE TEACHING AND TRAINING METHODS FOR THE MASTER CRAFTSMAN PROGRAMME (MCP)

The competency based modular craftsman programme has been designed with each module having detailed objectives and criteria (see 7.3.4, Figure 80). The course design process of the master craftsman curriculum deliberately viewed the course structure as an important mechanism to synchronise what gets taught when and how and detailed course maps, module description and evaluation strategies integrate as far as possible theory and practice. Courses in the Master Craftsman Programme that are of a theoretical nature represent all of the underpinning knowledge for the practical training component and other components and were clustered into convenient 'Technical Theoretical Modules' at a TT4, TT5 and TT6 level (see 7.3.3).

The competency based modular method caters for a learner to progress at his or her own pace and is underpinned by the didactic principle of individualisation. Fraser et al (1993:65-66) states that the didactic principle of individualisation should at all times recognise the fact that individuals are different. These differences are due to three variables namely: the intellectual characteristics, personality traits and investigative skills. Notwithstanding these differences all learners should be afforded equal education and training opportunities. The application of the principle of individualisation to the adult learner in the master craftsman curriculum is facilitated by a number of initiatives such as the bulk of the vocational education and training of the Master Craftsman Programme occurs at the place of work of the learner. Moreover because of the content and nature of instruction for the practical competencies in the craft technical and other technical components and because of machinery and equipment constraints one-on-one instruction is the only means for effective teaching.

The competency based modular method is based on an important didactic principle that new learning must be based on previous knowledge and experience. Learning is an evolving process and the notion of lifelong learning and learning to learn are by their very nature process orientated. This evolving process of learning works on the premise that each step must be mastered before the next step can be learned. Learning based on previous knowledge and experience has special significance for the adult learner in the Master Craftsman Programme. By specifying detailed entrance criteria for the potential learner target group together with the mechanism of a challenge test to access and recognise prior learning the entry level knowledge and experience is established for the individual learner thus facilitating a multi-entrant point to the Master Craftsman Programme.
Once the learner enters the Master Craftsman Programme the principle of new learning based on previous knowledge and experience is facilitated by the programme being competency based and modular. The distinctive phase of the programme and the multi-entrant and exit options also enhance the principle of new learning based on previous knowledge and experience especially when a learner enters and exits the Master Craftsman Programme over an extended period of time which also facilitates lifelong learning.

The competency based modular methods used in the interactive teaching-learning situation also facilitates for problem solving by the learner. Problem solving as a method of learning forms the basis of much of human learning. Klausmeier & Goodwin (1971:37-38) believes that problem solving is the highest form of learning and it enables the learner to develop new ideas and solutions independently of others. Problem solving generally involves the four major steps of defining the problem, formulating a tentative hypothesis or solution, testing the tentative hypothesis or solution and finally arriving at a solution to the problem. For the learner engaged in the Master Craftsman Programme the opportunities for problem solving being used as a method of learning are facilitated in three main areas: the craft technical competencies of origination, method of printing and book binding as a finishing process. For example, in the stamina building modules of running a press to produce four colour process illustration work, the main thrust of the skills and competencies involved are problem solving. As part of the course a module is included where the learner will have advanced problem solving and diagnostic fault finding on a five-day computer simulated programme termed 'Shots'.

The 'Shots' programme consists of a basic introduction to 'Shots' which includes an orientation to the hardware and software package as well as intensive practice sessions in navigating the programme. The next component of the programme covers problem-solving exercises on ink and water balance, registration, packing of plates and blankets, pressure and dot gain. An interim self-test exercise is held so that the learners can access their own learning and basic understanding of the computer simulated programme. The penultimate component of the programme involves the 'GATF problems 1 thru' 20' which covers registration, water and ink balancing to ghosting. The final assessment component of the programme involves the learner running the simulator on a full time basis for an eight-hour period. The simulator is of such a nature that combination and permutations of built in faults, which occur at random actually occur during the simulated production run. The response of the learner to these faults in the form of their diagnostic fault finding strategies is recorded as well as an immediate feedback of the outcomes of actions taken. The entire simulated exercise is assessed in terms of costs and the effectiveness of the learners' fault diagnosis strategy and problem-solving skills.
In certain learning encounters where a learner is faced with a situation for which he or she does not know how
to respond the reaction may be to retreat from the situation or make a random hit-or-miss response. This
random behaviour if persisted on by the learner could sooner or later produce a response, which would seem
appropriate. Appropriate responses are viewed as a success by the learner and hence reinforces this trial-and-
error learning in the future. Trial-and-error or heuristic learning has application in the master craftsman
competency based modular programme. The very nature of the type of product or service produced in the
Printing, Newspaper and Packaging Industries is primarily of a bespoke once off product or service. No two
consecutive newspapers from a newspaper company contain exactly the same news or advertisements or
layout. Magazines likewise are unique and have a limited shelf life. Packaging design and specifications
vary from order to order, repeat orders are so well spaced apart in time that the repeats become almost first off
runs. Because of the complexity of the production process in the Printing, Newspaper and Packaging
Industries the Master Craftsman Programme has certain modules especially for the craft technical and other
technical competencies that are termed 'stamina building modules'. The nature of the stamina building
modules is such that the learner has the opportunity to practice learned skills over a sustained period of time
so as to have exposure to many changes and a variety of job complexities before being finally assessed for
competence. The stamina building modules also enable the learner to experience a variety of problem-
solving situations where trial-and-error may be the only method available to find solutions to the problems.

Fraser et al (1993:79-84) state that effective instruction and learning is dependent on thorough planning and
control. Effective planning implies continuity between present instruction, past instruction and future
instruction. Each lesson that is planned should be linked to the total curriculum and the lesson should also
link where possible to an individual learner's learning style. The learner readiness to learn needs to be
considered as well as the fact that individual differences can and do exist between learners. Participation of
the learner in the learning situation and the opportunity to practice the new skills are important. The design
and structure of the Competency Based Modular Programme and its intended implementation has through the
provider quality assessment and accreditation system (see Appendix 4) a strong control mechanism in place
which details the measurement strategy and articulates the cost of non-conformance. Accreditation visits,
student surveys and ongoing monitoring of the vocational education and training intervention enables control
and feedback and facilitates formative evaluation of the master craftsman curriculum. The master craftsman
Competency Based Modular Programme is designed in such a manner so as to facilitate active involvement
of the adult learner. The course maps and concomitant module identification with module element objectives,
criteria and evaluation strategy are available to the learner at all times (see 7.3.4, Figure 80). Feedback to the
learner for the practical competencies in the craft technical and other technical competencies is immediate
since the theoretical education and training takes place within the work situation where the milieu is such that
the learning has direct links to reality, the here and now of the real world. The course maps for the Master
Craftsman Programme, the module description and concomitant criteria as well as the evaluation strategy
gives the adult learner a clear view of what is expected. Because of the accreditation and quality assurance
system lesson plans, actual lesson guides and learner notes are a prerequisite and these are there not only to
structure the learning encounter but to act as motivation for the teacher and learner (see Appendix 4).

7.4.5 ON-THE-JOB INSTRUCTION, PRACTICE AND STAMINA BUILDING AS A DELIVERY
MODE FOR THE MASTER CRAFTSMAN PROGRAMME

The potential learner target group for the master craftsman curriculum are adults who are highly skilled and
hold critical positions within companies and organisations in the Printing, Newspaper and Packaging
Industries. Once they enter the Master Craftsman Programme there is a problem in trying to classify these
learners as trainees or learners since their existing skills are of such a nature that in most instances they are
indispensable and very often are involved in shift work where product and service output are paramount.
Their status is that of a qualified skilled worker and simply because of the existing high level of skills these
potential learners for the master craftsman curriculum have a high cost to the employer. The recovery of
these costs can only be realised through the productive utilization of these highly skilled employees.

This problem of utilizing the skills of the learner can only be partly solved by a process of transferring the
instruction and learning interaction for the Master Craftsman Programmes on to the production floor, that is,
instruction should occur in an on-the-job situation. Fortunately within the Printing, Newspaper and
Packaging Industries this capacity for on-the-job instruction has been developed over the years. The
apprentice training and career path progression training that is now well entrenched in the industries is a work
based approach to instruction and learning. According to the Sectorial Study Report (Printing, Newspaper
and Packaging Industries, 1997:26) 345 companies and organisations in the industries are accredited to
provide apprenticeship vocational education and training. A further 79 companies and organisations are
accredited to provide career path progression training. Thus a third of all companies and organisations within
the Printing, Newspaper and Packaging Industries have an existing capacity to provide structured accredited
instruction on-the-job. When one considers that of the 1 273 companies and organisations in the sector 37
percent employ less than twenty-five people and because of the very nature and size of these small enterprises
the capacity or need for training is non-existent. These small and micro enterprises do, however, have a
centralised capacity for vocational education and training through the Southern African Printing College.
(SAPC). The SAPC, however, is an accredited vocational education and training provider for the industries and it too offers instruction in an on-the-job mode.

The anticipated Skills Development Bill which is due for legislation in the latter part of 1998 emphasises that the funding of skills development through a compulsory levy of one percent of wage and salary bill will be imposed across the board. This factor coupled to the increasing demand for high skills within the Printing, Newspaper and Packaging Industries will no doubt accelerate the vocational education and training capacity within the industries and thus increases the opportunities for instruction at the workplace for the learners in the master craftsman curriculum.

The instructional strategy of practice and stamina building modules is important if learning outcomes are to be meaningful and measurable against pre-determined criteria. The concept of a qualified worker standard relating to a output in terms of a performance index of one hundred percent on a 0 to 100 scale allows job and task outputs to be benchmarked internationally (ILO:1986). Once unit standards are generated through the mechanisms and structures of the emerging National Qualification Framework it is hoped that all learning outcomes beyond those of job functions and tasks will be encapsulated a concept such as a 'Qualified Learning Outcome Standard'. The learning outcomes of all fields of education, training and even experiential learning could be incorporated by this concept.

Any 'Qualified Learning Outcome Standard' would need to satisfy intellectual scrutiny where the described learning outcome should be easily subjected to international comparative benchmarking where criteria such as the theoretical construct used in describing learning outcomes is identifiable and sound, where semantic clarity is attained, where assessment criteria is relevant and valid, where the assessment strategies to be used are unambiguously stated and assessment of outcomes is as objective as is possible in the context of the type of learning being assessed.

To attain a 'Qualified Learning Outcome Standard' should also indicate that the learner has the capacity and the adaptive skills and abilities to demonstrate the learning outcome in a variety of situations. In order to expose the learner to a variety of situations in the workplace the Master Craftsman Programme has stamina building modules, which are aimed at affording sufficient practice and repetition so as to enable the learner to attain experience and cope with the effect of changes and thus develop the necessary adaptive skills to deal with these changes. These stamina building modules generally entail the stringing together of a variety of previous learning modules in a variety of permutations and combinations over a period of time. Naturally
because of the nature of the work situation the stamina building modules, as has been previously stated, are a mechanism to build problem solving skills and abilities for the learner and enhance the diagnostic fault finding aspects of problem solving.

7.4.6 BLOCK RELEASE OPTIONS AS A DELIVERY MODE FOR THE MASTER CRAFTSMAN PROGRAMME

Clustering theoretical modules, which also contain underpinning knowledge for practical competencies into specific technical theoretical module groupings at a TT4, TT5 and TT6 level lends itself to the possibilities of providing an individual technical theoretical module in one concentrated time period. Currently within the Printing, Newspaper and Packaging Industries the practice of releasing indentured apprentices or registered trainees for concentrated theoretical instruction at registered offsite providers in the form of a block release is well received and accepted as being an efficient and effective method. In the case of indentured apprentices the company or organisation who sends the apprentice to a block release is compensated for the costs incurred which includes registration fees, course fees, books, transport, accommodation and wages based on a gazetted rate. This cash grant is made by the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) who through the mechanism of a training levy imposed on the industries has funding available for this purpose. A number of checks and balances are in place to ensure that the technical theoretical modules are provided by accredited institutions and repayment is made only after due performance of all parties concerned.

Extending the block release system for the Master Craftsman Programme is a natural development of a workable option, however, the course duration of a technical theoretical module at the TT4, TT5 and TT6 level is 324 hours whereas the existing block release for a technical theoretical module at a TT1, TT2 and TT3 level is only 120 hours (3 weeks) plus 3 days for examination purposes (24 hours). Indications are that a technical theoretical module for the Master Craftsman Programme would need to be split and spaced in such a manner so as to ensure that the time the learner would be away from work would not exceed four weeks at a time.

Experience in the Printing, Newspaper and Packaging Industries has shown that block release scheduling has to be negotiated periodically with the employers in the Printing, Newspaper and Packaging Industries. As part of a proposed pilot study to implement the master craftsman curriculum a detailed survey needs to be included in the study to establish how block releases will be implemented in practice and what changes in the
compensation for loss of time by employees who are learners engaged in block release needs to be made.

At present the Southern African Printing College (SAPC) and certain accredited companies within the industries have the capacity to provide technical theoretical modules. These providers have all indicated their willingness to extend their capacities to accommodate the technical theoretical modules for the Master Craftsman Programme.

7.4.7 DISTANCE LEARNING AND MENTORSHIP AS A DELIVERY MODE FOR THE MASTER CRAFTSMAN PROGRAMME

Because of the wide geographical spread of companies and organisations in the Printing, Newspaper and Packaging Industries and the heterogeneous nature of the sector with its distinct sub-sectors and niche markets it will not always be possible to release a learner involved in the Master Craftsman Programme to attend an offsite block release for the technical theoretical modules. Smaller companies who operate with limited skills resources as well as those companies that have twenty-four hour a day production processes, especially the newspaper sector, require a different approach to the provision of technical theoretical modules.

Distance learning within the Printing, Newspaper and Packaging Industries is well established. The National Diplomas in Printing or Packaging Management are currently offered via distance learning through Technikon RSA. The technical theoretical modules for artisan vocational education and training are offered via distance learning through the Southern African Printing College (SAPC). Certain technical theoretical modules which have direct application for the Master Craftsman Programme are already available via distance learning through the SAPC.

The distance learning system devised for the Southern African Printing College offers an effective and efficient intervention because of the following:

- Learning guides are well-structured where objectives of lessons, assignments and course content have been arrived at by a process of design and reviewed by expert technical committees which included all the relevant stakeholders.
• A mentorship programme is prescribed for a company or organisation who may wish to have an employee as a learner undertaking distance learning. The programme identifies within a company or organisation a suitable mentor candidate who undergoes a detailed mentorship training programme which is aimed at providing a link between the learner, company management, the distance learning provider and a supportive role for the learner. The mentor for an employee engaged in distance learning has a detailed timetable for the technical theoretical module in question and is obliged to record and control the learners progress especially with regards assignment preparation and submission. Assignments are where possible designed in such a manner that they are related directly to the work situation and need to draw from that work situation for successful completion.

The distance learning system of the Printing, Newspaper and Packaging Industries is also unique in that companies and organisations that have registered mentors and have learners who successfully achieve the learning outcome for the technical theoretical module via an externally set and controlled National Examination are given cash grants by the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB). This performance based cash grant system will be equally applicable for the technical theoretical modules of the Master Craftsman Programme.

7.4.8 IN-HOUSE PRESENTATION AS A DELIVERY MODE FOR THE MASTER CRAFTSMAN PROGRAMME

Certain theoretical modules that make up the technical theoretical modules at the TT4, TT5 and TT6 lend themselves to being presented in-house to an audience which is wider than that of the learner engaged in the Master Craftsman Programme. World class manufacturing is a topic which has special significance for companies and organisations in the Printing, Newspaper and Packaging Industries. The Sectorial Study (Printing, Newspaper and Packaging Industries 1997:32-35) revealed that there was a pressing need for vocational education and training to enable companies to become globally competitive by means of attaining world class manufacturing status. To enable companies to attain world class manufacturing status a series of independent studies but aligned to the master craftsman curriculum development process have been conducted.
The Qualtech organisation through the auspices of the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) has already validated that the quality assurance modules for the Master Craftsman Programme have wider application within the industries. Based on the research of this study course materials, unit standards and a detailed course presentation schedule for in-house presentation is well advanced.

The modules on change management, costing and estimating, production planning and control and productivity improvement are also identified as having wider application than for the learner engaged in the Master Craftsman Programme. In-house presentation of costing and estimating and production planning and control is a well established practice within the industries at present and indications are that this practice will expand in the near future especially in the light of the pending Skills Development Bill promulgation and stated implementation date.

7.4.9 ORGANISATION–PERFORMANCE AWARENESS IS NECESSARY FOR LEARNING IN A DECENTRALISED DELIVERY MODE FOR THE MASTER CRAFTSMAN PROGRAMME

The emerging National Qualification Framework emphasises the integration of theory and practice, identifies the importance of critical cross-field and fundamental skills and competencies and promotes the notion of assessing learning outcomes in the world of work. These concepts introduce a new dimension to the teaching-learning situation especially for the adult as a learner.

In order to best accommodate these concepts vocational education and training interventions and opportunities need to occur wherever possible in a work related situation. This implies a decentralised approach where companies and organisations become the main providers of vocational education and training. The learner in the master craftsman curriculum would de facto be in this sort of environment when the andragogic didactic activities occur and the way an organisation facilitates job performance then becomes important. Modifying Graham's performance pyramid (see 6.3.3) a new learning principle of organisation-performance awareness is necessary for learning when it occurs in the andragogic mode in a structured on-the-job situation.

Organisation-performance awareness necessary for learning entails that the company or organisation address the following:
• Have the facilities and structures for vocational education and training and a learning environment where process and product objectives are congruent with learning objectives and application-oriented objectives to ensure the transfer of learning to on-the-job competence (see 7.4.5).

• Integrating expectations of the learning encounter for the learner and the organisation where learning outcomes lead to qualifications that are recognised and form part of the rewards and incentive policies and practices of the organisation. Recognised qualifications should marry qualification for purpose and position and are articulated into the structures and organisational hierarchies in an overt manner.

• Opportunities are created for the transfer of learning into on-the-job competencies through structured on-the-job projects, which enable application-oriented objectives to be met.

For the potential learner in the master craftsman curriculum the organisation-performance awareness necessary for learning is facilitated by the following:

• The provider quality assessment and accreditation system (see Appendix 4) which is aimed at structuring facilities for vocational education and training and identifies the instruments and mechanism for monitoring the vocational education and training encounter.

• The aims and objectives of the Master Craftsman Programme (see 6.4) coupled to the expressed needs of the Printing, Newspaper and Packaging Industries for a qualification level that is above that of the existing artisan and craftsman level in the industries. A defined career path which enables progress to the master craftsman level (see 5.3, Figure 35) where qualification for purpose and position are articulated.

• The actual course design of the Master Craftsman Programme which is aimed at learning to occur in a predominantly on-the-job mode where module structure, process, product and learning objectives are congruent and where appropriate opportunities are built in so as to meet the necessary application-oriented objectives.
7.4.10 ON-THE-JOB PROJECT CONTROL AS AN INSTRUCTIONAL TECHNIQUE FOR THE MASTER CRAFTSMAN PROGRAMME

The course map outline for the craft, other technical and non-technical courses and on-the-job projects (see 7.3.3, Figure 78) indicate that in phase three of the Master Craftsman Programme on-the-job projects for implementing a quality assurance system, improving work methods and establishing time standards and doing a detailed training needs analysis are required.

Broad & Newstrom (1992:79-85) discuss transfer strategies for learning whether it be training or education to the on-the-job situation and believe it is important to supplement effective learning processes with concurrent transfer programmes. This involves taking those who manage the learners from behind the scenes and placing them in visible learning transfer management roles during learning and provide learners with tools to help them plan their own transfer process.

Broad & Newstrom (1992:86-87) suggest that beside the usual process objectives and product/outcome objective an instructional designer could also develop for a specific lesson a third type of objective which they call the application-oriented objective. Application-oriented objectives are suggested to be more skills directed or performance-oriented and should place pressures on the learner to take what they have learned and put it to use. On-the-job projects as a strategy to transfer learning to the work situation are a means of achieving application-oriented objectives. However, the application-oriented objectives must be clearly articulated and stated before learning commences so that both the instructor and learner are aware of the application-oriented objective. The practical modules for developing the craft technical skills and competencies for the master craftsman because of their practical skills orientation and the fact that they are instructed and learned whilst on-the-job makes the objectives for the modules of learning application-oriented.

The course map for the Master Craftsman Programme indicates that in the third phase of the programme three on-the-job projects are to be completed (see 7.3.3, Figure 79). Each project is represented as a module in the Master Craftsman Programme. However, they are prefixed by an on-the-job (O-J-B) sub code. The modules in question would be: Code O-J-B, Q5 for quality assurance, O-J-B, PI4, for productivity improvement and O-J-B TEC4 for technical training. The Master Craftsman Programme (MCP) with the modules for on-the-job projects together with their criteria and evaluation strategy are shown in Figure 81 where the learning outcome is expressed in terms of an application-oriented objective language.
## The Master Craftsman Programme (MCP) On-The-Job Modules Criteria and Evaluation Strategies

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Title</th>
<th>Module Application Objective</th>
<th>Evaluation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-J-B Q5</td>
<td>Quality Assurance</td>
<td>Design and implement a Quality Assurance System in a selected area of the production process by applying the internal and external quality knowledge.</td>
<td>The project should result in a Quality Assurance System that has as a means of verification a detailed documented write-up as evidence. Assessor and management verification that the Quality Assurance System has utility and can result in improved quality in products or services in the company or organisation.</td>
</tr>
<tr>
<td>O-J-P PI4</td>
<td>Productivity Improvement</td>
<td>Conduct a detailed work study investigation by applying method and time study principles, procedures, processes and practices to a selected production method being used within the company or organisation.</td>
<td>The project should result in a new method being developed and installed which results in an improved utilization of resources and have a Standard Minute Value (SMV) for the production method that is usable for estimating and planning.</td>
</tr>
<tr>
<td>O-J-P TEC4</td>
<td>Technical Training</td>
<td>Conduct a detailed Training Needs Analysis for a selected department in the company or organisation by applying the appropriate Training Needs Analysis techniques.</td>
<td>The detailed Training Needs Analysis must be documented and identify which skills areas of present and future employees need to be developed. Verification and assessment of the findings are to be done by the human resources department or by management of the company or organisation.</td>
</tr>
</tbody>
</table>

\[Figure 81: The Master Craftsman Programme (MCP) On-The-Job Modules Criteria and Evaluation Strategies\]

### 7.4.11 The Vocational Education and Training Management System for the Master Craftsman Curriculum

The master craftsman curriculum for the Printing, Newspaper and Packaging Sector in South Africa is to be implemented in a complex milieu where decentralised provision and evaluation is incorporated in a competency based modular vocational education and training system which is learning-outcome orientated.

Watson (1990:32) views managing a large multi-subject enterprise like modular courses as a complex process which is dependent on an excellent administrative and consultative system and which is capable of coping with a high degree of complexity yet can clearly define the lines of accountability for decisions as well as identify who is responsible for carrying out the decisions.
Spanbauer (1992:229-230) discussing the new paradigms for curriculum management and administration felt technology must be utilised wherever possible and that support services are so organised that they are able to produce concise reports, timeous documents and communication as well as proper plans. The information system should also produce meaningful reports, which can assist vocational education and training managers and instructors. There must also be an agreed system of accountability and productivity accomplished through a mechanism of establishing and monitoring class sizes, instructor workloads and facility utilization.

For the effective and efficient management of the Master Craftsman Programme it is of cardinal importance that the whole vocational education and training information system is integrated and that persons and bodies are identified who have specific responsibilities and are accountable for the management of learning. Naturally clear lines of accountability should be established as well as feedback loops and the necessary checks and balances. At the onset the Master Craftsman Programme being competency based and modular falls in line with the accepted competency based modular vocational education and training system within the Printing, Newspaper and Packaging Industries.

The key players who are identified as essential to the management system for the master craftsman curriculum are:

- The learner who has satisfied the entrance criteria and is therefore a highly skilled person occupying an important position in a company or organisation.

- The teacher or instructor or trainer who is appropriately qualified and accredited and registered by the accreditation body in the form of the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB).

- The provider who is accredited by the PNPIETB as a provider of modules for the Master Craftsman Programme.

- The Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) as the vocational education and training quality assurance and monitoring body.

- The assessors who are qualified accredited and registered as internal and external assessors.
As part of the education and training management system very specific processes and procedures together with certain documents are also vital and integral to the management of learning in the master craftsman curriculum, these are contained in the provider quality assessment and accreditation criteria (see Appendix 4) which specifies procedures and instruments for evaluating the capacity and capability of the provider. The PNPIETB accreditation mechanism involves on-site visits to the provider where physical resources are evaluated by means of inventory checklists.

Documented evidence is also required in terms of affirmative action plans, annual report, organisational climate survey reports, placement records, and documented review plans on goal setting, annual budget and the review of the provider management information systems. The provider quality assessment and accreditation criteria also indicate that quality assurance is integral to the process by including formative evaluation such as performance management evaluation, instructional audits, learner satisfaction surveys, employer satisfaction survey reports, staff satisfaction survey reports, annual perception record study reports and customer satisfaction survey reports.

The Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) being the body which is charged by the sector to oversee the vocational education and training in the sector is the standards setting, quality assurance and monitoring and qualifications awarding authority and as such is party to the learning contracts which the learner target group for the master craftsman will enter into with their respective employers and the providers of the Master Craftsman Programme. The PNPIETB as part of the vocational education and training management system will maintain and monitor the learner progress system and conduct through suitably qualified and accredited assessors summative evaluation at appropriate times. Regular visits and learner progress reports as well as severity reports will be a feature of the monitoring role the PNPIETB will play.

The competency based modular training system with its outcome orientation has its own inherent learning management strategies and is facilitated by a progressive system founded on the following:

- Each module of learning has a clear objective, concomitant criteria and directed evaluation strategies.
- Each module requires a test for mastery. Visible proof via module test check lists, product or service outcome or behavioural and observation check list must be generated by the instructor. The results must be fed back immediately to the learner which in itself satisfies the important didactic category of motivation for the learner and offers possible remedial action by the instructor if warranted. Module results are also fed back to the PNPIETB who record and are able to monitor progress accordingly.
• Each phase evaluation is conducted by external assessors who will gather portfolio evidence, conduct challenge tests and collect whatever other evidence is needed including on-the-job projects and via a system of verification through external national examiners and moderators. Phase credits and qualifications will be awarded.

Where a learner does not satisfy the outcome requirements for a phase evaluation the PNPIETB would need to conduct a formal investigation. The master craftsman curriculum being a systems driven curriculum incorporating a competency based modular approach with an outcomes orientation demands that it has a tenet that if a learner is unsuccessful at a specific phase of the Master Craftsman Programme then the vocational education and training system itself has failed. The causes of the failure need to be discovered and addressed so as to improve and refine the master craftsman curriculum on an ongoing basis.

The teaching-learning sub-system of the curriculum viewed from a systems perspective is where didactic action takes place and where the curriculum comes to life. In developing the master craftsman curriculum the teaching-learning sub-system subsumes interaction between a teacher and a learner. The initial situation of the potential learner target group (see 6.2) identified that the learner would bring a wide range of competencies, skills and experience into the teaching-learning situation. Establishing what the initial situation of the potential teacher through an accreditation and registration was also necessary. The initial situation of the potential teacher or instructor grouping in the master craftsman interactive teaching-learning situation revealed that certain skills and competencies were lacking. Appropriate trainer training courses were developed to enhance the skills and competencies of the teacher and instructor grouping (see 7.4.2).

The course content for the master craftsman curriculum was organised in a competency based modular method for instruction which would take cognisance of sound andragogic didactic principles. Organising the course content in a competency based modular format (see 7.3) did not indicate how the course content would be delivered in a practical, didactically sound manner. The teaching and training methods and modes of delivery based on the competency based format were developed to include many of the andragogic didactic principles and practices (see 7.4.4, 7.4.5, 7.4.6, 7.4.7, 7.4.8 and 7.4.9). An on-the-job project instructional technique was deemed necessary and developed in such a manner that it identified application-orientated objectives and evaluation strategies (see 7.4.10). Any interactive teaching-learning situation needs to be managed if effective teaching and learning are to take place. Structuring a suitable vocational education and training management system for the master craftsman curriculum centred about identifying key players and suitable monitoring and control instruments.
7.5 EVALUATION SYSTEM FOR THE MASTER CRAFTSMAN CURRICULUM

Curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries is centred about addressing a specific need for an industrial sector. The particular sector in question operates in a dynamic highly competitive environment and is particularly sensitive to rapid technology changes and global competition.

The companies and organisations within the sector behave as adaptive systems in order to survive and it is appropriate that any curriculum for the sector should itself behave as a system. Evaluation as a component of the curriculum when viewed from a systems perspective is seen in its widest sense where evaluation in all its guises and forms is part of the aims and objectives, the situational analysis, the selection and organisation of learning content and the interactive teaching-learning opportunities that exist.

Evaluation should inform and through formative and summative modes should transform the curriculum and ultimately transform education and training in the Printing, Newspaper and Packaging Industries. Evaluation becomes particularly important when the learning process occurs by and large in an on-the-job situation where the andragogic didactic situation is also dependent on those factors which influence job performance and upon which the transfer of learning and the evaluation of learning outcomes are made. The job performance factors which will influence the evaluation of learning for the learner in the master craftsman curriculum are expectations and feedback, tools and environment, rewards and incentives, desire to perform, physical and mental capacity and knowledge and skills (see 6.3.3).

The assessment of learning outcomes for a learner in the Master Craftsman Programme should occur in the interactive andragogic didactic situation by internal assessment which is vital and integral to learning. This assessment should inform not only the teachers or instructors and the learners but also the factors necessary for job performance and create the necessary on-the-job situation where learning can be transferred into on-the-job competence. The internal assessment should not only inform and be of a formative nature but should result in appropriate action. External assessment should confirm the internal assessment but be of a more summative nature.

When evaluation in a curriculum is viewed from a system perspective it is an important sub-system and interacts dynamically with all the other sub-systems of the curriculum. An evaluation system could have the features of evaluation as a process, within a structure and linked to the vocational education and training management functions. Evaluation of a vocational education and training curriculum such as the master
craftsman curriculum could be seen as a process of appraisal, of estimating the value of the curriculum and is closely linked to quality control and quality assurance of vocational education and training provision. With the advent of the outcomes based approach to education and training in South Africa and the aims of integrating education and training a change in paradigm is needed with regards evaluation and the notion of on-the-job assessment.

Fraser et al (1993:189) believe that evaluation should be part of the teaching activity and should involve assessment based on values, norms or criteria. Gagne et al (1992:352) state that evaluation in its most general sense is to 'assess the worth of a variety of states or events, from small to large, from specific to the very general'.

Jessup (1991:48) when discussing learning outcomes, which have been based on specific criteria, feels that assessment is a process of collecting evidence and making judgements on whether the specific performance criteria have been met. The evaluation system for the master craftsman would entail both formative and summative evaluation of the curriculum as a whole and individual modules of learning and would need to adopt the connotation that the word evaluation would mean attaching a value to a particular measurement or assessment. Measurement on the other hand would imply that the learner's knowledge or skill, or certain aspects of the curriculum are compared to some pre-determined standard. For the learner, the learning or job outcome is compared to a specific learning outcome criteria or a qualified worker standard. For the curriculum the learning or job outcome is compared to the aims and objectives of the curriculum.

Assessment for the purposes of this study is viewed as an estimate of a learner's knowledge and skill and is synonymous with the notion of collecting evidence and making judgements on whether specific performance criteria have been met. Evaluation and evaluation systems in the world of work are particularly applicable to the master craftsman curriculum and it is necessary to consider the special needs of the world of work.

Brenthal (1995:41-42) revisits Kirkpatrick's original classification of vocational education and training evaluation which were at four levels: reaction, learning, behaviour and results and concludes that although the model implied that conducting evaluation is a standardised packaged process it was flawed. Certain faulty assumptions were made, such as evaluations are definitive, evaluation equals effectiveness, the teachers and trainees are accountable for effectiveness, measurement is all that is necessary and that level four for evaluation is superior. He believes that when one is to engage in the evaluation process it is important to first consider the following:
• Consider the context – understand how the vocational education and training fits within the organisation’s operations and culture. This takes cognisance of the performance pyramid relating to the curriculum behaving as a system (see 6.3.3, Figure 49).

• Establish a link – drawing cause-and-effect paths between vocational education and training interventions and the job or learning outcomes as well as behaviour and productivity that may have been affected.

• Make an appropriate choice of an evaluation system or design a system with appropriate measurement instruments and assessment techniques.

• Resource inventory – irrespective of what level of evaluation one decides on or what evaluation system or strategy you intend to use a resource inventory must be made. The courses of learning themselves need to be evaluated so as to establish whether they can support the evaluation system or strategy. Availability of measurement instruments, assessment tools, testers and assessors, tools and equipment and the cost implications are some of the resources that need to be evaluated.

• Set goals and long range plans – evaluation is an ongoing process and evaluation programmes need to be dynamic and have multiple evaluations at various levels.

The outcome-based approach to education and training advocated at the macro level by the emerging National Qualification Framework is also a paradigm shift for evaluation where assessment moves from content measurement to performance assessment. The content measurement approach was a more behavioural orientation to learning and assessment. It operated from the stance of accumulation of isolated facts and skills and the assessment activity was separated from instruction. Assessment practices concentrating on discrete isolated bits of knowledge and skill, centred about textbook based knowledge, paper and pencil tests and single occasion assessment based on single attributes with major emphasis on individual assessment. The performance assessment approach is more cognitively orientated where the application and use of knowledge is integrated with teaching and learning. Assessment is based on the use of knowledge and skills in real life and is not confined to a single occasion assessment or a single dimension.

Bearing the above in mind the master craftsman curriculum comes to life when the curriculum is implemented, that is, when teaching and learning takes place in the interactive phase. This teaching and learning occurs when the providers of the vocational education and training interact with learners. Prior to
this interactive phase the resources of the provider need to be evaluated and bearing in mind the macro needs of the National Qualification Framework, the SAQA Draft Regulations (SAQA, 1997b:52) states that a provider needs to demonstrate through its quality management system that it has 'the capacity and ability to develop, deliver and evaluate learning programmes which culminate in specified National Qualification Standards and/or qualifications' coupled to this and implicit to evaluation is what evaluation strategies are to be implemented and how is the evaluation system to be managed.

7.5.1 ACCREDITATION REQUIREMENTS AS A MEANS OF EVALUATING VOCATIONAL EDUCATION AND TRAINING RESOURCES

The provider quality assessment and accreditation system of the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) was devised so as to meet the quality management requirements as specified by the South African Qualifications Authority. The system has a dual purpose of evaluating a potential provider for registration purposes as a provider of vocational education and training of registered units on the National Qualification Framework and a formative and summative evaluation of the actual interactive vocational education and training phase when it occurs (see Appendix 4).

The resource evaluation for potential providers of vocational education and training for the Printing, Newspaper and Packaging Industries which includes the master craftsman curriculum would consist of the following:

- Documented evidence supported by accreditation visits to validate that the provider can meet the provider quality assessment and accreditation system (see Appendix 4).

- The actual PNPIETB accreditation, which involves the process of establishing whether the provider has the resources to provide the necessary vocational education and training programmes envisaged. These resources are specified in terms of physical resources such as lecturing facilities, tools and equipment, machinery and suitable premises. For the teacher, trainer or instructor, qualifications and experience of teachers, trainers or instructors are specified for specific programmes. Where necessary further development of teachers, trainers or instructors through appropriate training in competency based modular vocational education and training systems and assessment practices could be necessary for registration purposes. The vocational education and training programme as a resource is also evaluated in terms of content, planning, learner entrant criteria, suitable examinations, assessment criteria, certification practices and its ability to facilitate lifelong learning. The administrative resources are also evaluated with regards manpower, administrative systems and general management of all aspects of being a provider.
• The revalidation of accredited providers on an annual basis and through ongoing monitoring of the quality of the vocational education and training that takes place at a provider are further ongoing resource evaluation strategies. This ongoing process is facilitated by the PNPIETB acting as an Education and Training Quality Assurance Body (ETQA).

The accreditation system for providers of vocational education and training makes provision for specific categories in which a provider may be accredited for the Master Craftsman Programme. Category one registration for a provider of the Master Craftsman Programme would indicate that the provider has met the accreditation criteria for providing all the practical and theoretical vocational education and training for the entire Master Craftsman Programme and has the capacity to provide the necessary on-the-job experience and project opportunities. Category two registration for a provider of the Master Craftsman Programme indicates that the provider has the capacity to deliver either all the practical vocational education and training plus the necessary on-the-job experience and project opportunities or all the theoretical vocational education and training of the Master Craftsman Programme. Category three registrations for the Master Craftsman Programme indicates that the provider has the capacity to deliver only part of the practical vocational education and limited on-the-job experience and project opportunities or part of the theoretical vocational education and training of the Master Craftsman Programme.

At the macro level the National Qualification Framework through the South African Qualifications Authority (SAQA) has identified that SAQA can delegate certain of its authority to Education and Training Quality Assurance Bodies (ETQA's) provided that the ETQA meets certain criteria. According to the Draft Regulations (SAQA, 1997b:50-54) an ETQA in order to perform its duty certain functions are assigned to it such as accrediting providers, promoting quality amongst the constituent providers, monitoring the provision of vocational education and training by providers, evaluation of outcomes by assessment, facilitate moderation of assessment, register assessors for specified national standards, certificate learners, co-operate and liaison with all bodies to moderate across ETQA's, recommending of new or modified standards and qualifications to National Standards Bodies, submission of reports to SAQA and any other functions SAQA may from time to time delegate to the ETQA.

Assuming that the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) is registered and accredited by SAQA as an Education and Training Assurance Body (ETQA) then the process of evaluation and the evaluation system for the master craftsman curriculum becomes embodied within a single entity where both the quality control and quality assurance aspects can be effectively and efficiently carried out.
The current practice within the Printing, Newspaper and Packaging Industry is that the PNPIETB is the only body that has the capacity and ability to evaluate and exercise quality control (monitoring) and quality assurance of vocational education and training provided in the industries. In October 1991 the then Department of Manpower accredited the Printing, Newspaper and Packaging Industries Training Board (PNPITB) at the first level and devolved all the vocational education and training powers to it including the privatisation of artisan training. This status has been retained and expanded upon where decentralised on-the-job evaluation has been achieved in all instances in the industries. The Printing, Newspaper and Packaging Industries Training Board (PNPITB) underwent a change in name in terms of its constitution and since 1995 the name change has included the education component and is now called the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB).

7.5.2 STRATEGIES FOR EVALUATING OUTCOMES OF A PRACTICAL NATURE

In keeping with the outcomes-based approach to education and training the evaluation system for learning of a practical or theoretical nature would need to have effective and informative assessment which has clear and direct links with the learning outcomes and be integral with teaching, training and learning. In keeping with the competency based modular vocational education and training system adopted for the master craftsman curriculum, performance criteria are integral to the modules of learning and necessary for evaluation purposes. The performance assessment for modules should ideally be direct and systematic observations of a learner performing or an examination of the products or services created by the learner in the world of work.

The performance assessment strategy for the learner in the master craftsman curriculum should not only require the learner to perform, produce, create or do something but should be so structured that they tap higher order thinking processes and problem-solving skills. The teacher or instructor developed tests during the learning encounter must be seen as integral to the teaching and learning process, be clearly linked to outcomes and flow directly from the module as in a normal teaching-learning situation.

The general classification of the master craftsman competencies into craft technical, other technical and non-technical and the further division of units of competencies into specified fields with modules of learning that address these units being of either a practical or theoretical nature lends itself to adopting different strategies for assessment and overall evaluation. The practical modules lend themselves to being evaluated by means of an outcomes-based approach where assessment takes place in real life on-the-job situations. This is secured by means of the accreditation system for providers of the practical component of the vocational education and training curriculum for the master craftsman.
A two-tier assessment strategy is necessary for the master craftsman curriculum. Competency based modular training systems require a continuous assessment of modules of learning so as to ensure effective formative and summative evaluation of the interactive teaching and learning situation. A registered teacher or instructor according to the accreditation criteria for providers of the master craftsman curriculum would have the necessary skills and knowledge to do assessment referred to as internal assessment. The internal assessment of learners is facilitated by the course maps, the module objectives, their criteria and the evaluation strategy. The evaluation strategy for the practical modules are all focused on real life on-the-job activities where direct and systematic observation of a learner performing or an examination of the products created by the learner are assessed.

As part of the quality assurance of providers (see Appendix 4) and coupled to the macro needs of the National Qualification Framework with regards qualifications and certification an ETQA will provide external assessment of the practical vocational education and training component of the master craftsman curriculum. The external assessment would be done at the end of each phase of the Master Craftsman Programme and would consist of the following:

- For the craft technical competencies of a practical nature in origination, methods of printing and finishing a challenge test to produce a product or service which would also include a direct and systematic observation of the learner engaged in the practical test. The challenge test is similar to the practical component of the Recognition of Prior Learning challenge test (see 6.2.4).

- For the practical components of other technical and non-technical competencies the external assessment will be based on one, or a combination of the following:
  
  - A portfolio of evidence developed for the purposes of assessment by the learner candidate.
  - Evidence and verification that a product or service was produced or provided by the learner candidate.
  - An on-the-job project where the evidence of the project outcome is available for assessment.

The verification process is facilitated by an agreement in the form of a learning contract between the provider, learner and PNPIETB acting as an ETQA and an employer for on-the-job experiential and project implementation opportunities. Details of these arrangements are included in the evaluation management sub-system (see 7.5.4) and in the structuring of the andragogic didactic situation particularly the methods of instruction to be used (see 7.4.4).
7.5.3 STRATEGIES FOR EVALUATING LEARNING OUTCOMES OF A THEORETICAL NATURE

The evaluation of learning outcomes of a theoretical nature for the Master Craftsman Programme need to follow a performance assessment strategy so as to satisfy the outcomes-based approach of the competency based modular training system adopted by the Printing, Newspaper and Packaging Industries. The internal assessment of learners is facilitated by the course maps, the module objectives, the criteria and the evaluation strategy. The evaluation strategy for the theoretical modules is focused on the higher order thinking processes and problem solving skills.

Tests and other measuring instruments would emphasise the higher cognitive areas of comprehension application, synthesis and evaluation where facts, concepts, principles, processes and procedures are used in a more problem solving approach. For example a test of theoretical content revolving about principles would not only entail the recalling of the definition of the principles but also the application of the principles by means of guidelines.

By structuring the modules of learning that are predominantly of a theoretical nature into the broad based 'technical theoretical module' as used in the Printing, Newspaper and Packaging Industries at present at the TT4, TT5 and TT6 level, external national examinations for each level become feasible. This external assessment strategy will be managed and controlled by the PNPIETB acting as an Education and Training Quality Assurance Body (ETQA). National Examiners for each theoretical module or series of modules will be selected based on their expertise and experience and they will set examination papers. There will be moderation of examinations and all the necessary requirements of an integrated examinations management system to support these activities. The present TT external examination system used for artisan and craftsman vocational education and training within the Printing, Newspaper and Packaging Industries which has international accreditation through City and Guilds of London Institute can be extended to cope with the TT4, TT5 and TT6 levels.

7.5.4 THE EVALUATION MANAGEMENT SUB-SYSTEM

For the master craftsman curriculum to be implemented satisfactorily and realise its aims and objectives yet be dynamic and sensitive to change, the evaluation system has to be managed effectively and efficiently. The outcomes-based approach to education and training is focused on the learning outcome and less on the input side. However, it is contended that unless the input side is properly managed the outcomes will not be realised.
A mechanism is needed to facilitate the evaluation of the master craftsman curriculum. Both formative and summative evaluation is required. Fortunately within the Printing, Newspaper and Packaging Industries the practice of apprenticeship, traineeship and of late learnerships are well entrenched and formalised through very detailed learning contracts.

For the potential learner for the Master Craftsman Programme a master craftsman learnership contract will be applied. This learning contract will be a contract between the learner and the accredited provider (who will in most instances be the employer) or accredited providers, where a group of providers with different accreditation registration categories co-operate to provide for the entire Master Craftsman Programme (see 7.5.1) and details the obligations and duties of the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) acting as an Education and Training Quality Assurance Body (ETQA).

This contract will be legally binding, subject to existing legislation such as the Basic Conditions of Employment Act and the South African Constitution Act and any other applicable statute as well any future contemplated status such as the anticipated Skills Development Bill and Employment Equity Bill.

The contract in essence will identify and detail the following:

- The biographical details of the contracting parties to the learnership contract.

- The details of the rights and obligations of the contracting parties. Particular emphasis will be placed on providers supplying meaningful and well-structured vocational education and training interventions and where necessary provide for on-the-job experience and project work. The providers are also obliged to furnish ongoing assessment data, progress reports and information as specified in the contract and continuously review their operations in light of the industries quality assessment and accreditation criteria (see Appendix 4). Naturally the learners will also have rights and obligations. Particular emphasis will be placed on learners applying themselves diligently to their studies of both practical and theoretical nature as well as specific clauses relating to confidentiality with regards their employers business especially where contracts make use of a multi-provider system. The rights and obligations of the PNPIETB acting as an ETQA will be that of quality assurance of the education and training interventions and resources as well as protecting the rights of providers and learners within the confines of the contract.
• The learnership contract will not supersede any employment contract but will be confined to the vocational education and training requirements of the Master Craftsman Programme.

• Details of non-performance for both provider or providers and learners are specified as well as the mechanism for rescinding or cancelling the contract due to non-performance. (For instance a learning contract may be terminated if a learner fails to pass a TT level at the third attempt).

All learnership contracts for the Master Craftsman Programme will be flexible enough to specify that only parts of the programme could be undertaken and will also recognise prior learning through granting credits for learning. This flexibility permits multi-entrant and multi-exit points. Learnership contracts as a management tool for the Master Craftsman Programme enables the envisaged evaluation system to operate efficiently and effectively and realise the aims and objectives of the master craftsman curriculum.

7.5.5 CERTIFICATION PRACTICES FOR THE MASTER CRAFTSMAN PROGRAMME (MCP)

In order to satisfy the requirements for lifelong learning, multi-entrant and multi-exit points in a learning programme, the Master Craftsman Programme would need to have specific points where certification for qualifications can be gained. Any credits of learning achieved also need to be recognised and if possible should have intrinsic and extrinsic value to the learner on the micro level, the Printing, Newspaper and Packaging Industries at the meso level and the national qualification structures at the macro level.

The question of awarding qualification certification for learning outcomes achieved hinges about the question of whether the skills and competencies achieved truly represent competencies which are representations of multi-skilling or whether they are merely multi-tasking disguised as multi-skilling. The debate on what constitutes multi-tasking and multi-skilling is hotly contested. However, in order to establish a framework for certification practices for the master craftsman curriculum the following would apply: multi-skilling is related to competencies gained in the craft technical competencies other than the field in which the learner entered the Master Craftsman Programme. Thus a learner who enters the learning situation with a craft certification in the field of origination would become multi-skilled when the competencies in transfer media, methods of printing, finishing, the maintenance mechanism and electrician fields have been attained. A multi-skilled craft certification would then be awarded. Multi-skilling in the competencies for the other technical fields of quality assurance, technical training, productivity improvement and costing and estimating would result in a 'technical production support' multi-skilled certificate. Where the multi-skilled craft
competencies and the technical production support competencies have been attained an advanced craft certificate will be awarded. When all the requirements in terms of the identified competencies for the master craftsman have been achieved and duly evaluated the national master craftsman diploma together with the Licentiate of City and Guilds of London Institute (LCGI) representing the international benchmark, will be awarded. The awarding body would need to be the appropriate Education and Training Quality Assurance Body (ETQA) so as to ensure that the certification has national recognition.

7.6 SYNTHESIS

When the curriculum is viewed from a systems perspective the curriculum development process needs to be aware of the mutual interdependence of the sub-systems of the curriculum. In developing the master craftsman curriculum the selection and organisation of learning content was facilitated as follows:

- The evaluation of the suitability of existing content for the competencies, their underpinning skills and knowledge as well as the necessary critical cross field and fundamental skills and appropriate underpinning knowledge (see 6.5.1, 6.5.2 and 6.5.3) took place so as to have appropriate course content.

- Organising the selected course content into competency based modular programmes which address the needs of the potential learning target group, the accepted training system and methods used in the Printing, Newspaper and Packaging Industries and the national requirements of the emerging National Qualification Framework took place.

The identification and analysis of the course design requirements indicated that the organisation of the learning content should incorporate a competency based modular format, accommodate the specific andragogic didactic requirements of the learner and be outcomes-based. These features were incorporated in the master craftsman course structure and resulted in a detailed course map (see 7.3). The course map indicates three phases where each phase contains practical and theoretical modules that are sequenced and linked. The course map indicates how progress can be made and is supported by a detailed description of the module, module elements, element objectives, criteria and evaluation strategies (see 7.3, Figure 80).

No matter how well learning content is sourced and developed into a coherently structured and ordered programme and supported by an integrated evaluation system the actual interactive situation where the teaching-learning opportunities, experience and activities occur is where the programme or entire curriculum
comes to life and it becomes critical that this interactive teaching-learning situation is addressed. For the master craftsman curriculum the interactive teaching-learning situation occurs in the andragogic didactic mode in the real world, that is to say in the world-of-work. In developing the interactive teaching-learning component of the master craftsman curriculum it was evident that the teacher or instructor would need additional skills and competencies. An outcomes-based train the trainer course and a course on assessment practices was developed to address this need and is an integral requirement for trainer and instructor accreditation (see 7.4.2). The competency based modular format of the Master Craftsman Programme (see 7.3) enabled a number of important andragogic didactic principles and practices to be designed and incorporated into teaching and training methods, modes of delivery and instructional techniques for the programme (see 7.4.4, 7.4.5, 7.4.6, 7.4.7, 7.4.8 and 7.4.10). In order for the teaching and training methods, modes of delivery and instructional techniques to be effective it was necessary to investigate where these activities would take place. Majority of the master craftsman teaching and learning interaction would take place in a decentralised manner through the various companies and organisations that make up the Printing, Newspaper and Packaging Industries. For effective teaching and learning to occur in this environment specific organisation-performance conditions were articulated (see 7.4.9). How the delivery of the Master Craftsman Programme in a decentralised manner is to be controlled entailed developing a vocational education and training management system (see 7.4.11). This management system identifies the key players involved and specifies what their responsibilities are and who is accountable for what.

The development of the evaluation component of the master craftsman curriculum was a complex process and entailed exploring evaluation as a process and as a system as well as identifying when evaluation should occur. An accreditation system for evaluating vocational and training resources (see 7.5.1) and various strategies for evaluating learning outcomes of a practical and theoretical nature (see 7.5.2 and 7.5.3) addressed the issues of process, systems and when evaluation should take place. To enhance the evaluation component of the master craftsman curriculum an evaluation management sub-system was developed which included a learnership contract mechanism to facilitate evaluation (see 7.5.4).
CHAPTER 8: THE IMPLEMENTATION OF THE MASTER CRAFTSMAN CURRICULUM

8.1 THE CURRICULUM CONTINUUM REVISTED

The curriculum continuum from preparing, planning and designing the curriculum to producing a curriculum package during which due consideration is given to dominant theories and models which may result in a specific theoretical construct does not take place in a vacuum because as the process proceeds pressure for change and innovation also occurs. This has been evident during the curriculum development of the master craftsman curriculum. Marsh & Willis (1995:132-133) depict the next stage of the curriculum continuum as the stage when diffusion activities take place where the curriculum is adopted and implemented.

The adoption of the master craftsman curriculum involves specific dissemination activities aimed at advocating the desirability of the curriculum so as to enable the implementation to take place. In order to advocate the curriculum for the master craftsman the actual master craftsman curriculum package should be seen as a whole and be marketed as such. As part of the marketing strategy a pilot study with a selected group of learners could be a suitable means of launching the master craftsman curriculum and thus could facilitate the adoption and implementation of the master craftsman curriculum within the Printing, Newspaper and Packaging Industries.

The pilot study will not only facilitate the adoption of the master craftsman but it will offer the opportunity to critically evaluate the entire curriculum and validate the premises that were made and the actual curriculum development process used. Once teaching and learning occurs and learning outcomes become evident all aspects of the curriculum will be scrutinised. Where gaps and shortcomings become evident adjustments and changes can be immediately and easily implemented.

8.1.1 THE MASTER CRAFTSMAN CURRICULUM PACKAGE

The master craftsman curriculum has been developed in response to a specific need expressed by the Printing, Newspaper and Packaging Industries. The developed curriculum in the form of a package has also taken into consideration the emerging outcomes based education and training model advocated by the National Qualification Framework (NQF) and the South African Qualification Authority (SAQA).
The master craftsman package facilitates lifelong learning, is learner-led and satisfies those characteristics of a learner-led approach as expressed by Jessup (1991:136-137) namely:

- The effective provision of information and guidance on the qualification, the units on offer in a programme and how they relate to each other within a progressive framework. The Master Craftsman Programme including the prospectus and the course maps provides the learner with all the relevant information and guidance as to how the qualification can be achieved and how progress can be made.

- Recognition of prior achievements. Built into the master craftsman curriculum package the mechanism of recognition of prior learning facilitates for establishing a base line for the learner on which future learning can be built. This acknowledges the uniqueness of each and every learner in the learner target group.

- Individual action plan development with flexibility and modular delivery mechanism. The master craftsman curriculum package offers this flexibility and through a variety of delivery mechanism such as block release, distance learning and in-house modules, facilities for individual learners to create their own action plans for learning.

- Clear understanding by the learners of what learning they are expected to undertake and what performance is required. The master craftsman curriculum package through its structured course maps, module objectives, criteria and evaluation strategies articulates for the learner what is to be learned and what outcome standards are expected and how assessment will take place to evaluate learning.

- The process of self-assessment and participation in summative assessment should enable the learner to demonstrate what they know and can do. The master craftsman curriculum package with its module assessment and phase assessment enables the learners to demonstrate exactly what they know and can do at the formative and summative level.

The master craftsman curriculum package also clearly articulates the aims and objectives of the curriculum at the meso and macro levels where organisations are able to determine beforehand what the curriculum offers to them in enhancing the skills of the workforce and facilitates career growth and lifelong learning. The master craftsman curriculum package because it was developed by viewing the curriculum from a systems perspective took cognisance of the interactive and mutually inclusive cause and effect dynamics that affected the sub-system of the curriculum.
8.1.2 ADOPTION OF THE MASTER CRAFTSMAN CURRICULUM

The adoption of the master craftsman curriculum to a large extent is dependent on the original perceived needs for such a curriculum and a process of advocacy for the resultant curriculum package may be necessary. The original perceived need which led to this study was that the Printing, Newspaper and Packaging Industries desired a level of skills beyond that of an artisan or craftsman which they viewed as being that of a master craftsman level. This master craftsman would need to be the custodian of the craft of printing and the point of introduction of new technology. The curriculum was researched by means of a competency profiling exercise (see 3.3.1) and the subsequent curriculum development process centred about a situation analysis, development of aims and objectives, selection and organisation of learning content, arranging and organising the teaching-learning opportunities and activities and evaluation (see 6.2, 6.3, 6.4, 6.5, 7.2, 7.3, 7.4 and 7.5).

The resultant curriculum package would need an advocacy campaign so as to launch and validate the curriculum especially with regards course content and the interactive teaching-learning andragogic didactic situation achieving the stated aims and objectives of the curriculum. This action could enable the adoption of the curriculum packaged within the Printing, Newspaper and Packaging Industries.

As part of the proposed advocacy strategy the detailed prospectus will be published in instalment form in the trade magazines to which the industries subscribe namely 'Graphix' and 'Packaging Review'. This would ensure that the employer grouping become aware of the Master Craftsman Programme and the benefits they could derive if they nominated a suitable employee as a learner for such a programme. The learner target group would through the auspices of the South African Typographical Union (SATU) monthly publication 'South African Typographical Union Journal' also have the detailed prospectus published in instalments. This would sensitise the potential learner target group to the programme. Coupled to the publication of the prospectus a launch date and details of a pilot study for testing the curriculum would also be included in the various publications.

A pilot study with a selected group of learners undergoing the Master Craftsman Programme could also facilitate the adoption of the curriculum package. Such a pilot study could also be a valuable aid for implementing the curriculum in the Printing, Newspaper and Packaging Industries.
8.1.3 IMPLEMENTING THE MASTER CRAFTSMAN CURRICULUM

In the curriculum continuum the diffusion activities of adopting and implementing the curriculum indicate that when implementation occurs certain evaluation activities also take place. The evaluation activities enable the institutionalization of the curriculum. Using a pilot study as a means of implementing the master craftsman curriculum enables the process of diffusion to take place. Evaluation of the pilot study should be viewed in its widest sense where evaluation of resources and capacity is necessary together with formative evaluation as the pilot study progresses and the summative evaluation after the pilot study has been completed. This ongoing evaluation could highlight problem areas and immediate responsive actions could be made where necessary. This process would enable dynamic change and innovation to occur whilst formative evaluation is in progress and could thus ease the passage of the master craftsman curriculum to become institutionalised within the Printing, Newspaper and Packaging Industries as a valuable vehicle for furthering the vocational education and training initiatives within the industries.

8.2 CAPACITY BUILDING FOR CURRICULUM ADOPTION AND IMPLEMENTATION

Using the advocacy strategy of publishing the detailed master craftsman prospectus in focused publications and using a pilot study with a selected group of learners undergoing the Master Craftsman Programme as a means of adopting and implementation of the curriculum needs to be carefully planned and synchronised.

Conkright (1998:62-67) believes that an excellent way of testing a training programme is to run a pilot study managed as a project. Good practices for project management uses tools that originated from the construction industry where a construction project has five phases namely: initiating, planning, executing and closing. Conkright furthermore believes that these project phases when used to manage a training programme pilot study should not be confused with the phases in instructional systems design of analysis, design, development, delivery and evaluation.

For the project management of the pilot study for the master craftsman curriculum the project phases would be as follows:

• The initiating phase should be seen as setting the scope of the project where the goals of the project would be clearly stated and be quantitatively and qualitatively measurable.
• The planning phase is where resource evaluation and resource application is developed into a plan which highlights critical paths, critical success factors, deliverables, estimate to completion, milestone identification, resource loading or levelling and work breakdown structure. Work breakdown structure is the detailed subdivision of the project into tasks and subtasks so as to allocate resources effectively. This process can be facilitated by use of Gantt charts as a means of planning.

• The executing phase is simply where the project comes to life where monitoring takes place and where scope creep may take place. Scope creep is where the gradual addition of extra effort or size of deliverables occurs which can influence the project outcome considerably.

• The closing phase is when the project has ended and results and lessons are reviewed.

Using the above phases to manage the pilot study the scope of the pilot study project would be as follows:

• To launch the master craftsman curriculum within the Printing, Newspaper and Packaging Industries.

• To validate the curriculum in terms of its aims and objectives, course content, teaching and learning arrangements and evaluation system by means of a pilot study in which a select group of learners are engaged in the programme of vocational education and training.

• To develop capacity and capability for delivery of the master craftsman curriculum within organisation and institution so as to implement and institutionalization the master craftsman curriculum.

8.2.1 RESOURCE EVALUATION AND CAPACITY BUILDING

A pilot study aimed at launching and testing the master craftsman curriculum in the Printing, Newspaper and Packaging Industries would require specific resources in place within the organisations and institutions which could provide the learning opportunities for the learner target group.

The resources needed would include human resources, training and teaching facilities and machine and equipment resources. An institution or organisation wishing to provide the practical and theoretical components of the Master Craftsman Programme would need specific machinery, tools and equipment, lecture rooms, course materials and certain intangible resources such as a good administration system and
the infrastructure to manage learning effectively. The human resource requirements would hinge about suitably qualified and available teachers and instructors to deliver effective and efficient vocational education and training. The Printing, Newspaper and Packaging Industries through the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) is the centralised quality assurance body for the vocational education and training initiatives in the industries. The PNPIETB through an agreed code of practice for vocational education and training have specific accreditation and registration practices for organisations and institutions within the industries to become accredited providers. The accreditation process currently in use has been included in the provider quality assessment and accreditation system (see Appendix 4) and will be used to accredited potential providers of the Master Craftsman Programme.

According to the Code of Practice for Training in the Printing, Newspaper and Packaging Industries (PNPITB, 1990b) any organisation or institution wishing to provide vocational education and training to employees or potential employees would need to be accredited and registered to do so by the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB). The criteria for accreditation covers the facility requirements such as machinery, equipment and tools, the course or programme requirements which are specified as being in a competency based modular format with an appropriate evaluation system, and the qualification requirements of instructors, trainers and teachers to deliver the module or programme of study.

Since the master craftsman curriculum is yet to be introduced into the Printing, Newspaper and Packaging Industries no organisation or institution is currently accredited to provide all aspects of the Master Craftsman Programme. However, certain modules of the programme which are aimed at developing the technical competencies of origination, method of printing, and finishing (especially book binding) are provided by a large number of accredited providers. If one views the necessity for a single provider to be accredited to provide for origination and methods of printing and book binding finishing then according to the PNPIETB database eighteen such providers exist with a geographical concentration of six in the greater Cape Town area, nine in the greater Johannesburg area and three in the greater Durban area. These potential providers are all large organisations who are very active in vocational education and training interventions for their employees.

The geographical concentration of accredited providers of vocational education and training for the identified technical competencies of origination, method of printing and finishing has a similar pattern for
accredited providers of vocational education and training for certain of the technical and non-technical programmes for the Master Craftsman Programme such as costing and estimating, production planning and control, productivity improvement, technical training, team development and company disciplinary procedures.

No accredited providers currently exist for all the quality assurance modules, all the change management modules as well as the customer care, budgeting and interviewing technique modules. Capacity would need to be built in order to provide these modules to the learner target group for the Master Craftsman Programme. This lack of capacity at present is not a limiting factor for initiating a pilot study because the present identified vocational education and training capacity available with the Printing, Newspaper and Packaging Industries indicates that phase one of the Master Craftsman Programme can be provided at present (see 7.3.3, Figure 78). An incremental approach for launching the pilot study is feasible and could be beneficial in facilitating the adoption and implementation of the master craftsman curriculum within the industries.

8.2.2 AN INCREMENTAL IMPLEMENTATION OPTION AND ITS IMPLICATIONS

Viewing the proposed pilot study as a means of facilitating the adoption and implementation of the master craftsman curriculum and launching the pilot study by offering phase one (see 7.3.3) of the Master Craftsman Programme which covers vocational education and training in the craft technical competencies common with those currently offered in artisan training, has some distinct advantages, namely:

- The course content is familiar to the Printing, Newspaper and Packaging Industries and present accreditation practices for providers is immediately applicable enabling the study to be launched as soon as possible.

- The selected learner target group for the proposed pilot study being qualified artisans or craftsman are by the very nature of the positions that they occupy in their respective organisations, hands-on practical people who feel more at ease with the predominately practical nature of the course content in phase one of the programme.
• Because of the certification practice developed for the master craftsman (see 7.5.5) a learner from the selected target group would not only embark on the master craftsman qualification route but would be able to incrementally acquire multi-skilled capabilities which would allow multi-exit points from the programme.

• Phase one of the Master Craftsman Programme having a duration of 800 hours of practical training and theoretical instruction covers printing, newspaper and packaging related subject content specifically costing and estimating, production planning and control, team development and company disciplinary procedures. It is feasible that some of the selected learner target group for the pilot study would through recognition of prior learning be able to obtain module credits in phase one which in itself could encourage learner participation and company involvement.

• As phase one of the Master Craftsman Programme is being introduced capacity can be developed to deliver phase two and three of the programme (see 7.3.3, Figure 78).

• By incrementally introducing the master craftsman curriculum by means of the pilot study and the distinct phases of the programme it is possible that as soon as phase one of the pilot study is completed, evaluated and adjusted the next group of learners can commence with phase one of the programme whilst the pilot study learner group commence phase two of the programme.

The implications of this incremental approach are that lessons learned after each phase of the Master Craftsman Programme has been completed can be used to improve the master craftsman curriculum and also help instutionalise the curriculum in a controlled gradual manner where capacity can be developed in tandem with the pilot study.

8.2.3 CREATING STRUCTURES AND REVIEW MECHANISMS FOR IMPLEMENTATION

The developed curriculum for the master craftsman has resulted in a curriculum package, which through certain advocacy strategies has the aim of having the package adopted and implemented with the Printing, Newspaper and Packaging Industries. Viewing curriculum from a systems perspective and developing the curriculum accordingly with a competency based modular methodology for delivery designed into the curriculum, and where an outcomes-based approach was also incorporated, implies that certain unique structures and review mechanisms are needed when implementation takes place.
These structures and review mechanisms would need to be conceptualised and in place even before the pilot study commences. The pilot study must not be seen merely as a means of testing course content, learning outcomes and the like but also as a means of identifying problems that may occur with structures and review mechanisms which support the vocational education and training interventions. Certain structures are identified in the quality assessment system for providers of vocational education and training (see Appendix 4) and the evaluation management sub-system for the master craftsman curriculum (see 7.5) as well as special requirements for the pilot study when managed as a project.

Essential structures that need to be in place are:

- A management information system that is capable of tracking a learner in the master craftsman programme from learnership contract formulation, through module progress, recording and updating assessment results and phase evaluation outcomes. The management information system would also need to highlight problem areas and generate feedback reports on progress and flag certification milestones. The management information system presently in use within the industries has a well-structured and configured computerised system controlled and operated by the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) which is capable of meeting the needs of the pilot study.

- A learnership contract for each selected learner for the pilot study target group. Learnership contracts of a suitable form are already in use within the industries and need minor adjustments to make them suitable for the pilot study.

- The accreditation process for potential providers of the Master Craftsman Programme must be initiated and instruments such as inventory checklists need to be in place. Moreover, the evaluation of potential teachers or instructors for the master craftsman must be evaluated by means of documentary proof of qualification that are necessary for specific modules and, where necessary, the training of the teachers or instructors in techniques and other requirements for presenting the modules as well as in assessment practices by means of appropriate training courses (see 7.4.2).

- Learning plans, lesson guides and assessment instruments are in place for each module of the programme. Such plans and guides currently exist for phase one of the Master Craftsman Programme.
A review committee consisting of representatives from the accrediting and quality assurance body in the form of the PNPIETB, the providers in the form of the organisations and institutions that provide practical or theoretical instruction to the learners, the companies or organisations who employ the learners and the selected learner target group. This review committee is to meet at regular intervals to monitor and control the pilot study especially the interactive teaching and learning activities and module assessment results.

The representatives of the PNPIETB on the review committee should ideally be at least two Board members, one from the employer organisation body and one from the employee organisation body. This arrangement would ensure that two large and important stakeholders are intimately involved in the process of implementing the curriculum.

The review committee would also examine progress reports, assessment reports and any other matter that may be brought to its attention including disciplinary issues and breaches of learnership contracts. The pilot study managed as a project would also have a detailed project plan and through the review committee structure a means of measuring project progress and milestones against project plan is facilitated.

8.2.4 A PILOT STUDY AS A MEANS OF LAUNCHING THE MASTER CRAFTSMAN CURRICULUM

A pilot study which is confined to a selected learning target group within limited geographical areas such as the greater Johannesburg, Durban and Cape Town areas makes the study logistically manageable. By launching the study incrementally where phase one of the Master Craftsman Programme is initially provided by organisations and institutions who already have the capacity and are accredited to deliver the required modules enables the pilot study to be launched immediately. This incremental approach of introducing each phase separately enables capacity to be developed by those providers engaged in the pilot study to prepare for phase two and phase three of the programme. Simultaneously all other potential providers of the Master Craftsman Programme not involved in the pilot study can be aided by the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) to develop the necessary capacity to become accreditation providers for phase one of the programme.

The pilot study will be launched in such a manner that the participants in the study will have an active and important role in the formative evaluation of the master craftsman curriculum and will be able to dynamically influence the curriculum package. This process will ensure that ownership of the curriculum
package becomes that of the providers and learners involved in the programme and then through the entire Printing, Newspaper and Packaging Industries as more and more organisations and institutions become accredited to provide the programme. The pilot study, managed as a project, will have a tangible and documented plan and detailed structures and review mechanisms, which could also be a valuable marketing tool to encourage potential providers and learner target group participation.

8.3 THE PILOT STUDY PROJECT

The pilot study managed as a project has a project scope of launching the master craftsman curriculum within the Printing, Newspaper and Packaging Industries so as to facilitate the adoption and implementation of the curriculum. The scope of the project also includes validating the curriculum in relationship to its design and to develop capacity and capability for the delivery of the programme to learners and consequently facilitating the institutionalisation of the curriculum. An incremental approach by initially offering phase one to a select group of learners by a select group of accredited providers not only enables the Master Craftsman Programme to be launched immediately but enables the formative evaluation of the curriculum as it is introduced to take place.

The aims and objectives of the pilot study are, however, more specific and need to be articulated and documented together with the entire pilot study details so that marketing and advocacy for the adoption of the curriculum as well as participation in the pilot study is facilitated.

8.3.1 THE PILOT STUDY AIMS AND OBJECTIVES

The aims and objectives of the pilot study are:

• To have a selected group of learners undergo vocational education and training for qualification and certification as master craftsman in the Printing, Newspaper and Packaging Industries.

• To provide a skills development intervention that will equip a select learner target group with competencies which cover the full range of technical competencies from origination to finishing as well as the important other technical and non-technical competencies deemed to be essential for a master craftsman in the Printing, Newspaper and Packaging Industries.
• To provide the Printing, Newspaper and Packaging Industries with employees who will have skills and competencies above the artisan or craftsman level and enable them to be custodians of the craft of printing and the point of introduction of new technology in their organisations.

• To validate the master craftsman curriculum especially the course content, aims and objectives of the various modules, the teaching and learning methods used and the assessment strategies for evaluating learning outcomes.

• To develop vocational education and training providers capable of providing the master craftsman programme effectively and efficiently.

8.3.2 THE MARKETING PLAN FOR THE PILOT STUDY

The eighteen organisations and institutions who currently are accredited and have the capability of delivering the first phase of the programme have through personal contact indicated their interest to participate in the pilot study. The potential learner target group within the eighteen organisations will through a formal presentation with employer participation be presented with details of the pilot study including the aims and objectives, planning details and the detailed Master Craftsman Programme prospectus. This information meeting is scheduled to not only give information but to answer questions linked to time requirements for instruction, block release or distance learning or in-house presentation options for the TT4 theoretical studies encompassed in phase one of the master craftsman programme. The information meeting would also explain how capacity will be developed to deliver phase two and three of the programme whilst funded issues and what claims providers will be able to make as learning milestones are achieved by their learners will be clarified. The claims procedures and practices currently in use within the Printing, Newspaper and Packaging Industries would apply with the necessary adjustment for the actual costs of the higher skills the learner target group has. As part of the marketing strategy the pilot study proposal will also be published together with the first instalment of the prospectus in industry trade magazines and the employee trade union publication (see 8.1.2).

Visits will be conducted to the respective organisations and institutions who indicate willingness to participation in the pilot study by the PNPIETB where more information can be given especially on such issues as recognition of prior learning, course duration and course content.
8.3.3 THE PLAN AND CRITICAL PATH OF THE PILOT STUDY

The detailed plan for the pilot study is best depicted in the form of a Gantt chart coupled together with the person or body responsible for the activities that are planned. The Gantt chart would need to indicate specific time frames. These time frames are controllable up to the point when actual teaching and learning occurs, thereafter the time frames become vague because the potential target group may well have individuals who through recognition of prior learning commence their learning from different base levels. Furthermore because the competency based modular structure of the Master Craftsman Programme individualisation is catered for and being learner-led progress is dependent on individual learners setting their own learning time frames.

The critical path for the pilot study to be successfully launched is as follows:

- The first published instalment of the master craftsman prospectus in the trade and trade union magazines.
- The pilot study potential participant information sessions.
- The recognition of prior learning assessment of selected potential learner target group for the pilot study.
- The successful completion of learnerships contracts being registered and recorded.

The actual plan for the launch of the pilot study in the form of a Gantt chart is shown in Figure 82.
Review Committee Meetings to take place every 6 weeks where progress, results, problems or any other matter that arises as the learners progress through the modules in the programme

Figure 82 : Gantt Chart for the Pilot Study Plan
8.3.4 EVALUATION REQUIREMENTS FOR THE PILOT STUDY

The pilot study managed as a project identifies that the executing phase is when the project comes to life. Thus when instruction and learning for the Master Craftsman Programme commences the project and pilot study is active. Monitoring commences as the instruction and learning commences. This monitoring is not only confined to simply recording progress against plan but would include vocational education and training quality assurance and permit for adjustment, modification and change in scope of the project as lessons are learned. Scope creep due to these changes could result in changes to the overall pilot study time frame.

As the interactive teaching-learning execution phase of the pilot study managed as a project takes place then the entire master craftsman package can be subjected to intellectual scrutiny. Intellectual scrutiny should not only evaluate the curriculum package in relation to the sub-system of the curriculum viewed from a systems perspective but should be more encompassing and ensure that the curriculum package was correctly developed to ensure that the curriculum is capable of change and renewal so as to satisfy the ultimate customers the curriculum package was aimed at. These customers are the Printing, Newspaper and Packaging Industries which includes both employers and employees and the customer at the macro level in the form of the emerging National Qualification Framework model and the outcomes-based approach of this model. Formative evaluation becomes active as soon as learning occurs both during and after each module. How does one ensure that meaningful intellectual scrutiny occurs? It can be facilitated by means of a vocational education and training quality assurance process. The quality assurance process can be the mechanism by which the pilot study review committee can judge the effective and efficient execution of the pilot study.

8.3.5 QUALITY ASSURANCE AND MONITORING OF THE PILOT STUDY

Housley (1998:11-12) refers to the adoption of certain International Standards Organisation (ISO) systems by colleges as a way to ensure the efficiency and reliability of the delivery of education. These systems are equally applicable to the master craftsman pilot study and should be part of the agenda of the review committee whenever it meets.

The mechanisms by which the review committee could review the progress of the pilot study in terms of a regular agenda are:
The vocational education and training quality assurance aspect of the pilot study should be aimed at ensuring that errors are as far as possible designed out before full implementation of the master craftsman curriculum package occurs. The quality assurance for the pilot study should examine the aims and objectives, course content, capacity and resources and projected outcomes of modules and the entire curriculum as it occurs during the pilot study.

The vocational education and training quality control aspect which is aimed at correcting errors and entails regular feedback from learners, teachers, instructors and the Printing, Newspaper and Packaging Industries.

The vocational education and training quality management aspect which ensures that quality processes happen, particularly module planning and delivery, assessment and validation of module outcomes and learner progress. The quality audit of internal and external quality management systems is also necessary and involves regular audit checks to see if the quality management aspects occur by means of documented evidence being regularly submitted.

The vocational education and training quality assessment aspect where judgement of performance against criteria occurs. This naturally is centred about the learner having demonstrated competency for modules of learning and exhibited learning outcomes at a qualified worker standard.

The vocational education and training quality enhancement aspect where conscious decisions are made to improve the curriculum package by either rejecting, restructuring or adding to the curriculum package.

By regular review of these vocational education and training quality aspects a meaningful summative evaluation of the curriculum package is possible. The post pilot study review can quantify lessons learned and establish for future use conforming requirements and quantify the cost of non-conformance when the curriculum becomes institutionalized.
8.4 FROM IMPLEMENTATION TO INSTITUTIONALIZATION OF THE MASTER CRAFTSMAN CURRICULUM

The curriculum continuum identifies that implementation and institutionalization of the curriculum involves evaluation activities. The pilot study as the vehicle by which the master craftsman curriculum is to be launched for implementation would be closely monitored and evaluated by a vocational education and training quality assurance process. Regular review will enable inherent design faults and inefficiencies to be designed out before full implementation of the curriculum takes place. Whilst the pilot study is in progress resources and capacity within the Printing, Newspaper and Packaging Industries will be developed so that more providers are capable of presenting the Master Craftsman Programme. The adoption of the curriculum within the Printing, Newspaper and Packaging Industries is of course a crucial issue and in order for full implementation and institutionalization of the curriculum further strategies are necessary.

8.4.1 FURTHER IMPLEMENTATION STRATEGIES

As the first phases of the master craftsman is launched an advocacy campaign will begin to start with the standards generating process so as to develop the unit standards for the master craftsman qualifications. The standards setting process for developing the units of standards for the master craftsman curriculum will be by means of the project cycle management methodology (see 5.4.2). Crucial to the adoption and implementation of the master craftsman curriculum is the stakeholder buy-in into the standard setting process. As has been stated (see 5.4.2.2) it is important that the ideal list of participants buy into the unit standard setting process by expressing their willingness to become involved in standard setting and participate actively in the process.

An informal standards generating exercise using aspects of project cycle management methodology for generating unit standards for the quality assurance competencies for the master craftsman (see 6.5.2.1) provided an ideal opportunity to verify the proposed standard setting process (see 5.4.2). This exercise not only produced unit standards but stimulated great interest in all stakeholders in the master craftsman curriculum and by a process of word of mouth wider interest in the Master Craftsman Programme has occurred.
8.4.2 CHANGE AND INNOVATION AS A MEANS OF RENEWAL AND FURTHER DEVELOPMENT OF THE CURRICULUM

By having the pilot study and standards generating process running in tandem will enable the master craftsman curriculum to be adopted, implemented and partially institutionalized. The review committee for the pilot study using vocational education and training quality systems and processes particularly the quality enhancement aspect, which is aimed at improving the curriculum package, is directly aimed at renewal and further development of the master craftsman curriculum.

The standards generating process will itself act as a catalyst for change and innovation and thus be a stimulus for renewal and further development of the curriculum. The informal standards generating exercise alluded to (see 8.4.1) proved that the project cycle management methodology could produce meaningful learning unit standards. During this informal standards generating process it was interesting to note that the identified module names and module sequences (see 6.5.2.1) were modified and changed. The module names and sequence deemed correct for the quality assurance competencies should be Scientific Methods 1 (Q1), Internal and External Quality Standards (Q2), Statistical Applied Methods (Q3), Quality as an Organisational Strategy (Q4) and the Implementation of a Quality Assurance System project (Q5). Further suggestions were also made where course content was reviewed in relation to the learning outcomes expressed by the unit standards and changes in course content emphasis was made.

Change and innovation as a means of renewal and further development of the master craftsman curriculum is also facilitated by the fact that when curriculum is viewed from a systems perspective it enables dynamic change to occur because the sub-systems of the curriculum are interdependent and interact with each other. As the pilot study progresses the review committee can implement changes in the curriculum in a holistic manner.

8.4.3 UNIT STANDARDS AND THE OUTCOMES-BASED MACRO NEEDS IN RELATION TO THE MASTER CRAFTSMAN CURRICULUM

The present emphasis in the vocational education and training debate in South Africa to a large extent is to do with the transformation of education and training. This transformation will affect the entire spectrum of education and training in whatever form it occurs in South Africa. As one of the means to achieving transformation the National Qualification Framework (NQF) and the work of the South African Qualification Authority (SAQA) are vital to this process. Unit standards generating and the articulation of
standards into the NQF are at this time topical and receiving great attention. The preoccupation centred about writing of unit standards is in many instances based on the premise of producing a nice package of unit standards. Having these unit standards available as a shining example of creative juices, unbound energy and huge investments in time and money is a noble act and an interesting experience. Much can be learned from this process of starting out with a unit standard expressed as an outcome of some learning encounter, but to generate unit standards without having insight into curriculum, curriculum design, benchmarking practices, workplace assessment and the dynamics of systems can be foolish and dangerous.

Some theoretical construct should be in place and ideally should be systems orientated when unit standards are generated. The premise of sound theory builds good practice must not be lost in this transformation process. The 'just do it' approach to writing unit standards even though the standards generating process has been consultative and involved all possible stakeholders is a rather heuristic approach where hopefully by trial and error we may get unit standards right one day. Unit standards as presented should meet all the requirements stipulated by the South African Qualifications Authority (SAQA) but should also meet certain acid tests.

The acid tests for a unit standard are at various levels, namely:

- The Micro Level. At this level the potential learner should be able to understand from the unit standard what will be learned and what capability the learner will have after successfully achieving the unit standard, emphasising qualification for position.

- The Meso Level. At this level the potential customer in the form of an organisation or institution will be able to judge from the unit standard whether a learner who has achieved the unit standard will be able to perform at a desired level within the potential customer organisation or institution emphasising qualification for purpose.

- The Macro Level. At this level the unit standard should be capable of being articulated into the NQF and have cross field utility allowing for lifelong learning transferable competencies and meet all the principles of integration, relevance, credibility, coherence and flexibility, legitimacy, access, articulation, progression portability, recognition of prior learning and guidance of learners.
- 301 -

- The International Level. At this level the unit standards should be capable of being benchmarked against international standards where semantic integrity and clear identification of the level of cognitive, affective and psychomotor outcomes are expressed in conjunction with the performance outcome described in the unit standard. Range statements should be finite and clearly stated.

- The Curriculum Level. At this level the unit standards should be capable of being used by providers to design suitable curricula. Again it is essential that semantic integrity is evident in not only describing the unit standard in terms of its learning outcome component but should leave no doubt for curriculum designers of what assessment is desired nor what evaluation strategy is to be used.

- The Assessment Level. At this level the unit standard should enable a potential provider or an Education and Training Quality Assurance body (ETQA) to design appropriate assessment instruments and develop suitable evaluation strategies for the unit.

By viewing curriculum from the systems perspective and designing curriculum within the systems milieu has distinct advantages for writing unit standards. The sub-systems of the curriculum being mutually inclusive and interacting dynamically with each other increases awareness of what needs to be done to pass the acid tests for a unit standard. Moreover, incorporating the performance pyramid in relation to the curriculum behaving as a system (see 6.3.3, Figure 49) enables the unit standard writer to produce standards that are capable of being benchmarked internationally. The unit standards written with the above in mind would be able to withstand in-depth intellectual scrutiny. This systems approach to curriculum and curriculum development deals in a holistic manner with outcome-based education and training and avoids the puerile debate of a top-down approach to curriculum obviating the chicken and egg question.

8.5 SYNTHESIS

The master craftsman curriculum falls under the guise of the vocational education and training curriculum. The development of the master craftsman curriculum has, as a point of departure, viewed the curriculum from a systems perspective. The developed curriculum as a package only comes to life when the curriculum is adopted and implemented. Only when the initial implementation of the curriculum takes place is it possible to critically scrutinise and evaluate whether the curriculum delivers what it was intended to deliver. Using a pilot study as a means of incrementally implementing and verifying the
curriculum allows for dynamic change where gaps and shortfalls become evident. Psychologically a pilot study indicates that one is testing the curriculum so as to verify assumptions and make changes where necessary before officially launching and implementing the curriculum. Using a pilot study as a means of implementing and verifying the master craftsman curriculum in the Printing, Newspaper and Packaging Industries necessitated articulating how the pilot study is to be managed. A pragmatic approach of managing the pilot study using project management techniques was developed (see 8.2). This approach allowed the pilot study to be planned logically (see 8.3.3) and indicated that the implementation could be done in an incremental manner (see 8.3.2). The project management approach also facilitated for a detailed pilot study management system (see 8.3.4 and 8.3.5).

The master craftsman curriculum was developed in phases (see 2.5). Phase three of the curriculum development process addressed the important sub-system of situational analysis where the initial situation of the potential learner target group was examined (see 6.2). This analysis revealed the wide range of competencies, skills and qualifications that exist within the potential learner target group. Standardised challenge tests through the mechanism of recognition of prior learning proved to offer a suitable means of establishing the minimum entrance criteria for a learner into the Master Craftsman Programme (see 6.2.4). The situational analysis was also applied to companies and organisations in the Printing, Newspaper and Packaging Industries and revealed the industries to be heterogeneous in nature with a wide range of company sizes. This diversity had to be accommodated because the majority of the interactive teaching-learning activities of the master craftsman curriculum would occur within these companies and organisations. When the interactive teaching-learning activities of the master craftsman curriculum occur an existing provider quality assessment and monitoring system (see Appendix 4) will apply. This system establishes the minimum requirements a company or organisation must meet to be accredited as a provider and then specific measurement strategies for monitoring the interactive teaching-learning situation takes place on an ongoing basis (see 6.3). If during monitoring activities shortfalls are encountered these are expressed in terms of non-conformance costs and could lead to a provider losing its accreditation status. The companies and organisations within the industries will be the main providers of the master craftsman curriculum and would be where the teaching-learning interaction takes place. For a learner to successfully transfer learning into on-the-job performance, a specific organisational climate which encourages the transfer of learning, needs to exist. These performance-enhancing fundamentals were identified and incorporated in the master craftsman curriculum (see 6.3.3).
In developing the aims and objectives of the master craftsman curriculum the needs of the Printing, Newspaper and Packaging Industries (see 1.2.1), the National Qualification Framework (see 1.2.4) and the adult learner target group (see 6.2) had to be considered. These needs emphasised different aspect and consequently the aims and objectives were articulated for the Industries, the National Qualification Framework and the adult learner target group specifically (see 6.4). For each module of learning module objectives and criteria were developed (see 7.3.4) which reflected specific module learning aims and objectives.

Included in phase three of the curriculum development process the pre-interactive component of course selection and organisation needed to be investigated. The best practices profiling technique (see 3.3) had established a comprehensive competency profile of the master craftsman. These identified competencies were refined to include critical cross field and fundamental skills and underpinning knowledge (see 4.4). Refining the competencies to include as much detail as possible was necessary to enable the master craftsman qualification to be nationally recognised and to be a framework and point of reference from which course content could be developed. Using the craft technical refined competencies as a benchmark the course content currently used by the Printing, Newspaper and Packaging Industries to develop artisan craft technical competencies was evaluated and found suitable for the purpose (see 6.5.1). For the other technical competencies of the master craftsman a similar process was used to establish suitable course content (see 6.5.2). The establishment of suitable course content for the non-technical competencies needed a different approach for sourcing course content. By means of a national survey an inventory was made of all the vocational education and training that is undertaken within the industries in the various non-technical competencies and units of competencies which could be applicable to the master craftsman (see 6.5.3). The course content sourced by this inventory was evaluated for suitability using the refined competencies as a benchmark. Where necessary additional course content had to be sourced and evaluated through extensive literative surveys and contact with specialist organisations for example in the change management competencies (see 6.5.3.1). Using the refined competencies as a point of reference for sourcing suitable course content proved to be cost effective and pragmatic and enabled the curriculum development process to progress.

Sourcing and evaluating course content was only part of the selection and organisation of learning content component of the master craftsman curriculum. The organisation of the identified course content into a competency based modular format entailed identifying what the course design requirements were (see 7.2). These identified course design requirements were incorporated in the development of the course
maps for the master craftsman curriculum (see 7.3). The interactive teaching-learning component of the master craftsman curriculum was also addressed in phase three of the curriculum development process. The situation analysis of the teacher and instructor for the master craftsman curriculum revealed additional skills and competencies were needed. Appropriate courses were developed for this purpose and these developed courses are a prerequisite for teacher and instructor accreditation and registration requirements (see 7.4.2). How the interactive teaching-learning activities were to take place needed to be investigated. Specific andragogic didactic principles and practices were identified (see 7.4.3) and incorporated into the teaching and training methods (see 7.4.4), modes of delivery (see 7.4.5, 7.4.6, 7.4.7, 7.4.8 and 7.4.9) and instructional technique (see 7.4.10) for the Master Craftsman Programme. Managing the interactive teaching-learning situation needed to be established to ensure the effective delivery of the master craftsman curriculum. For the management system to be effective key players were identified and the duties and obligations for these key players were established (see 7.4.11).

In developing the evaluation sub-system of the master craftsman curriculum it was necessary to investigate and establish what evaluation is, when and how evaluation should take place, and what structures and mechanisms where necessary (see 7.5). An appropriate accreditation system for providers of the Master Craftsman Programme was developed (see 7.5.1) which also enabled the ongoing monitoring of the quality of provision of the master craftsman by accredited providers. Strategies for evaluation learning outcomes of a practical and theoretical nature were developed (see 7.5.2 and 7.5.3) which incorporated external assessment and moderation so as to maintain standards. In order to manage the evaluation system an appropriate evaluation management sub-system which incorporated learning contractual arrangements was developed (see 7.5.4).

The development of the master craftsman curriculum was in answer to the needs of the Printing, Newspaper and Packaging Industries. At the onset of the curriculum development process the curriculum was viewed from a systems perspective. This necessitated that the master craftsman curriculum be categorised under the guise of vocational education and training curriculum. Various vocational education and training curriculum development models were therefore considered and evaluated for suitability for this study. Using appropriate aspects of selected models the curriculum development process could be planned and structured to enable systematic and logical progress. In order to establish what the competencies for the master craftsman should be a best practices competency profiling technique was used to develop a competency profile of the master craftsman (see 3.3.4). This competency profile as part of the first phase of the curriculum development process represents a top-down approach.
This top-down approach enabled an outcomes-based curriculum to be developed that integrated theory and practice. This competency profile formed the basis from which course content could be searched, developed and organised into a competency based modular format. Also included in this first phase of the curriculum development process was the need to determine how the master craftsman qualification would be articulated onto the National Qualification Framework. This was established by investigating what standards setting practices were considered necessary and by using a project cycle management approach a detailed project for standards setting for the units of learning of the master craftsman curriculum was developed (see 5.4.2).
CHAPTER 9: CONCLUSIONS AND RECOMMENDATIONS

9.1 INTRODUCTION

The Printing, Newspaper and Packaging Industries identified a need for a master craftsman level in the industries. The industries viewed the master craftsman as being the custodian of the craft of printing and the point of introduction of new technology. This vague definition of the master craftsman did not allude to what the job functions and tasks were nor what competencies were expected. Furthermore it was unclear how the vocational education and training of employees to attain master craftsman qualifications was to be provided. What was apparent was that the industries viewed the vocational education and training for a master craftsman level as essential and providing a career path extension for the artisans and craftsmen currently in the industries.

9.2 REVIEW OF THE FACTORS MOTIVATING THE STUDY

The factors leading to this study are diverse yet all contributed in a dynamic manner to create a complex problem where the development of the master craftsman curriculum was concerned. The study was motivated by the Printing, Newspaper and Packaging Industries who saw the need for a master craftsman level in the industries and urged for an appropriate vocational education and training programme to be developed to provide further vocational education and training opportunity for the existing artisans and craftsmen in the industries so that they could acquire new skills knowledge and competencies which would benefit both the industry and the artisan and craftsman in the industries. The master craftsman level was seen as a level beyond that of the artisan or craftsman and an extension of the vocational education and training of the said artisans and craftsmen in the industries. Unfortunately the Printing, Newspaper and Packaging Industries had no idea of what the specific skills and competencies were for a master craftsman and only had the vague definition of the master craftsman as being the custodian of the craft of printing and the point of introduction of new technology. This study was further complicated by the fact that the Printing, Newspaper and Packaging Industries has historically had a great influence on the vocational education and training on the artisans and craftsmen in the industries who collectively would make up the potential learner target group for the envisaged master craftsman curriculum.

The intimate involvement of the Printing, Newspaper and Packaging Industries in the vocational education and training for artisans or craftsmen was epitomised by apprenticeship vocational education and training
always being a core concern of both employer and employee organisations from the earliest day of the industries in South Africa. At the establishment of the National Industrial Council for the Printing and Newspaper Industries (NIC) in 1920 apprentice vocational education and training issues appeared on the agenda of NIC meetings on a continuous basis throughout the entire life span of the NIC from 1920 to 1989. In 1922 apprenticeship training was formalised in the industries by means of the 1922 Apprenticeship Act, Act No. 20 of 1920. In June 1923 one of the first apprenticeship committees in South Africa was constituted for the printing industries and through all the years up to December 1989 the vocational education and training debate on artisan or craftsman training in the industries was an ongoing event. After 1989 the newly formed Printing, Newspaper and Packaging Industries Training Board (PNPITB) continued with the evolutionary process with regards the vocational education and training of artisans and craftsmen in the industries. In 1995 with the change in the title of the PNPITB to the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) more emphasis was placed on all forms of vocational education and training that occurred within the industries. The PNPIETB as a body corporate still has the employer and employee organisations and associations in a somewhat modified form as was in the National Industrial Council for the Printing Industries prior to 1990.

The involvement of the Printing, Newspaper and Packaging Industries in vocational education and training of apprentices since early times has involved continuous debate on curriculum and curriculum development over the years. The move from a time based apprenticeship system to that of a competency based modular system was discussed as early as 1986 where at the same time the first mention was made of the possible need for master craftsman vocational education and training. At the national level a research project into artisan training resulted in the HSRC/NTB report on artisan training being published in 1985. This report indicated that further vocational education and training of qualified artisans in specific areas of specialisation were a possibility and needed to be accommodated, thus indicating that at the national level the possibility of a master craftsman level was not only desirable but should be encouraged. In 1992 the Printing, Newspaper and Packaging Industries adopted their own distinct competency based modular training system for the development of artisans or craftsman in the industries. Competence in the industries was not viewed in a narrow job task sense but from a much broader perspective where adaptive, core, interpersonal and intrapersonal, change management organisational skills and basic fundamental skills were also recognised as being essential for job competence. The competency based modular training system viewed for the first time vocational education and training from a systems perspective.
The issue of the need for a master craftsman level was raised continuously from 1985 onwards and in 1995 the South African Institute of Printing stated that there should be a concerted effort to develop a vocational education and training programme for the master craftsman level in the Printing, Newspaper and Packaging Industries. Whenever the need for a vocational education and training programme to develop the master craftsman within the industries was raised no mention was made of the specific competencies a master craftsman should be capable of after learning had occurred, nor how such a master craftsman curriculum could be developed, or how such a master craftsman curriculum could be provided in practice. A futile attempt in 1986 of translating the German 'Meister' programme for printers showed that the content of the programme was unsuitable for the South African situation.

Curriculum and curriculum development in the Printing, Newspaper and Packaging Industries has never been properly defined nor understood. Historically, syllabus, course content, practical training and theoretical education have at various times been called curriculum. Designing courses for specific theoretical education was often referred to as curriculum development or syllabus design. Clarification of the concept curriculum, curriculum development and syllabus was necessary so that a realistic curriculum development process could be engaged in for developing the master craftsman curriculum.

On the national level certain factors impacted on this study particularly with regards how curriculum is now viewed and how curriculum development should take place. The national debate on the transformation of education and training have since 1995 impacted dramatically on education and training in South Africa. The emerging National Qualification Framework model, which has certain aims and objectives particularly with regards the integration of education and training and the advocated outcomes-based approach influences curriculum and curriculum development. This outcomes-based approach emphasises that learning outcomes should be the starting point from which curriculum and curriculum development should evolve. This top-down approach moves away from the traditional content-based curriculum and is demand-led rather than supply-driven. The outcome-based approach has fundamental principles which directly influence curriculum and curriculum development especially with regards learning outcome standards expressed as applied competencies, assessment practices and evaluation strategies and how the education and training is to be provided in the real world. The emerging National Qualification Framework model inadvertently also raised the question of whether the master craftsman curriculum would lead to a qualification for purpose or position.

The Printing, Newspaper and Packaging Industries expressed the need for a master craftsman level within the industries. This level was viewed as being above that of the artisan and craftsman and was seen as a career
path extension for the existing artisan and craftsman cadre. Viewing the existing artisans and craftsmen as the potential learner target group for a master craftsman curriculum was problematic because of the variety of routes qualifications and status could have historically been achieved within the industries. Many artisans and craftsmen obtained their qualification or status under the time based apprenticeship training system. In the time based system it was possible to achieve trade or craft qualification by means of voluntary or compulsory trade tests which depended on combinations and permutations of theoretical vocational education and training and time periods of apprenticeship. The time based system also enabled artisan or craftsman status to be attained without any form of testing but merely because of effluxion of time. Compounding the problem for the potential learner target group for the master craftsman curriculum was that from 1992 artisans and craftsmen obtained their qualifications through the competency based modular training system which by its very nature compelled a learner to pass all components of the vocational education and training programme before final competence testing can take place. How this diverse potential learner target group was to be accommodated to be able to participate in the master craftsman curriculum indicated that the curriculum development process had to take cognisance of the initial situation of the potential learner target group and accommodate them in the master craftsman development process.

The Printing, Newspaper and Packaging Industries in South Africa is not a homogenous economic sector but consists of distinct economic sub-sectors and niche markets. This heterogeneity within the sector created a vexing problem of whether the master craftsman curriculum should address the Printing, Newspaper and Packaging Industries as a homogenous sector only or address the micro-level where different curriculum should be developed for the specific sub-sectors and niche markets of the industries.

This study was motivated by the Printing, Newspaper and Packaging Industries which had specific needs. However, numerous other factors such as the emerging National Qualification Framework model complicated the study and could influence the curriculum development process. How the master craftsman curriculum was to be developed in order to meet the needs of the industries and be didactically sound and functional became the central theme of this study. A thorough investigation of the following was necessary:

- The nature of the curriculum and a specific perspective of the curriculum suitable for the study.
- Curriculum design models from which a suitable design model could be derived which would enable the development of the master craftsman curriculum in a logical systematic manner.
9.3 SUMMARY OF FINDINGS

Stemming from the needs of the Printing, Newspaper and Packaging Industries for a master craftsman level and an appropriate master craftsman curriculum for developing the existing artisan and craftsman to master craftsman status this study established the following:

- The master craftsman curriculum fell under the guise of vocational education and training in a defined economic sector. In order to address the specific needs of the Printing, Newspaper and Packaging Industries where the companies and organisations that make up this sector operate as adaptive systems, curriculum and curriculum development had to be congruent with the systems milieu in which it would interact. Viewing curriculum from a systems perspective enabled the needs of the industry to be accommodated and also addressed the requirements of the emerging outcomes-based education and training model embodied in the National Qualification Framework. Using aspects of selected vocational education and training curriculum development models, an adapted model for curriculum development was selected for this study which facilitated systematic and logical curriculum development.

- The Printing, Newspaper and Packaging Industries perceived the need for a master craftsman level yet were unable to articulate what skills and competencies such a master craftsman would need. Skills and competency profiling via a structured approach using the nominal group technique and detailed surveys in the Printing, Newspaper and Packaging Industries enabled the articulation of skills and competencies for a master craftsman that would satisfy the needs of the industrial sector, a sector which is more heterogeneous than homogenous with distinct sub-sectors and niche markets. Viewing competencies from a wider perspective that saw job competence going beyond job tasks and skills, a taxonomy of competencies, skills, knowledge and attributes was used to accommodate the critical cross field and fundamental skills and underpinning knowledge advocated by the emerging National Qualification Framework model.

- In order for the master craftsman curriculum to lead to a qualification that would be recognised and recorded on the National Qualification Framework and bear intellectual scrutiny by means of international benchmarking the standards generating process for unit standards had to be articulated. The standards generating process would need to be transparent and embody the principles set out by the emerging National Qualification Framework model of integration, relevance, credibility, coherence and flexibility, standards, legitimacy, access, articulation, progression, portability, recognition of prior learning and guidance of learners. In order to facilitate the effective standards generating process, the
project cycle management technique when applied to unit standards generating of the master craftsman learning outcomes resulted in a detailed project plan which identified stakeholders, processes and structures, plans and time frames, detailed resource allocations, costs and instruments to measure progress. This project plan for standards generating has utility value and can be implemented by the Printing, Newspaper and Packaging Industries for producing the unit standards for the master craftsman qualifications.

- A proposed new career path system which was linked to learnerships could be developed. This career path system plotted career progression paths, identified specific learnerships and identified the potential learner target group for the master craftsman curriculum as well as the relevant NQF level for the qualification and the international benchmark equivalent. The proposed career path system also facilitates lifelong learning, one of the tenets of the emerging National Qualification Framework model.

- The potential learner target group for the master craftsman curriculum represented a population with a wide range of qualifications and experiences. Past certification practices for qualifications were disjointed and were obtained via different vocational education and training systems. The recognition of prior learning challenge test used as a mechanism for evaluation the entry level of the potential learner target group for the master craftsman curriculum proved to be an easy and cost effective way to enable learner access to the master craftsman curriculum.

- Curriculum development for the master craftsman in the Printing, Newspaper and Packaging Industries required the process to be linked to a systems perspective for curriculum and the preferred competency based modular vocational education and training system of the industries. Using various models the pre-interactive phase of the articulation of aims and objectives, designing courses of learning, evaluation of learning outcomes, as well as the evaluation of vocational education and training provision resulted in a provider quality assessment and accreditation system which enables effective and efficient vocational education and training quality assurance of all potential providers of the Master Craftsman Programme.

- Using aspects of the Twente Model a search process for suitable existing curricula coupled with empirical research, literature and industry surveys resulted in the development of technical, other technical and non-technical course content for the master craftsman curriculum.
- Curriculum development which incorporates systems theory didactics, the preferred competency based modular vocational education and training system of the Printing, Newspaper and Packaging Industries, the specific needs of the adult as a learner and the outcomes based approach of the emerging National Qualification Framework model resulted in the comprehensive articulation of the aims and objectives of the master craftsman programme and detailed course maps for the Master Craftsman Programme. The integration of theory and practice could also be facilitated by sequencing theory and practice in a logical framework. Because of the heterogeneous nature of the Printing, Newspaper and Packaging Industries specific courses for the craft technical finishing competencies were developed so as to accommodate the needs of the newspaper and packaging sub-sectors.

- The interactive teaching-learning situation in which the adult learners would be engaged in when undertaking modules of the Master Craftsman Programme would occur in a decentralised world-of-work situation in organisations and companies who could provide accredited vocational education and training opportunities. Considering the heterogeneity of the Printing, Newspaper and Packaging Industries and the uniqueness of the learner target group specific teaching and training methods to be used for the master craftsman were developed. These teaching and training methods were aimed at facilitating learning for individual needs in decentralised on-the-job situations with further block release and distance learning opportunities. Cognisance of the andragogic didactic principles had to be taken and incorporated in the teaching-learning situation. Special attention could thus be paid to the teacher, instructor and assessor needs within the interactive teaching-learning situation.

- Evaluation and the evaluation sub-system of the curriculum when viewed from the systems perspective for the master craftsman curriculum had to be developed so as to meet the unique needs and environment in which the master craftsman curriculum is to be implemented. An evaluation system could be developed for the master craftsman curriculum that caters for evaluating the vocational education and training resources, as well as the formative and summative evaluation of learning outcomes of a practical and theoretical nature. The evaluation system is also supported by an evaluation management sub-system. The evaluation system could also be linked to the certification practices for the Master Craftsman Programme where multi-exit points with credits and certification were identified.

- The certification practices were linked to the three phases of the competency based modular Master Craftsman Programme. Each phase represents progress in a specific multi-skilled area and when a learner achieves mastery of the phase certification can take place for the achievement.
- 313 -

- The master craftsman curriculum after development would need to be adopted and implemented in the Printing, Newspaper and Packaging Industries. Following the curriculum continuum of preparing, planning and designing the curriculum and producing the curriculum package, the diffusion activities of the adoption of the curriculum is to be facilitated by means of a distinct marketing strategy followed by a pilot study so as to enable implementation of the curriculum to occur. During the proposed pilot study evaluation by means of a review committee will enable the master craftsman curriculum to become institutionalised within the Printing, Newspaper and Packaging Industries.

- The incremental implementation of the pilot study offers the Printing, Newspaper and Packaging Industries the opportunity to develop vocational education and training capacity and facilitates the master craftsman curriculum adoption and institutionalisation in the industries.

Curriculum development for the master craftsman curriculum in reality does not end once the curriculum has been developed, implemented and institutionalised. Pressures for change and innovation will arise especially in the Printing, Newspaper and Packaging Industries where technological innovations and global competition demand ever changing worker skills and competencies. These pressures could result in the need to plan and redesign the master craftsman curriculum on a regular demand-led basis.

The methodology and processes used in developing the master craftsman curriculum can be used to develop curriculum in other vocational education and training fields. Viewing the curriculum from the systems perspective enables the development process to be sensitive to all aspects and components of the curriculum and considers the demands of the outcomes based approach to education and training advocated by the emerging National Qualification Framework model.

9.4 CONCLUSIONS

The master craftsman curriculum that has been developed in this study falls under the guise of vocational education and training and was driven by the needs of a specific industrial sector. The curriculum development process had to take cognisance of a number of factors whilst development proceeded especially because of the systems driven environment in which companies and organisations in the Printing, Newspaper and Packaging Industries operate. Viewing curriculum and the curriculum development process from a systems perspective and applying sound andragogic didactic principles accommodated the needs of the industries and the macro needs identified for the emerging National Qualification Framework model.
The proposed implementation strategy of a pilot study is seen as a further stage in the curriculum continuum and of vital importance in verifying the validity of the master craftsman curriculum. The coupling of the unit standards generating process with the pilot study will aid in a more critical review of the curriculum especially with regards course content, learning outcomes, assessment practices and evaluation. Notwithstanding the master craftsman curriculum that has been developed through this study a number of problems are anticipated when the pilot study, as a means of implementation commences which in turn will affect the adoption, institutionalisation and renewal of the curriculum. The problem areas anticipated in the pilot study are:

- The advocacy strategy may well encourage companies and organisations other than those currently identified as being capable of implementing phase one of the Master Craftsman Programme. These companies may lack capacity in terms of human resources, machinery, equipment and the administrative system to manage the learning process. It is feasible that a special capacity building exercise may become necessary so as to enable more companies and organisations to participate in the pilot study.

- Companies and organisations identified as being capable of providing modules of the Master Craftsman Programme for the pilot study have at this early stage expressed concern about the duration of the 'Outcomes-Based Train the Trainer Course'. Releasing key staff members to attend a course with a duration of 40 hours so that accreditation and registration of instructors can take place is seen to be impractical. The need to train and accredit instructors for the Master Craftsman Programme is acknowledge and the necessity of an on-the-job project is not contested. The 'Outcomes-Based Train the Trainer Course' would need to be modularised so as to enable the identified teachers and instructors to attend a series of modules over shorter periods over an extended time frame so as to meet the accreditation requirements and accommodate the needs of the companies and organisations concerned.

- Companies and organisations identified as being capable of providing modules of the Master Craftsman Programme have likewise also expressed concern over the duration time of 32 hours for the assessor training. It is again evident that the assessor training course would also need to modularise so as to enable the identified teachers and instructors to attend a series of modules over shorter periods over an extended time frame so as to meet the accreditation requirements and accommodate the needs of companies and organisations concerned.
• Indications are that even among the potential teacher and instructor grouping for the pilot study there are those who themselves would like to undertake the Master Craftsman Programme. The extent of this problem is not at present quantifiable but should become more detailed once the master craftsman pilot study is officially launched by means of the envisaged advocacy programme.

• The selection of a learner target group for the master craftsman pilot study has potential logistic problems especially where the recognition of prior learning is concerned. Challenge tests, as the principle form of recognition of prior learning for craft related technical and other technical fields are time consuming and in many instances have to be planned so as to not disrupt production schedules. The extent of this problem is not known but may well require a short-term solution by exploring portfolio evidence as an alternative to a challenge test.

• Basing curriculum development of the Master Craftsman Programme around a competency profile which was derived from an ideal shopping list of skills identified by a nominal group and refined by industry surveys has no real practical benchmark for comparison. This situation arose because no master craftsman exists in the Printing, Newspaper and Packaging Industries in South Africa. The ideal competency profiled, identified specific skills and underpinning knowledge, which became the source for developing the master craftsman curriculum especially with regard course content have course content and learning outcomes that do not result in the desired competencies being attained. Moreover the competencies identified may not be all inclusive for the practical needs of the world of work. Once implementation takes place shortcomings may be identified and the review, renewal and further development of the master craftsman curriculum would have to be undertaken.

• Once the unit standard generating process has commenced and unit standards are produced a problem may arise where many of the unit standards of the master craftsman qualifications could fall in a number of learning fields of the National Qualification Framework model. The learning outcomes of these units would then be compared with similar learning outcomes in a learning field or sub-field and questions about pitching level and learning outcomes could reveal certain shortfalls especially with regards critical cross field and fundamental outcomes. These findings will impact on the master craftsman package where course content, assessment strategies and evaluation systems may need to be reviewed and modified accordingly.
• The envisaged master craftsman qualification is viewed as resulting in a qualification at a NQF 5 level. This level falls within the higher education band and as such the unit standards for the master craftsman qualification would need to withstand intellectual scrutiny at this level. The demands for qualifications at the NQF 5 level are currently predominantly of a formal tertiary educational nature which are still dominated by course content and a supply-led mindset. How these qualifications are to be expressed in an outcomes-based language and be demand-led would flavour the intellectual scrutiny of the unit standards of the master craftsman qualification and may well require aspects of the curriculum to be modified and further developed.

• The debates on the emerging National Qualification Framework model will in itself impact on the master craftsman curriculum especially with regard the quality assurance and monitoring aspects of the providers of the Master Craftsman Programme. The quality assurance and monitoring requirements and regulations that evolve out of the current debate could influence the entire evaluation sub-system of the master craftsman curriculum. Because the basic tenet of this study for developing the master craftsman curriculum was systems theory didactics any change in the evaluation sub-system will interact dynamically and affect the other sub-systems of the curriculum.

• There is no doubt that the master craftsman curriculum that resulted from this study will in future be subjected to continuous change and development as technology and the environment in which organisations and companies in the Printing, Newspaper and Packaging Industries operate change. The curriculum continuum phases of preparing, planning and designing the curriculum, producing the curriculum package, adopting the curriculum, implementing and institutionalisation of the curriculum and new pressure for change and innovation will be ongoing as long as the need for a master craftsman level exists in the Printing, Newspaper and Packaging Industries.

9.5 RECOMMENDATIONS

In order to implement and validate the master craftsman curriculum that has been developed it is essential that the pilot study and the standards generating project take place as soon as possible. In order for the pilot study to commence the process of advocacy, accreditation and associated training of teachers and instructors in the 'Outcomes-Based Train the Trainer Course' and would need to be implemented as soon as possible.
Funding from the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) would have to be sourced and agreed upon for the launch of the Master Craftsman Programme and the pilot study. The funding would have to include the following critical areas:

- The cost of modularisation and presentations of the 'Outcomes-Based Train the Trainer Course' for prospective teachers and instructors who will deliver modules of the Master Craftsman Programme.

- The list of modularisation and presentation of the 'Evaluation Practices for Assessor Course' for prospective teachers and instructors who will assess outcomes for modules of the Master Craftsman Programme.

- A cash grant system that would be needed to compensate companies for the lost time, registration fees, examination fees, travel and accommodation costs for learners in the master craftsman pilot study who attend live classes.

- The costs that would be incurred by the project review committee which would entail travel and accommodation for committee members.

- The costs for developing and administering the distance learning options for the TT4, TT5 and TT6 theoretical modules.

- The funding requirements for the master craftsman standards generating process need to be secured and approved.

- The costs for the master craftsman advocacy project including accreditation visits, and other administration costs that may be incurred need to be funded.

In order to ensure that the pilot study is well-structured and managed master craftsman learnership contracts would need to be drawn up so that the learner, provider, sponsoring company and the Printing, Newspaper and Packaging Industries Education and Training Board (PNPIETB) have clear understanding of their respective obligations and duties whilst the contracts of learning are in force.
Whilst the Standards Generating Process is taking place it is recommended that close contact be established and maintained with the developments in the National Qualification Framework model especially with regards to the field and sub-field in which the master craftsman qualification may fall as well as with the current discussions on level descriptors and the quality assurance roles and functions of education and training qualifications authorities. The registration of the Standards Generating Body with SAQA would secure the involvement of specific National Standards Body, thus securing involvement for the emerging National Qualification Framework model.

9.6 FINAL OVERVIEW

This study was prompted by the Printing, Newspaper and Packaging Industries who had identified a need for a master craftsman level and desired a suitable vocational education and training programme to develop the existing artisan and craftsman to the master craftsman level. The master craftsman was viewed by the industries as the custodian of the craft of printing and the point of introduction of new technology. This vague definition did not allude to the competencies, skills and underpinning knowledge that a master craftsman would need so as to meet the industries’ expectations. What was apparent was that the industries desired a vocational education and training programme which would incorporate features of the competency based modular training system currently in use in the industries for artisan and craftsman vocational education and training. The master craftsman level was also seen as an extension of the career path in the industries to enable artisan and craftsman further learning opportunities and extend the lifelong learning opportunities for employees in the industries.

The impact of the national debate on the transformation of education and training embodied in the emerging National Qualification Framework (NQF) model had to be taken cognisance of this study. The paradigm shift from a supply-driven to a demand-led education and training system with certain underpinning principles and an emphasis on learning outcomes epitomised in applied competence language complicated the study. Furthermore the evolving NQF model is being achieved through an iterative process where the eventual end product is at this stage abstract and conceptual rather than practical and concrete which in itself added to the complexity of the problem for this study. Notwithstanding the above the master craftsman curriculum that was developed incorporated the following features:

- The master craftsman curriculum falls under the guise of vocational education and training and as such is orientated to the needs of the printing, newspaper and packaging economic sector.
Curriculum was approached from a systems perspective where systems didactics had congruence with the current competency based modular training system used in the industries as well as the adaptive systems dynamics in which organisations and companies in the Printing, Newspaper and Packaging Industries operate.

Establishing a detailed competency profile for the master craftsman and a taxonomy of competencies skills and underpinning knowledge including critical cross field and fundamental skills proved an invaluable tool for enabling the curriculum development process to proceed.

Using models such as the Twente Model and the Design Model of a Competency Based Modular Training System for the Printing, Newspaper and Packaging Industries facilitated the development of course content for the Master Craftsman Programme.

The learner target group for the master craftsman curriculum being adults entailed careful consideration of the andragogic didactic principles applicable to this learner target group. These principles coupled with the outcomes-based approach of the emerging National Qualification Framework model were incorporated in the curriculum design process. Learning outcomes were emphasised by means of a competence application orientated approach where learning objectives and evaluation strategies were designed to ensure applied competencies were measured in the world of work at a qualified worker standard.

The master craftsman curriculum that was developed would remain an academic study unless implementation takes place. A pilot study to facilitate the adoption, implementation and institutionalisation of the master craftsman curriculum formed part of the study and is a phase of the curriculum continuum.

The debate on curriculum development is ongoing. Viewing curriculum from a systems perspective in a discrete field such as vocational education and training does not necessarily consider broad social issues but is confined to the needs of a specific economic sector. Economic sectors by their very nature are introspective and despite operating as adaptive systems in a dynamic environment their objective is to survive and prosper. Broader social issues and the social constructs demanded by a specific society are not an issue and may well be neglected. The tenets of the emerging National Qualification Framework model may well be the answer in bringing social issues into the vocational education and training field. However, as has been suggested before
the actual qualifications arrived at with the NQF model may result in qualifications determining the nature and structure of jobs in the world of work.

Looking beyond the master craftsman curriculum and the vocational education and training milieu in which it operates and the correctness or otherwise of its lack of social construct, an area which could offer even greater challenges and debate is curriculum and curriculum development for the global society. The global society is rapidly evolving where competitiveness, economic and political survival are intertwined. The morality of intellectual capacity and capability equated with competitive edge and having price tags attached coupled with the impact of exponential knowledge growth generation and the need to access and use such knowledge efficiently and effectively, could conceivably lead to a new and innovative approach to curriculum and curriculum development which could be universal and all encompassing.
BIBLIOGRAPHY


3. BELLIS, I. 1995. Integrating Education and Training is the result of 'two into one' less or more? Paper delivered at a conference on Transforming Tertiary Education. Johannesburg: Rand Afrikaans University.


<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
   Curricula and Lifelong Education. Paris: Imprimeries Rénnies de Chambery UNESCO.


22. EMPLOYMENT COMMISSION OF QUEENSLAND. 1981. 


   Innovators have to meet the Challenge of Change. Printing Impressions. 25 (11): 32-34. Los Angeles: Primimp.


27. FIELD, G.G. 1996. 
   Printing Production Management. New York: Graphic Arts Publishing Inc.


42. ISAACS, S. 1997

Update on Progress made by the South African Qualifications Authority (SAQA) and the Implications for ETD. Johannesburg: Education, Training and Development Forum.


44. JESSUP, G. 1990.


<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>


108. UTS. 1993. Writing Competency Based Standards and Assessment in Competency Based Training. Sydney: University of Technology. Faculty of Education.


TECHNO-ECONOMIC
FORECAST
QUESTIONNAIRE
1997
TECHNO-ECONOMIC FORECAST QUESTIONNAIRE 1997

September 1996
(Return Date: 30 October 1996)
PREAMBLE

As an industry it is necessary to keep ourselves in line with the changing environment in which we operate. The vocational education and training field in South Africa is undergoing rapid changes and by the end of October a Green Paper on Human Resource Development will be published by the Department of Labour. This HRD Green Paper will, in essence, be the forerunner to an HRD Bill which should be ready for the legislature by mid 1997.

The new HRD bill will replace the existing Manpower Training Act and will dramatically influence how the Printing, Newspaper and Packaging Industry approaches its vocational education and training questions.

The envisaged HRD Bill will attempt on a macro-scale to co-ordinate through sector feedback where the state can place its energies with regards funding for emerging vocational education and training opportunities as well as assisting in re-training where employees are threatened with job redundancy due to economic or technological reasons.

As a sector, the Printing, Newspaper and Packaging Industries, through the PNPTB, would have to identify the human resource development needs for the short, medium and long term. The mechanism to achieve this is via an annual techno-economic forecast for vocational education and training. This forecast will expand on the training needs surveys that both the PNPTB and SAPC conducted in the past.

SCOPE OF THE FORECAST

The proposed forecast is to be based on a questionnaire as well as interviews with as many of the roles players as is feasible. The questionnaire is aimed at identifying the following:


2. What technological developments are taking place and what developments are anticipated in the short to medium terms and how these will impact on vocational education and training in the industries.

3. Highlight the immediate human resource development needs identifying short and medium term skills shortages as well as identifying the type of training needed for new emerging technologies.

4. In response to a perceived industry need the skills and attributes for a multi-skilled master craftsman level are to be identified with a view to developing a suitable curriculum so as to facilitate further human resource development in the industries.
SURVEY QUESTIONNAIRE FOR THE SEPTEMBER 1996
TECHNO-ECONOMIC FORECAST FOR
VOCATIONAL EDUCATION AND TRAINING IN THE
PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES
IN SOUTH AFRICA

GENERAL REQUEST

1. A survey of this nature needs careful consideration and if possible a multi-input response where experts within an organisation can be called on to answer the questions.

2. Your company details are affixed to the survey should the details be incorrect please make the necessary adjustments.

3. A self addressed envelope is included with the survey, please return the survey by 30 October 1996.

4. All questionnaires returned are treated in the strictest confidence and the final report on the techno-economic forecast will be of a general nature only. All participants will receive a full report.

5. Mark the appropriate answer with an X.

SECTION 1: COMPANY DETAILS

COMPANY ADDRESS

ANY APPLICABLE CHANGES FOR ADDRESS

1. Person answering this survey: .................................................................

2. Position in the organisation/company: ..................................................

3. Total number of employees:

<table>
<thead>
<tr>
<th></th>
<th>0 - 25</th>
<th>26 - 50</th>
<th>51 - 100</th>
<th>101 - 400</th>
<th>401 - 600</th>
<th>601+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Please indicate, within the broad categories listed, the nature of your business. Note your business could cover a number of categories.

| 4.1  | Bag Making                   |
| 4.2  | Book Manufacture             |
| 4.3  | Can and End Making           |
| 4.4  | Carton Making                |
| 4.5  | Commercial Printer           |
| 4.6  | Continuous Stationery         |
| 4.7  | Manufacturing                |
| 4.8  | Corrugated Board Printing    |
| 4.9  | Corrugated Board Manufacturing|
| 4.10 | Flexible Packaging           |
| 4.11 | In-Plant printing            |
| 4.12 | Laminating                   |
| 4.13 | Magazine Publishing          |
| 4.14 | Metal Decorating             |
| 4.15 | Newspaper                    |
| 4.16 | Repro House                  |
| 4.17 | Roll Label Manufacturing     |
| 4.18 | Screen Printing              |
| 4.19 | Security Printing            |
| 4.20 | Stationery and Envelope       |

4.21 Others not specified: ____________________________________________

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

4.22 General comments: ____________________________________________

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
5. Please indicate what functions in the Printing, Newspaper and Packaging Industries are carried out within your company:

| ORIGINATION                  | 1. Electronic Composing                                |
|                              | 2. Electronic Origination (DTP)                        |
|                              | 3. Photo-Lithography                                   |
|                              | 4. Photo-Gravure Cylinder Processing                   |
| TRANSFER MEDIA               | 1. Gravure Cylinders                                   |
|                              | 2. Lithographic Plates                                  |
|                              | 3. Engraving plates (Embossing: Letterpress)           |
|                              | 4. Photopolymer Plates (Cyrel, Jet)                    |
|                              | 5. Screens                                              |
| METHODS OF PRINTING          | 1. Flexography                                         |
|                              | 2. Gravure                                              |
|                              | 3. Letterpress                                          |
|                              | 4. Lithography                                         |
|                              | 5. Screen Printing                                      |
| CONVERSION METHODS           | 1. Corrugated Board Manufacturing                      |
|                              | 2. Corrugated Board Printing & Finishing                |
|                              | 3. Carton Making                                       |
|                              | 4. Metal Decorating                                    |
|                              | 5. Envelope and Stationery Adjuster                    |
|                              | 6. Can and End Making                                  |
| FINISHING                    | 1. Mechanical Bookbinding                              |
|                              | 2. Craft Bookbinding                                   |
| MECHANICIAN                  | 1. Printers’ Mechanic                                  |
|                              | 2. Envelope Adjuster                                   |
| ELECTRICIAN                  | 1. Macro (Heavy)                                       |
|                              | 2. Micro (Electronics)                                 |

Others not specified: __________________________________________

________________________________________________________________
________________________________________________________________
________________________________________________________________
SECTION 2: ECONOMIC INDICATORS

In this section please indicate how you perceive trading conditions are and will be in the short to medium term using a rating scale where, 0 represents worst case, 5 represents levels as at present and 10 represents a positive growth.

2.1 MACHINERY UTILISATION

2.1.1 Present Machinery Utilisation: Sept - Oct 1996 as opposed to Sept - Oct 1995:

<table>
<thead>
<tr>
<th>Deteriorating utilisation</th>
<th>Static</th>
<th>Improving utilisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

No Movement

2.1.2 Projected Machinery Utilisation 1997:

<table>
<thead>
<tr>
<th>Deteriorating utilisation</th>
<th>Static</th>
<th>Improving utilisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

No Movement

2.1.3 Projected Machinery Utilisation 1998:

<table>
<thead>
<tr>
<th>Deteriorating utilisation</th>
<th>Static</th>
<th>Improving utilisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

No Movement

Any specific comments you feel may be necessary:
2.2 LABOUR UTILISATION

2.2.1 Present Labour Utilisation: Sept - Oct 1996 as opposed to Sept - Oct 1995:

Deteriorating utilisation Static Improving utilisation

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No Movement

2.2.2 Projected Labour Utilisation 1997:

Deteriorating utilisation Static Improving utilisation

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No Movement

2.2.3 Projected Labour Utilisation 1998:

Deteriorating utilisation Static Improving utilisation

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No Movement

Any specific comments you feel may be necessary:
2.3 SALES FORECAST

This section is difficult to predict, however you are encouraged to at least predict on items 2.3.1 and 2.3.2.

2.3.1 Short term sales forecast (3 to 6 months):

<table>
<thead>
<tr>
<th>Deteriorating sales</th>
<th>Static</th>
<th>Improved sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

No Movement

2.3.2 Sales forecast for 1997:

<table>
<thead>
<tr>
<th>Deteriorating sales</th>
<th>Static</th>
<th>Improved sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

No Movement

2.3.3 Medium term sales forecast for 1998:

<table>
<thead>
<tr>
<th>Deteriorating sales</th>
<th>Static</th>
<th>Improved sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

No Movement

2.3.4 Long term sales forecast for 1999:

<table>
<thead>
<tr>
<th>Deteriorating sales</th>
<th>Static</th>
<th>Improved sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

No Movement

Any specific comments you feel may be necessary:
2.4 TRAINING/HUMAN RESOURCE NEEDS

2.4.1 Based on your economic forecasts with regards plant and labour utilisation and projected sales forecast, do you envisage training new apprentices/trainees in 1997/1998/1999 in the trades currently designated within the industry

2.4.2 If "YES", please indicate the estimated numbers of new intake you anticipate against the discipline in the grid below:

<table>
<thead>
<tr>
<th>TRADE</th>
<th>1997</th>
<th>1998</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photo-Gravure Cylinder Processing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic Composition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photo-Lithography</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process Engraving</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic Origination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous Stationery Machine Minding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexographic Machine Minding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gravure Machine Minding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letterpress Machine Minding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lithography (Paper Section)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lithography (Metal Decorating)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roll Label Machine Minding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotary Offset Machine Minding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screen Printing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bag Making</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carton Making</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotary Printing &amp; Re-Reeling - Flexography</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotary Printing &amp; Re-Reeling - Gravure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrugated Board Manufacturing Machine Minding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrugated Board Printing and Finishing Machine Minding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can Making</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End Making</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laminating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bookbinding Craft/Cutting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bookbinding Mechanised Cutting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruling/Cutting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printers' Mechanic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stationery and Envelope Machine Adjuster</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printers' Electrician</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A = APPRENTICE
T = TRAINEE
SECTION 3: TECHNOLOGY CHANGES

3.1 ORIGINATION

3.1.1 In the Origination area do you foresee introducing new technology or updating existing technology in 1997. (e.g. Introducing DTP or obtaining new software)

[YES | NO]

If “NO” please answer from 3.1.11 onward.

If “YES” how will this impact on existing technology and on your skills requirements? Please answer 3.1.2 onward.

3.1.2 Which skills, of existing staff, will become redundant?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

3.1.3 How many existing employees will be effected by skills redundancy?

[ ]

3.1.4 Do you plan to retrain employee in new technology?

[YES | NO]

3.1.5 What type of training would you require for your employee retraining?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

3.1.6 Who do you believe should supply this retraining?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
3.1.7 If new technology will lead to creating more job opportunities, what new skills will be necessary?

________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________

3.1.8 How many new employees will be needed to handle this technology?

________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________

3.1.9 What type of training would be required?

________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________

3.1.10 Who do you believe should supply this training?

________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________

3.1.11 If no new technology or updating of existing technology is contemplated for 1997, are you envisaging changing in

| 1998 | YES | NO |
| 1999 | YES | NO |

3.1.12 If “YES”, could it result in existing skills redundancy?

| YES | NO |

OR

3.1.13 If “NO”, could it result in increased employment opportunities?

| YES | NO |
3.2 TRANSFER MEDIA

3.2.1 In the area of transfer media do you foresee introducing new technology or updating existing technology in 1997. (e.g. Introducing new platemaking equipment, equipment to make gravure cylinders)

If "NO" please answer from 3.2.11 onward.

If "YES" how will this impact on existing technology and on your skills requirements? Please answer 3.2.2 onward.

3.2.2 Which skills, of existing staff, will become redundant?

_____________________________________________________________

_____________________________________________________________

_____________________________________________________________

_____________________________________________________________

3.2.3 How many existing employees will be effected by skills redundancy?

3.2.4 Do you plan to retrain employee in new technology?

3.2.5 What type of training would you require for your employee retraining?

_____________________________________________________________

_____________________________________________________________

_____________________________________________________________

_____________________________________________________________

3.2.6 Who do you believe should supply this retraining?
3.2.7 If new technology will lead to creating more job opportunities, what new skills will be necessary?

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

3.2.8 How many new employees will be needed to handle this technology?

____________________________________________________________________________________

3.2.9 What type of training would be required?

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

3.2.10 Who do you believe should supply this training?

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

3.2.11 If no new technology or updating of existing technology is contemplated for 1997, are you envisaging changing in

| 1998 | YES | NO |
| 1999 | YES | NO |

3.2.12 If "YES", could it result in existing skills redundancy?

| YES | NO |

OR

3.2.13 If "NO", could it result in increased employment opportunities?

| YES | NO |
3.3 METHODS OF PRINTING

3.3.1 In the area of printing do you foresee introducing new technology or updating existing technology in 1997. (e.g. Introducing new computerised printing machines, etc)

[YES | NO]

If "NO" please answer from 3.3.11 onward.

If "YES" how will this impact on existing technology and on your skills requirements? Please answer 3.3.2 onward.

3.3.2 Which skills, of existing staff, will become redundant?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

3.3.3 How many existing employees will be effected by skills redundancy?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

3.3.4 Do you plan to retrain employee in new technology?

[YES | NO]

3.3.5 What type of training would you require for your employee retraining?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

3.3.6 Who do you believe should supply this retraining?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
3.3.7 If new technology will lead to creating more job opportunities, what new skills will be necessary?

3.3.8 How many new employees will be needed to handle this technology?

3.3.9 What type of training would be required?

3.3.10 Who do you believe should supply this training?

3.3.11 If no new technology or updating of existing technology is contemplated for 1997, are you envisaging changing in 1998?

<table>
<thead>
<tr>
<th>1998</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.3.12 If “YES”, could it result in existing skills redundancy?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OR

3.3.13 If “NO”, could it result in increased employment opportunities?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.4 FINISHING

3.4.1 In the Finishing area do you foresee introducing new technology or updating existing technology in 1997. (e.g. Introducing fully automatic computer-controlled sewing machines and/or fully automatic computer-controlled gang stitching machines, etc)

YES | NO

If “NO” please answer from 3.4.11 onward.

If “YES” how will this impact on existing technology and on your skills requirements? Please answer 3.4.2 onward.

3.4.2 Which skills, of existing staff, will become redundant?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

3.4.3 How many existing employees will be effected by skills redundancy?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

3.4.4 Do you plan to retrain employee in new technology?

YES | NO

3.4.5 What type of training would you require for your employee retraining?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

3.4.6 Who do you believe should supply this retraining?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
3.4.7 If new technology will lead to creating more job opportunities, what new skills will be necessary?

_________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________
SECTION 4: MULTI-SKILLING NEEDS

INTRODUCTION

As technology advances and the demands for manufacturers to become world-class, a need has been expressed to identify the skills a master craftsman in the Printing, Newspaper and Packaging Industries would require. This multi-skilling also enables the artisan in the industry to further develop this skills base and obtain a master craftsman level which is beyond that of an artisan.

With this in mind, there is a three part questionnaire which follows:

In each matrix, identify with an X which skills you identify as being essential or nice-to-have or not necessary for a master craftsman.

4.1 TECHNICAL TRADE RELATED SKILLS

Please mark your appropriate choice accordingly:

<table>
<thead>
<tr>
<th>ORIGINATION</th>
<th>ESSENTIAL</th>
<th>NICE-TO-HAVE</th>
<th>NOT NECESSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>★ basic computer literacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>★ able to use a DTP packaging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>★ understand computer control equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>★ familiar with Electronic proofing systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>★ understand imposition schemes for magazines, newspapers and book work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>★ able to prepare different flats e.g. pos/neg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>★ able to operate step-and-repeat equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>★ understand camera operating systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>★ understand principles of sensitometry and densitometry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>★ understand use of colour and light in the industry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>★ able to operate a scanner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>★ able to do colour corrections</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TRANSFER MEDIA

★ basic understanding of the operations of preparing transfer media for the different processors

<p>|★ basic understanding of the operations of preparing transfer media for the different processors | ESSENTIAL | NICE-TO-HAVE | NOT NECESSARY |</p>
<table>
<thead>
<tr>
<th>METHODS OF PRINTING</th>
<th>ESSENTIAL</th>
<th>NICE-TO-HAVE</th>
<th>NOT NECESSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>✪ skill to run 1, 2 and 4 colour process illustrations especially sheet fed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✪ basic understanding of machine proofing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✪ basic understanding of web presses e.g. newspaper, magazine, book work, Continuous Stationery, Roll Label, Flexography and Gravure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✪ basic understanding of all preventative maintenance procedures of the above procedures</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONVERSION METHODS</th>
<th>ESSENTIAL</th>
<th>NICE-TO-HAVE</th>
<th>NOT NECESSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>✪ basic understanding of converting paper to board, metal into cans and tubes, decorating, printing and finishing of the above</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✪ skill to convert paper into envelopes and stationery</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FINISHING</th>
<th>ESSENTIAL</th>
<th>NICE-TO-HAVE</th>
<th>NOT NECESSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>✪ basic understanding of all Bindery methods e.g. hard cover, soft cover lines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✪ understanding of craft method of binding e.g. library, flexible, stationery, etc</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MECHANICIAN</th>
<th>ESSENTIAL</th>
<th>NICE-TO-HAVE</th>
<th>NOT NECESSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>✪ know all legislative acts pertaining to safety and maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✪ skill to do workshop layout</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✪ basic pneumatic skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✪ basic hydraulic skills</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ELECTRICIAN</th>
<th>ESSENTIAL</th>
<th>NICE-TO-HAVE</th>
<th>NOT NECESSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>✪ basic understanding of electrical safety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✪ basic understanding of electronics used in machine control systems</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please identify any other skills you believe are essential or nice-to-have:  

__________________________________________

__________________________________________

__________________________________________

__________________________________________
4.2 OTHER TECHNICAL SKILLS

Please mark your appropriate choice accordingly:

<table>
<thead>
<tr>
<th>1. QUALITY ASSURANCE SKILLS</th>
<th>ESSENTIAL</th>
<th>NICE-TO-HAVE</th>
<th>NOT NECESSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 general knowledge of quality assurance principles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2 general knowledge of statistical quality assurance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3 knowledge of ISO 9002 type quality assurance systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4 Skill to implement a quality assurance system</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. TECHNICAL TRAINING SKILLS</th>
<th>ESSENTIAL</th>
<th>NICE-TO-HAVE</th>
<th>NOT NECESSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 knowledge of competency based training systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 training needs analysis skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3 instructional design skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4 presentation skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5 evaluation skills</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. PRODUCTIVITY IMPROVEMENT SKILLS</th>
<th>ESSENTIAL</th>
<th>NICE-TO-HAVE</th>
<th>NOT NECESSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 basic method improvement skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2 basic time measurement skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3 integrated work study skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4 advanced industrial engineering skills</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. COSTING AND ESTIMATING SKILLS</th>
<th>ESSENTIAL</th>
<th>NICE-TO-HAVE</th>
<th>NOT NECESSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 basic principles of costing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2 basic principles of estimating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3 printing estimating skills</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please identify any other skills you believe are essential or nice-to-have:

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________
4.3 NON-TECHNICAL SKILLS

Please mark your appropriate choice accordingly:

<table>
<thead>
<tr>
<th></th>
<th>ESSENTIAL</th>
<th>NICE-TO-HAVE</th>
<th>NOT NECESSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. CHANGE MANAGEMENT SKILLS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 understand the principles of change management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2 understand the impact of product changes on work process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3 understand the impact of process changes on work flow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4 skills to implement changes in product and work processes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2. PRODUCTION CONTROL SKILLS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 understand basic business budgetary systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 understand principles of production planning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3 understand principles of production progress systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4 able to monitor and control production through the use of production control systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3. TEAM DEVELOPMENT SKILLS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 team building skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2 team activity planning skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3 team maintenance skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4. INTERPERSONAL SKILLS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 discipline and grievance handling skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2 negotiating skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3 counselling skills (identify and minimise interpersonal conflict)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.4 basic communication skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.5 advanced multi-media communication skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.6 customer care skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ESSENTIAL</td>
<td>NICE-TO-HAVE</td>
<td>NOT NECESSARY</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td><strong>5. INFORMATION SYSTEMS SKILLS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1 basic knowledge of business information skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2 information evaluation skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.3 diagnostic/problem solving and decision making skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.4 effective meeting skills for problem solving and decision making</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6. SKILLS TO CONTRIBUTE TO THE RECRUITMENT AND SELECTION OF PERSONNEL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.1 skills to define future personnel requirements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2 interviewing skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7. BUSINESS MANAGEMENT SKILLS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1 basic principles of business management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.2 principles of small business management</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please identify any other skills you believe are essential or nice-to-have:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

YOUR CO-OPERATION IS MUCH APPRECIATED.

Yours in training

[Signature]

D L THOMAS
Executive Director
PROJECT PLANNING MATRIX
### OBJECTIVES

**1. PROJECT GOAL:**
A contribution is made to the formalisation of a national qualifications framework which ensures access, legitimacy, progression, portability and recognition of prior learning within the national qualification system.

**2. PROJECT OBJECTIVE:**
Master craftsman standards and level descriptor is available for a qualification system/framework.

### RESULTS

**3.1** Stakeholder buy-in is established.

Have national representation of each of the eight groups of stakeholders as identified in the participant analysis (PtA) within two months after start up of project.

**3.2** Organisational infrastructure is in place.

- A project management team is appointed within two months after project approval.
- A steering committee is democratically elected within one month after stakeholder buy-in has been established.
- A task team co-ordinating body is democratically elected within one month after stakeholder buy-in has been established.
- Representative task teams are constituted according to agreed criteria within one month after stakeholder buy-in has been established.

### PROJECT PLANNING MATRIX

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>OBJECTIVELY VERIFIABLE INDICATORS</th>
<th>MEANS OF VERIFICATION</th>
<th>ASSUMPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. PROJECT GOAL:</strong></td>
<td>Master craftsman standards are compatible and integrated into the NQF.</td>
<td>Standards are documented, available and integrated into the various NQF levels.</td>
<td>• Organised business and organised labour will buy into the need for national master craftsman standards. • A nationally accepted model that has defined level descriptors, is in place.</td>
</tr>
<tr>
<td><strong>2. PROJECT OBJECTIVE:</strong></td>
<td>Nationally accepted master craftsman standards are available within thirteen months after the start up of the project.</td>
<td>• Standards are documented. • Delivery date of the final standards document. • Signatures of approval by eight major groups of stakeholders.</td>
<td></td>
</tr>
</tbody>
</table>

---

**3. RESULTS**

**3.1** Stakeholder buy-in is established.

- Attendance list. Comparison of list to participant analysis (PtA).
- Job specification vs selected candidate.
- Name list of representatives vs PtA and selection criteria.
- Name list of members vs PtA and selection criteria.
- List of selected task team members vs competence criteria and competence evaluation.

**3.2** Organisational infrastructure is in place.

- A project management team is appointed within two months after project approval.
- A steering committee is democratically elected within one month after stakeholder buy-in has been established.
- A task team co-ordinating body is democratically elected within one month after stakeholder buy-in has been established.
- Representative task teams are constituted according to agreed criteria within one month after stakeholder buy-in has been established.
<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>OBJECTIVELY VERIFIABLE INDICATORS</th>
<th>MEANS OF VERIFICATION</th>
<th>ASSUMPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3 Nationally accepted standard setting model is developed.</td>
<td>Nationally acceptable model to all stakeholders aligned with NQF model and philosophy established within two months after formation of the steering committee.</td>
<td>Documented models are verified. Process write up of standard setting process.</td>
<td>A national standards setting model and process can be developed within the NQF framework.</td>
</tr>
<tr>
<td>3.4 Master craftsman standards are developed.</td>
<td>• Standards are developed in a transparent and consultative way according to the accepted model. • Standards are aligned with international benchmarks.</td>
<td>• Documented contributions. • Documented standard setting model. • Documented benchmark standards.</td>
<td></td>
</tr>
<tr>
<td>3.5 Stakeholders acceptance of master craftsman standards.</td>
<td>The consultation process ensures that all stakeholders with established standards have presented them for inclusion in the standard setting process at the commencement of the process. Draft standards are available according to nationally accepted framework within two months after task teams are operational. Draft standards are circulated to all stakeholders for evaluation to contribute to the final standards within four months after the task teams are operational. The final draft is accepted by all master craftsman standard stakeholders within six months after the task teams are operational.</td>
<td>Documented evidence of standards for submission. • Documented draft standards. • Documented framework (model and process). Documented evidence of circulation of draft standards completed with names, addresses and dates when draft standards were circulated. Documented and accepted final draft standards available.</td>
<td></td>
</tr>
<tr>
<td>OBJECTIVES</td>
<td>OBJECTIVELY VERIFIABLE INDICATORS</td>
<td>MEANS OF VERIFICATION</td>
<td>ASSUMPTIONS</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------</td>
<td>----------------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>4. ACTIVITIES RE: STAKEHOLDER BUY-IN</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **4.1 Do participation analysis** | • Participation analysis completed according to PtA procedure within two weeks after commencement of project.  
• Participant list representative of eight major stakeholder groups as identified according to PtA. | • Participation analysis document. | • Participant list. |
| **4.2 Design buy-in survey structure.** | • Survey structure identifies needs at the various NQF levels within two weeks after the commencement of the project.  
• Survey identifies benefits, obstacles design and conceptualisation of standard setting process within two weeks after the commencement of the project. | • Structure of the survey document. | • Structure of the survey document. |
| **4.3 Conduct a survey to clarify management and organisation paradigms.** | • Survey conducted professionally according to designed structure and including comprehensive sample of stakeholders within two months after the design of the survey structure. | • Documented findings with list of respondents. | |
### PROJECT PLANNING MATRIX

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>OBJECTIVELY VERIFIABLE INDICATORS</th>
<th>MEANS OF VERIFICATION</th>
<th>ASSUMPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6 Obtain buy-in by:</td>
<td>• The master craftsman standards setting conference is representative of all stakeholders and addresses interests, fears and benefits of national standards and ensure buy-in within two weeks after the formulation of the buy-in strategy.</td>
<td>• Documented and approved minutes of conference.</td>
<td>• The conference will be representative of all the identified stakeholders from the PTA.</td>
</tr>
<tr>
<td>4.6.1 Inviting stakeholders to national supervisory and management standard setting conference.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.6.2 Setting concepts and benefits.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.6.3 Outlining potential stakeholders.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### RE: ORGANISATIONAL INFRASTRUCTURE

<p>| 5.1 Select project management team                                           | The project management team is efficient according to specification.                           |                                                                                        |                                                                                                 |
| 5.1.1 Project planning group define project facilitator job specification.  |                                                                                                  |                                                                                        |                                                                                                 |
| 5.1.2 Project planning group recruits project facilitator.                  |                                                                                                  |                                                                                        |                                                                                                 |
| 5.1.3 PNPIETB provides secretariat facility to enable project facilitator to function. |                                                                                                  |                                                                                        |                                                                                                 |
| 5.2 Democratically select a steering committee.                             | Representatives are democratically elected by stakeholders within one month after stakeholder buy-in has been established. |                                                                                        |                                                                                                 |
| 5.2.1 Stakeholders define selection criteria for steering committee.        | • Selection criteria ensure democratic selection and representation of members during national conference. |                                                                                        |                                                                                                 |
| 5.2.2 Stakeholders nominate and select members for the steering committee.  | • Members of steering committee nominated and selected according to specified criteria during national conference. |                                                                                        |                                                                                                 |</p>
<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>OBJECTIVELY VERIFIABLE INDICATORS</th>
<th>MEANS OF VERIFICATION</th>
<th>ASSUMPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2.3 Steering committee defines operating criteria and guidelines.</td>
<td>• Operating guidelines are defined by members of the steering committee on the basis of consensus at the end of the conference.</td>
<td>• Publication of guidelines.</td>
<td></td>
</tr>
<tr>
<td>5.3 Select task team co-ordinating body.</td>
<td>A competent and democratically selected task team co-ordinating body is established within one month after the formation of the steering committee.</td>
<td>• Proven track records of members are available.</td>
<td>• Selection criteria verified and available.</td>
</tr>
<tr>
<td>5.3.1 Convene stakeholders to select task team co-ordinating body.</td>
<td>• Selection criteria ensure democratic selection and representation of members during national conference.</td>
<td>• List of nominees.</td>
<td>• List of nominees and participation analysis.</td>
</tr>
<tr>
<td></td>
<td>• Members of task team co-ordinating body nominated and selected to specific criteria during national conference.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Selection criteria ensure democratic selection and representative of members during national conference.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.3.2 Task team co-ordinating body articulates own operating criteria and guidelines.</td>
<td>• Task team co-ordinating body operating guidelines are defined by members of that body by the end of the national standard setting conference.</td>
<td>• Documented operating guidelines.</td>
<td></td>
</tr>
<tr>
<td>5.3.3 Stakeholders define criteria for selection of task team members.</td>
<td>• Selection criteria ensure democratic selection and representation of task team members by the end of the national standards setting conference.</td>
<td>• List of selection criteria.</td>
<td></td>
</tr>
<tr>
<td>OBJECTIVES</td>
<td>OBJECTIVELY VERIFIABLE INDICATORS</td>
<td>MEANS OF VERIFICATION</td>
<td>ASSUMPTIONS</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------</td>
<td>----------------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>5.3.4</strong> Decide on format and content of task team member training.</td>
<td>• Format and content of task team member training ensures learning by doing and competence in standard setting processes according to nationally accepted model and framework within two weeks of the first steering committee meeting.</td>
<td>• Training specifications.</td>
<td></td>
</tr>
<tr>
<td><strong>5.3.5</strong> Define operating criteria/guidelines for task teams.</td>
<td>• Task team operating guidelines are defined by task team members in conjunction with the task team co-ordinating body within two weeks of the first task team co-ordinating body meeting.</td>
<td>• Documented guidelines.</td>
<td></td>
</tr>
<tr>
<td><strong>5.4</strong> Select task teams and ensure that they are operational.</td>
<td>• Task team members are competent standard setting procedures and processes.</td>
<td>• Training plan available.</td>
<td>• Nomination of final selection name lists available (minutes of meeting available).</td>
</tr>
<tr>
<td><strong>5.4.1</strong> Stakeholders identify representative task team members according to set criteria.</td>
<td>• Task team members nominated and selected according to specified criteria by the end of the national standard setting conference.</td>
<td>• Training schedule available.</td>
<td>• List of selected members.</td>
</tr>
<tr>
<td>OBJECTIVES</td>
<td>OBJECTIVELY VERIFIABLE INDICATORS</td>
<td>MEANS OF VERIFICATION</td>
<td>ASSUMPTIONS</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------</td>
<td>-----------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>5.4.2 Train task team members in the model and guidelines.</td>
<td>• Master craftsman standards task team members competent in standard setting process according to nationally accepted model and framework within one month after format and content of task team member training have been agreed.</td>
<td>• Documented competence evaluation results.</td>
<td></td>
</tr>
<tr>
<td>RE: STANDARD SETTING MODEL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.1 Key stakeholders to identify standard setting experts in their industries/disciplines, etc.</td>
<td>• Standard setting experts are identified on the basis of competence and track record in standard setting processes by the end of the conference.</td>
<td>• A list of a team of experts.</td>
<td></td>
</tr>
<tr>
<td>6.2 Standard setting experts to design model/language/concepts.</td>
<td>• Model aligned with NQF model and philosophy within one month after the formation of the steering committee.</td>
<td>• Documented model.</td>
<td></td>
</tr>
<tr>
<td>6.3 Achieve wider consensus in terms of model.</td>
<td>• Input made by stakeholders.</td>
<td>• Distribution list to whom model was sent for input.</td>
<td></td>
</tr>
<tr>
<td>• Model incorporates all stakeholder contributions.</td>
<td></td>
<td>• Amended model documented.</td>
<td></td>
</tr>
<tr>
<td>• Model clearly describes the logic that distinguishes between the various NQF levels (levels 4 &amp; 5 in particular).</td>
<td></td>
<td>• Documented model.</td>
<td></td>
</tr>
<tr>
<td>• Consensus is achieved within one month after standard setting experts have designed the model.</td>
<td></td>
<td>• Documented evidence of acceptance of model.</td>
<td></td>
</tr>
<tr>
<td>RE: MASTER CRAFTSMAN STANDARDS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1 Obtain and integrate master craftsman standards from stakeholders.</td>
<td>• The consultation process ensures that stakeholders with established standards have presented them for inclusion in the standard setting process at the commencement of the process.</td>
<td>• Documented standards contributions.</td>
<td></td>
</tr>
</tbody>
</table>
### PROJECT PLANNING MATRIX

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>OBJECTIVELY VERIFIABLE INDICATORS</th>
<th>MEANS OF VERIFICATION</th>
<th>ASSUMPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.2 Compare local and international information concepts.</td>
<td>Standards aligned with international benchmark standards competed within two months of task teams being operational.</td>
<td>Documented international benchmark standards.</td>
<td></td>
</tr>
<tr>
<td>7.3 Task teams produce draft standards documents.</td>
<td>Nationally equitable standards in line with international standards benchmark as well as the NQF within two months of task teams being operational.</td>
<td>Documented draft standards according to NQF levels.</td>
<td></td>
</tr>
<tr>
<td>7.4 Integrate various task team documents into single draft</td>
<td>Draft document reflecting the various NQF levels for supervisory and management standards within one month of completion of individual task team contributions.</td>
<td>Documented integrated draft standards according to NQF levels.</td>
<td></td>
</tr>
</tbody>
</table>

### RE: ACCEPTANCE OF STANDARDS

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 Circulate draft standards to all stakeholders for evaluation to contribute to the final standards within two months after completion of the draft document.</td>
<td>The consultation process ensures participation of all stakeholders.</td>
<td>Documented evidence of draft standards completed with names, addresses and dates when draft was circulated.</td>
</tr>
<tr>
<td>8.2 Gain stakeholder acceptance of draft master craftsman standards.</td>
<td>The final draft is accepted by all master craftsman standards stakeholders within one month after the circulation of draft standards document.</td>
<td>Minutes of national stakeholder standards acceptance conference.</td>
</tr>
</tbody>
</table>
RESOURCE PLANNING MATRIX
## RESOURCE PLANNING MATRIX

<table>
<thead>
<tr>
<th>ACTIVITY NO</th>
<th>TABLE OF ACTIVITY</th>
<th>NEED FOR PERSONNEL (NATURE &amp; QUANTITY)</th>
<th>MATERIAL NEEDS (INCLUDING CONFERENCE VENUES, OFFICE, ACCOMMODATION, ETC.)</th>
<th>COST ASSUMPTIONS (RANDS)</th>
<th>NON-MONETARY INPUT OF PROJECT PARTICIPANTS (ORGANISATION, TRANSPORT, TIME, ETC.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Participation analysis</td>
<td>4 people from the PNPETB.</td>
<td>Sensitising programme for attracting as many stakeholders to buy into the project and associated costs for surveys.</td>
<td>R6 000</td>
<td>P = R40 000 M = R 6 400</td>
</tr>
<tr>
<td>1.2</td>
<td>Design of buy-in survey</td>
<td>NIL</td>
<td></td>
<td></td>
<td>Transport to venue, organisation and logistic arrangements and incidental consumables.</td>
</tr>
<tr>
<td>1.3</td>
<td>Conduct survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>Identify stakeholders</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>Utilise buy-in strategy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-Total 1.1 to 1.5</td>
<td></td>
<td></td>
<td></td>
<td>R6 000</td>
<td>R46 000</td>
</tr>
<tr>
<td>ACTIVITY NO</td>
<td>TABLE OF ACTIVITY</td>
<td>NEED FOR PERSONNEL (NATURE &amp; QUANTITY)</td>
<td>MATERIAL NEEDS (INCLUDING CONFERENCE VENUES, OFFICE, ACCOMMODATION, ETC.)</td>
<td>COST ASSUMPTIONS (RANDS)</td>
<td>NON-MONETARY INPUT OF PROJECT PARTICIPANTS (ORGANISATION, TRANSPORT, TIME, ETC.)</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------</td>
<td>----------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EXTERNALLY FUNDED NRB</td>
<td>OWN CONTRIBUTION</td>
<td>EXTERNALLY FUNDED NRB</td>
<td>OWN CONTRIBUTION</td>
</tr>
<tr>
<td>1.6</td>
<td>Stakeholder conference which includes activities 2.2, 2.2.1, 2.2.2, 2.2.3</td>
<td>4 people from the PNPIETB.</td>
<td>Conference facilities PLUS accommodation for some disadvantaged delegates</td>
<td>Subsidised conference facilities (PNPIETB)</td>
<td>M = R86 400</td>
</tr>
<tr>
<td>2.2.1</td>
<td>Stakeholders define selection criteria for steering committee.</td>
<td>NIL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2.2</td>
<td>Nominate and select members of steering committee.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2.3</td>
<td>Steering committee to define operating criteria</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-Total 1.6 to 2.2.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACTIVITY NO</td>
<td>TABLE OF ACTIVITY</td>
<td>NEED FOR PERSONNEL (NATURE &amp; QUANTITY)</td>
<td>MATERIAL NEEDS (INCLUDING CONFERENCE VENUE, OFFICE, ACCOMMODATION, ETC.)</td>
<td>COST ASSUMPTIONS (RANDS)</td>
<td>NON-MONETARY INPUT OF PROJECT PARTICIPANTS (ORGANISATION, TRANSPORT, TIME, ETC.)</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------</td>
<td>----------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
<td>-------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EXTERNALLY FUNDED NSB</td>
<td>OWN CONTRIBUTION</td>
<td>EXTERNALLY FUNDED NSB</td>
<td>OWN CONTRIBUTION</td>
</tr>
<tr>
<td>3.1 Standard setting expert identification</td>
<td>5</td>
<td>Secretariat</td>
<td>2 day workshop</td>
<td>Subsidised workshop and secretariat</td>
<td></td>
</tr>
<tr>
<td>3.2 Standard setting experts to design model/language/concepts</td>
<td>5</td>
<td>Secretariat</td>
<td>5 day workshop</td>
<td>Subsidised workshop and secretariat</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### RESOURCE PLANNING MATRIX

<table>
<thead>
<tr>
<th>ACTIVITY NO</th>
<th>TABLE OF ACTIVITY</th>
<th>NEED FOR PERSONNEL (NATURE &amp; QUANTITY)</th>
<th>MATERIAL NEEDS (INCLUDING CONFERENCE VENUES, OFFICE, ACCOMMODATION, ETC.)</th>
<th>COST ASSUMPTIONS (RANDS)</th>
<th>NON-MONETARY INPUT OF PROJECT PARTICIPANTS (ORGANISATION, TRANSPORT, TIME, ETC.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EXTERNALLY FUNDED NSB</td>
<td>OWN CONTRIBUTION</td>
<td>EXTERNALLY FUNDED NSB</td>
<td>OWN CONTRIBUTION</td>
</tr>
<tr>
<td>2.3.1</td>
<td>Convene stakeholders to select task team coordinating body includes activities 2.3, 2.3.1, 2.3.2, 2.3.3, 2.3.4 and 2.4.1</td>
<td>Project facilitator</td>
<td>Conference facilities</td>
<td>Subsidised Conference facilities (PNPITB)</td>
<td>M = R24 000</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>2.3 to 2.4.1</td>
<td>4</td>
<td>R24 000</td>
<td>R43 400</td>
<td></td>
</tr>
<tr>
<td>ACTIVITY NO</td>
<td>TABLE OF ACTIVITY</td>
<td>NEED FOR PERSONNEL (NATURE &amp; QUANTITY)</td>
<td>MATERIAL NEEDS (INCLUDING CONFERENCE VENUES, OFFICE, ACCOMMODATION, ETC.)</td>
<td>COST ASSUMPTIONS (RANDS)</td>
<td>NON-MONETARY INPUT OF PROJECT PARTICIPANTS (ORGANISATION, TRANSPORT, TIME, ETC.)</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------</td>
<td>----------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>------------------------------------------------------------------</td>
</tr>
<tr>
<td>2.4.2</td>
<td>Task team training.</td>
<td>Project facilitator and task teams</td>
<td>Conference facilities</td>
<td>Subsidised conference facilities (PNPITB)</td>
<td>M = R10 350</td>
</tr>
<tr>
<td></td>
<td>PLUS 3 research workers</td>
<td></td>
<td></td>
<td></td>
<td>P = R90 000</td>
</tr>
<tr>
<td>4.1</td>
<td>Task teams setting standards in terms of activities 4.1 to 4.4</td>
<td>Project facilitator and task teams</td>
<td>Conference facilities</td>
<td>Subsidised conference facilities (PNPITB)</td>
<td>M = R43 200</td>
</tr>
<tr>
<td>4.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R143 550</td>
<td>R209 900</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACTIVITY NO</td>
<td>TABLE OF ACTIVITY</td>
<td>NEED FOR PERSONNEL (NATURE &amp; QUANTITY)</td>
<td>MATERIAL NEEDS (INCLUDING CONFERENCE VENUES, OFFICE, ACCOMMODATION, ETC.)</td>
<td>COST ASSUMPTIONS (RANDS)</td>
<td>NON-MONETARY INPUT OF PROJECT PARTICIPANTS (ORGANISATION, TRANSPORT, TIME, ETC.)</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------</td>
<td>---------------------------------------</td>
<td>-------------------------------------------------</td>
<td>----------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EXTERNALLY FUNDED NSB</td>
<td>OWN CONTRIBUTION</td>
<td>EXTERNALLY FUNDED NSB</td>
<td>OWN CONTRIBUTION</td>
</tr>
<tr>
<td>2.1</td>
<td>Select project management team</td>
<td>Project facilitator</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>to to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2</td>
<td>Stakeholder acceptance of draft supervisory and management standards (S&amp;M)</td>
<td>Office and office equipment</td>
<td>-</td>
<td>PNPITB subsidises office space and supply telephone lines</td>
<td>M = R10 575</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PROVIDER QUALITY ASSESSMENT AND ACCREDITATION SYSTEM
A QUALITY ASSESSMENT SYSTEM FOR PROVIDERS OF VOCATIONAL EDUCATION AND TRAINING IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

PREAMBLE

As a sector, the Printing, Newspaper and Packaging Industries place a high value on effective, efficient and cost beneficial vocational education and training. The sector has a philosophy of placing its emphasis on vocational education and training outcomes in terms of prescribed competencies and as such places rewards on output rather than input and is demand driven.

In order for the sector to ensure an effective and efficient vocational education and training intervention at all levels, a suitable quality assessment instrument is needed for all providers of vocational education and training to the sector.

Quality Assurance for vocational education and training forms one of the functions of a Sector Education and Training Authority (SETA). The function is the same as those specified for ETQA’s by SAQA.

The Quality Assurance system for the Printing, Newspaper and Packaging sector encompasses the following:

- It uses the Quality Assurance principles linked to productivity issues.
- It evaluates outcomes-based vocational education and training interventions where curriculum is outcomes-based and modular in nature and competence is the outcome goal.

THE QUALITY ASSURANCE / ACCREDITATION MATRIX SYSTEM

The Quality Assurance and Accreditation Matrix System is based on aspects of the PNPIETB accreditation process, the code of practice for vocational education and training within the sector and the requirements of the South African Qualifications Authority Act.

The system is based on evaluating:

- The facilities and resources: human resources, goal setting, use of technology.
- The course in question: curriculum and instruction.
- The lecturer/trainer: curriculum and instruction.
- The business capacity: marketing, customer service, quality-based management.

Each quality element identifies the conforming requirements (criteria), the measurement strategy (evaluation system), and the cost of non conformance as well as the accreditation requirements.
Quality Element - Human Resources

Each provider employee is a valuable resource to the organisation. The provider will work with all employees to enable them to meet the pre-established requirements for their jobs. Employees at all levels will be provided the opportunity to interact with each other in such a way that mutual respect for one another and for the organisation is achieved.

The provider ensures a quality work environment which is supportive of people doing their jobs right the first time in meeting the vocational educational and training of their customers, the Printing, Newspaper and Packaging Industries of South Africa. The organisational climate fosters an attitude of respect for one another and provides opportunities to maximise every employee’s potential. Such an environment is safe, clean, technologically current, comfortable, and attractive for vocational educational and training administrative functions.

The provider employees are expected to display behaviour that creates a positive attitude, enthusiasm, loyalty and a commitment to the goals, the objectives and the mission of the institution. Employee commitment, dedication, and hard work will, in turn, enable the provider to meet its goals, objectives and mission.

<table>
<thead>
<tr>
<th>Conforming Requirements</th>
<th>Measurement Strategy</th>
<th>Cost of Non-Conformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Employees meet the minimum qualifications for the position they currently hold. Qualifications for each position are periodically reviewed and updated as duties and responsibilities change.</td>
<td>PNPIETB Accreditation.</td>
<td>Certification audit exception. Cost of reclassification and upgrading, e.g. RPL.</td>
</tr>
<tr>
<td>2. Professional growth, career planning and promotional preparedness opportunities are clearly defined. Information and support are made available to employees. A professional development plan exists for each employee in the organisation.</td>
<td>Growth Budget. Performance Management Evaluation. Professional Growth Plan.</td>
<td>Vocational education and training program discontinuance. Decrease in productivity of individual.</td>
</tr>
<tr>
<td>3. All recruitment, written materials, media materials and human interaction are free of discrimination.</td>
<td>Affirmative Action Plan. Instructional Audit by PNPIETB.</td>
<td>Loss of cash grants and monies due to not meeting certain mandated requirements, if found to be discriminatory.</td>
</tr>
<tr>
<td>5. Recognition of an employee whose efforts meet and/or exceed the job requirements is immediate, individual and flexible.</td>
<td>Performance Management Evaluation. Climate survey - several questions address this issue. Recognition Plan.</td>
<td>Decrease in productivity of individual. Loss of feeling of being part of the organisation. Higher employee turnover.</td>
</tr>
<tr>
<td>7. Employee work space is attractive and is: professionally designed and maintained. appealing to the needs of the customers. colour co-ordinated and aesthetically compatible with surroundings.</td>
<td>Organisational Climate Survey. Instructional Audit by PNPIETB.</td>
<td>Personnel Problems: - Morale-Counselling. - Physical-Insurance Costs. - Absenteeism. Higher employee costs of recruitment and training.</td>
</tr>
</tbody>
</table>
8. An ongoing safety inspection is conducted by a provider safety committee to identify potential problems.

9. Employees display initiative on the job that includes suggesting new ideas to improve personal and provide performance and individual job satisfaction.

10. Flexibility which includes the ability and willingness to readily accept and adapt to changes in procedures or assignments is shown by employees.

11. Employees have a positive attitude and enthusiasm on the job, including co-operation with all other employees, customers, and the general public and working toward the implementation of goals and policies with an openness to constructive criticism.

12. Employees display the ability to effectively communicate-listen, understand and be understood both in written and oral communication and to express themselves in a positive manner.

13. Managers actively promote teamwork and problem solving within their immediate unit and beyond in order to develop higher levels of job satisfaction.

**QUALITY ELEMENT CURRICULUM AND INSTRUCTION**

**Quality Element - Curriculum and Instruction**

The purpose of curriculum is to prepare individuals for success in the world of work, both now and in the future. Our broad-based, flexible curriculum format provides an overall instructional strategy for developing each individual learner’s potential.

The goal is to have each program course developed into a complete plan for instruction with measurable objectives geared toward helping the individual master a set of specific, relevant competencies that are based on the current and future requirements of the workplace.

In recognising the variety of learners' learning styles, as well as the variety of instructional styles within the instructional process, the PNPIETB supports competency-based instruction utilising current technology both in the traditional group-based setting and in independent self-paced study.
Since the instructional process revolves around the individual learner, the provider provides appropriate services to support learners during the vocational education and training process as this is essential for their success. Additional counselling should be available to identify and serve the needs of the traditional, non-traditional and special needs of learners throughout their learning period, including a spectrum of job placement activities before and after completing the vocational education and training provided by the provider, i.e. as per learnership structures.

<table>
<thead>
<tr>
<th>Conforming Requirements</th>
<th>Measurement Strategy</th>
<th>Cost of Non-Conformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. There is a complete plan for learning for each course or module in a program.</td>
<td>Instructional Audit by PNPIETB.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>a. Curriculum is based on competencies needed for the person to perform successfully on the job.</td>
<td>Instructional Audit by PNPIETB.</td>
<td>Learner and employer costs.</td>
</tr>
<tr>
<td>b. Course prerequisites are clearly defined.</td>
<td>Program Development as per CBMT.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>c. Curriculum and course requirements are consistent for content, textbook, materials/tools.</td>
<td>Learner Satisfaction Survey.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>d. Learners may receive advanced standing and/or credit for past experiences in education in occupations related to the program.</td>
<td>PNPIETB Evaluation. Learner Satisfaction Survey. Counsellor Survey.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>e. An optimum class size is established for each course.</td>
<td>Instructional Audit by PNPIETB. Learner Satisfaction Survey.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>f. Examinations have criteria with a direct link to the performance objectives.</td>
<td>Instructional Audit by PNPIETB. External Exam by PNPIETB.</td>
<td>Employer costs.</td>
</tr>
<tr>
<td>2. Programs are structured to permit multiple-entry and multiple-exit.</td>
<td>Certification on Skill Lines and within the NQF.</td>
<td>Irrelevant Training costs.</td>
</tr>
<tr>
<td>3. Instructors use industry standard technology placing emphasis on leading edge technology as identified.</td>
<td>Instructional Audit by PNPIETB. Employer Survey. Placement Records.</td>
<td>Learner and employer costs.</td>
</tr>
<tr>
<td>4. Each program will provide some type of work experience related to the learner’s training.</td>
<td>Instructional Audit by PNPIETB. Evaluation by PNPIETB.</td>
<td>Learner and employer costs.</td>
</tr>
<tr>
<td>5. Instructors use a variety of teaching techniques to meet the unique needs of the learner.</td>
<td>Instructional Audit by PNPIETB. Learner Satisfaction Survey.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>6. Services to support learner success are accessible and effective.</td>
<td>Learner Satisfaction Survey.</td>
<td>Learner costs. Loss of funding.</td>
</tr>
<tr>
<td>7. Curriculum and instruction is customised for individual businesses to assist them with their productivity and profitability.</td>
<td>Requirements of customer contract by Marketing Instructional Audit by PNPIETB.</td>
<td>Employer costs. Retraining costs.</td>
</tr>
<tr>
<td>8. There are formal articulation and/or transfer credit agreements.</td>
<td>Instructional Audit by PNPIETB. Evaluation by PNPIETB.</td>
<td>Learner costs. Employer costs.</td>
</tr>
<tr>
<td>9. Learners are aware of expectations for each course through a syllabus, attendance and safety requirements.</td>
<td>Vocational Education and Training System.</td>
<td>Learner costs.</td>
</tr>
<tr>
<td>10. Instructors conform to establish time lines. a. Classes start and end on time. b. Grades are submitted promptly. c. Records are updated daily.</td>
<td>Learner Satisfaction Survey. PNPIETB Accreditation.</td>
<td>Learner costs.</td>
</tr>
</tbody>
</table>
QUALITY ELEMENT
GOAL SETTING

Quality Element – Goal Setting

The provider should use a strategic planning process which encourages and provides opportunities for participation at all levels in the organisation to include both short- and long-range plans that are consistent with the directions of the institution. Planning is used as the cornerstone for establishing goals, operational plans and individual management objectives with research being used to solidify that framework. An important factor is the necessity to link the strategic planning process with the operational and budgetary process. The purpose of this linkage is to properly reflect resource allocation.

<table>
<thead>
<tr>
<th>Conforming Requirements</th>
<th>Measurement Strategy</th>
<th>Cost of Non-Conformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The provider's current mission and purpose are clearly stated without ambiguous or confusing jargon.</td>
<td>Documentation of Review Plan.</td>
<td>Resources may be used for inappropriate activities.</td>
</tr>
<tr>
<td>2. There is a 3-year operational plan which contains strategic directions and includes the following elements:</td>
<td>Documentation of Review Plan Instructional Audit.</td>
<td>Resources may be used for inappropriate activities.</td>
</tr>
<tr>
<td>- Goal Setting.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Human Resources.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Curriculum and Instruction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Use of Technology.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Marketing.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Customer Service.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Quality-Based Manager.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. The needs of external customers are identified, prioritised and used to provide direction for the organisation/program/department.</td>
<td>Instructional Audits. Program Approval. Employer Survey as per Techno- Economic Survey by PNPIETB</td>
<td>High-cost, low-enrolment programs and customer complaints where customer needs are not being met. Employer costs.</td>
</tr>
<tr>
<td>4. Individuals at all levels in the organisation are involved in the planning process.</td>
<td>Climate Survey. Employee Satisfaction Survey. Instructional Audits by PNPIETB. PNPIETB Evaluation.</td>
<td>Poor staff morale, lack of support and commitment to the organisation. Increased grievances and labour unrest. Poor customer service.</td>
</tr>
<tr>
<td>5. Communication on operational planning is ongoing and flows upward, downward and across the organisation.</td>
<td>Climate Survey. Instructional Audits by PNPIETB. PNPIETB Evaluation and Accreditation. Advisory Committee Minutes.</td>
<td>Higher costs. Poor customer service.</td>
</tr>
<tr>
<td>6. The operational plan is the basis for the development of the budget.</td>
<td>Annual Budget. Instructional Audits by PNPIETB.</td>
<td>Goals and objectives in operational plan not met. Poor employee morale. Lack of customer satisfaction.</td>
</tr>
<tr>
<td>7. The planning process is continuous (year-round) and flexible to allow the organisation to be dynamic and responsive.</td>
<td>Budget Allocations. Staff Satisfaction Survey. Instructional Audits by PNPIETB. PNPIETB Evaluation.</td>
<td>Higher learner dropout rates. Poor employee morale. Higher employee turnover.</td>
</tr>
</tbody>
</table>
Quality Element – Use of Technology

Comprehensive use of technology is required at all levels at the provider. Relying on an effective system of technology use, competency-based instruction allows learners to proceed through at a pace considered consistent with their past experiences. Technology is used to assist in the management and instruction programs. Information processing systems which include functions related to instruction, administration and office computing are a part of everyday life.

<table>
<thead>
<tr>
<th>Conforming Requirements</th>
<th>Measurement Strategy</th>
<th>Cost of Non-Conformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Management units use technology and support services to effectively manage and produce concise reports, documents, communications and schedules.</td>
<td>Survey staff to find out if they: Are receiving the reports they need to manage effectively. Are getting the reports in a timely manner. Are using the reports to guide their action. Ensure that internally generated reports and communications are concise. Insist on short memos (no more than one page). Conduct interviews of staff to determine needs.</td>
<td>Paper costs. Employee costs of meetings where lengthy reports are presented. Costs of handling, reading, storing, etc., excessively long documents.</td>
</tr>
</tbody>
</table>

QUALITY ELEMENT MARKETING

Quality Element – Marketing

The provider marketing process aligns with the mission, goals and objectives of the provider in an accurate, effective and timely manner. Marketing permeates the entire organisation in all facets of employee, board and customer relations. The result is the development and refinement of an organisation image that is clear to external and internal publics.

<table>
<thead>
<tr>
<th>Conforming Requirements</th>
<th>Measurement Strategy</th>
<th>Cost of Non-Conformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A current, flexible tactical marketing plan is in place and is implemented throughout the provider. This plan includes plans to reach the following markets:</td>
<td>Number of business and industry contracts. Number of avocational course enrolment figures compared to previous year.</td>
<td>Loss of rands generated by contracts. Loss of tuition and training costs.</td>
</tr>
<tr>
<td>a. High school market.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. 25-54 year old market.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Business and industry training market.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Avocational and lifelong learning market.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. For each instructional and administrative unit, there is a current written marketing plan that supports the unit.</td>
<td>Instructional Audit by PNPIETB. Marketing Tactical Plan</td>
<td>Increased long-term provider marketing costs. Staff layoffs. Program discontinuance.</td>
</tr>
<tr>
<td>3. The perception of civil society toward provider is favourable.</td>
<td>Yearly Perception Research Study.</td>
<td>Increased long-term provider marketing costs.</td>
</tr>
</tbody>
</table>
Conforming Requirements | Measurement Strategy | Cost of Non-Conformance
--- | --- | ---
4. Internal and external customers, are satisfied with provider products and services. | Annual Employer Satisfaction Survey. Annual Learner Satisfaction Survey. | Increased long-term provider marketing costs. Cost of retraining.

QUALITY ELEMENT
CUSTOMER SERVICE

Quality Element - Customer Service

The key to the success of the provider is a satisfied customer.

The provider owes to current customers, graduates and potential customers to have and maintain a quality image. This image must be clearly stated and understood by all the provider employees.

A total organisational approach includes the following three points:

1. Customer-oriented "front line" employees.
2. Management that supports the "front line" employees.
3. Customer-friendly systems-designed for the convenience of the customers.

Customers include learners, staff, board members, visitors, employers, vendors, etc.

<table>
<thead>
<tr>
<th>Conforming Requirements</th>
<th>Measurement Strategy</th>
<th>Cost of Non-Conformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. All customers are greeted and served in a friendly and cordial manner.</td>
<td>Customer Satisfaction Surveys.</td>
<td>Loss of Customers.</td>
</tr>
<tr>
<td>2. All customers have opportunities to evaluate the instruction and services from the customer’s perspective.</td>
<td>Customer Satisfaction Surveys. Instructional Audits by PNPIETB.</td>
<td></td>
</tr>
<tr>
<td>3. All provider staff are continuously trained in all aspects of customer service from the customer’s perspective.</td>
<td>In-service program. In-service program evaluation data.</td>
<td></td>
</tr>
<tr>
<td>4. All customer complaints and concerns are handled quickly and efficiently via established processes.</td>
<td>File of grievances, reports, customer complaints. Suggestion box system.</td>
<td></td>
</tr>
<tr>
<td>5. All faculty and staff know and are trained on the scope of services available at the provider.</td>
<td>Orientation program. In-service program and evaluation data.</td>
<td></td>
</tr>
</tbody>
</table>
Conforming Requirements | Measurement Strategy | Cost of Non-Conformance
---|---|---
6. Every courtesy and support is given to internal customers, they in turn can give the best quality service to external customers. | Customer Satisfaction Surveys. | Loss of Customers. 
7. Customer service and satisfaction are continuously monitored, evaluated and measured in an effort toward constant improvement. | Satisfaction Surveys. Organisational Climate Surveys. | 
8. Each service department of the provider develops conforming requirements specific to the customers they serve. | List of Conforming Requirements in each department. Customer Satisfaction Surveys. | 

QUALITY ELEMENT
QUALITY-BASED MANAGER

Quality Element - Quality-Based Manager

Management at the provider is an ongoing, problem-solving leadership development process. A person who fulfils the management role in this organisation is first a coach and facilitator of people, second a manager of things and events. This person will establish and nurture a creative climate, built on trust, where all members of the team are self-motivated toward the continual success, satisfaction and improvement of employees, customers, self and organisation to fulfil the provider's mission.

<table>
<thead>
<tr>
<th>Conforming Requirements</th>
<th>Measurement Strategy</th>
<th>Cost of Non-Conformance</th>
<th>Benefits of Conformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Is accessible to co-workers.</td>
<td>To be determined by the team within defined time lines.</td>
<td>Workers will not change. Loss of creativity. Communication breaks down. Lack of growth. Organisation will not change. Loss of enthusiasm. Resentment. Frustration.</td>
<td>Increased opportunities for communication. Willingness to deal with real issues realistically. Ability to confront conflict. People are allowed to have differences and still function creatively. Time becomes available for everyone.</td>
</tr>
<tr>
<td>Conforming Requirements</td>
<td>Measurement Strategy</td>
<td>Cost of Non-Conformance</td>
<td>Benefits of Conformance</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------------</td>
<td>--------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Is sensitive and tuned in.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understand human behaviour.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Gives and accepts feedback.</td>
<td>To be determined by the team within defined time lines.</td>
<td>Continued game playing and “old boy” networks. Increased employee frustration. Loss of communication. Lack of growth and creativity. Reduced staff retention.</td>
<td>Clear expectations. Risks are able to be taken without fear of reprisal. Networks replace line-and-staff charts. Increased employee self-esteem. Growth occurs through coaching. Understanding. Increased flow of communication by all means, including face to face.</td>
</tr>
<tr>
<td>7. Plans ahead.</td>
<td>To be determined by the team within defined time lines.</td>
<td>Crisis management. Reactive vs. proactive planning. Deadlines are not met. Down time. Poor public relations.</td>
<td>Crises are anticipated. Contingency plans are in place. People are cross-trained. Long-range realistic planning. Clear goals and objectives. Process for solving problems is in place.</td>
</tr>
<tr>
<td>8. Confronts the need to improve as a leader/ motivator:</td>
<td>To be determined by the team within defined time lines.</td>
<td>Lack of personal and professional growth. Organisation will not change. Problems will not be solved. Atmosphere becomes stagnant.</td>
<td>Operates realistically. Resources and time for professional and personal development. Clear personal goals and values. Clear direction and commitment. Continued growth/stimulation.</td>
</tr>
<tr>
<td>Sets personal and professional goals. Professional growth oriented.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conforming Requirements</td>
<td>Measurement Strategy</td>
<td>Cost of Non-Conformance</td>
<td>Benefits of Conformance</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------</td>
<td>-------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>10. Delegates effectively.</td>
<td>To be determined by the team within defined time lines.</td>
<td>People don’t know what’s expected. Communication breaks down. Overloads. People’s talents are under or overtaxed.</td>
<td>Obstacles to drift removed. Independence encourages teamwork and reciprocal support of all members. Individual talents used to potential. Shared leadership and decision making.</td>
</tr>
</tbody>
</table>

**BIBLIOGRAPHY:**


QUESTIONNAIRE ON SOFT SKILLS COURSES IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES
QUESTIONNAIRE ON COURSES OR PROGRAMMES FOR SOFT SKILLS DEVELOPMENT IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES

Preamble:

As a follow up to the Techno-Economic forecast questionnaire of September 1996 and the resultant Sectorial Study Report of February 1997 a skills profile for the proposed Master Craftsman was developed. Certain skills were identified as being essential for the Master Craftsman and this questionnaire has the following objectives:

(a) To identify the nature and extent of the industries vocational, education and training initiatives for developing selected skills and competencies applicable to the Master Craftsman.
(b) To evaluate the content of the courses or programmes that have and are being used to develop the identified skills and competencies.

General Request

1. A survey of this nature needs careful consideration and if possible a multi-input response where experts within an organisation can be called on to answer the questions.
2. If your company details as affixed to the survey should be incorrect please make the necessary adjustments in Section 1 below.
3. A self-addressed envelope is included with the Questionnaire, please return the Questionnaire by July 1997.
4. All questionnaires returned together with any course or programme outline, syllabus or course notes are treated in the strictest confidence and none of the materials will be revealed or published. The information obtained will only be used to develop 'generic' courses or programmes.
5. Mark the appropriate answer with an X or furnish any information you may feel necessary and appropriate.

SECTION 1: COMPANY DETAILS

COMPANY ADDRESS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>COMPANY ADDRESS</th>
<th>ANY APPLICABLE CHANGES FOR ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Person answering this survey: ..............................................</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Position in the organisation/company: ......................................</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Total number of employees in the organisation/company:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 - 25</td>
<td>26 - 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

1.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

- The principles of change management. How to manage change. The change process, or implement change in an organisation?

1.2 If your answer to the above was yes please furnish the following information

1.2.1 The course or programmes title: __________________________________________________________

1.2.2 The duration in hours of the course or programme _______ hours.

1.2.3 Was the programme developed:  
   (a) internally
   (b) by a consultant or training provider

1.2.4 How was the course presented:  
   (a) in-house seminar
   (b) in-house workshop
   (c) off-site company seminar
   (d) off-site workshop
   (e) public seminar
   (f) public workshop
   (g) Other, please specify __________________________

1.2.5 How was the learning evaluated for the course?  
   (a) Competency test
   (b) Practical test
   (c) On-the-job project
   (d) Written test for knowledge
   (e) Other, please specify: __________________________

1.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

1.2.7 Any other comments you feel necessary on the course or programme: __________________________

__________________________________________________________

__________________________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

2.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following: 

How to implement product or process changes, the impact of product or process changes on work flow or introducing new product lines or production processes?

2.2 If your answer to the above was yes please furnish the following information

2.2.1 The course or programmes title: ________________________________

2.2.2 The duration in hours of the course or programme ____________ hours.

2.2.3 Was the programme developed: 
(a) internally
(b) by a consultant or training provider

2.2.4 How was the course presented: 
(a) in-house seminar
(b) in-house workshop
(c) off-site company seminar
(d) off-site workshop
(e) public seminar
(f) public workshop
(g) Other, please specify ___________________________

2.2.5 How was the learning evaluated for the course? 
(a) Competency test
(b) Practical test
(c) On-the-job project
(d) Written test for knowledge
(e) Other; please specify: ____________________________

2.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

2.2.7 Any other comments you feel necessary on the course or programme: ________________________________

_________________________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

3.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

- The principles of production planning, production planning in practice or production planning for the printer?

3.2 If your answer to the above was yes please furnish the following information

3.2.1 The course or programmes title: ______________________________________________________

3.2.2 The duration in hours of the course or programme ____________ hours.

3.2.3 Was the programme developed: (a) internally (b) by a consultant or training provider

3.2.4 How was the course presented: (a) in-house seminar (b) in-house workshop (c) off-site company seminar (d) off-site workshop (e) public seminar (f) public workshop (g) Other, please specify ___________________________

3.2.5 How was the learning evaluated for the course? (a) Competency test (b) Practical test (c) On-the-job project (d) Written test for knowledge (e) Other; please specify: __________________________

3.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

3.2.7 Any other comments you feel necessary on the course or programme: __________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

4.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

\[
\text{Production Control and progressing principles, processes, procedures or systems?}
\]

4.2 If your answer to the above was yes please furnish the following information

4.2.1 The course or programmes title: ________________________

4.2.2 The duration in hours of the course or programme ________ hours.

4.2.3 Was the programme developed: 
(a) internally
(b) by a consultant or training provider

4.2.4 How was the course presented:
(a) in-house seminar
(b) in-house workshop
(c) off-site company seminar
(d) off-site workshop
(e) public seminar
(f) public workshop

(g) Other, please specify _____________________________

4.2.5 How was the learning evaluated for the course?
(a) Competency test
(b) Practical test
(c) On-the-job project
(d) Written test for knowledge

(e) Other, please specify: _____________________________

4.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

4.2.7 Any other comments you feel necessary on the course or programme: _____________________________

________________________________________________________________________

________________________________________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

5.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

Budgeting principles and practices, how to formulate budgets or how to read and interpret budgets and budget reports?

5.2 If your answer to the above was yes please furnish the following information

5.2.1 The course or programmes title: ________________________ 

5.2.2 The duration in hours of the course or programme ____________ hours.

5.2.3 Was the programme developed: 
(a) internally
(b) by a consultant or training provider

5.2.4 How was the course presented: 
(a) in-house seminar
(b) in-house workshop
(c) off-site company seminar
(d) off-site workshop
(e) public seminar
(f) public workshop
(g) Other, please specify ___________________________ 

5.2.5 How was the learning evaluated for the course? 
(a) Competency test
(b) Practical test
(c) On-the-job project
(d) Written test for knowledge
(e) Other, please specify : ___________________________ 

5.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

5.2.7 Any other comments you feel necessary on the course or programme: ___________________________ 

______________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

6.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

The principles of team Development. How to form effective work teams. Team Building. How to maintain effective and efficient work teams or how to plan team activities for effectiveness?

6.2 If your answer to the above was yes please furnish the following information

6.2.1 The course or programmes title: ______________________________________________________

6.2.2 The duration in hours of the course or programme ______ hours.

6.2.3 Was the programme developed: (a) internally (b) by a consultant or training provider

6.2.4 How was the course presented: (a) in-house seminar (b) in-house workshop (c) off-site company seminar (d) off-site workshop (e) public seminar (f) public workshop (g) Other, please specify ____________________________

6.2.5 How was the learning evaluated for the course? (a) Competency test (b) Practical test (c) On-the-job project (d) Written test for knowledge (e) Other, please specify: ______________________________________________________

6.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

6.2.7 Any other comments you feel necessary on the course or programme: ____________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

7.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:  

**YES**  

**NO**

**Effective Communication Skills in the Work Place, how to communicate. English language communication skills or advanced communication skills?**

7.2 If your answer to the above was yes please furnish the following information

7.2.1 The course or programmes title: __________________________________________________________

7.2.2 The duration in hours of the course or programme ___________ hours.

7.2.3 Was the programme developed:  

(a) internally 

(b) by a consultant or training provider

7.2.4 How was the course presented:  

(a) in-house seminar 

(b) in-house workshop 

(c) off-site company seminar 

(d) off-site workshop 

(e) public seminar 

(f) public workshop 

(g) Other, please specify: __________________________________________________________

7.2.5 How was the learning evaluated for the course?  

(a) Competency test 

(b) Practical test 

(c) On-the-job project 

(d) Written test for knowledge 

(e) Other, please specify: __________________________________________________________

7.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

7.2.7 Any other comments you feel necessary on the course or programme: ____________________________

________________________________________________________________________________________

________________________________________________________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

8.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

Customer care processes or strategies. Customer orientation. How to satisfy customer needs. How to identify the customer or how to solve customer complaints and problems?

8.2 If your answer to the above was yes please furnish the following information

8.2.1 The course or programmes title:

8.2.2 The duration in hours of the course or programme ___________ hours.

8.2.3 Was the programme developed:  
(a) internally
(b) by a consultant or training provider

8.2.4 How was the course presented:  
(a) in-house seminar
(b) in-house workshop
(c) off-site company seminar
(d) off-site workshop
(e) public seminar
(f) public workshop
(g) Other, please specify_____________________

8.2.5 How was the learning evaluated for the course?  
(a) Competency test
(b) Practical test
(c) On-the-job project
(d) Written test for knowledge
(e) Other; please specify : _______________________

8.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

8.2.7 Any other comments you feel necessary on the course or programme: _______________________________

________________________________________________________________________________________

________________________________________________________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

9.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

Disciplinary code or Disciplinary procedures and grievance handling?

9.2 If your answer to the above was yes please furnish the following information

9.2.1 The course or programmes title: ________________________ 

9.2.2 The duration in hours of the course or programme ____________ hours.

9.2.3 Was the programme developed:  
(a) internally 
(b) by a consultant or training provider

9.2.4 How was the course presented:  
(a) in-house seminar 
(b) in-house workshop 
(c) off-site company seminar 
(d) off-site workshop 
(e) public seminar 
(f) public workshop 
(g) Other, please specify ____________________________ 

9.2.5 How was the learning evaluated for the course?  
(a) Competency test 
(b) Practical test 
(c) On-the-job project 
(d) Written test for knowledge 
(e) Other, please specify: ____________________________ 

9.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

9.2.7 Any other comments you feel necessary on the course or programme: ____________________________ 

__________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

10.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

How to negotiate effectively in business or in the industrial relations arena or negotiating skills development?

10.2 If your answer to the above was yes please furnish the following information

10.2.1 The course or programmes title: ____________________________________________

10.2.2 The duration in hours of the course or programme ____________ hours.

10.2.3 Was the programme developed: (a) internally 
         (b) by a consultant or training provider

10.2.4 How was the course presented: (a) in-house seminar 
         (b) in-house workshop 
         (c) off-site company seminar 
         (d) off-site workshop 
         (e) public seminar 
         (f) public workshop 
         (g) Other, please specify ____________________________ 

10.2.5 How was the learning evaluated for the course? (a) Competency test
         (b) Practical test
         (c) On-the-job project
         (d) Written test for knowledge
         (e) Other, please specify: ____________________________ 

10.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

10.2.7 Any other comments you feel necessary on the course or programme: ____________________________ 
____________________________________________________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

11.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

- Employee counselling skills development or how to reduce interpersonal conflict through counselling?

11.2 If your answer to the above was yes please furnish the following information

11.2.1 The course or programmes title: ____________________________

11.2.2 The duration in hours of the course or programme ________ hours.

11.2.3 Was the programme developed:

(a) internally
(b) by a consultant or training provider

11.2.4 How was the course presented:

(a) in-house seminar
(b) in-house workshop
(c) off-site company seminar
(d) off-site workshop
(e) public seminar
(f) public workshop

(g) Other, please specify ____________________________

11.2.5 How was the learning evaluated for the course?

(a) Competency test
(b) Practical test
(c) On-the-job project
(d) Written test for knowledge

(e) Other, please specify: ____________________________

11.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

11.2.7 Any other comments you feel necessary on the course or programme: ____________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

12.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

How to use and understand advances multi-media communication systems such as interactive video, CD-ROM, internet, etc.?

12.2 If your answer to the above was yes please furnish the following information

12.2.1 The course or programmes title: _____________________________

12.2.2 The duration in hours of the course or programme ____________ hours.

12.2.3 Was the programme developed: (a) internally

(b) by a consultant or training provider

12.2.4 How was the course presented: (a) in-house seminar

(b) in-house workshop

(c) off-site company seminar

(d) off-site workshop

(e) public seminar

(f) public workshop

(g) Other, please specify _____________________________

12.2.5 How was the learning evaluated for the course? (a) Competency test

(b) Practical test

(c) On-the-job project

(d) Written test for knowledge

(e) Other, please specify: _____________________________

12.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

12.2.7 Any other comments you feel necessary on the course or programme: _____________________________

__________________________________________________________________________________

__________________________________________________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

13.1  Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

   How to run effective meetings for problem solving or decision making?

13.2  If your answer to the above was yes please furnish the following information

13.2.1 The course or programmes title: ___________________________________________

13.2.2 The duration in hours of the course or programme ___________ hours.

13.2.3 Was the programme developed:
   (a) internally
   (b) by a consultant or training provider

13.2.4 How was the course presented:
   (a) in-house seminar
   (b) in-house workshop
   (c) off-site company seminar
   (d) off-site workshop
   (e) public seminar
   (f) public workshop
   (g) Other, please specify ___________________________

13.2.5 How was the learning evaluated for the course?
   (a) Competency test
   (b) Practical test
   (c) On-the-job project
   (d) Written test for knowledge
   (e) Other, please specify: __________________________________________

13.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

13.2.7 Any other comments you feel necessary on the course or programme: __________________________________________

__________________________________________

__________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

14.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

The principles of business information systems, understanding company information systems or management information systems?

14.2 If your answer to the above was yes please furnish the following information

14.2.1 The course or programmes title: ____________________________

14.2.2 The duration in hours of the course or programme ____________ hours.

14.2.3 Was the programme developed: (a) internally (b) by a consultant or training provider

14.2.4 How was the course presented: (a) in-house seminar (b) in-house workshop (c) off-site company seminar (d) off-site workshop (e) public seminar (f) public workshop (g) Other, please specify ____________________________

14.2.5 How was the learning evaluated for the course? (a) Competency test (b) Practical test (c) On-the-job project (d) Written test for knowledge (e) Other, please specify: ____________________________

14.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

14.2.7 Any other comments you feel necessary on the course or programme: __________________________________________

________________________________________

________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

15.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

- How to determine personnel needs, job analysis, manpower requirement forecasting or manpower planning?

15.2 If your answer to the above was yes please furnish the following information

15.2.1 The course or programmes title: ____________________________

15.2.2 The duration in hours of the course or programme _______________ hours.

15.2.3 Was the programme developed:
   (a) internally
   (b) by a consultant or training provider

15.2.4 How was the course presented:
   (a) in-house seminar
   (b) in-house workshop
   (c) off-site company seminar
   (d) off-site workshop
   (e) public seminar
   (f) public workshop
   (g) Other, please specify ____________________________

15.2.5 How was the learning evaluated for the course?
   (a) Competency test
   (b) Practical test
   (c) On-the-job project
   (d) Written test for knowledge
   (e) Other, please specify: ____________________________

15.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

15.2.7 Any other comments you feel necessary on the course or programme: ____________________________

____________________________________________________

____________________________________________________

____________________________________________________
Please indicate with an X the appropriate box and furnish as much detail as possible on the following:

16.1 Does or has your company or organisation run courses or programmes for your employees that may cover aspects of the following:

How to interview. Structured interviewing techniques. Interviewing principles or the interview process?

16.2 If your answer to the above was yes please furnish the following information

16.2.1 The course or programmes title: ________________________ 

16.2.2 The duration in hours of the course or programme ________ hours.

16.2.3 Was the programme developed: (a) internally

(b) by a consultant or training provider

16.2.4 How was the course presented: (a) in-house seminar

(b) in-house workshop

(c) off-site company seminar

(d) off-site workshop

(e) public seminar

(f) public workshop

(g) Other, please specify __________________________

16.2.5 How was the learning evaluated for the course? (a) Competency test

(b) Practical test

(c) On-the-job project

(d) Written test for knowledge

(e) Other; please specify :

16.2.6 Could you please enclose an outline of the course or programme and/or the course or programme syllabus and if possibly the course content in the form of candidate notes and any other information such as programme presenters administration documentation etc. Any documentation furnished will be returned to you.

16.2.7 Any other comments you feel necessary on the course or programme: ____________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
SURVEY RESULTS ON SOFT SKILLS COURSES IN THE PRINTING, NEWSPAPER AND PACKAGING INDUSTRIES
<table>
<thead>
<tr>
<th>Course or programme</th>
<th>Number of companies offering courses</th>
<th>Type of course/programme</th>
<th>Method of presentation</th>
<th>Average duration or range for the courses in hours</th>
<th>Evaluation methodology of courses or programmes</th>
<th>No. of courses or programmes submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Course or programme</td>
<td>Method of presentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>origins</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>In-house developed</td>
<td>Externally developed</td>
<td>In-House seminar</td>
<td>Off-site seminar</td>
<td>Public seminar</td>
</tr>
<tr>
<td>Principles of change Management (Non-production orientated)</td>
<td>22</td>
<td>nil</td>
<td>22</td>
<td>10</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Principles of Production Management</td>
<td>86</td>
<td>6</td>
<td>80</td>
<td>30</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>Planning and Control Principles &amp; Systems</td>
<td>47</td>
<td>18</td>
<td>29</td>
<td>28</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Production Control Systems including Production Progress procedures</td>
<td>56</td>
<td>36</td>
<td>20</td>
<td>42</td>
<td>14</td>
<td>nil</td>
</tr>
<tr>
<td>Business budgeting for non-financial employees</td>
<td>118</td>
<td>nil</td>
<td>118</td>
<td>48</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Team building</td>
<td>92</td>
<td>nil</td>
<td>92</td>
<td>51</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>Effective Communications</td>
<td>235</td>
<td>42</td>
<td>193</td>
<td>200</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>Customer Care Skills</td>
<td>192</td>
<td>90</td>
<td>102</td>
<td>90</td>
<td>80</td>
<td>22</td>
</tr>
<tr>
<td>Disciplinary Codes and Grievance Handling Procedures</td>
<td>250</td>
<td>215</td>
<td>35</td>
<td>200</td>
<td>40</td>
<td>nil</td>
</tr>
<tr>
<td>Negotiating Skills</td>
<td>58</td>
<td>nil</td>
<td>58</td>
<td>48</td>
<td>nil</td>
<td>10</td>
</tr>
<tr>
<td>Interpersonal Conflict handling skills ***</td>
<td>216</td>
<td>200</td>
<td>16</td>
<td>196</td>
<td>10</td>
<td>nil</td>
</tr>
<tr>
<td>Running Effective Meetings</td>
<td>110</td>
<td>20</td>
<td>90</td>
<td>92</td>
<td>8</td>
<td>nil</td>
</tr>
<tr>
<td>Personnel Requirements Planning</td>
<td>34</td>
<td>nil</td>
<td>34</td>
<td>30</td>
<td>nil</td>
<td>4</td>
</tr>
<tr>
<td>Interviewing Techniques</td>
<td>116</td>
<td>nil</td>
<td>116</td>
<td>83</td>
<td>23</td>
<td>nil</td>
</tr>
</tbody>
</table>

public or in-house

*** Effective communication competency evaluation took the form of written tests to specified criteria for being able to use communication forms or systems to a specified performance criteria

**** Criteria reference evaluation for effective communication were specified as part of the methodology used for the training or skills development

***** Interpersonal conflict handling skills generally fell under disciplinary and general industrial relations courses and programmes for skills development

SURVEY RESULTS FOR THE SOFT SKILL'S QUESTIONNAIRE FOR THE MASTER CRAFTSMAN