THE IMPLEMENTATION OF THE ELECTRONIC WHITEBOARD IN A PRIVATE HOSPITAL: CHALLENGES EXPERIENCED BY NURSES IN GAUTENG

by

PRAXEDIS PAIDAMOYO HWINDINGWI

submitted in accordance with the requirements for the degree of

MASTER OF PUBLIC HEALTH – WITH SPECIALISATION IN MEDICAL INFORMATICS

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: PROF Z Z NKOSI

NOVEMBER 2013
DEDICATION

In loving memory of my late father Barnabas Tazvishaya Mugamu who achieved great successes in his life and working career against all odds.
DECLARATION

I declare that THE IMPLEMENTATION OF THE ELECTRONIC WHITEBOARD IN A PRIVATE HOSPITAL: CHALLENGES EXPERIENCED BY NURSES IN GAUTENG is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.

30 November 2013

PRAXEDIS PAIDAMOYO HWINDINGWI DATE
I would like to acknowledge the following people and institutions for their support and contribution as I worked on this dissertation.

- PROF ZZ Nkosi, for her continued guidance, support and encouragement throughout the study journey.
- Andrew Rogers, for his support in facilitating the research.
- Jeananne Dunsdon, for granting permission to perform the study.
- The nursing staff at Flora Clinic, for volunteering to participate in the study.
- Elizabeth Munjeri, for granting permission to pilot test the data collection instrument.
- The nursing staff at the Brenthurst Clinic, for volunteering to test the data collection instrument.
- My husband Rutendo for always believing in me, sacrificing many hours and being supportive through this journey together with our three sons Joshua, Nathan and Arnold.
THE IMPLEMENTATION OF THE ELECTRONIC WHITEBOARD IN A PRIVATE HOSPITAL: CHALLENGES EXPERIENCED BY NURSES IN GAUTENG

STUDENT NUMBER: 3324-719-6
STUDENT: PRAXEDIS PAIDAMOYO HWINDINGWI
DEGREE: MASTER OF PUBLIC HEALTH
DEPARTMENT: HEALTH STUDIES, UNIVERSITY OF SOUTH AFRICA
SUPERVISOR: PROF ZZ NKOSI

ABSTRACT

The purpose of this study was to investigate challenges experienced by nurses in the use of electronic whiteboards at one private hospital in the Gauteng province in South Africa. The researcher had observed a continuation of use of the manual dry-erase patient whiteboards in parallel to the use of new the electronic whiteboards in a ward, yet the electronic whiteboard had been implemented to replace the manual system in order to improve service delivery. A descriptive, quantitative study design was used for the study, with n=83 participants being voluntarily surveyed at the hospital over a one month period. The major findings were that the new electronic whiteboards were not always online which necessitated a parallel manual system as backup. Secondly, 47.5% of the respondents requested more training on the whiteboards. A needs assessment to determine training requirements and further investigation into the frequent unavailability of the electronic whiteboards is recommended.

KEY CONCEPTS

Challenges, electronic whiteboard, hospitals, manual dry-erase whiteboard, nurses, technology, training
CHAPTER 1
ORIENTATION TO THE STUDY

1.1 INTRODUCTION ................................................................. 1
1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM ...2
1.2.1 The source of the research problem ........................................... 2
1.2.2 Background to the research problem .......................................... 3
1.2.3 Study location .......................................................................... 4
1.2.4 Implementation and training of the touchscreens ......................... 4
1.3 RESEARCH PROBLEM ...................................................... 5
1.4 AIM OF THE STUDY ........................................................... 5
1.4.1 Research purpose .................................................................. 5
1.4.2 Research objectives ............................................................... 5
1.5 SIGNIFICANCE OF THE STUDY ........................................ 5
1.6 DEFINITION OF TERMS ...................................................... 6
1.7 FOUNDATIONS OF THE STUDY .......................................... 7
1.7.1 Conceptual Framework .......................................................... 7
1.8 RESEARCH DESIGN AND METHOD ..................................... 9
1.9 ETHICAL CONSIDERATIONS ............................................ 9
1.9.1 Confidentiality and Anonymity ................................................ 10
1.10 SCOPE AND LIMITATIONS OF THE STUDY ......................... 11
1.11 STRUCTURE OF THE DISSERTATION ................................. 11
1.12 CONCLUSION ..................................................................... 11
CHAPTER 2
LITERATURE REVIEW

2.1 INTRODUCTION .................................................................................................12

2.2 CHARACTERISTICS OF THE SOCIO-POLITICAL CONTEXT - NURSING AND COMPUTERS IN AFRICA.................................................................12

2.3 CHARACTERISTICS OF THE ORGANISATION – A LOOK AT TRAINING AND EMPLOYEE DEVELOPMENT .................................................................13

2.4 CHARACTERISTICS OF THE ADOPTING PERSON (USER) ......................16

2.5 CHARACTERISTICS OF THE INNOVATION .............................................17

2.6 CONCLUSION .................................................................................................20

CHAPTER 3
RESEARCH DESIGN AND METHOD

3.1 INTRODUCTION .................................................................................................21

3.2 RESEARCH DESIGN .........................................................................................21

3.2.1 Descriptive design .........................................................................................21

3.2.2 Quantitative paradigm ....................................................................................21

3.3 RESEARCH METHOD .......................................................................................22

3.3.1 Sampling ......................................................................................................22

3.3.1.1 Population .................................................................................................22

3.3.1.2 Sampling ..................................................................................................22

3.3.1.2.1 Purposive sampling .................................................................................22
Table of contents

3.3.1.2.2 Convenience sampling ................................................................. 23
3.3.1.3 Ethical issues related to sampling ................................................. 23
3.3.2 Data Collection .............................................................................. 23
3.3.2.1 Development and testing of the data collection instrument ...... 23
3.3.2.1.1 Developing the questionnaire .................................................... 24
3.3.2.1.1 Testing the data collection instrument .................................... 25
3.3.2.2 Characteristics of the data collection instrument ...................... 28
3.3.2.3 Data collection process ................................................................. 29
3.3.2.4 Ethical considerations related to data collection ....................... 29
3.3.2.4.1 Seeking approval for research .................................................. 29
3.3.2.4.2 Informed consent ................................................................. 30
3.3.3 Data Analysis ............................................................................... 30
3.4 INTERNAL AND EXTERNAL VALIDITY OF THE STUDY .................... 31
3.4.1 Internal validity .............................................................................. 31
3.4.2 External validity ............................................................................. 31
3.5 LIMITATIONS OF THE STUDY DESIGN .......................................... 32
3.5.1 Data collection instrument – the questionnaire / survey .......... 32
3.5.2 Non-random sampling ................................................................. 32
3.6 CONCLUSION .................................................................................. 32

CHAPTER 4

ANALYSIS, PRESENTATION AND DESCRIPTION OF THE RESEARCH FINDINGS

4.1 INTRODUCTION .............................................................................. 33
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2</td>
<td>DATA MANAGEMENT AND ANALYSIS</td>
<td>33</td>
</tr>
<tr>
<td>4.3</td>
<td>RESEARCH RESULTS</td>
<td>33</td>
</tr>
<tr>
<td>4.3.1</td>
<td>Sample characteristics</td>
<td>33</td>
</tr>
<tr>
<td>4.3.1.1</td>
<td>Gender</td>
<td>33</td>
</tr>
<tr>
<td>4.3.1.2</td>
<td>Age</td>
<td>34</td>
</tr>
<tr>
<td>4.3.1.3</td>
<td>Ranking</td>
<td>34</td>
</tr>
<tr>
<td>4.3.1.4</td>
<td>Ward Speciality</td>
<td>35</td>
</tr>
<tr>
<td>4.3.2</td>
<td>Characteristics that affected nursing staff</td>
<td>36</td>
</tr>
<tr>
<td>4.3.2.1</td>
<td>Characteristics of the socio-political context</td>
<td>36</td>
</tr>
<tr>
<td>4.3.2.2</td>
<td>Characteristics of the Organisation</td>
<td>37</td>
</tr>
<tr>
<td>4.3.2.3</td>
<td>Characteristics of the adopting person (user)</td>
<td>37</td>
</tr>
<tr>
<td>4.3.2.3.1</td>
<td>Correlation between respondents requiring more training and those who found the touchscreens challenging to use</td>
<td>38</td>
</tr>
<tr>
<td>4.3.2.3.2</td>
<td>Correlation between respondents who found the touchscreens easy to use and those who required more training</td>
<td>39</td>
</tr>
<tr>
<td>4.3.2.3.3</td>
<td>Correlation between respondents who found the touchscreens easy to use and those who were used to working with computers</td>
<td>39</td>
</tr>
<tr>
<td>4.3.2.4</td>
<td>Characteristics of the innovation (the touchscreen)</td>
<td>40</td>
</tr>
<tr>
<td>4.3.2.5</td>
<td>Characteristics of the innovation strategy</td>
<td>42</td>
</tr>
<tr>
<td>4.4</td>
<td>CONCLUSION</td>
<td>42</td>
</tr>
</tbody>
</table>
CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION ................................................................. 43
5.2 RESEARCH DESIGN AND METHOD ........................................... 43
5.3 SUMMARY AND INTERPRETATION OF RESEARCH FINDINGS ...... 43
5.3.1 Factors that affected nursing staff when the electronic whiteboards were implemented in the wards ................................................................. 43
5.3.1.1 Touchscreens were not always online ........................................ 43
5.3.1.2 Respondents who needed more training ..................................... 44
5.3.1.3 Still using the old whiteboard method for other patient information .... 45
5.4 CONCLUSIONS ................................................................. 45
5.5 RECOMMENDATIONS .......................................................... 46
5.6 CONTRIBUTIONS OF THE STUDY ........................................... 46
5.7 SCOPE AND LIMITATIONS OF THE STUDY ............................... 47
5.8 CONCLUDING REMARKS ....................................................... 47

LIST OF REFERENCES ........................................................................... 48
<table>
<thead>
<tr>
<th>Table 4.1</th>
<th>Listing of questions that contained the characteristics of the adopting person (the user) in the study</th>
<th>37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 4.2</td>
<td>Correlation between respondents who found the touchscreens easy to use and those who found the touchscreen use challenging</td>
<td>39</td>
</tr>
<tr>
<td>Table 4.3</td>
<td>Correlation between respondents who found the touchscreens easy to use and those who were used to working with computers</td>
<td>39</td>
</tr>
<tr>
<td>Table 4.4</td>
<td>Listing of questions that contained the characteristics of the innovation in the study</td>
<td>40</td>
</tr>
<tr>
<td>Table 4.5</td>
<td>Touchscreen helps me do my job better</td>
<td>40</td>
</tr>
</tbody>
</table>
List of figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1.1</td>
<td>Photograph of electronic whiteboard installed with two additional manual dry-erase whiteboards on either side</td>
<td>2</td>
</tr>
<tr>
<td>Figure 1.2</td>
<td>A manual dry-erase patient board at a nurses' duty station</td>
<td>3</td>
</tr>
<tr>
<td>Figure 1.3</td>
<td>Map of South Africa, study location</td>
<td>5</td>
</tr>
<tr>
<td>Figure 1.4</td>
<td>Framework representing the innovation process and related categories of determinants</td>
<td>8</td>
</tr>
<tr>
<td>Figure 1.5</td>
<td>Internet population and penetration</td>
<td>9</td>
</tr>
<tr>
<td>Figure 1.6</td>
<td>Design, measurement and analysis</td>
<td>10</td>
</tr>
<tr>
<td>Figure 2.1</td>
<td>Magnet Recognition Program® Model</td>
<td>15</td>
</tr>
<tr>
<td>Figure 2.2</td>
<td>Information and communication channels pre- and post-GIM whiteboard implementation</td>
<td>18</td>
</tr>
<tr>
<td>Figure 4.1</td>
<td>Number of study participants by gender</td>
<td>33</td>
</tr>
<tr>
<td>Figure 4.2</td>
<td>Frequency of study participants by age category</td>
<td>34</td>
</tr>
<tr>
<td>Figure 4.3</td>
<td>Percentage of study participants by position</td>
<td>35</td>
</tr>
<tr>
<td>Figure 4.4</td>
<td>Number and percentage of respondents by ward speciality</td>
<td>35</td>
</tr>
<tr>
<td>Figure 4.5</td>
<td>Percentage of respondents who had not seen the electronic patient whiteboard in other hospitals in Gauteng</td>
<td>36</td>
</tr>
<tr>
<td>Figure 4.6</td>
<td>Touchscreens were a very good company investment</td>
<td>37</td>
</tr>
<tr>
<td>Figure 4.7</td>
<td>I am used to working with computers</td>
<td>38</td>
</tr>
<tr>
<td>Figure 4.8</td>
<td>Touchscreens are always online</td>
<td>41</td>
</tr>
<tr>
<td>Figure 4.9</td>
<td>Screen size too small</td>
<td>41</td>
</tr>
</tbody>
</table>
## List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN</td>
<td>Enrolled nurse</td>
</tr>
<tr>
<td>ENA</td>
<td>Enrolled nursing assistant</td>
</tr>
<tr>
<td>ICU</td>
<td>Intensive Care Unit</td>
</tr>
<tr>
<td>RN</td>
<td>Registered nurse</td>
</tr>
<tr>
<td>UNISA</td>
<td>University of South Africa</td>
</tr>
</tbody>
</table>
ANNEXURES

ANNEXURE A: Respondents informed consent form

ANNEXURE B: Study questionnaire

ANNEXURE C: University ethical clearance certificate

ANNEXURE D: Permission to pilot test questionnaire

ANNEXURE E: Letter seeking permission to conduct research

ANNEXURE F: Letter granting permission to conduct research
Dear Colleagues

RE: Multi-Touch Screens Research Survey – Informed Consent

As part of my studies with the University of South Africa, I am required to conduct a research study. I have chosen to study the impact of the Multi-touch screens on nursing staff implemented in 2012. Do they really help and what challenges have you experienced using them?

The information provided is anonymous and cannot be traced back to any individual. Your responses have no impact on your work performance and are strictly for research purposes. Please DO NOT put your name or contact details on the survey form for anonymity purposes. Your participation is entirely voluntary and you may withdraw at any point during the survey.

The 2 page questionnaire should take about 10 minutes of your time. Kindly return the completed survey sealed in the attached envelope for confidentiality purposes into the box provided at reception by Friday 28 June 2013 5pm.

Please include your email address or mobile number below if you would like to have a summary of the research findings sent to you. Thanking you in advance for your participation. Should you have any queries regarding this survey, please contact me on 076 639 8563 / 33247196@mylife.unisa.ac.za

Yours Sincerely

Praxedis Hwindingwi

MPH (Medical Informatics) – Student
Mobile: 076 639 8563
Email: 33247196@mylife.unisa.ac.za

<table>
<thead>
<tr>
<th>Respondent Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Respondent Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Email address/ Mobile No:</th>
</tr>
</thead>
</table>
## Touch Screens Research Survey

### INSTRUCTIONS
Enter your responses on a scale of 1 - 5 where 1 means you totally disagree and 5 means that you totally agree. 3 is neutral meaning that you are not really sure. Tick your selection.

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Unsure</th>
<th>Agree</th>
<th>Totally Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) The touchscreen is easy for me to use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) The touchscreen helps me do my job better</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Only the Ward Secretary updates the touch screen for us</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) The old whiteboard method was better</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) The touchscreen saves me a lot of time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) I would like more training on the touch screens</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) The touchscreens were a very good company investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8) the screen is too small making it difficult to read</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9) I have seen touch screens at other hospitals outside our company in Gauteng</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10) I find using the new touchscreens challenging</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11) I was well prepared for the new touch screens</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12) I am used to working with computers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13) computer training at work would be helpful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14) the nursing staff in my ward are happy with the touch screen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15) The use of new touch screens gives us more time to be with the patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16) The touch screens are always online</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17) The displayed details of the patient are always correct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
18) We still use the old whiteboard for other patient information

19) Ward Speciality:

<table>
<thead>
<tr>
<th>Maternity</th>
<th>Medical</th>
<th>Paediatric</th>
<th>Neo Natal ICU</th>
<th>Oncology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour Ward</td>
<td>Orthopaedic</td>
<td>Adult ICU</td>
<td>Paeds ICU</td>
<td>Surgical</td>
</tr>
<tr>
<td>Neurology</td>
<td>Other (Please specify ward type):</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20) What improvements would you like to see on the touch screen? Write in box below

21) Tick your correct age category:  
- 18-29  
- 30-49  
- 50-69  
- 70 & above

22) What is your position?  
- ENA  
- EN  
- RN  
- Ward secretary

23) Please write any other challenges experienced while working with the new touchscreens in the box below:

Please return this questionnaire sealed in the attached envelope at the box provided at Reception. Thank you for your participation.
UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

HSNDC/163/2013

Date: 6 March 2013  Student No: 3324-713-5

Project Title: The implementation of the electronic whiteboard in a private
hospital: challenges experienced by nurses in Gauteng.

Researcher: Praveda Paasmooyo Hwimologw

Degree: Masters in Public Health

Supervisor: Prof ZZ Nkwane
Qualification: PhD
Joint Supervisor: -

DECISION OF COMMITTEE

Approved [ ]  Conditionally Approved [ ]

Prof L Roots
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

Prof MM Moleki
ACTING ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES
ANNEXURE D: Evidence of permission to pilot test questionnaire

Thank you for allowing me to pilot test my research questionnaire with a few nursing staff at the Brethurst Clinic on Saturday afternoon. The exercise was helpful in refining the questionnaire for my studies.

Kind regards
Prax

Praxedis Hwindingwi
IM Technical Specialist
Life Healthcare
Tel: +27 11 319 9116
Fax: +27 11 319 9901
Mobile: +27 76 629 8848
Email: prax.hwindingwi@lifehealthcare.co.za
Website: www.lifehealthcare.co.za
22 May 2013

The Nursing Manager
Life Flora Clinic
Rooodepoort
Johannesburg

Dear Ms J Dunsdon

RE: Request to conduct research

As part of my Masters in Public Health (Medical Informatics) studies with the University of South Africa (UNISA), I am required to conduct a research study. The approved title of the study is ‘the implementation of the electronic whiteboard in a private hospital: challenges experienced by nurses in Gauteng’. This letter serves to request permission for me to conduct my research study at the Life Flora Clinic.

A quantitative study focused on the challenges nursing staff face with the use of the new touchscreens will be beneficial to the hospital management and Information Technology by providing feedback to indicate whether the implementation of these new touchscreens have yielded the success intended and areas management can possibly offer further support to the nursing staff where required in their use of the new touchscreens.

The feedback will also be useful when planning any future new technological projects involving the nursing staff. Result of the survey can be provided to Hospital Management.

As defined in the UNISA policy on research ethics, there is a strict obligation to maintain privacy, anonymity and confidentiality of the institution and participants. Life Healthcare or the hospital name will not appear in any document. I have attached my ethical clearance certificate issued by the university.

The 2 page questionnaire should take approximately 10 minutes of the participant’s time. All participants are instructed not to put their names or contact details on the questionnaire as this is an anonymous study. Participation is voluntary.

I look forward to your favourable response.

Yours sincerely,

Praxedis Paidamoyo Hwindingwi
IM Technical Support Specialist (Snr)

Email: praxedis@webafrica.org.za
Telephone: 011 219 9000
Mobile: 076 639 8563
25 May 2013

Dear Praxedis Hwindingwi

RE: LETTER OF PERMISSION – LIFE FLORA CLINIC

Research Topic: The implementation of the electronic whiteboard at a private hospital: challenges experienced by nurses in Gauteng

This serves to inform you that permission for you to conduct your research at the Life Flora Clinic has been granted.

Yours faithfully,

Andrew Rogers
Governance & Efficiency Manager
CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

“Today’s clinical setting is undergoing an explosion in technology used by all health care providers. Yesteryear’s clinical settings used telephones, fax and copy machines, and slow computers that primarily stored patients’ contact and billing information” (Cherry & Jacob 2014:254). Today through developments such as the patients’ electronic health records (EHRs) there are newer technological advancements enabling patient records to be presented in readily informative ways, such as displaying the longitudinal record of a patient’s medical history during patient encounter to guide a medical professional during consultation. This is all part of health information technology (HIT). Further benefits and efficiencies are created when such records are shared between different medical facilities (Cherry & Jacob 2014:254).

As a result of this advancing technology, hospitals are moving to the use of electronic patient screens over the commonly used manual dry-erase patient whiteboards (Rasmussen & Kushniruk 2013:174). This advancement is to improve service delivery and provide electronic medical records of the patients. This is widely occurring in first world nations through the adoption of new technologies, bringing about a host of added functionality and a transformation in healthcare service delivery that was not possible with the manual method as it was a stand-alone system and did not interact with any other system a hospital facility (Jacques & Rothman 2011:508).

While technological advancements to improve efficiency and effectiveness in healthcare are beneficial, it is important that the users of these technologies are not left behind. The authors were discussing an efficiency evaluation study of an electronic whiteboard in Denmark when they emphasised that “With this it also becomes increasingly important that these systems do not disrupt or delay the working practices of the departments where they are taken into use. Usability evaluations should therefore be employed as part of developing and implementing these systems” (Rasmussen & Kushniruk 2013:174).
1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM

1.2.1 The source of the research problem

The researcher observed that in a ward where the electronic whiteboard had been installed, the nursing staff used the new electronic whiteboard but also maintained the use of the manual dry-erase whiteboard resulting in what appeared to be a duplication of systems. Yet the electronic whiteboards were implemented to replace the manual dry-erase whiteboard system.

Are the whiteboards not user friendly? Was the training perhaps inadequate? Was there critical working practice functionality missing as cited in de Veer, Fleuren, Bekkema and Francke (2011:67)? Could it be due to change resistance? As stated in Harvey & Broyles(2010:3) “Resistance is the heart of the change process.” These are all
questions that led the researcher to investigate any challenges that the nursing staff might have experienced as a result of the implementation of this innovation.

1.2.2 Background to the research problem

Historically and still current prevailing practice world-wide is the use of the manual patient whiteboard. The patient whiteboard is simply a listing of all the patients in a hospital unit or ward with the name of the attending doctor(s) and which room and or bed the patient was admitted into or any other information relevant to the ward as described by Chaboyer, Wallen, Wallis and McMurray (2009:S138). This board or list is used to assist nursing staff, doctors, other healthcare providers and visitors in locating the patient within the unit as observed by the researcher in the hospitals of this private company prior to the installation of the electronic patient whiteboard. This patient listing is commonly located at the entrance or reception area hand-written on a whiteboard or on paper as a standalone system.

Figure 1.2 Photograph taken by the researcher showing a manual dry-erase patient board at a nurses’ duty station
The electronic whiteboard is the new innovation that has replaced the traditional manual method. There are several well understood benefits of the electronic whiteboards for the patients, doctors, hospitals, other service providers and nursing staff themselves which influence hospital facilities to upgrade. Included in these benefits is the creation of electronic medical records for patients and real time in-patient tracking as cited in Wong, Caesar, Bandali, Agnew and Abrams (2009:241) in a study that was conducted in a general hospital in Toronto, Canada.

As much as there are several benefits brought about by the electronic whiteboards as shown in literature, there seems to be discussion around implementation of technological innovations in general causing challenges with the adoption and continuation of use. This study will investigate the challenges experiences by nurses on the use of the newly implemented touch screens guided by Fleuren, Wiefferink and Paulussen’s (2004) theoretical framework on the innovation process. This framework was used in a study conducted in the Netherlands to determine factors which influenced the success or failure of new technologies from the nursing staff perspective. In the same study conducted in the Netherlands, half the nursing staff respondents positively viewed their new technological innovation. Some of the main issues raised were malfunctioning, not user friendly and lack of adequate innovation strategy (de Veer et al 2011:67).

The main users of the touchscreens in this study are nurses and ward secretaries as they were all trained on the use of the new electronic whiteboards.

1.2.3 Study Location

A private hospital group in Gauteng province in South Africa is amongst the first companies to roll-out the implementation of the electronic patient whiteboards in the in-patient units throughout all its hospitals nation-wide in 2012.
1.2.4 Implementation and training of the touchscreens

As confirmed by the nursing manager at the facility, the implementation go live date in July 2012 was preceded by two weeks of training conducted in a training room setup at the hospital. Demonstration touchscreens were setup in the training room to enable the nursing staff to familiarise themselves with the look, feel and functionality of the new touchscreens. Training was scheduled in order to include staff from the different day and night shifts at the hospital. The training was conducted in by teams from the private hospital group’s head office as part of the roll-out plan.

1.3 RESEARCH PROBLEM

The main problem is to identify challenges affecting nursing staff in the use of the implemented electronic whiteboards in the wards at the private hospital.

1.4 AIM OF THE STUDY

1.4.1 Research purpose

The aim of the study is to contribute to the existing body of knowledge and to also improve the success of technological innovations to nurse users by addressing any challenges nursing staff have experienced with implementation of the electronic whiteboard.
1.4.2 Research objectives

The objective of this research is to identify the key factors that affected nursing staff when the electronic whiteboards were implemented in the private hospital wards. The second objective is to document the findings.

1.5 SIGNIFICANCE OF THE STUDY

A focused study on any challenges in the use of the new electronic whiteboards by nurses at this institution has not been conducted before. The results would provide feedback as to whether the implementation of these new touch screens has yielded the success intended and hi-light areas that management could maybe offer further support to ensure that the nursing staff are generally comfortable with their use of the new touch screens. The results could also be beneficial to the hospital management when considering or planning any future new technological projects involving the nursing staff. This study was conducted one year after the implementation of the electronic whiteboards.

1.6 DEFINITION OF TERMS

Clinician: a doctor having direct contact with patients rather than being involved with theoretical or laboratory studies (Oxford dictionaries. [s.a.]). In this study clinician can also refer to nurses, other healthcare providers and related healthcare administration staff.

Electronic health record (EHR) or electronic medical record (EMR): The Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports. The EHR automates and streamlines the clinician's workflow. (Healthcare Information and Management Systems Society [s.a.]).

Electronic patient whiteboard: used interchangeably with the term touch screen and electronic whiteboard with reference to the multi-touch screen (see multi-touch screen).
Multi-Touch Screen: is a larger than normal interactive flat computer screen that is 50cm width x 30cm height. It is an ordinary computer without a keyboard or a mouse. A user operates the computer by moving the finger/s on the screen through the use of its touch functionality (cited in Multi-Touch Screen: 2012).

Nursing staff: In this study, the three categories of nurses which are included are registered nurse, enrolled nurse and enrolled nurse auxiliary. The nurses are practicing under their relevant scope of practice as regulated by the South African Nursing Council (Regulation R425, R2175, R1649 and R1648).

1.7 FOUNDATIONS OF THE STUDY

1.7.1 Conceptual Framework

The study will be guided by a framework that was used in a study that looked at successful implementation of new technologies in nursing care in the Netherlands cited in de Veer et al (2011). The framework represents the innovation process and related categories of determinants originally developed by Fleuren et al (2004).

Innovations are defined as guidelines, interventions or programs that are perceived as new by an individual or organisation in Rogers (2003). The framework as cited in Fleuren et al (2004) states that the stages of the innovation process (dissemination, adoption, implementation and continuation) can be affected by various determinants that are (i) characteristics of the socio-political context, (ii) characteristics of the organization, (iii) characteristics of the person adopting the innovation and (iv) characteristics of the innovation itself. These determinants are further affected by (v) characteristics of the innovation strategy.
Figure 1.4 Adapted from Fleuren et al (2004). Framework representing the innovation process and related categories of determinants.

According to Fleuren et al (2004:107), there are determinants or characteristics that facilitate or impede the innovation process. For purposes of this study, this framework has been adopted to map areas within which to look for any challenges that might be present.

The assumption is that the challenges experienced by the nurse users will fall within the innovation determinant categories as defined by Fleuren et al (2004).

It must be highlighted that although this framework is a tried and tested model, the environment in which it was derived i.e. the Netherlands is a country in the first world economy with advanced Information Technology infrastructure as compared to that of the South African environment which is a developing country where this study was conducted.

Diagram (Figure 1.4) developed by the Graham and De Sabbata at the Oxford Internet Institute using data from the World Bank (2011) which shows the internet population and penetration world-wide. Internet penetration was used by the researcher as an indicator of technology advancement in the world. In the diagram, internet population and penetration in Netherlands (NLD) is over 80% of the country whereas in South
Africa the penetration is between 20%-40%. As such the researcher will bear this in mind when applying this model to the South African environment.

Figure 1.5  Internet population and penetration  [n.d.].

1.8  RESEARCH DESIGN AND METHOD

Vogt (2007:6) explains that once one has a research question, design, measurement and analysis are pillars on which a research investigation is built. The diagram below describes the design-measurement-analysis cycle as an repetitive process and Vogt further explains that although design is put as the first point in the order of process, there is no set starting point.

1. The design looks at the method to conduct a study. It answers the question of how a study is to be conducted. 2. Measurement looks at the tools used in order to collect the data and measure the phenomenon of interest. 3. Analysis includes the means of organising and interpreting the results.
This study will follow a quantitative, descriptive design as a survey will be conducted in order to statistically analyse and quantify the research findings. “Descriptive designs function to portray some phenomenon of interest as accurately as possible” (Macnee & McCabe 2006:213).

1.9 ETHICAL CONSIDERATIONS

Ethical consideration “in the protocol, explain the plans for safeguarding the rights and welfare of participants” Joubert, Ehrlich, Karim & Katzenellenbogen (2007:52).

1.9.1 Confidentiality and Anonymity

The responses of the participants were handled confidentially and were not accessible to other respondents. All the study respondents’ questionnaires remained anonymous as all respondents were instructed not to write their names on the questionnaires.

Further to this, no patient information was captured from the electronic whiteboards during the study. The study only recorded the experiences of the respondents in using the electronic whiteboard.
1.10 SCOPE AND LIMITATIONS OF THE STUDY

The scope of the study will look at the use of the touch screens by nursing staff at one private hospital in Gauteng out of the sixty-five hospitals with the private hospital group across South Africa. The study results can therefore not be generalised across the entire hospital group as experiences of nursing staff at different hospitals and provinces may differ significantly.

1.11 STRUCTURE OF THE DISSERTATION

The overall structure of the dissertation is as follows:

Chapter 1: Orientation to the study

Chapter 2: Literature review

Chapter 3: Research design and method

Chapter 4: Analysis, presentation and discussion of the research findings

Chapter 5: Conclusions and recommendations

1.12 CONCLUSION

This chapter is a brief overview of the aspects of the study mainly detailing the aim, background, research objectives, design and methodology used for the data collection.

It is the researcher’s conviction that an investigation of potential challenges experienced by the nursing staff in the use of this new innovation will aid in improving the adoption and continuation of use of the electronic whiteboards.
CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Chapter one was an overall introduction to the research study. Chapter 2 is a detailed write-up of the existing literature reviewed relating to the study.

The literature review will be guided by the conceptual framework identified for this study looking into issues related to the determinants that facilitate implementation of innovations in health care organisations in order to identify any challenges in healthcare in general as the socio-political context as well as factors in the domain of the organisation, adopting user and innovation as cited in Fleuren et al (2004).

2.2 CHARACTERISTICS OF THE SOCIO-POLITICAL CONTEXT - NURSING AND COMPUTERS IN AFRICA

For purposes of this study, the socio-political context refers to the external environment to the private hospital group and specific hospital where the research was conducted. In general it is a look at the current challenges in healthcare in the broader context of Africa and South Africa and then a look at whether the electronic patient whiteboards have been implemented in the 3rd world, developing nation’s context. During the survey, respondents were asked if they had seen the electronic touchscreens as other hospitals outside their own hospital group. This is discussed in Chapter 3 under the development of the data collection instrument.

With reference to the Healthcare – Siemens Southern Africa (2013) which is a large healthcare infrastructural supplier in the world, “Everyone should have access to affordable and efficient healthcare that ensures medical treatment. However, demographic changes in Africa and around the world are putting traditional healthcare models under serious strain, and new answers are needed.”

It goes on to say, “In today’s world we are faced with growing populations and longer life expectancies. This change represents a serious challenge to healthcare systems.
Africa’s population has rapidly increased, from 221 million people in 1950 to more than 1 billion today. In some African states, half of the population or more is under 25 years of age. And poverty, malnutrition, and poor health affect a large proportion of the people on the African continent” Healthcare – Siemens Southern Africa (2013).

Although this Siemens narration emphasises that there are challenges in Africa’s healthcare system around medical supplies, medical treatment, incorporation of reliable diagnostics technology and healthcare financing itself, it also aids in painting a picture of the current healthcare environment with respect to challenges in Africa.

In a separate web-based report by Agility Global Health Solutions (2012) which discusses the current environment with medical aid schemes, which largely fund private healthcare such as the private hospital where the researcher conducted her study, there is uncertainty around the implementation of the government policies and roll out plans around the proposed National Health Insurance (NHI). Medical aid schemes are therefore looking at ways to reduce costs through investment in technology in order to mitigate risk. This shows that as medical aid schemes are pushed to invest in technology, the same would apply to the institutions they fund which include private hospital groups.

Further to this, legislation in Africa has not switched over to the electronic, paper-less method and still largely requires the paper-based systems of patient record keeping.

Private hospital groups however, are not faced with similar resource limitations that public facilities encounter, which better positions private facilities to invest in technological improvements and install the required infrastructural equipment.

### 2.3 CHARACTERISTICS OF THE ORGANISATION – A LOOK AT TRAINING AND EMPLOYEE DEVELOPMENT

An international study on nurses and technology was conducted by McGillivray, Yates and McLister (2007). The study investigated nurses’ comfort with electromedical and computer equipment that they used daily in the hospitals they worked at. The nurses
who participated in the study worked at hospitals in Australia, Canada, Great Britain, Singapore and South Africa.

As stated by McGillivray et Al (2007), “the analysis of the survey results showed that nurses were concerned about the training they received on both technologies, the impact that computer time had on their workload and the reliability and accessibility of these systems and devices. …The professional nurse leaves school with an extensive education in clinical and medical practices, and is often then thrust into an environment that necessitates an immediate understanding of many technologies.”

In the researcher’s view, it is therefore important that healthcare organisations pay particular attention to the quality of training provided to nursing staff for computer equipment use when technological innovations are implemented. In addition to this, involving the nurse user where possible in the development of these innovations is key as this involvement facilitates for adoption and continuation of use depicted in the contextual framework (Figure 1.3).

Further to this, creating an on-going environment of development perhaps through a computer training room or kiosk setup to harness a culture of computer training with online training programs and provide a safe place for nurses to practice.

Under the sub-heading, “Never Underestimate the Power of Organizational Culture” Harvey & Broyles (2010:30) explains that, “An organization’s vision and values portray not only what it stands for but also a profound sense of what its members view as important. Consequently, any proposed change must be seen as congruent with an organization’s mission, vision, and values if it has any chance of being successful. “

The American Nurses Credentialing Center (ANCC) introduced a program for recognising hospitals with excellent nursing recruitment and retention rates called the Magnet Recognition Program ®. Magnet status is now seen as the single most effective mechanism for providing consumers and nurses with comparative information, the gold standard for quality nursing care. The Magnet Recognition Program ® Model shows that transformational leadership is a factor that contributes to the success of Magnet hospitals as well as a factor that has an influence on new knowledge, innovations and improvements (Cherry & Jacob 2014:255).
Characteristics of the organisation would therefore also include transformational leadership when implementing technological innovations such as the electronic whiteboard.

In another journal article published on a study that looked at inter-departmental workflow challenges, Abraham et al (2010:112-122) discuss the importance of the involved process of transferring a patient from one unit to another in a hospital and the role players and clinical as well as administrative functions that can be involved. This has necessitated the development of technologies such as the electronic whiteboard in facilitating a smooth coordination of the different roles and departments concerned. Effective technological tools to manage these inter-departmental tasks enable the nursing staff to be more efficient and reduce time delays that may be experienced with manual systems.

The qualitative study focused on challenges that affected the patient flow within the hospital including issues such as bed management, resource allocation and planning and technologies that would alleviate the hold-ups and reduce patient waiting times. The study highlighted the complexity of patient transfers workflow and important socio-technical considerations to be made when developing technologies. The authors also mentioned an issue of misuse of intent that could also cause further challenges. Systems need to be used for what they were designed for to achieve best results. The electronic whiteboards installed at the private hospital in this study had a bed management function which enabled the unit at any point in time to be able to check bed availability for any new admissions or transfers from any other wards and promptly allocate the beds.
The implementation of the touchscreens was at the private hospital where the study was conducted, was done after a 2 week training process where all the nurses attended a 30 minute training session.

2.4 CHARACTERISTICS OF THE ADOPTING PERSON (USER)

The adopting person in this study is the nurse user. Traditionally, nurses were not required to use computers in their scope of practice and nursed the patient, manually updating patient charts and the patient dry-ease whiteboard. With the advancement of technology, the nurse user is now required to interact with the electronic patient screen, which is a touchscreen with a built in computer.

An article written by Schwartz (2012) while discussing adoption of electronic health records by nurses indicates that although there are significant benefits, there are many challenges and a lot to be learnt.

The following considerations are listed as important for EHR implementations by the school of nursing at the University of California as cited by Schwartz (2012):

1) Ensuring solid infrastructure to carry the technology, EHRs.

2) Involving the nurse user in the design stage

3) Adequate and balanced customisation

4) Ensuring the staff is prepared for the innovation, however resistance to change is to be expected.

5) Prepare for reduced production in the beginning weeks as the users will be adjusting to the new system.

6) The objective of improving care must not be lost during system design.
7) Understand how the system will work during patient encounter and incorporate facilitate for this during design.

8) Aim that that the system is interoperable across the facility

9) Be careful not to have too much information that burdens the users

10) Measure results and have a process in place for nonstop change

In the researcher’s view, these considerations could also be applied to a certain extent to the current study as they fall under the umbrella of health information technology and can also include use during patient encounter.

The involvement and preparation of clinicians is emphasised and it is stated that resistance should be anticipated. A discussion around information overload is also documented with the nurses in mind so that the innovation does not hinder operations.

“Many nurses in practice have not had opportunities to learn the wide range of computer skills identified as important. Health care institutions are beginning to recognize the need to support the education of nurses in core computing skills” Ellis and Hartley (2009:463). It is with this fact that the researcher will enquire of any challenges in the use of the touch screens.

2.5 CHARACTERISTICS OF THE INNOVATION

In order to attain successful implementation of innovations, the characteristics of the innovation itself influence the innovation process as shown in the conceptual framework (Figure 2.1).

The perceived complexity of the technology (cited in de Veer et Al 2011:2) is an aspect to be considered under characteristics of the innovation. How did the nurses perceive their experience with the new whiteboards and specifically in this regard were the electronic whiteboards considered user-friendly by the nurses?

Electronic in-patient whiteboards implemented in Canada improved multi-disciplinary communication and coordination of care Wong et al (2009). In the reported study, the
electronic whiteboard had been implemented in the emergency department and yielded great success and underwent further development for implementation in the inpatient units in the acute care hospital.

The impact that the electronic whiteboards could have on the workflow of the clinicians was considered during the development stage of the whiteboards. This showed that the innovation had potential to hinder the operations of the clinicians. The intention was to help the clinicians or nurses do their job better. This was clearly demonstrated in the orderly flow of communication and reduced interactions showing efficiency in this implementation diagram below.

![Diagram showing information and communication channels pre- and post-GIM whiteboard implementation](image)

**Figure 2.2** Information and communication channels pre- and post-GIM whiteboard implementation as cited by Wong et al (2009)

The information and communication flows in the pre state part of the diagram above depict confusion and several back and forth channels. This may have confused the patient concerned. It may have been possible that a patient was asked the same question several times were different service providers were concerned.

However, in the post state diagram the communication channels are clearly defined and the process appears to be less cluttered, with one solid flow of communication to the patient. The electronic whiteboard becomes the central tool ‘collecting’ information from the various role players in the unit and again the central place from which information concerning the patient is displayed.
Electronic whiteboards have been largely implemented in emergency departments as a tool to enhance patient flow and communication. This has been seen in Denmark as reported by Hertzum and Simonsen (2010). This functionality has now been extended for use in wards with in-patients. The innovation should be user-friendly, available, beneficial to the user and not complicated.

The researcher found a particular study conducted by Patterson, Rogers, Tomolo, Wears & Tsevat (2010:817-823) quite interesting as a similar phenomenon of simultaneous use of the eboard and manual whiteboard was observed. The study was conducted to compare the usage, functions and accuracy of the information on both the manual and electronic patient boards in two medical centers. There are significant lessons to be learnt from this study even though it is based on observations from emergency departments in medical facilities. There a significant amount of literature reviewed on emergency departments as they are the units of high patient turn-over and fast pasted multi-disciplinary functions all at once.

It is also mentioned in the study that several have suggested replacement of the manual whiteboards with electronic whiteboard to improve communication and workflow efficiency and the Veterans Health Administration had a different approach which was to install the electronic whiteboards without removing the manual boards. This was due to the fact that literature they reviewed at the time on the introduction of new technologies says there may be challenges that are difficult to foresee such as loss of the basic functionality. The study was conducted in 2008. This was common when moving from manual to electronic systems with individual logins for the system users.

The findings of the mixed qualitative and quantitative method study showed that the clinicians used the manual whiteboards much more that the electronic boards. They also found the information on the manual boards was more accurate than that displayed on the electronic boards. At both sites that were being compared the manager of the emergency department used the electronic whiteboards for a reporting task. Recommendations to increase the electronic screen size and resolution for ease of reading from a distance as per the bigger manual boards were made. However, considerations of the privacy of patient information would also need to be made.
It was also found that data entry on the electronic whiteboards was found to be time consuming and data entry clerks were used instead of having the clinicians enter the data themselves as they worked. The system was however found to be useful with confirming patient admission, discharge and transfer times as well as flagging of any system alerts on the patient vital signs for example for prompt attention.

This study concluded that the manual and electronic whiteboards were more of complimenting systems and not a duplication and further improvements were required on the eboards to further adoption of use.

2.6 CONCLUSION

This chapter reviewed existing literature on the study aspects guided by the conceptual framework adapted from Fleuren et al (2004). The following chapter will discuss the research design and methodology applied in the study.
CHAPTER 3

RESEARCH DESIGN AND METHOD

3.1 INTRODUCTION

The previous chapter discussed the literature reviewed for the study. Chapter 3 gives a detailed description of the research design and methods used to collect the data on the challenges experienced by the nursing staff in the use of the electronic whiteboard.

3.2 RESEARCH DESIGN

According to Joubert, Ehrlich, Karim and Katzenellenbogen (2007:77) “Study design refers to the structured approach followed by researchers to answer a particular research question. Study design has also been called the ‘architecture’ of the study, because the choice of a study design determines how we sample the population, collect measurements and analyse the data. Cost and ethical considerations also influence and are influenced by the choice of study design.”

3.2.1 Descriptive design

This study used a descriptive design “Descriptive designs function to portray some phenomenon on interest as accurately as possible” Rebar, Gersch, Macnee and McCabe (2006:213).

3.2.2 Quantitative paradigm

This study followed a quantitative methodology as a survey was conducted in order to statistically analyse the research findings and quantify the challenges impacting the nursing staff in the use of the whiteboards for reporting purposes.
3.3 RESEARCH METHOD

3.3.1 Sampling

Sampling refers to drawing elements from a population to obtain a sample. The usual goal of sampling is to obtain a representative sample, which is a sample that is similar to the population on all characteristics (except that it includes fewer people, because it is a sample rather than the complete population) Christensen, Burke Johnson and Turner (2011:150).

3.3.1.1 Population

According to Christensen et al (2011:150) the population is the full set of elements or people from which you are sampling. In this study, the population is therefore all the nursing staff and ward secretaries who work at the private hospital where the study was conducted. The nursing management estimated the population to be 250 people at the time the study was conducted.

3.3.1.2 Sampling

Non random sampling methods were used in this study. These are viewed as weaker sampling methods, but sometimes they are considered necessary due to practical reasons Christensen et al (2011:158). Limited time and cost constraints were the reasons for using non random sampling methods in this study.

3.3.1.2.1 Purposive sampling

When using purposive sampling, the researcher specifies the characteristics of the population of interest and then locates individuals who match the needed characteristics (inclusion criteria). Christensen et al (2011:159)

The inclusion criteria in this study was nurses who were RNs, ENs, ENAs or ward secretaries as these were the staff categories that where trained to use the electronic patient whiteboards. Hospitality attendants, doctors, visitors and other hospital service providers also use the new touchscreens albeit to a small capacity, however, were not the targets of the study.
3.3.1.2.2  *Convenience sampling*

Convenience sampling was also used in this study as the researcher approached nurses who were easy to find (Weathington et al 2010:205).

3.3.1.3  *Ethical issues related to sampling*

Probability sampling is theoretically the ideal sampling method however it is often resource intensive and costly to researchers. As a result of these reasons, nonprobability sampling methods are commonly adopted in many research studies due to their convenience. Results and conclusions for studies draw from nonprobability sampling methods will therefore need to be carefully interpreted (Weathington et al 2010: 205).

3.3.2  *Data Collection*

Joubert et al (2007:106) say “The collection of information for a study is called *measurement*. It is the process by which values are obtained for the characteristics of individuals being studied. Whether we want to study children’s weights, compliance with treatment…or women’s attitudes towards contraception, we need to measure some characteristics. These characteristics are called *variables*.”

In this study we are measuring the nurses’ experiences to identify and measure any challenges that the nurses may have encountered in the implementation of the electronic whiteboards. The study data was collected through a self-administered survey.

3.3.2.1  *Development and testing of the data collection instrument*

Joubert et al (2007: 107) defines a question as “a list of questions which are answered by the respondent, and which give indirect measures of the variables under investigation.”
A self-designed questionnaire was developed for this study for study respondents to self-administer (Annexure B). Self-administered questionnaires require the study respondents to fill in the questionnaires by themselves. Joubert et al (2007:107)

3.3.2.1.1 Developing the questionnaire

The researcher compiled a list of questions again guided by the characteristics of innovations from Fleuren et al’s (2004) framework.

Questions that looked at the respondents experience under characteristics of the innovation included the following:
2) The touchscreen helps me do my job better
4) The old whiteboard method was better
5) The touchscreen saves me a lot of time
8) The screen is too small making it difficult to read
16) the touchscreens are always online

Questions that fell under the characteristics of the adopting user included the following examples:

6) I would like more training on the touchscreens
10) I find using the new touchscreens challenging
12) I am used to working with computers

A Question that looked at the socio-political context was as follows:
9) I have seen touchscreens at other hospitals outside our company in Gauteng

Characteristics of the organisation were covered by the following questions:
7) The touchscreens were a very good company investment

Characteristics of innovation strategy were represented by the following question:
11) I was well prepared for the new touchscreens
An open section was also included for respondents to note any other challenges they may have experienced in the use of the touchscreens or any improvements that they might want to see, which would also indirectly highlight what might currently be a challenge.

3.3.2.1.1 Testing the data collection instrument

The testing of the data collection instrument was conducted at another hospital within the same hospital group. The researcher obtained verbal permission from the Nursing Manager which was later confirmed in writing (Annexure D) at that particular hospital and approached ten (10) nurses, briefly explained the purpose of the research and specifically testing the questionnaire. The exercise was conducted on Saturday the 13\textsuperscript{th} of April 2013 in the afternoon.

The researcher found that interacting with the nurses as they completed the questionnaire was helpful as the researcher was available to answer any queries or further simplification of the questions asked. Where the questionnaires were handed out and left with the nurses in the unit, on return to collect, the researcher would still have to wait for the respondent to complete the questionnaire. This raised a concern with the researcher as it could imply that there could be a low response rate if the researcher was not present to collect the questionnaires in person as had been the proposed method for the actual data collection.

As stated by Weathington et al (2010: 236) “…perhaps the easiest thing you can do as a researcher to increase response rate is to make sure you do not give your sample members and easy excuse for not completing the survey immediately.”

The planned data collection process as per the researcher’s proposal was to deliver questionnaires to each ward in the hospital and leave a collection box at the hospital main reception for respondents to post their questionnaires in a sealed envelope which would be provided. Scheduling time with each ward and obtaining informed consent, issuing the questionnaire and collecting completed questionnaires immediately appeared to be a more fruitful approach. Out of the ten (10) pilot testers, only one (1) respondent completed the survey in the researcher’s absence and the researcher found the questionnaire complete and ready for collection as had been requested.
Questionnaire format

The researcher intended to change the format of some of the questions in order to make the questionnaire interesting and keep the respondents' attention. However, keeping the same Likert scale format of questions seemed to make it easier for the respondents and maintained the flow of the questionnaire.

Confidentiality and Anonymity

The respondents were comfortable with the questionnaire being anonymous. Respondents did not feel the need to use an envelope and were comfortable handing back their folded survey to the researcher. Further to this, most of the respondents did not want to sign an informed consent form (Annexure A) and only agreed to anonymously complete the questionnaire.

Ward identification

Ward identification could be useful in the study as a challenge was mentioned in the pilot, that related to specific functions of the ward the nurse was working in. A registered nurse (RN) in the labour ward expressed significant challenges with the electronic whiteboard. She had used the old whiteboard as a handover tool. As shifts changed, the new staff would know exactly where each patient was, how far they had progressed, etc. The electronic whiteboard did not provide that handover function for the labour ward team. This was expressed verbally but not captured on the form. Hence the researcher saw the benefit in interacting with the respondents and prompting them to capture their responses.

Questions to that were changed:

Question 3) Our ward secretary updates the touchscreen for us.

The question sought to identify if the nurses were actually using the touchscreens or if the ward administration staff (ward secretary) alone was interacting with the touchscreen.
All of the respondents agreed, but also added that other nurses also used the touchscreens. The question was therefore re-phrased as follows:

*Only our ward secretary updates the touchscreen for us.*

Question 4) The old whiteboard method was better

The respondents had varying opinions as to why the old whiteboard was better. Providing an open field for respondents to write down any improvements respondents would like to see on the touchscreens would indirectly highlight any current existing challenges.

Question 7) The touchscreens were a very good company investment.

One nurse did not know what an investment was. Several just assumed it was a good investment based on the company’s decision to install the electronic whiteboards and felt they could not comment on the investment aspect as they were not in the full context of management’s objectives to install the touchscreens in the first place.

The question was however important as it addressed an organisational characteristics. When a nurse understands the organisation’s reasons for the innovation, it facilitates for more favourable adoption of the innovation.

Question 9) I have seen touchscreens at other hospitals in Gauteng.

The question did not specify that by ‘other hospitals’ the researcher meant hospitals from other private hospital groups or government hospitals separate from the company where the study was conducted. Where a respondent agreed, they could have been referring to another hospital of the same group. The question was therefore rephrased to read as follows:

*I have seen touchscreens at other hospitals outside our company in Gauteng*

Question 12) I am not used to working with computers
Some respondents chose totally disagree, when they meant to agree. The question asked in the negative confused respondents with the likert scale. The researcher simplified the question and the statement was written in the positive as follows:  
I am used to working with computers

Question 14) The nursing staff in our hospital are happy with the touchscreens

That question was too broad for a nurse user who typically worked in only one ward. It was too high an expectation on the researchers part to expect a nurse working in one ward to have a general opinion on how the nursing staff in the hospital found the touchscreens. That broad question would have been relevant if it was intended for management. The question was therefore rephrased to apply to staff in the respondents current ward.

The nursing staff in my ward are generally happy with the touchscreens

Question 15) We now have more time to nurse the patient

Statement was re-phrased to read as follows:  
The use of new touchscreens gives us more time to be with the patients.

Question 18) and 19) The touchscreens are good but a lot of things can be changed.  
Question 19 explaining what can be changed

Question 18 was removed as it could be gathered from all the other responses.

Question 19 was changed to ward speciality and Question 20 added as an open field for respondents to write and improvements they would like to see on the touchscreens.

3.3.2.2 Characteristics of the data collection instrument

The data collection instrument consisted of two pages with a total of twenty-three questions. It would take approximately five to ten minutes of the respondent’s time to complete. The first section of the questionnaire contained eighteen positive statements in a 5 point Likert scale format ranging from strongly disagree to totally agree.
The second page contained questions related to the respondent’s demographics and two open ended questions. One question was for respondents to write down and improvements they would like to see on the touchscreens. The last question was and open ended question for the responded to write any other challenges they may have liked to highlight whilst working with the new touchscreens.

3.3.2.3  Data collection process

The data collection process began on Saturday 1 June 2013 and was completed on Friday the 5th of July 2013. The researcher reported to the matron on duty and then walked through the hospital wards requesting for any volunteers to participate in the study. All the data was collected by the researcher.

As Weathington et al (2010:235) say, “...if one of your research goals is to maximise the number of responses from people within a certain larger group, one strategy is to try to distribute your survey within natural subgroupings of the larger group.” Thus the researcher visited each hospital unit, that had the touchscreen installed and asked for any nursing staff in accordance with the inclusion criteria who were willing to respond to the survey.

3.3.2.4  Ethical considerations related to data collection

Ethics is the process of studying moral standards and examining how we should interpret and apply them in various situations Weathington et al (2010:34). The ethical considerations relating to data collection as discussed by Weathington et al (2010:44-55) include seeking approval for research, informed consent, confidentiality and anonymity.

3.3.2.4.1  Seeking approval for research

The approval to conduct the research was sought from the private hospital group Head Office and from the hospital where the research was conducted. A letter detailing the research and the purpose of the research (annexure E) and the ethical clearance certificate (Annexure C) from the University of South Africa was sent to the nursing
manager of the institution. The approval was given in writing from the private hospital group’s head office (Annexure F).

3.3.2.4.2 Informed consent

According to Weathington et al (2010:46), voluntary informed consent is mandatory for studies that involve human respondents. People cannot be forced to participate in a study by researchers and evidence that respondents participated out of their own free will is required. Study participants should be clearly informed on purposes of the study and be allowed to withdraw from the study at any point in time.

The researcher gave the study participants informed consent forms, however, most participants did not want to give their identity and contact details as they felt it would compromise their anonymity. Further to this. “Anonymous questionnaires and surveys are also typically exempt from the informed consent requirement… instead of requiring signed consent, you indicate that completion and return of a survey constitutes that person’s consent to participate” (Weathington et al 2010:50).

Although 100 questionnaires were printed, 8 questionnaires remained and were not handed out. The total number of questionnaires handed out to consenting participants was: 100 (printed) – 8 (remaining) = 92 (handed out)

However, only 83 questionnaires were received. This means that 9 people (92-83) withdrew from the study for whatever reason unknown to the researcher.

3.3.3 Data Analysis

The data was going to be analysed with SPSS version 21.0 mainly using frequencies.
Descriptive analysis for the following:
- Demographics
- Responses to likert scale questions

Correlation for the following variables
- Used to computers and easy for me to use
- Need more training and easy for me to use
3.4 INTERNAL AND EXTERNAL VALIDITY OF THE STUDY

“It is often said that validity refers to the truth or accuracy of the research. …But when talking about design or measurement, it is probably better to say that assessments of validity speak to the relevance of the design or the measurement" Vogt (2007:117).

Vogt goes on to explain that validity is important in order to draw accurate conclusions on a study.

3.4.1 Internal validity

According to Vogt (2007:118) internal validity looks at whether the study design answers what the researcher wants to know. For this study, internal validity would question whether the survey design is the correct approach and further query the accuracy of the questions on instrument in capturing any challenges that the nursing staff might have experienced in the use of the touchscreens. The internal validity of the questionnaire was tested by the researcher through pilot-testing of the instrument that was conducted at a different hospital to the one where the study was conducted. The participants of the pilot test did not participate in the actual study. The questionnaire was then further modified in order to improve study relevance.

The questionnaire was also reviewed by the panel of experts on the Ethical Clearance Committee of the University of South Africa as well as the researcher’s study supervisor and recommendations applied.

3.4.2 External validity

Vogt further explains that external validity refers to whether the results obtained can be generalized beyond the study sample. The question that is posed with external validity is the degree to which the sample information can provide information about the population. Sample size and sampling methods play a significant part in determining external validity.

The number of nurses at the hospital where the study was conducted was estimated to be 250. The study was conducted with n=83 participants which was deemed a good
sample size by the researcher. The university’s Ethical Clearance Committee had accepted the sample size of n=80 as was submitted in the study proposal.

Although a good sample size was used, generalisation of the study results across the study population should be considered with caution as a non-probability sampling method was used (Weathington et al 2010: 205).

3.5 LIMITATIONS OF THE STUDY DESIGN

3.5.1 Data collection instrument – the questionnaire / survey

This study used a survey. Surveys can have several limitations. As cited in Weathington et al (2010: 121) people are not always honest and can also incorrectly respond to surveys with what they think they should answer, the ideals, as opposed to answering factually. The authors suggest that there is a possibility that when the same people are observed, the observations could differ from what the individuals may have reported.

A quantitative approach may not capture detailed in-depth information as is possible in a qualitative study or a mixed-method methodology where participants can fully express their views in interviews or open-ended questions (Creswell 2009:9).

3.5.2 Non-random sampling

The researcher ran the risk of sampling bias, where it was possible that only participants with an interest in the challenges of the touchscreens participated.

3.6 CONCLUSION

Chapter 3 discussed the study design and the method used for data collection, the data collection instrument and how it was developed, guided by the conceptual framework of Fleurel et al. It then discussed how the data would be analysed, internal and external validity of the study and ended with the limitations of the study.

Chapter 4 will discuss the research findings.
CHAPTER 4

ANALYSIS, PRESENTATION AND DESCRIPTION OF THE RESEARCH FINDINGS

4.1 INTRODUCTION

The previous chapter discussed the research design and research method adopted for this study. Chapter 4 gives a detailed description of the survey results from the respondents.

4.2 DATA MANAGEMENT AND ANALYSIS

The data was collected over a month’s period from 1 June 2013 to 5 July 2013 using a self-administered questionnaire consisting of 23 questions. The respondents manually completed the surveys. In order to analyse the findings, the data was captured directly into IBM SPSS Statistics (v 21.0).

4.3 RESEARCH RESULTS

4.3.1 Sample characteristics

4.3.1.1 Gender

This study was dominated by female participants n = 78 (94%) while n = 5 (6%) was the male participant representation. (Figure 4.1)

![Gender Representation Chart](image)

Figure 4.1 Number of study participants by gender
4.3.1.2 Age

Most of the study participants were within the 30 to 49 years category n = 41 (56.9%). The maximum age of the respondents fell within the 50 to 69 years category and the minimum age ranges reported were within the 18 to 29 years category.

Figure 4.2 Frequency of study participants by age category

4.3.1.3 Ranking

The study targeted registered nurses, enrolled nurses, enrolled nursing assistants and ward secretaries only, as these were the positions trained and authorised to use the electronic patient screens. The different nursing positions were well represented across the study participants with n = 28 (36.4%) registered nurses, n = 23 (29.9%) enrolled nurses and n = 21 (27.3%) enrolled nursing assistants. The ward secretaries constituted only n=5 (6.5%) of the study respondents. The relatively low number of responses from ward secretaries is due to the fact that there is only a single ward secretary per ward, whereas, all the other positions are represented in several numbers per ward.
The study sample of n=83 represented nursing staff from all wards across the private facility. One ward had as many as n=20, 27% study participants and some wards had
n=1 participants. This means correlating the ward speciality against possible factors or challenges found will not be possible.

4.3.2 Characteristics that affected nursing staff

As the study was guided by Fleuren et al’s (2004) framework representing the innovation process and related categories of determinants, the study participants’ responses will be analysed and presented in the same categorical structure. Characteristics of the socio-political context, characteristics of the organisation, characteristics of the adopting person (user), characteristics of the innovation and characteristics of the innovation strategy. The characteristics depicted in the framework will be referred to as ‘factors’ for purposes of this study.

4.3.2.1 Characteristics of the socio-political context

Question number 9 in the questionnaire asked respondents if they had seen the electronic patient whiteboards at other hospitals that were not part of the respondents company. Respondents that disagreed were n=54 (66.6%), while n=19 (23.5%) were unsure. The phenomenon of electronic patient whiteboard is currently not common in the external environment of most of the study participants.

![Figure 4.5 Percentage of respondents who had not seen the electronic patient whiteboard in other hospitals in Gauteng](image)
4.3.2.2 Characteristics of the Organisation

The majority of the study participants n=47 (56.6%) viewed the implementation of the electronic whiteboards as a good company investment, however, there was still a significant number of participants n=25 (30.1%) who were unsure. There were n=11 (13.3%) nurses who disagreed and did not think that the electronic whiteboards were a very good company investment.

4.3.2.3 Characteristics of the adopting person (user)

Table 4.1: Listing of questions that contained the characteristics of the adopting person (the user) in the study

<table>
<thead>
<tr>
<th>Question number and statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1        The touchscreen is easy for me to use</td>
</tr>
<tr>
<td>6        I would like more training on the touchscreen</td>
</tr>
<tr>
<td>10       I find using the touchscreen challenging</td>
</tr>
<tr>
<td>12       I am used to working with computers</td>
</tr>
</tbody>
</table>

There was an equal percentage (47%) of study respondents who were used to working with computers as there were those who were not used to working with computers.
Most of the study participants (n = 71, 85.5%) reported that the touchscreens was easy for them to use. However, (n = 38, 47.5%) reported that they would like more training on the touchscreens. The request for more training correlated with the responses received under question 10, where (n = 49, 59.0%) of the respondents reported that they found the touchscreen challenging.

### 4.3.2.3.1 Correlation between respondents requiring more training and those who found the touchscreens challenging to use

The Pearson Correlation test was run in SPSS to determine whether there was a correlation between respondents who needed more training and those who reported that they found the use of the touchscreens challenging. There was no correlation found. This suggests that the question about finding the touchscreens challenging may have been misunderstood or perhaps had a different meaning to the respondents.
Table 4.2: Correlation between respondents who found the touchscreens easy to use and those who found the touchscreens use challenging

<table>
<thead>
<tr>
<th>Correlations</th>
<th>need more training</th>
<th>screen use a challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>need more training</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>80</td>
</tr>
<tr>
<td>screen use a challenge</td>
<td>Pearson Correlation</td>
<td>.231*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.039</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>80</td>
</tr>
</tbody>
</table>

*: Correlation is significant at the 0.05 level (2-tailed).

4.3.2.3.2 Correlation between respondents who found the touchscreens easy to use and those who required more training

The Pearson correlation test was run in SPSS to determine a correlation between respondents who found the touchscreens easy to use, yet still required more training. There was no correlation between the two variables. This signifies that the basis of requiring more training was independent of the fact that the touchscreen was easy to use for most of the respondents (n = 71, 85.5%).

Table 4.3 Correlation between respondents who found the touchscreens easy to use and those who were used to working with computers

<table>
<thead>
<tr>
<th>Correlations</th>
<th>touchscreen use easy for me</th>
<th>need more training</th>
</tr>
</thead>
<tbody>
<tr>
<td>touchscreen use easy for me</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>83</td>
</tr>
<tr>
<td>need more training</td>
<td>Pearson Correlation</td>
<td>-.231*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.039</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>80</td>
</tr>
</tbody>
</table>

*: Correlation is significant at the 0.05 level (2-tailed).

4.3.2.3.3 Correlation between respondents who found the touchscreens easy to use and those who were used to working with computers

The Pearson correlation test was run in SPSS to determine a correlation between respondents who found the touchscreens easy to use and those who were used to
working with computers. There was no correlation between the two variables. This signifies that the basis of requiring more training was independent of the fact that the touchscreen was easy to use for most of the respondents (n = 71, 85.5%).

4.3.2.4 Characteristics of the innovation (the touchscreen)

Table 4.4: Listing of questions that contained the characteristics of the innovation in the study

<table>
<thead>
<tr>
<th>Question number and statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 The touchscreen helps me do my job better</td>
</tr>
<tr>
<td>4 The old whiteboard method was better</td>
</tr>
<tr>
<td>5 The touchscreen saves me a lot of time</td>
</tr>
<tr>
<td>8 The screen is too small making it difficult to read</td>
</tr>
<tr>
<td>16 The touch screens are always online</td>
</tr>
<tr>
<td>17 The displayed details of the patient are always correct</td>
</tr>
<tr>
<td>18 We still use the old whiteboard for other patient information</td>
</tr>
</tbody>
</table>

The frequency table below, Table 4.5 shows that most of the study participants agreed that the touchscreens helped them to do their job better. Most of the study respondents did not think the old whiteboard method was better.

Table 4.5: Touchscreen helps me do my job better

<table>
<thead>
<tr>
<th>touchscreen helps me do my job</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Strongly Disagree</td>
<td>4</td>
<td>4.8</td>
<td>4.9</td>
<td>4.9</td>
</tr>
<tr>
<td>2 Disagree</td>
<td>10</td>
<td>12.0</td>
<td>12.2</td>
<td>17.1</td>
</tr>
<tr>
<td>3 Unsure</td>
<td>11</td>
<td>13.3</td>
<td>13.4</td>
<td>30.5</td>
</tr>
<tr>
<td>4 Agree</td>
<td>32</td>
<td>38.6</td>
<td>39.0</td>
<td>69.5</td>
</tr>
<tr>
<td>5 Totally Agree</td>
<td>25</td>
<td>30.1</td>
<td>30.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>98.8</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing System</td>
<td>1</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>83</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Most of the respondents disagreed with the fact that the touchscreens were always online (n = 61, 74.0%). This was also mentioned as a challenge in the open ended fields as respondents elaborated on the fact the new touchscreens were often offline presenting a challenge for real-time patient tracking functionalities.

![Figure 4.8 Touchscreens are always online](image)

**Screen size too small**

The majority (n=49, 59.8%) of the study participants did not find the touchscreen size too small, a significant percentage of the study participants reported that the touchscreen was too small (n=30, 36.6%). A small percentage was unsure.

![Figure 4.9 Screen size too small](image)
4.3.2.5 Characteristics of the innovation strategy

Training the users was a key element of the innovation strategy. Most of the study participants (n = 53, 64.6%) agreed or strongly agreed that they had been well prepared for the use of the new electronic patient screens. The response to this question is not a direct reflection on the percentages of respondents trained on the use of the electronic patient screens but rather a reflection of the respondent’s view of how well they were prepared or trained for the new innovation. i.e. A respondent might have attended the training but felt inadequately prepared. However, the respondents that agreed that they were well prepared for the touch screens would have definitely attended the training. Therefore, the researcher can confirm that at least 64.6% of the respondents attended the training.

4.4 CONCLUSION

This chapter presented the quantitative research findings as well as the procedures used to analyse the data. Chapter 5 will interpret the research findings and make recommendations then conclude the study.
CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

Health information technology (HIT), or technology used to promote the health and well-being of patients and the community, has rapidly increased as technology has advanced. These advancements have led to a new technological era Cherry and Jacob (2014:255).

The electronic patient whiteboards are an aspect of this technology advancement. The researcher’s intention was to identify any challenges the nursing staff may have experienced in the use of the new electronic whiteboards. The main findings and recommendations will be discussed in this chapter.

5.2 RESEARCH DESIGN AND METHOD

The research followed a descriptive quantitative research design as the research was describing the current experiences of nurses and their survey responses analysed statistically.

Convenience sampling was used to select the facility where the research was conducted as it was within geographical location of the researcher. A total number of 83 study participants responded to the survey.

5.3 SUMMARY AND INTERPRETATION OF RESEARCH FINDINGS

5.3.1 Factors that affected nursing staff when the electronic whiteboards were implemented in the wards

5.3.1.1 Touchscreens were not always online

A significant number of study participants reported that the touchscreens were not always online which was interpreted as a challenge to the nursing staff by the researcher. It was further confirmed in the open text fields as several respondents
mentioned the challenge of the touchscreens either freezing or going offline. The purpose of the electronic touchscreens is to enable real-time patient information to be captured. This could not be achieved if the touchscreens were often offline as the nursing staff would be required to follow a manual process in the interim. Further to this, the staff would be required to update the electronic touchscreens in retrospect once back online posing a possible further challenge of time constraints from the backlog of information to be captured.

As mentioned in an article on a study conducted by Wong et al 78(4):239, timely and effective communication of information pertaining to the patient is crucial in order for nursing staff to deliver quality care. Technologies such as the electronic patient touchscreens such as those in this study, are a tool to deliver this necessary information in real-time, however, the opposite is also true. If the technology is not available or often offline as reported by the study respondents, it creates inefficiencies and delays, thus compromising on the intended efficient quality care.

5.3.1.2 Respondents needed more training

Almost half of the respondents 47.5% reported that the needed more training on the touchscreens. Although most of the respondents reported that they were well prepared for the touchscreens, the significant number of participants who reported that the required more training was interpreted by the researcher to show that a significant number of study participants were not fully conversant with the use of the new touchscreens. McGillivray et Al (2007) also confirm the importance of adequate user training with new innovations.

As described by Huston (2013:2) “Technology is changing the world at warp speed and nowhere is this more evident than in healthcare settings.” These technological changes also have an impact on the nursing practice itself. Electronic health records (EHR) are listed as one of the emerging technologies that are re-engineering the practice of nursing. Huston (2013:2) further explains that certain skills sets are required by nursing staff in order to adapt to these emerging technologies.

One of the listed skills sets is being able to use technology. A broad range of examples are listed as this new technology spans across several functions such as the use of
email, the internet, telehealth and telemedicine to name a few. In light of this, it is important that adequate training is provided in order to equip the nursing staff with the necessary technology skills set to facilitate for adoption of future technological advances.

Nursing challenges discussed in adopting new technologies are considered to include the human element as this is new, the need to balance the implementation costs against the benefits, training the nursing staff to ensure competency and continuation of use and ensuring that all ethics are maintained in the use of the new technologies. Some respondents in this study requested additional training which is also listed as a challenge in the integration of new technologies as cited by Huston (2013:2).

5.3.1.3 Still using the old whiteboard method for other patient information

A small number of respondents said they were still using the old whiteboard method for other patient information. This could suggest that there might be added functionality missing from the electronic whiteboard that is being carried out manually by the specific respondents. Further investigation would be required to explore this interpretation further. There was no correlation between those using the old whiteboard method and ward speciality.

Again, a few respondents clearly requested the old manual board method to be reinstated when they were asked for suggestions to improve the electronic whiteboard. This was interpreted as resistance to change by the researcher. According to Harvey & Broyles (2010:54) “Anything that increases one’s burdens will be resisted. Whether it increases the time you must give or the money you will expend or the energy you will have to put out or the added skills you will have to learn, you will act with resentment to the change. If you’re forced to make the change, you will either sabotage it or find ways to undermine the change effort. If you’re not forced to make the change, you will not do it. You will successfully resist it.”

5.4 CONCLUSIONS

The major challenges experienced by the nurses in the use of the electronic whiteboards are that the electronic whiteboards are often offline, a characteristic of the
innovation and that a significant number of nurses requested more training which is a characteristic of the adopting user and can also be a characteristic of the innovation strategy from the conceptual framework adopted for the study (Fleuren et al 2004).

5.5 RECOMMENDATIONS

Hospital nursing management at the facility is recommended to do the following:

- Needs assessment on the training requirements required by the nursing staff.

- Follow-up training as a characteristic of the innovation strategy should be implemented in order to facilitate for complete adoption and a positive continuation of use experience.

- Enquiry into the whiteboards being offline frequently as reported. There might be technical hardware faults with the electronic whiteboards.

- Further study including more hospitals in different regions in order to determine any other challenges from a group perspective.

5.6 CONTRIBUTIONS OF THE STUDY

A study of the use of the new electronic whiteboards by nurses at this institution has not been conducted before. The results of this study provide feedback as to whether the implementation of these new touch screens has yielded the success intended and highlight areas management can maybe offer further support to ensure that the nursing staff are generally comfortable with their use of the new touch screens. The results could be beneficial to the hospital management when considering or planning any future new technological projects involving the nursing staff. A further contribution of the study is to the existing body of knowledge as regards the challenges experienced by nurses with the advancing technology of the electronic whiteboards for in patients in a private hospital in Gauteng province of South Africa.
5.7 SCOPE AND LIMITATIONS OF THE STUDY

The scope of the study looked at the challenges experienced by nurses in the use of the touch screens at one private hospital in Gauteng out of the sixty-five hospitals with the private hospital group across South Africa. The study results can therefore not be generalised across the entire hospital group as experiences of nursing staff at a different hospital and province may be totally different.

5.8 CONCLUDING REMARKS

Technological advancements are the way of the future. It is the researcher’s conviction that new implementations are evaluated and adjustments made where required to further facilitate for continued use and maximisation of the good the technology was intended.

Further investigation would be required to see if the recommendations made alleviate the challenges experienced by nurses at the private hospital.

“With this it also becomes increasingly important that these systems do not disrupt or delay the working practices of the departments where they are taken into use. Usability evaluations should therefore be employed as part of developing and implementing these systems” (Rasmussen & Kushniruk 2013:174).


Internet population and penetration [n.d.]. From: [http://geography.oii.ox.ac.uk/](http://geography.oii.ox.ac.uk/) (accessed 10/12/2013)


Multi-Touch Screen – FAQ Pre-Implementation. 2012. Internal company document for the implementation

Oxford dictionaries. [s.a.]. From: http://www.oxforddictionaries.com/definition/english/clinician (accessed 12/12/13)


