



**ONLINE REGISTRATION CHALLENGES FACED BY STUDENTS AT A SELECTED
UNIVERSITY IN THE WESTERN CAPE**

by

NAOMI RICE

Dissertation submitted in fulfilment of the requirements for the degree

Master of Technology: Business Administration

in the Faculty of Business and Management Sciences

at the Cape Peninsula University of Technology

Supervisor: Dr Michael Twum-Darko

Cape Town

October 2020

CPUT copyright information

The dissertation may not be published either in part (in scholarly, scientific or technical journals), or as a whole (as a monograph), unless permission has been obtained from the University.

DECLARATION

I, Naomi Rice, declare that the contents of this dissertation represent my own unaided work, and that the dissertation has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signature:

A handwritten signature in black ink, appearing to read 'Naomi Rice', written in a cursive style.

Date: September 2020

ABSTRACT

The aim of the research was to investigate the challenges students face during e-registration (online registration) and to explore the system interaction and interface of the e-registration system. Students at the Cape Peninsula University of Technology face numerous challenges when registering online. Challenges such as network congestion, long queues, inaccessibility and computer literacy were among those investigated. It was discovered that some students prefer registering at campuses and not from their places of comfort. Some students cannot log into the e-registration system, hence they go to campus to register, while others do not know how to use the e-registration system as it is not user-friendly and accessible to everyone.

A mixed method was employed in this research. Qualitative and quantitative data were integrated to gain clear insight into the research topic under investigation. A survey questionnaire administered to students formed the quantitative component and interviews conducted with faculty administrators and information technology support staff formed the qualitative component. Qualitative data were gathered on the feelings, behaviour and experiences of individuals. Questionnaires, interviews and observations were used to gain perceptions and in-depth understanding of the research subject. An interpretative paradigm was adopted in qualitative methodology while quantitative methodology gathered statistical data from students. A Likert-type scale was used for quantitative data collected to determine the frequency of the variables.

Thirty-five students, six faculty administrators and four information technology support staff made up the participants for this study. Technical challenges embedded in the e-registration system were identified. The recommendations of the study will assist the Cape Peninsula University of Technology to overcome on-line registration challenges faced by its students and bring this institution to parity with the latest technology, improved service efficiency and competency.

ACKNOWLEDGEMENTS

I wish to thank:

- My supervisor, Dr Twum-Darko, for his constant guidance and support through this journey;
- Mr Jay Barnes, Dr Ogbamichael and Prof Van Zyl for their insight;
- My friend Matthew, thank you for your unwavering support, encouragement and assistance;
- Special thanks to my former boss, Prof van der Merwe, for being my mentor and my support;
- My current boss, Prof Bechan, thank you for all your support and your faith in me;
- My family for their support and to my little nephew Zac, thank you for your support too;
- My special friend Precious, thank you;
- My colleagues, thank you for your support. May you all be blessed.

DEDICATION

All glory and honour to my Lord Jesus Christ for making this thesis possible and for smoothing over all the stumbling blocks.

ABBREVIATIONS AND ACRONYMS

API	Application programming interface
BAT	Business acceptance testing
BTECH	Bachelor of Technology
CMU	Central Money Unit
CPUT	Cape Peninsula University of Technology
CSS	Cascading style sheets
DBMS	Database management system
DHET	Department of Higher Education and Training
HTML	Hypertext markup language
IS	Information system
ISP	Internet service provider
IT	Information technology
JRE	Java Runtime Environment
KCSE	Kenya Certificate of Secondary Education Enrolment
LAN	Local area networks
ND	National Diploma
ORS	Online registration system (e-registration)
SIMS	Student Information Management System
SOS	Student online system
SPSS	Statistical Package for Social Sciences
UOT	University of Technology
WAN	Wide area networks
WEBR	Web registration

GLOSSARY

Integration	To form, coordinate, or blend into a functioning or unified whole
Registration	The process of entering information about something or someone in a book or system of public records
Students	Persons who are studying at a university or other place of higher education
Systems interaction	The way systems interact to achieve some common functional goal.
Web-based	Particular type of software that allows users to interact with a remote server through a web browser interface

TABLE OF CONTENTS

DECLARATION.....	ii
ABSTRACT.....	iii
ACKNOWLEDGEMENTS.....	iv
DEDICATION	v
ABBREVIATIONS AND ACRONYMS.....	vi
GLOSSARY	vii
LIST OF FIGURES	xi
LIST OF TABLES.....	xi
CHAPTER 1 INTRODUCTION AND BACKGROUND.....	1
1.1 Introduction and background to the study.....	1
1.2 Background to the research study.....	1
1.3 Problem statement.....	3
1.4 Research aim.....	4
1.5 Research questions	4
1.6 Research objectives.....	4
1.7 Research design	5
1.8 Delineation of the study.....	5
1.9 Pilot study	5
1.10 Significance of the research	5
1.11 Ethical considerations	5
1.12 Structure of the dissertation	5
CHAPTER 2 LITERATURE REVIEW	7
2.1 Introduction	7
2.2 E-registration system	7
2.3 E-registration efficiency.....	12
2.4 E-registration process	13
2.5 iEnabler e-registration steps and challenges.....	13
2.6 Students' perspectives on using the e-registration system	15
2.7 Students' challenges when using the online registration system	16
2.8 Advantages of using the e-registration system	17
2.9 Disadvantages of using the e-registration system	18
2.10 Systems interaction.....	19
2.11 Role of information technology in managing the e-registration system	19
2.12 E-registration system data, system interaction and e-registration interaction management.....	21
2.13 Summary.....	22
CHAPTER 3 RESEARCH METHODOLOGY.....	23
3.1 Introduction	23
3.3 Research design	23
3.4 Research method.....	24

3.5	Qualitative approach	24
3.6	Quantitative approach	25
3.7	Research strategy: Case study	25
3.8	Sampling	26
3.9	Pilot study	27
3.11	Data collection and analysis	27
3.11.1	Techniques and procedures	27
3.12	Validity	28
3.13	Data reliability	28
3.14	Ethical considerations	28
3.15	Summary.....	29
CHAPTER 4 DATA ANALYSIS AND INTERPRETATION		30
4.1	Introduction	30
4.2	Challenges of the e-registration process faced by students.....	31
4.2.1	Computer literacy	31
4.2.2	Access	32
4.2.3	Communication	35
4.2.4	Pre-existing conditions	36
4.2.5	Staff training.....	37
4.2.6	Technology system	39
4.2.7	Infrastructure for e-registration	39
4.3	Students' experience of the e-registration process	42
4.4	E-registration system efficiency.....	43
4.5	Student experiences of the usability of the e-registration system	46
4.6	Advantages and disadvantages of using the e-registration system	48
4.7	The interaction of systems at CPUT	50
4.8	Role of IT support system in monitoring the systems	51
4.9	Technologies utilised in operating the systems	51
4.10	Student data management by staff.....	52
4.11	Summary.....	52
CHAPTER 5 FINDINGS AND DISCUSSIONS.....		54
5.1	Introduction	54
5.2	How research questions were answered.....	54
5.2.1	Research question 1	54
5.2.1.1	Research sub-question 1a)	54
5.2.1.2	Research sub-question 1b)	57
5.2.1.3	Research sub-question 1c).....	58
5.2.1.4	Research sub-question 1d)	59
5.2.1.5	Research sub-question 1e)	59
5.2.2	Research question 2	60
5.2.2.1	Research sub-question 2a)	60

5.2.2.2	Research sub-question 2b)	61
5.2.2.3	Research sub-question 2c)	61
5.2.2.4	Research sub-question 2d)	61
5.2.2.5	Research sub-question 2e)	62
5.3	Summary	62
CHAPTER 6 RECOMMENDATIONS AND CONCLUSION		64
6.1	Introduction	64
6.2	Research objectives revisited	64
6.2.1	Research objective i)	64
6.2.2	Research objective ii)	65
6.2.3	Research objective iii)	65
6.2.4	Research objective iv)	65
6.2.5	Research objective v)	65
6.2.6	Research objective vi)	66
6.2.7	Research objective vii)	66
6.2.8	Research objective viii)	66
6.2.9	Research objective ix)	66
6.2.10	Research objective x)	67
6.3	Research contribution	67
6.3.1	Findings	67
6.3.2	Practical contribution	69
6.3.3	Methodological contribution	71
6.4	Recommendations	71
6.5	Limitations and further research	73
6.6	Conclusions	74
REFERENCES		76
APPENDICES		82
APPENDIX A: CPUT ETHICAL CLEARANCE		82
APPENDIX B: CPUT PERMISSION TO CONDUCT RESEARCH		83
APPENDIX C: LETTER OF INFORMED CONSENT FOR SURVEY		84
APPENDIX D: QUESTIONNAIRE		85
APPENDIX E: FACULTY ADMIN STAFF INTERVIEW SCHEDULE		88
APPENDIX F: FINANCE DEPARTMENT INTERVIEW SCHEDULE		89
APPENDIX G: IT SUPPORT INTERVIEW SCHEDULE		90
APPENDIX H: GRAMMARIAN CERTIFICATE		91

LIST OF FIGURES

Figure 4.1: Computer literacy level.....	31
Figure 4.2: E-registration accessibility.....	34
Figure 4.3: Competency of the administrative staff	38
Figure 4.4: Competency of the technical staff	38
Figure 4.5: Adequate computers for e-registration	40
Figure 4.6: Respondents' location of registration	41
Figure 4.7: Challenges of e-registration	42
Figure 4.8: Experience of using e-registration.....	43
Figure 4.9: E-registration system and its effectiveness	44
Figure 4.10: E-registration system log in procedures	44
Figure 4.11: Online registration efficiency - long queues at campus for registration	45
Figure 4.12: E-registration system user-friendliness	46
Figure 4.13: Orientation for the e-registration system.....	47
Figure 4.14: Accessibility of the e-registration system.....	48

LIST OF TABLES

Table 2.1: E-registration steps	13
Table 3.1: Level of computer literacy	27
Table 4.1: The advantages and disadvantages of using the e-registration system.....	49

CHAPTER 1

INTRODUCTION AND BACKGROUND

1.1 Introduction and background to the study

Annual enrolment of students in higher education has increased significantly in South Africa in recent years (Department of Higher Education and Training [DHET], 2018:9). Therefore, the advent of the Internet associated with information technology (IT) has seen organisations, universities and colleges adapting to online service (AwwAd & Al-Mohammad, 2010:5). The e-registration or online registration system (ORS) was introduced at universities and is an effective alternative to manual registration. ORS allows students to register electronically, saving time in the process (AwwAd & Al-Mohammad, 2010:6). For instance, the implementation of the ORS iEnabler at the Cape Peninsula University of Technology (CPUT), has improved the registration process (Chipeperekwa, 2017:11-12). Simultaneously, CPUT has a manual registration process as a parallel to the e-registration process, meaning the e-registration process is incorporated into the Students' Account system process. The e-registration system and Students' Account system process are not automated as an online system interface, which causes problems with the e-registration process and other problems of e-registration. The researcher investigated the interaction or interfaces between both systems process and with the students facing challenges during the registration process.

1.2 Background to the research study

The use of a student e-registration system is becoming more common in all universities due to the rapid growth of students enrolling for their degrees (Adepoju, 2010:204; DHET, 2018:9). The process of e-registration at institutions of higher education is vital and needs to replace the old manual process to improve efficiency and offer better services. Universities that use a manual process of registration waste time and money of students as they have to travel to register (Mashabela & Pillay, 2017:32). With an ORS, students can choose their modules electronically and they can register remotely at their own convenient time (AwwAd & Al-Mohammad, 2010:6). Furthermore, the e-registration period is shorter than the traditional manual registration where students must be at campus to register. Many universities have moved from offline registration to the e-registration process that reduces paperwork significantly, it is cost-effective, secure, saves time and students can register from their place of comfort if there is Internet connection (Salisu, 2020:289). However, the system needs to be fully automated to move away from manual registration. Handling vast amounts of information for students can be cumbersome; hence, the Student Information Management System (SIMS) provides a solution by providing a simple interface for student information maintenance, student data retrieval and keeping of records. Online registration forms part of this system and provides a paperless service and automation of records (Bharamagoudar et al., 2013:2342).

Raja and Nagasubramani, (2018:33) postulate that technology has made work easy, efficient and less time consuming since its inception in the 21st century. Typically, the application of IT and the advent of e-registration services allows students to register from anywhere and in any place (Bhardwaj & Walia, 2012:1). However, unavailability of the correct software impedes the use of computers from home (Siddiquah & Salim, 2017:4993). IT provides opportunities to students for the development of their individual, creative and intellectual abilities, which extends to e-registration (Siddiquah & Salim, 2017:4988). IT provides productive and innovative instruction and learning to enhance the intellectual and creative potential of the students (Siddiquah & Salim, 2017:4988). By using e-registration, institutions can focus less on processing paperwork and more on meeting the educational needs of their students (Salisu, 2020:289).

The scope of e-registration includes programmes that contain detailed information of students from their date of enrolment up to the day of graduation. E-registration provides information in real time and electronic format that allows confirmation of students' enrolment status at the university. The education system requires a vast amount of data and documentation from students during study semesters. E-registration emerged due to issues associated with manual handling of registration and student records. For example, in many cases, student data are lost due to a manual registration procedure or it is difficult to share within different departments at the university. The ORS allows universities to focus less on processing of paperwork and more on what matters most meeting the educational needs of their students. The e-registration system provides effective access to information needed in daily tasks such as effective decision-making, planning and research (Salisu, 2020:290-291).

Without system interaction, e-registration would be futile. System interaction is described by Baghdadi (2002:55) as a system that is made up of components such as hardware, software, interactions, procedures and people and is a subsystem of an information system (IS). According to Alter (2018:236), there are two types of system interaction. The first is socio-technical, in which humans work in the system, which is dependent on its sub-systems to work effectively and efficiently. The second is the fully automated interaction system that depends entirely on the system to perform the work. For e-registration to be fully functional, system interaction is necessary and crucial (Alter, 2018:233). The e-registration system is dependent on the system interaction to perform its functionalities. In this research, system interaction enables students to register for their courses, choose the subjects they need, allows the Finance department to access student accounts and allows faculties to access student profiles. Furthermore, system interaction enables management to make decisions, depending on the type of information needed.

However, Alter (2018:233) claims that system interaction can devalue the efficiency and performance of the system, regardless of how IT-reliant the organisation is. This means the

effectiveness of ORS interaction is degraded in one way or the other. The students are inconvenienced when attempting to register online because some aspects of e-registration cannot proceed as the system is dependent on sub-systems to perform certain functions. This prevents the student from continuing with registration, which is a problem.

Raja and Nagasubramani (2018:33) claim that manual tasks can now be automated because of technology that has certainly changed our way of living. System interaction subsystem is helpful with the automation of some manual tasks, especially on the e-registration process. The use of technology in the education sector makes life easier (Raja & Nagasubramani, 2018:33). The fact that students can now register from the comfort of their homes mean there is a lot of system interaction that takes place for e-registration to be considered a success. This interaction happens between different elements of the ORS, including the Finance department, faculties, Residence department and so forth.

1.3 Problem statement

Lack of confidence of students to use the ORS on their own and in the comfort of their homes has undermined the online student registration system at CPUT. Although an ORS is supposed to speed up the registration process, the student registration system is embedded with various problems and its functions are not comprehended by many. Students struggle to use the system, hence opt to go to the university campus for assistance, which defeats the purpose of being able to register from anywhere in the world. System interaction plays an integral role in the process of e-registration; however, the system is not fully automated, meaning that students still have to go to campus physically for assistance with certain functionalities of the e-registration process. According to the CPUT website, the problem was identified when CPUT introduced e-registration in 2012. Some of the challenges identified were prolonged registration periods, long queues and a congested network during the registration period. Students still had to get their student cards at the campus after registering online and at times the financial block was not lifted, which prevented students from completing the registration process. Only when the block was cleared by the faculty administrative staff or the Finance department, could students proceed and complete their registration process.

Similar studies were conducted in Nigeria, Canada and Ghana (Adepoju, 2010:202; Estevez et al., 2014:51; Bemile et al., 2014:322). Challenges faced by students registering online included non-user-friendly registration systems, inability to log into the ORS, long queues during registration periods, students still had to go to campus to register even though they should be able to register from anywhere in the world and students blocked from registering for various reasons. The focus of Estevez et al. (2014:51) was on the usability of the ORS but they concur with Adepoju (2010:196) that the system comes with challenges. According to Madigan et al. (2007:410), most first-year students do not have adequate computer skills,

which is to be expected as they come directly from high school and they are not confident to use the online system. Estevez et al. (2014:51) share the same sentiments as Madigan et al. (2007:414) that many newcomers from high school lack computer literacy. Most of the first-year students who come from previously disadvantaged backgrounds are not computer literate, which could contribute to their lack of confidence (Madigan et al., 2007:412) and they should receive assistance to enable them to relate to the ORS or any basic online tasks (Madigan et al., 2007:414).

1.4 Research aim

The aim of this research study was to investigate the challenges students face during e-registration and to investigate the system interaction and interface of the e-registration system.

1.5 Research questions

The research questions that guide this study are:

- 1) What are the main challenges faced by students when registering online?
- 2) What is the interaction process between the registration system and multiple other systems

1.6 Research objectives

The objectives for the study, based on the problem statement and aim, are:

- i) To investigate the challenges of e-registration by students
- ii) To investigate students' experience during the e-registration process
- iii) To determine the extent of e-registration system effectiveness
- iv) To determine students' experience in using the e-registration system application
- v) To investigate the advantages and disadvantages of using the e-registration system by students during their registration period
- vi) To investigate the interaction between e-registration and Students' Account systems
- vii) To investigate the role of IT support staff in monitoring the interaction between the registration and Student' Account systems
- viii) To investigate the technologies used to integrate the registration and Students' Account systems
- ix) To investigate the extent administrators and Finance department reconcile student' data between Students' Account systems
- x) To investigate how student data are managed between registration and Students' Account system

1.7 Research design

Research design is described as the structure that the research is going to take including type of data, the size of the sample, data gathering method and the theoretical aspect the research will adopt (Akhtar, 2016:68). This research adopted mixed methodology because the researcher wanted to gain meaningful information from both qualitative and quantitative data.

1.8 Delineation of the study

This study was limited to iEnabler ORS that is used by students to register at CPUT, where the challenges of registering online were identified. Other systems were not included as they are not directly linked to the ORS.

1.9 Pilot study

A pilot study is a process used to test the data collection instrument to identify defects and clarify unclear questions on the data collection instrument (Welman et al., 2005:148). The questionnaire was piloted and corrections were made before final administration.

1.10 Significance of the research

CPUT will benefit from this study by assisting CPUT to comprehend the challenges of the ORS and to overcome these challenges. This study will add to the body of knowledge, bring CPUT to parity with latest technology and improve service, efficiency and competency. Full automation of system interaction of the ORS will improve the efficiency of the e-registration process. Primary sources such as interviews, questionnaires and observations obtained from interviewees and students were used in this study, which makes it original. Though this study only focused on the Faculty of Informatics of Design, other faculties may also benefit from this study.

1.11 Ethical considerations

Ethical considerations in research refer to honesty and respect for human rights displayed by the researcher (Welman et al., 2005:156). All participants were fully informed of their exact role in the study. The cover letter of the survey questionnaire assured participants that their participation was voluntary, that all their responses would remain confidential and their anonymity was assured.

1.12 Structure of the dissertation

Chapter 1: Introduction and background

Chapter 1 introduces the study and provides a background and context to the research. The chapter offers a brief outline of the research problem, aim, objectives, research questions and research design. Ethical considerations applied in this study conclude the chapter.

Chapter 2: Literature review

This chapter reviews existing literature relevant to the topic under study. The literature is divided into sub-sections according to the variables of the research, namely ORS, e-registration efficiency, the e-registration process at CPUT, iEnabler e-registration steps and challenges, students' perspective on using ORS, challenges faced by students in e-registration, advantages and disadvantages of using ORS, system interaction, the role of IT in managing e-registration, e-registration system data management and system interaction management.

Chapter 3: Research methodology

Chapter 3 addresses the methodology and techniques applied in conducting the study. The chapter explains the research design, research approach, sampling technique and the procedures of data collection.

Chapter 4: Data presentation, analysis and interpretation

In this chapter, all the data that were gathered are analysed, presented and discussed. The results are presented graphically in the form of tables and graphs.

Chapter 5: Findings and discussion

Chapter 5 is built on the findings that emerged from the analysis of the data presented in the preceding chapter.

Chapter 6: Conclusions and recommendations

The final chapter, Chapter 6, outlines practical, theoretical and methodological contributions. The research objectives are revisited. Conclusions are drawn and recommendations made,

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The aim was to investigate the challenges students face during e-registration and to investigate the system interaction and interface of the e-registration system. The term e-registration is used interchangeably with the term online registration in this study. The literature sourced from books, journal articles and Internet were relevant as it contributed vastly by giving an insight to challenges, and interaction of various online registration systems. The literature gives an overview of how students feel about online registration and highlights some of the challenges that have been encountered by previous researchers. The literature is aligned with the objectives of this research and is divided into ORS, e-registration efficiency, the CPUT e-registration process, iEnabler online registration steps and challenges, students' perspectives on using e-registration, students' challenges in using ORS, the advantages and disadvantages of using ORS, system interaction. It further covers the role of IT in managing e-registration, e-registration system data management, system interaction management and e-registration interaction management.

2.2 E-registration system

According to Okoye (2015:2), the ORS is a process whereby students capture information online as per perimeters set and then submit when all the information required is completed. The information captured becomes a registration file once information is collated and saved. The folder can then be accessed at any time by the institution to review the details from the student's profile. Dar (2018:805) states that e-registration is a three-tier architecture, comprising user interface, web server and database server.

Students at CPUT can now register from the comfort of their homes but this technology comes with its own challenges. In their research about online registration conducted in Ghana, Bemile et al. (2014:321-322) are of the opinion that the use of technology has brought relief in many organisations as technology makes work a lot swift and effective in this digital era. Bemile et al. (2014:321) discovered that the system that was being used at the place of their study requested students to go in person to register at campus and decided to end the strenuous process by developing a system that does not require physical bodies at campus but instead, students could register from home. Bemile et al.' (2014:321) statement above is true but technology is not always smooth sailing, which sometimes leads to ineffectiveness although the general feature of technology is to make work less time-consuming.

While technology has brought some relief as asserted by Bemile et al. (2014:322), many previous researchers discovered many issues with the ORS. For instance, Okoye (2015:1) conducted a research at a university in Nigeria where he explored the online registration

challenges that open and distance learners face. Okoye discovered that most online registration problems are due to lack of Internet service, computer illiteracy, high cost of Internet, network problems, insufficient power supply and delays in bank transactions of payment of fees. The delay in bank transactions is a significant challenge at CPUT as some students remain blocked from registering even after paying fees, which impedes the registration process. The current study discovered that some students still have to call or physically go to campus to get the financial block lifted, which negates the advantage of registering from anywhere. The research conducted in Ghana, Kenya and Canada by Adepoju (2010:196) found similar challenges to those mentioned by Okoye (2015:1). This narrates similar online registration challenges at universities across the globe.

In efforts to curb the online registration issues at a university in Ghana, Bemile et al. (2014:321) designed an ORS model that captures data in real time and does not require students to go to campus to register but instead they could register remotely. Bemile et al. (2014:322) indicate concerns raised by students on the use of an online system, such as cost of technology, Internet access and reliability of technology but acknowledged that students appreciate the element of immediacy in getting responses from lecturers. Bemile et al. (2014:332) add that complaints from students about ORS should be addressed to solve the problems, satisfy clients and improve efficiency. Odero and Oloko (2013:119) share the same opinion above when they state that the online web should be a simple, clear and dependable system.

E-registration has replaced the old, traditional manual registration and is here to stay in this era of technical advancement. According to Odero and Oloko (2013:119), the e-registration system has to be stable, fully equipped and self-validated to provide seamless operation to eliminate errors. Salisu (2020:290) agrees that the e-registration system must be robust, self-validated, flexible, user-friendly and secure.

Fauzy et al. (2018:46-47) suggest that the ORS must be tested to check its functionality and if it meets clients' expectations. Fauzy et al. add that non-functional tests include security testing, load testing, compatibility and usability. Furthermore, Fauzy et al. (2018:46-47) argue usability testing of the ORS is to determine if productivity is increased by using the new developed online system and load testing assesses the performance of the system under normal and strenuous circumstances. The above statements from Fauzy et al. are very important, as it is worthless to implement a system that lacks these attributes.

Abu Doush (2019:1) identifies web accessibility and electronic accessibility as some of the problems of online systems and adds that technology resource electronics are needed for students to access information. Abu Doush (2019:2) further notes that website inaccessibility in higher education is not explored sufficiently and that universities should improve their website accessibility to accommodate their students and staff. Abu Doush adds that most

universities' websites are functionally inaccessible and suggests they could improve this situation by supplying basic accessibility guidelines. Abu Doush (2019:3) maintains that some obstacles to accessibility are web developers that have no experience in website accessibility. Abu Doush recommends that web developers receive training and simplify the accessibility criteria. Onuka and Ajayi (2012:424) claim that training of staff improves the profitability and effectiveness of an entity and needs to be taken seriously.

Odero and Oloko (2013:119) opine that online registration should be flexible, user-friendly and able to deal with vast numbers of students. The ORS should have easy instructions in simple, understandable language and online help for the language should be used (Odero & Oloko, 2013:119). The ORS needs to be accessible to students to enable them to register from home. Abu Doush (2019:1) opines that all students should be able to access university websites for activities such as online registration, access to articles and so forth. Abu Doush adds that many studies indicate that university website inaccessibility is still a common problem, which could stem from a lack of awareness of the importance of planning and implementing web accessibility guidelines.

Adams et al. (1985:155) claimed many years ago that an online system should be designed to accommodate the human factor, including using user-friendly software for online system end-users and that the online system's effectiveness should be of maximum quality. Adams et al. (1985:155-156) further argued that the human interaction dialogue with the computer system should be simple to make the process easy. The opinions above of Adams et al. still hold good today and are the underpinnings of an ORS. The ORS should be easy for students navigate but students should have adequate and relevant computer skills to be able to negotiate the system.

Broadly, the organisation identifies the operating function it would like to apply in its business process. It consults IS development companies to suggest the best possible options to accommodate the needs of the organisation and to provide support system and maintenance to the programme reference. Avison and Fitzgerald (2003:21) argue that system developers should analyse the user's requirements to satisfy their needs or else the system will be worthless if the end-users are unable to make full use of the system to their advantage. The same applies to the ORS at CPUT, where this study was conducted.

According to CPUT's website, the ORS at CPUT would encompass functions such as allowing students to make fee payments, register for residence and other applications (CPUT, 2017a). Despite the lengthy period between the studies of Adams et al. (1985:155) and Avison and Fitzgerald (2003:21), the researchers share the same values about the online system. Some of these values are that the ORS should be able to maintain files and data input, protect end-user information, be easy to use, resolve problems and be easy to maintain, amongst others.

According to Adams et al. (1985:155) and Avison and Fitzgerald (2003:21), these functions are some of the characteristics that should be embedded in an online system.

Network availability to the students attempting to register online is a further consideration, as previously indicated by various researchers. There are different types of networks, such as wide area networks (WAN) and local area networks (LAN), as reported by Pintello (2013:4). Researchers concur that WAN encompasses vast coverage across cities and nations, which gives access to students registering remotely but LAN only provides network coverage for computers within the same building or surrounding areas, which gives access to students who go to register at campus. Shelly and Rosenblatt (2012:506) are amongst many who confirm that the system implementation is phase-based. They note the phases as application development phase, testing phase, installation phase and evaluation of the new system phase. All phases are critical for any system to be fully functional, including the e-registration system. The e-registration process goes through the same phases and any problems detected are attended to by technicians as they arise.

This is the initial point where students, especially first-year students, start to engage with the university after being accepted to study, hence the experience should be exciting, interesting and memorable. Returning students may have an idea as to how the system works by the second time they register online but first-year students are strangers to the system. In efforts to curb the registration challenges at universities, Fahmy (2007:353) invented a Computer-Telephony Integration registration system for both undergraduate and postgraduate students at King Faisal University in Saudi Arabia. Fahmy (2007:353) explains that the system allows students to register by simply making a call to the institution, after two rings, a pre-recorded voice prompt guides students through the process.

The student is asked to enter his/her identity number and later a password to gain access into the system. Fahmy (2007:354) further explains that once the system identifies the student, the student will be asked to enter their departmental code as well as course code to be registered. The system has a function to amend possible errors and permits more attempts to log in if students enter wrong details. By creating this system, Fahmy (2007:353) wanted to eliminate queues of students waiting to register at campus. Fahmy adds that this system saves time for both students and employees as automated computers assist students with the registration process while employees can attend to other duties. Fahmy (2007:353) is adamant that the online registration problems are because numerous students access the website at the same time, causing network congestion, which is why the system should be able to accommodate masses at the same time, as suggested earlier.

It was, however, not discussed if the programmed computers were inundated with high volumes of calls during the registration period according to the system that Fahmy invented.

Fahmy's system has many advantages, including students not having to go to campus but the telephone bill attached to the system could be too costly for students, unless the calls are free or embedded in the fees to be paid at a later stage. This aspect too was not discussed to be able to see the bigger picture of how efficient the system is, especially because it has been indicated in previous research that e-registration is expensive for students. Though the system is effective and efficient, some students may not have access to phones. Students may not know the information that they will be asked when they are registering, such as departmental code and subject code, unless the information is sent to them prior to registration, which is not mentioned. This may be a downside to Fahmy's system but otherwise it is a brilliant system and cost-effective, especially because there are no travelling costs incurred to go to campus.

Dailey (1994:12) reports that in 1992, a similar system called "Touchtone Registration System" was implemented at Rutgers University. The author found that students were relieved to have a telephonic registration system where they could register from home. Students would call a regional number and enter 4-digit pin to gain access to the system, whereafter the student would follow voice prompts on how to add or drop a course. For the first time, students at Rutgers University could register from homes or anywhere they could access a telephone according to Dailey (1994:12-13). Registration was made easier, which came as a huge relief to students who were tired of the slow manual registration process and having to stand in long queues. Dailey (1994:12) and Fahmy (2007:353) have like-minded views that the telephonic system makes a significant difference when it comes to long queues and students do not have to go to campus to register. The idea of students not having to go to campus to register is supported by Adepoju (2010:204) and Bemile et al. (2014:321), who agree that students should be able to register online from anywhere and not necessarily have to go to campus.

Britto and Rush (2013:31) argue that orientation for online registration boosts students' confidence and instils in them a sense of belonging to the institution and community. Britto and Rush add that orientation helps students with learning technical skills, which assists them with online learning and gives them an idea of what computer skills, hardware and software are required of them. This implies that students should receive e-registration orientation before they register so that they familiarise themselves with their chosen institution and equip themselves with the necessary computer skills needed to interact with the ORS when registering. Implementation of the ORS is one of the challenges for universities with high numbers of students. The capability of an online registration system to accommodate large numbers of students is often not tested and it is unable to provide a steady Internet connection to all students during registration (Darunday et al., 2016:1). According to prior research, this is a familiar problem at many universities globally due to lack of budget, use of outdated technologies, lack of development time and lack of consultation on the user's requirements (Darunday et al. 2016:1). Some of the advantages of e-registration are dependability,

simplicity, quantifiability, personalised and systematic management. Students need a clear and simple online environment, the website should be always available, users should be comfortable using the system and realise the advantages of the system, the system should be flexible for students and successful, as well as sustainable (Salisu, 2020:290).

2.3 E-registration efficiency

Undoubtedly, the e-registration (iEnabler) system at CPUT is more effective than the old manual process. This is evident as manual registration process carries the risk of human error, loss of forms, meandering queues, time consuming and frustration on both staff and students due to the tedious process. On the other hand, e-registration offers students the luxury of registering from the comfort of their home. However, the exception is international students who are not yet able to register online at CPUT as a different system is used for international students.

E-registration is live, updates information as it is captured and safely retains student records from the outset, as well as their study history, which is more difficult to do with the old manual system, considering that hard copy files can be easily misplaced. In addition to that, e-registration reduces costs, student records are easily accessible with a click, it is quick, less errors, easy to capture data and students can register remotely (Odero & Oloko, 2013:119). Training of technical staff is highly recommended to enable them to handle technical queries and improve the efficiency of online registration. Odero and Oloko (2013:119) report that this training has made online registration and the Kenya Certificate of Secondary Education enrolment (KCSE) effective in Kenya.

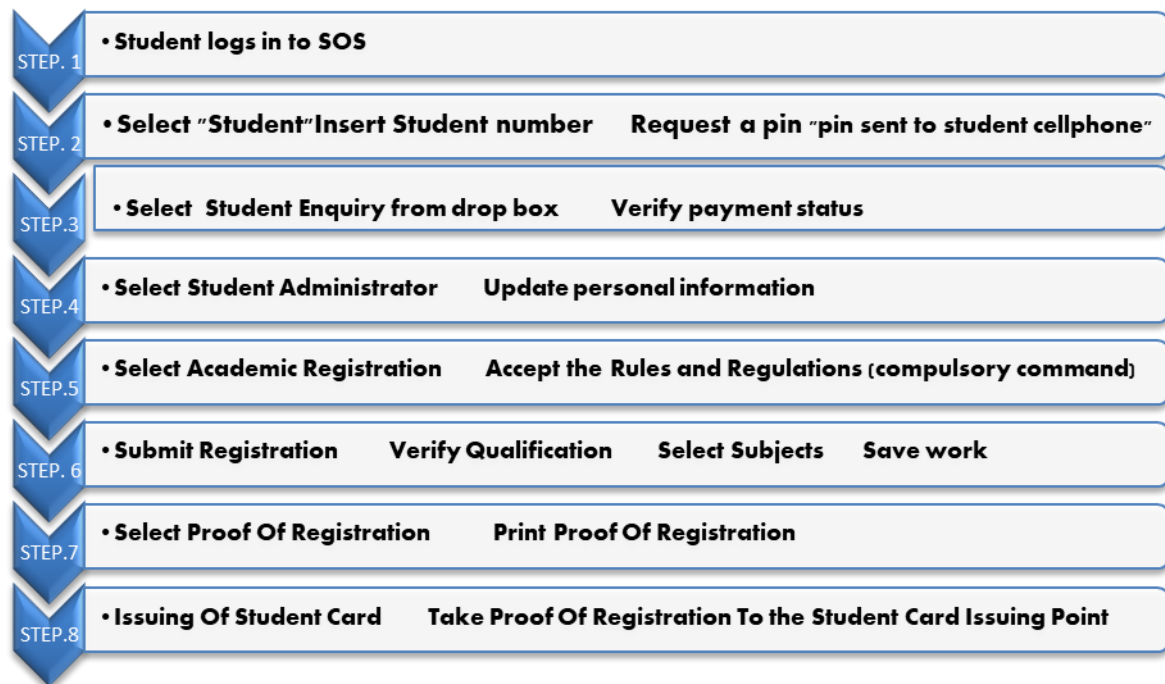
Shaltoni et al. (2015:82) explored students' satisfaction with university portals in developing countries, focussing on the satisfaction derived from students' use of Internet and technology when navigating the portals during their academic lives. Their findings were that students are satisfied with the availability of service, system information quality and the usability of the system when they use it for purposes such as online registration, accessing libraries searching for journals and any academic activities. Bemile et al. (2014:322) claim that the use of IT drives efficiency and effectiveness of the business process in an organisation. Shaltoni et al. (2015:84) postulate that for university portals, such as the iEnabler ORS in the current study, to be considered successful, it must be able to satisfy students as they are the primary clients of the universities. Otherwise, it is pointless setting all these technical platforms if they do not fully serve the desired purpose and meet the core function of the organization as well as satisfying clients. Instead of students thronging to campus to register, students can use their smart phones to access websites and information as well as register online (Fauzy et al. 2018:45). According to Dar (2018:809), e-registration is effective, efficient and significantly less time-consuming than manual registration. The researcher agrees with this statement although

some respondents in the current study still show negativity towards the ORS, despite its benefits.

2.4 E-registration process

Okoye (2015:1) found that no Internet access was one of the many problems that hamper online registration. At CPUT, for the e-registration system to operate, students must gain access by first logging into the CPUT website, which is connected to the Internet, and then log into the e-registration portal. This underscores how vital Internet access is at universities, especially for e-registration. Table 2.1 illustrates the CPUT e-registration steps.

Table 2.1: E-registration steps



(CPUT, 2017a)

2.5 iEnabler e-registration steps and challenges

Looking at all the steps of e-registration, there are challenges in most of these steps, if not all. The challenges of e-registration start from step 1 right through to step 8, according to observation and personal experience. Unfortunately, e-registration is not accomplished by the click of a button; it is a sequential process, each step dependent on the next step, for a student to register successfully. Some steps are easier to navigate than others are. Below are the detailed steps taken by students when registering online and the challenges that come with each step of the e-registration process.

Step 1

Logging into the website is a challenge at times; it takes a while during the registration period since the network is mostly congested.

Step 2

The pin number does not come through immediately after requesting it and in some cases, the pin number is not accepted by the system and requires administrator assistance. In addition, the pin number is sent to the student's email address, a process with which many students are not familiar, especially first-year students. Some students lose their student and/or pin number and have to contact the institution for assistance.

Step 3

In some cases, the payment does not reflect on the system, resulting in students having to contact or go in person to the Student Debtors department at campus to provide proof of payment before the financial block is lifted and the student is able to continue with the registration process.

Step 4

At times, student contact details remain incorrect, even after being updated.

Step 5

If students do not accept the compulsory and mandatory rules and regulations before attempting to move to the next step, they will not be able to continue with the registration process.

Step 6

In some cases, the qualification is wrong, for example the system still reflects the previous year's qualification for returning students and for first-year students in some cases, it reflects Bachelor of Technology (BTECH) instead of National Diploma (ND). In some cases, it reflects a wrong offering type e.g. "full-time instead of part-time" or vice versa. This hampers the registration process, as students cannot proceed until the problem is resolved by the Faculty office. In some instances, amendment of registration details may have to be completed by the student and submitted to the Faculty office before the registration process can continue. If a student was trying to register from home or elsewhere, this could mean that the student has to go to campus to first resolve the matter before proceeding. This is the stage where students select the subjects that they will be taking, whether per semester or a yearly course.

Courses that offer part-time studies could be problematic. Mostly, a maximum of five subjects should be registered, considering that the timetable is not sustainable if students register all seven subjects. Should a student register for seven subjects while attending part-time, the student has to go through a tedious paperwork process to cancel the extra two subjects since the system is not programmed to block the part-time student from registering more than five subjects. Returning students who may have failed subject(s) are blocked from registering online. They need to register manually to ensure that they repeat the failed subjects and do not skip subjects and register for the next level before completing the first level's prerequisite

subjects. The system does not allow a student to continue with registration if the student does not select all subjects available on the system. This results in copious paperwork as some students would need to cancel subjects because they are not managing. By the time the student thinks of cancelling some subjects, they would have already wasted time and fees on the subjects.

Step 7

This is the final step of the e-registration process, where a proof of registration is printed. The challenging aspects here are that if students have registered from a cell phone or any device not connected to a printer, the students will not be able to print the proof of registration. This results in the students having to go to campus to have proof of registration printed. If students had registered from an Internet café, they can have proof of registration printed from the Internet café at a cost. The student card is another burning issue. Students can only get their student cards from campus and those students who manage to register from home must still go to campus to obtain their student cards, having their photos taken first and then being issued with the student card. The student card grants access to the institution's resources, hence is crucial to have.

Step 8

At this stage, the student has successfully registered. Only those who applied for residence may take the proof of registration as well as the student card to the Residence department to be allocated accommodation. Again, this can only be done on campus. Those students who may have registered from further afield have no choice but to bring their proof of registration to campus to get rooms allocated to them. The allocation of accommodation normally takes a slow pace resulting in students becoming desperate and anxious about accommodation. At some point, students have no place to stay while attending classes, until they are finally allocated a place to stay while studying.

Even though there are challenges with the ORS, Cooner (2010:272) views technology in higher education as progress from the old manual system. However, practical challenges are that some students may have to compete with family for Internet access on home computers and ultimately still have to go to campus to gain online access. Nevertheless, students still appreciate the flexibility that comes with online access.

2.6 Students' perspectives on using the e-registration system

Odero and Oloko (2013:120) report that students with high perception of the online registration are mostly going to use it compared to manual registration, probably because they have a high level of computer literacy. Odero and Oloko (2013:120) further point out that social factors affect the use of online registration, as some students may not have access to technology. In a study conducted at the University of Tripoli, Almigheerbi et al. (2019:132) found that students

had higher expectations from online registration from a service and quality perspective, than what they actually perceived. Furthermore, students were concerned about the reliability and security of the ORS and deemed it of paramount importance that security issues of the ORS be resolved to improve the service. Mashenene (2019:1) concurs with Almigheerbi et al. above. Mashenene found that students' expectations of online registration were higher than their perceptions of service and quality and that they were dissatisfied with the service they received. Lee et al. (2011:159) opine that students who are comfortable with online technology perceive less challenges when using the ORS. This could be because they have a high level of computer literacy. In general, online registration is seen by students to be ineffective because students experience lack of face-to face interaction between students and administrators despite many advantages it comes with as students could not ask questions and get immediate answers, students complained that the online system is stressful (Udofia, 2015:92). Furthermore, students complained about technical issues and incompetency of the technicians as well as extra costs and security issues and added that most students preferred manual registration (Udofia, 2015:91). According to existing research, service quality and students' satisfaction with the online registration is regarded as poor.

2.7 Students' challenges when using the online registration system

Adepoju (2010:201-202), Okoye (2015:1) and Abu Doush (2019:1) note challenges similar to those previously observed in this research, which were later confirmed by the data collected. Some of these challenges are:

- a) Students could not log into the ORS and have to go to campus to register;
- b) The system is not user-friendly and had Internet access issues;
- c) Long queues during the registration period due to network congestion;
- d) Students still had to go to campus to register even though they should be able to register from anywhere in the world;
- e) Students blocked from registering for various reasons;
- f) Congested and unreliable computer network during registration period;
- g) Students not getting pin numbers promptly to be able to log into the ORS;
- h) Students could not get student cards after registration because the system was down;
and
- i) Financial blocks not lifted, preventing online registration,

Odero and Oloko (2013:120) state that the maintenance of the online registration infrastructure and total migration is a challenge because some students have a low level of computer literacy. This is a disadvantage to online registration as some students are left behind, struggling to register online. Odero and Oloko add that some students are not responsible enough to take ownership of their registration and depend on other people to help them, which results in errors

because students do not check if the information entered is correct and some end up registering for wrong subjects. Salisu (2020:292) lists power failure, poor environment, slow-speed servers, system breakdown and insufficient workstations as some of the online registration challenges.

Lack of computer literacy hampered the e-registration process. Mesfin et al. (2018:157) report that computer literacy is problematic in most local schools and advocate for it to be included in high school curricula and to make computer literacy a compulsory subject for graduating from high school. Ukwoma et al. (2016:716) concur with this notion, that computer lessons should be embedded in high school curricula, as they believe it assists students to have computer skills and being able to articulate a computer-based task. Mesfin et al. (2018:160) identify some of the challenges that impede the proper implementation of computer literacy in many developing countries as low self-esteem in students when using computers, poor marketing strategy for computer training to students and insufficient technical support. Manganello et al. (2019:45) opine that students need to be given support on the use of computer technology and they need to gain self-confidence and self-motivation. Ukwoma et al. (2016:708) and Mesfin et al. (2018:160) report that some students feel intimidated by using a computer with the little skills they have. This makes it uncomfortable for students to navigate the online registration process. However, Cooner (2010:272) asserts that most students have access to computers and Internet at home and they have experience in using computers, navigating the web browser to access study material. This implies that the level of technology usage is high among young people and they are familiar with the online learning environment. Adepoju (2010:203) asserts that the bandwidth can cause the server to respond slowly, which delays the online registration process. Adepoju recommends installing a large bandwidth that can accommodate all students at universities when registering online to avoid Internet congestion. Ginn and Hammond (2012:248-250) list some of the online registration challenges as effectiveness, poor quality, technical issues, infrastructure-related issues, computer literacy, technological skills, reliability of technology and student-related issues. Ginn and Hammond (2012:249) add that many people view the online education system as a difficult process embedded with many challenges, although it is generally effective compared to the old manual registration system where students had to be at campus. Ginn and Hammond believe that the efficiency of online education is dependent on the academic level of the students.

2.8 Advantages of using the e-registration system

- The process is quicker than manual registration
- Students can register from the comfort of their homes
- Students can register when it suits them
- Confidentiality and flexibility

- Information is updated spontaneously
- Real time system
- Students get to capture their own information and can make changes
- Students can call for help during working hours
- Students can pay fees online
- Students do not have to come to campus to register
- No long queues
- No conflict with staff
- Process not stressful if one knows how to navigate the system
- Students can familiarise themselves with the system
- Saves time
- Less paper work

2.9 Disadvantages of using the e-registration system

- No person to assist and make students comfortable
- Can be a lonely and intimidating experience for students
- Lack of resources
- Lack of support
- Lack of expertise
- Reliability
- Poor and slow network connectivity
- Incompatible software between home and school
- May become expensive by students calling for assistance
- Calls may go unanswered
- May be frustrating not to be able to articulate the registration process on your own
- Students may not be able to log into the system
- Network congestion may hinder the process
- Students may not know how to rectify mistakes and need assistance
- Students still have to go to the campus to get students cards
- Students have to submit proof of registration to the Residence department in person for the accommodation to be issued
- International students cannot register online
- Students may not have access to computer
- Not all students have access to computer or cell phone to be able to register

- Some students are not computer literate

The above advantages and disadvantages emanate from the researcher's observations as well as derived from numerous sources (Fahmy, 2007:353; Adepoju, 2010:201-202; CPUT, 2017a; Raja & Nagasubramani, 2018:34-35; Salisu, 2020:290-292; University of Illinois Springfield, 2020; Active Network, n.d.).

2.10 Systems interaction

System interaction is described by Alter (2018:239) as a one-way, two-way or multiple-way of interface or communication between work systems that may involve socio-technical and automated systems. According to Alter (2018:234), to any enterprise that relies on IT, system interaction is crucial but it may pose risks even to well-constructed IT systems. In addition, Alter states that direct and indirect interaction have the potential to affect the system negatively, causing inefficiency, failure and under-performance. Alter (2018:236) elaborates on types of system interactions i.e. socio-technical system interaction and automated system interaction. The author further explains socio-technical interaction as a system that requires a person to enter the work in the system manually, while in an automated interaction system all the work is performed by machines when the system is informed by its subsystem after an input to take action. Alter (2018:235) lists numerous work system interaction errors. Examples are work system operation at cross purposes, overlapping responsibilities in multiple work system, coding of information in one system is inconsistent with coding of the same information in the other system, mutual interference when two work systems use the same infrastructure technology. Further examples are deferring priorities in two work systems makes the product of the one system less useful, problems in one work system degrades efficiency in the other, activities in one work system cause accidents in the other and faulty infrastructure maintenance system causes outage in the other system. According to Ginn and Hammond (2012:250), broadband is one of the limitations of online interaction, which could be the reason why CPUT's system interaction is delayed.

2.11 Role of information technology in managing the e-registration system

Imparting and acquiring knowledge at school has been made enjoyable, less time-consuming and easier by technology and therefore, the importance of technology in schools cannot be overlooked (Raja & Nagasubramani, 2018:33). E-registration is a prime example of a technology that benefits universities and students. Raja and Nagasubramani (2018:33) add that technology, such as the Internet, enhances students' learning by giving them easy access to academic material that helps their learning. In addition, students can register from home using IT.

Even though some technological barriers are reliability and compatibility of hardware and software between home and school computers and may impede the use of technology, Raja and Nagaubramani (2018:35) suggest that students and lecturers should take advantage of the positives of technology and use it to their advantage. The technical infrastructure of an organization, such as equipment and devices, computers, servers, data processing, software operation systems and software network is referred to as IT (Bubel & Cichoń, 2017:119; Ahmad et al., 2018:512). According to Ahmad et al. (2018:512), the function of IT includes designing and processing an IS in a computer software application that selects, collects and retains information. Ahmad et al. (2018:513) add that IT comprises five components, namely people, software, hardware, data and network. All five components are pivotal to the e-registration process functionality. Students need to use computers connected to the network to access the CPUT website to register by capturing their information that needs to be securely stored. IT is the cornerstone of e-registration; without IT, e-registration would be impossible.

IT and IS are inseparable. Ndlovu (2015:27) states that IS is crucial to the operation of business. Therefore, it cannot be stressed enough how vital it is to understand the importance and purpose of having access to IS and IT in any organization, including universities. Satzinger et al. (2011:4) describe IS as synchronised computer elements that collaborate in gathering data and process it into vital information used for the articulation of an organisation's tasks.

Shaltoni et al. (2015:82) explored student satisfaction in university portals in developing countries, where they focused on the satisfaction that is brought by the use of the Internet and technology by students when navigating the portals during their academic lives. They found that students are satisfied with the availability of service, system information quality and the usability of the system when they use it for purposes such as e-registration, accessing libraries to search for journals and other academic activities. This highlights that IS, programs and business processes that are implemented in universities should not overwhelm students that are their main customers. Students should be able to access, enjoy and benefit from university portals, using them for constructive academic purposes. In the current study, the researcher believes that the e-registration service should be easily accessible to all students, provide quality service and valuable information to students.

Without IS and IT, e-registration would not be possible at CPUT. This notion is supported by Shelly and Rosenblatt (2012:4) who describe IT as a collection of hardware and software set programmed to provide services and process data into information that can be viewed and used by the organization and other parties who have access to the information. IS is a system that is responsible for processing input material into information that can be used by the organisation (Satzinger et al., 2011:4). Therefore, e-registration is dependent on both IT and IS to run, which is supported by Bemile et al. (2014:322) as they claim that the basic role of IS is to support business process and to assist with decision-making in an organization for

competitive advantage. Bemile et al. (2014:322) further claim that the use of IT propels efficiency and effectiveness of business process in an organisation. On the other hand, Shaltoni et al. (2015:84) postulate that for the university portals, in this research CPUT's iEnabler ORS, to be considered successful, it must be able to satisfy students as they are the primary clients of universities. Otherwise, all these technical platforms are useless if they do not fully serve the desired purpose and meet the core functions of an organization, as well as satisfying the clients. Bemile et al. (2014:332) posit that teamwork and collaboration is important at university for the success of the IS in the registration process. Furthermore, the institution can use IS to identify defects in the system and rectify them as they surface to improve the service, assist students with their queries and meet clients' need.

2.12 E-registration system data, system interaction and e-registration interaction management

Pollard et al. (2019:8) in their study on the impact of the student finance system on participation, experience and outcomes of disadvantaged young people, note that students are tired of the expenses of higher education, they are anxious about incurring debt and applying for financial help is stigmatised. In the current study, it was observed that some students are blocked from registering because they owe fees and most of the students come from disadvantaged socioeconomic backgrounds. While student loans could alleviate students' financial burdens, Pollard et al. (2019:8) highlight the paucity of information available to students about loans. It was further observed that the ORS and the Students' Account system do not interact automatically as students still have to go to the finance office for the block to be lifted, even after making a payment. This notion is supported by Lubanga et al. (2018:665), who found that students still stand in long queues to have their student accounts cleared before registering, even after making payment.

Lubanga et al. (2018:665) suggest, once the payment has been made at the bank, the system should automatically update the balance of students' accounts instead of it having to be manually done by a finance administrator before they can register. The online registration system is an important system to maintain student records and manage student information updates automatically in an effort to save time and improve student data information management efficiency (Bharamagoudar et al., 2013:2342). Lubanga et al. (2018:655) share the same sentiments and add that the student online IS has the ability to centralise all the information into one database for easy access and management of student data. Lubanga et al. add that poor Information and Communication Technology infrastructure hampers fully automated systems in African universities. As a result, the systems may be termed socio-technical as suggested by Alter (2018:236), meaning human input is required to update student information, resulting in long queues. Lubanga et al. (2018:658) opine that the total migration is challenging. This implies that student information may not be updated immediately, for

example because of slow Internet that is due to weak bandwidth (Lubanga et al., 2018:658). Lubanga et al. add that the network is affected by the overloading of servers due to too many users at the same time. Network issues definitely affect online registration and the other systems with which it interacts and interfaces, leaving many students frustrated. System interaction is crucial in organisations. Interaction is an important aspect of IS, as well as business process. Interaction allows global, unified and consistent synergy of process (Baghdadi, 2002:50). Baghdadi adds, "The interaction support system is dedicated to subsystem interactions with each other and with external sources." This implies that the ORS should be able to interact with other subsystems for smooth operation.

2.13 Summary

Although online registration at universities is never smooth, the long queues during the registration period are almost disappearing since online registration now dominates universities globally (Dailey, 1994:12). According to Little et al. (2000:453), years back, students had to gather in one place to register manually, which was a tiring and repetitive exercise and manual registration was costly in terms of human capital.

Many challenges may be embedded in the ORS but it has many positive aspects such as saving time, no travelling to campus to stand in queues the whole day, students can easily register from their desired location as long as they have Internet connection and resources. System interaction plays a major role in connecting students to the many elements of the e-registration process. If the system were set up properly, students would not have to go to the bank to pay their fees. A once-off login into the ORS would administer all student registration process requirements and queries, as well as fee payment. The e-registration system makes registration much easier as the data for clients are centralised and it is easy to retain clients through emailing them or sending messages (Active Network, n.d.). The ORS is regarded as environmentally friendly as it requires less paperwork although human input cannot be totally eliminated (Active Network, n.d.). System interaction and interface is crucial. The student residence should interact with the e-registration system and allocate rooms as soon as the registration is completed. Currently, students have to take their proof of registration to the Residence department to be allocated a room. This results in students having to wait for accommodation to be allocated to them even though they have registered already. Accommodation should only be allocated to accepted students who applied for it from the final acceptance lists that are sent by the departments to the faculties. However, challenges still overshadow the e-registration process, making it difficult for some students to register online due to many reasons, including inconsistent system interaction. Even though the e-registration process itself has many problems, Ginn and Hammond (2012:250) indicate that often faculties reported lack of computer skills of students as a great hindrance to online learning. Student data management is extremely important in retaining records of students for future reference.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

Chapter 2 reviewed literature relevant to the topic under investigation. This chapter explains the mixed method approach and why it was important to use in this study. In addition, it discusses the research philosophy, the research design, research strategy, sampling, piloting, data collection and data analysis. Validity, reliability and ethical considerations are also addressed in this chapter.

3.2 Research philosophy

The philosophical underpinning of this research is positivism because of the nature of this study. According to Atkinson (2017:28), the positivism methodological position of a study stems from a world perspective and incorporates interviews and focus group as data collection methods. The ontological position of this study was objective. Ontology is the existence of the phenomenon of study, what it embodies and how the world understands it (Drahos, 2017:81). The paradigm of this research is interpretative. Fade (2004:647) describes the interpretative paradigm as one that searches for detailed information about the phenomenon of the study and collects data of a qualitative nature. Taylor et al. (2015:4) add that qualitative research adopts a positivist paradigm that assists to pinpoint the root of the problem, which enables the researcher to take a deep dive into the complexities of the study topic.

3.3 Research design

Research design is described as the structure that the research is going to take, including type of data, the size of the sample, data-collection method and the theoretical aspect the research will adopt (Akhtar, 2016:68). This current research adopted mixed methodology because the researcher wanted to gain meaningful information from both qualitative and quantitative data. Most previous research adopted a single method. If a single method was employed in this research, it would not have given an insightful, broad perspective of the phenomenon under study.

A research method comprises the processes or techniques used to collect data or information for analysis to uncover new information and create better understanding of a topic. It explains how the researcher will articulate the phenomenon under study (Mackey & Gass, 2015:2). In this research, a questionnaire was designed and utilised as a data collection tool for quantitative research component (see Appendix D), comprising open- and closed-ended questions. The questionnaire was piloted and corrections were made before final administration. Telephonic semi-structured interviews were conducted (see Appendices E, F and G) and responses were captured verbatim during the course of the interviews to ensure data accuracy. The researchers' observations were also considered in this research.

3.4 Research method

This study employed a mixed methods technique. The term mixed methods refer to a research methodology that promotes the integration, or 'mixing', of quantitative and qualitative data within a single study. Such integration permits more complete utilisation of data than separate quantitative and qualitative data collection and analysis (Wisdom & Creswell, 2013:1).

According to Wisdom and Creswell (2013:1), the advantages of a mixed method are that it reflects participants' views and ensures that study findings are based on participants' experiences. Furthermore, It allows for the collection of rich and comprehensive data

Most previous research employed a single methodology. Plano Clark and Ivankova (2016:4) describe a mixed method as a method when data compilation is done by using two research methodologies, namely qualitative and quantitative, in a single study. A mixed method has the ability to broaden the scope of analysis (Sandelowski, 2000:248). A mixed methodology was deemed most suitable for this research because it promised a deep understanding of the study topic. It helped to solicit the feelings and emotions of the participants interviewed, as well as providing statistics and frequencies of the variables. Plano Clark and Ivankova (2016:4) argue that one of the fundamental principles of the mixed method approach is that it complements both qualitative and quantitative strengths and intersects both methodologies' weaknesses.

Both quantitative and qualitative data were integrated for the researcher to get a clearer understanding (Barkley, 2019:1). Thematic analysis was used to analyse the qualitative data collected from six faculty staff. Thematic analysis identifies themes from the qualitative data gathered (Braun & Clarke, 2006:81). The interview transcripts were perused in detail and data were coded using a highlighter and a pen to identify keywords and phrases across all questions. The keywords and phrases formed unique categories. Themes were then developed from those categories (Maguire & Delahunt, 2017:7).

3.5 Qualitative approach

Paltridge and Phakiti (2015:12) assert that qualitative data collection includes interviews, observations and text as well as pictures. Qualitative methodology is an approach that describes the feelings of the individuals and gathers descriptive data as asserted by Dawson (2002:14). Dawson adds that this method helps to get an in-depth perception of the participants. In addition, it helps to explore the challenges, as well as giving the bigger picture of how the ORS operates. It determines the feelings of the students and administrators towards the ORS. Fade (2004:648) postulates that the interpretative paradigm can be employed in a qualitative approach to understand and explore the individual's perspective. In this research, a qualitative methodology was used together with a quantitative methodology because it was deemed the most appropriate to solicit the behaviour, attitude and human experiences as suggested by Taylor et al. (2015:4). Taylor et al. further assert that questionnaires, face-to-

face interviews, focus group interviews, as well as observations, are used to derive descriptive data on the social phenomenon of the study. In this study, telephonic interviews were conducted due to time constraints. Questionnaires consisted of both open and closed questions as suggested by Dawson (2002:30). The telephonic interviews were conducted with the administrators and IT support staff but they also expressed in their responses how some students feel and perceive the ORS. This interlinks with the quantitative data collected from students by means of questionnaires. The researcher's observations were also considered in this research and later confirmed by the data collected. Content analysis was used for the qualitative component of this study as suggested by Dawson (2002:129). Kohlbacher (2006:6) describes content analysis as a study that pertains to people's recorded communication, in this case interviews that were coded to categorise same data. Kohlbacher adds that coding is the main factor for content analysis. The data from the interviews were coded and categorised, that then formed themes.

3.6 Quantitative approach

Paltridge and Phakiti (2015:12) claim that quantitative methodology is numerical data where scores are used. A Likert scale was used to determine frequencies. Kothari (2004:6) states that a quantitative method is mostly for obtaining statistics and measurements of quality or amounts. The Statistical Package for Social Sciences (SPSS) version 25.0 software was used to analyse quantitative data with only frequencies recorded, as other statistical measures were unnecessary in this study. Self-administered questionnaires were used to collect quantitative data. Creswell (2009:204) confirms that both qualitative and quantitative data are used in mixed methodology. Creswell and Clark (2017:13-14, 18) describe quantitative research as a methodology that adopts a post-positivist approach, using surveys and experiments. They add that open-ended questions are most suitable for quantitative methodology. Creswell and Clark (2017:5) explain that quantitative methodology is a method that determines discrepancies in variables.

3.7 Research strategy: Case study

A case study was used as the research strategy of this study because it gives an in-depth understanding of the aspect under study, by carrying out focus group interviews as well as one-on-one interviews to gather opinions, perceptions and attitudes from the sample selected (Kumar, 2019:123). Kohlbacher (2006:6) postulates that a case study helps to understand the phenomenon under study because it allows the researcher to maintain the full picture and characteristics of real-life events.

This case study helped to gain deep insight to the phenomenon of study where challenges of the e-registration process encountered by students and system interaction were explored. The study area was CPUT's Faculty of Informatics and Design and focused only on the Media

Department that comprises the four programmes mentioned earlier. CPUT was established in 2005 when Cape Technikon and Peninsula Technikon amalgamated. CPUT is the only UOT in the Western Cape, offers about 70 programmes and has several campuses. Questionnaires were administered in class and respondents were given sufficient time to complete them and return them to the researcher.

3.8 Sampling

Mohapatra and Chamola (2020:18) describe sampling as a process of selecting representative units (participants) from a population of a study as well as the method used to select the participants. Since this research was a case study and also due to time constraints, a sample of 35 students was selected from the Media department in the Faculty of Informatics and Design. The Media department has four programmes, namely Public Relations Management, Journalism, Photography and Film Production. The facts and figures were extracted from CPUT (2017b). The respondents were randomly selected as suggested by Dawson (2002:50). The notion of selecting a sample and not selecting the whole population is supported by Kumar (2019:208).

Rowley (2014:310) avers that a large sample harvests better and more generalised findings than a small sample. For the quantitative sampling element, a probability sampling technique was employed since the participants were chosen randomly and had a known and equal chance of being selected Dawson, 2002:51). Questionnaires were distributed to both male and female students from different programmes. Purposive sampling was used to select the six administrators from the Faculty and Finance department, as well as four IT support staff members. They were interviewed to gain an in-depth understanding of the problems faced by students when registering online and to ascertain the root of the problems (Dawson, 2002:50). Purposive sampling is the deliberate choice of an informant due to the qualities the informant possesses (Tongco, 2007:147; Etikan et al., 2016:2). Purposive sampling was deemed best for the qualitative data collection because the administrators and IT support staff selected are experts, knowledgeable and work directly with the e-registration process. They expressed their feelings and experience for both themselves and students about the ORS, which helped to link qualitative and quantitative findings. This is supported by Tongco (2007:147), who asserts that purposive sampling is best for the study of a particular area with knowledgeable experts within that particular area of study. Furthermore, Tongco (2007:147) regards data collected from purposive sampling as reliable, competent and of quality because it comes directly from the experts in that particular field of study. The researcher sought to gain meaningful data from the administrators and IT support staff that work directly with the ORS, hence purposive sampling was deemed best for semi-structured interviews. Tongco (2007:147) opines that purposive sampling can be used in both quantitative and qualitative methods However, Etikan et al. (2016:2) argue that it is typically used in qualitative research data collection to gain an in-depth

insight from the individuals who are well acquainted with the phenomenon of study at hand, who are articulate as well as expressive in their responses. Kumar (2019:42) asserts that a sample is a unit that will properly represent the population of the study. Qualitative data were collected from the sample of six administrators and four IT support staff member interviewees, while quantitative data were gathered from 35 student respondents. This represented the mixed methodology approach applied in this research study.

Table 3.1: Level of computer literacy

Participants (35)	Gender	Basic computer literacy	Intermediate computer literacy	Advanced computer literacy
First year, second year, third year and BTECH students	Male:10 Female: 25	6	14	15

3.9 Pilot study

Dawson (2002:95) advocates that a questionnaire has to undergo a pilot test before it is distributed to the actual participants of the study. Dawson adds that by doing a pilot test, the results will help to ascertain if the answers to the pilot test questions yield the desired results being sought in the study to be conducted. In this study, the questionnaire was piloted to the experts to test the amount of time that respondents needed to complete it and for errors that needed to be corrected, as well as to get advice on how best to construct questions that yield valuable unbiased data. The exercise of piloting a questionnaire is supported by Oates (2005:226), who asserts that questionnaires should be pre-tested by sending them to the experts who will help to amend the final questions before administration to the actual respondents. Piloting the questionnaire was imperative to check the layout, instructions, remove irrelevant questions, correct poor wording, all of which strengthened the validity and reliability of the questionnaire (Sang et al., 2017:101).

The contributions brought by the pilot testers assisted in restructuring the final questions, wording of the questions and the length of the questions, as further suggested by Dawson (2002:95).

3.11 Data collection and analysis

3.11.1 Techniques and procedures

Questionnaires were distributed to students for quantitative data collection. Semi-structured questions were constructed and used for telephonic interviews conducted with the administrators (see Appendices E and F) and IT support staff (see Appendix G) who work directly with the ORS in the faculty where this research was conducted. Data from interviews were coded and themes were derived from categories formed. Content analysis was used to

analyse qualitative data. Both quantitative and qualitative data were analysed accordingly. Quantitative data were presented graphically in tables and graphs. In addition, the researcher's observations were considered.

3.12 Validity

Validity is the appropriateness of the instrument used for data collection and whether it is truthful and authentic to provide unbiased research results (Litwin, 1995:33; Oates, 2005:227). The principle of the questionnaire was adopted from Diem and Burgess (2001:5). A Likert-type scale was used for quantitative data collected by using a questionnaire to determine the frequency of the variables. Willits et al. (2016:127) suggest the use of a Likert scale to ascertain the scale of agreement and disagreement with question being asked, as well as to measure the validity and reliability of data.

For the questionnaire, responses to Section A were ranked from 1 to 5 for easy analysis. Section B ranges from Strongly Disagree to Strongly Agree with 1 being the lowest and 5 being the highest (Diem & Burgess, 2001:10). Section C comprised the biographical details of the respondents and consisted of closed-ended questions only. The participants were asked to indicate their answers in the boxes provided.

As mentioned before, a verbatim account of telephonic interviews was captured during the interview to ensure an accurate account. Expressions made by the interviewees were taken into consideration and recorded to get a sense of the interviewee's feelings and emotions for data analysis purposes (Dawson, 2002:14).

3.13 Data reliability

Litwin (1995:6) posits that reliability is the correctness and sincerity of the data collected to provide stable and consistent results if the research is repeated using the same methodology. Oates (2005:293) describes reliability of research as being repeatable and still producing similar results. The questionnaire was piloted to test the time needed to complete it and for errors that needed to be corrected, as well as to obtain advice on how best to construct the questions to yield valuable, unbiased data.

3.14 Ethical considerations

Dawson (2002:150) postulates that a researcher has to adhere to ethical research principles to be regarded as an authentic researcher. Dawson further states that respecting and treating participants with dignity is of great importance as they should feel protected and have the right to know that they are participants in the research study so that they can give consent. Dawson (2002:151) stresses the importance of assuring respondents of confidentiality and that all information will be used solely for the purpose of the research. Ritchie et al. (2013:66) concur with Dawson's (2002:150) outlook on research ethics, adding that the participants should be

well aware of the research in which they are participating so that they can give consent to their participation. Dawson adds that participants should feel that they are in a safe environment to disclose information. Oates (2005:56) shares the same sentiments as those of Dawson (2002:150).

This research study adhered to all ethical research principles. Ethical clearance of the study was granted by CPUT (see Appendix A). A letter of permission was received from the Dean of the Faculty of Informatics and Design for the researcher to collect data in the faculty (see Appendix B). In line with ethical research principles, a letter of informed consent was attached to each questionnaire (see Appendix C). Before participating in the research, respondents were asked to read the consent letter and sign it to indicate that their participation was voluntary and they were aware that they could withdraw from the study at any time without any objection to their decision. The respondents were assured that all their answers would be treated with confidentiality and that their anonymity was guaranteed. For the telephonic interviews, a consent letter was sent via email to all participants. They were informed that their information would be used for the purposes of this study only and that they would remain anonymous.

3.15 Summary

This chapter discussed the mixed methodology applied in this study. It furthermore addressed the research design, research strategy, validity, reliability, piloting and sampling procedure. Considerations of ethical research principles concluded the chapter.

A mixed methodology was deemed the most suitable approach because the researcher wanted to gain an in-depth understanding of the phenomenon at hand. Furthermore, previous research used quantitative methodology only, which provided statistical data but did not reveal the feelings and emotions of the respondents. SPSS 25.0 software was employed to analyse the quantitative data, from which only descriptive frequencies were extracted. Content analysis was employed to analyse qualitative data that was gathered from telephonic interviews. A deductive method was utilised to select only information that was relevant to the challenges faced by students when registering online.

For the quantitative component, 35 questionnaires were administered to randomly selected students. Amongst the interviewees, there was one technician and one lecturer, to gain a broader perspective of the phenomenon under study. The researcher intended to interview more technicians and administrators from the Applications Office but unfortunately there were no responses to the invitations. Follow-up emails were sent but remained unanswered. However, the researcher believes that the responses from 35 students and six administrators were sufficient to gain meaningful insight into the challenges faced by students when registering online, which was the objective of this study.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter analyses the qualitative and quantitative data collected as well as discussing the outcomes from the data collected and inference. The previous chapter discussed the research methodology. Qualitative and quantitative data were integrated to obtain a clear understanding of the information obtained from respondents. The quantitative component was derived from the student respondents, while the qualitative data were gathered from administrator and IT support participants. Integration of quantitative and qualitative data is supported by Barkley (2019:1) asserting that students think that a mixed methods approach is separating qualitative and quantitative data but instead, the mixed methods approach is when an in-depth content of mixed techniques, qualitative and quantitative, is created in discussion to give insight to the phenomenon of the study at hand. Santos et al. (2017:3) confirms that the combination of qualitative and quantitative data to produce information that supports each methodology is called data integration.

Themes derived from qualitative data obtained from administrators were used and frequencies from quantitative data were used. Data from IT technicians and finance administrators supported the data obtained from administrators and was summarised as such. This chapter is divided into sections responding to the research questions in Chapter 1.

SPSS version 25.0 was used for descriptive quantitative data analysis as suggested by Bhatti et al. (2019:157), which provided statistical reports. The data were presented in tables and charts to illustrate the frequencies. SPSS is software package designed for statistical analysis (Bala, 2016:250). A Likert-type scale was used to collect quantitative numerical data as it allows participants the liberty to choose their response in a balanced symmetric way, for example from strongly disagree to strongly agree (Joshi et al., 2015:398; Paltridge & Phakiti, 2015:21)

The aim of this research study was to investigate the challenges students face during e-registration and to explore the system interaction and interface of the e-registration system.

This research focussed on South African citizen students only simply because international students use a different system and procedures when registering. However, because random sampling was applied in the survey, it was not possible to exclude international students. One of the respondents was an international student (3%) while the other 97% were South African citizens. This does not affect the outcome of this research. All respondents answered all the questions. The questionnaire was divided into three sections. Section A queried the experience of using e-registration. Section B contained questions that vary from the user-friendliness of

the ORS to challenges of the ORS and Section C asked for biological details of the respondents.

For the qualitative component, the interview transcripts were thoroughly perused and data were coded using a highlighter and a pen to find keywords and phrases across all questions. The keywords and phrases formed unique categories. Themes were then derived from those categories (Maguire & Belahunt, 2017:7).

4.2 Challenges of the e-registration process faced by students

Data show that e-registration is embedded with numerous challenges that impede the smooth e-registration process for many students. Some of the challenges that were reported are described in the following sections.

4.2.1 Computer literacy

From the interviews, it was discovered that some students had no computer skills. This was a huge hindrance to their successful e-registration as many did not know how to use a computer.

Interviewee 5, and administrator, stated:

I speak to students to check if they have basic computer skills and if they have computers at home or whether they used a computer at school, significant number of students do not have basic computer skills and do not have a computer at all and it is their first time to see and use a computer at CPUT...some schools do not have computers but students are expected to register online.

Figure 4.1 below illustrates the computer literacy level of the student respondents.

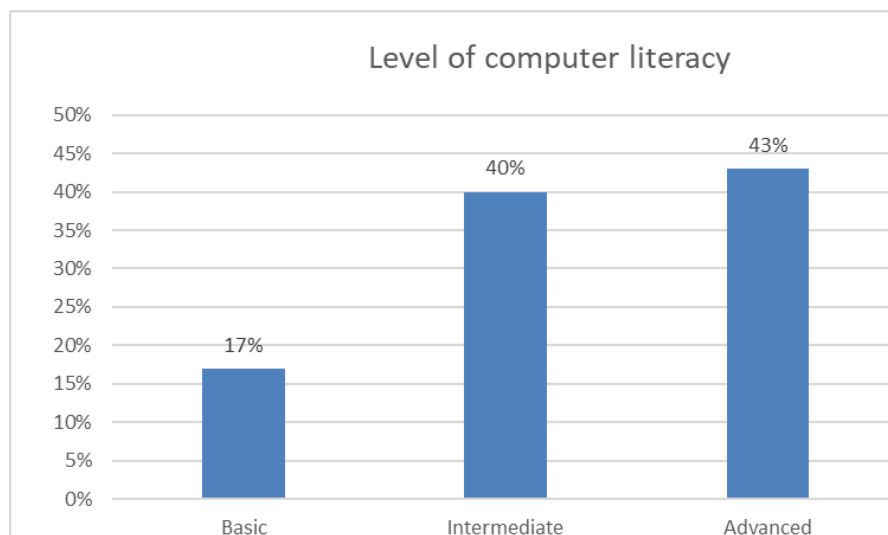


Figure 4.1: Computer literacy level

This statement sought to investigate if computer literacy contributes or reduces the challenges of e-registration. Of the respondents, 43% indicated that they have an advanced knowledge of computers, followed by 40% who had intermediate computer skills, whilst 17% had only a basic knowledge of computers. This shows that all the student participants had some level of computer literacy, though it is a self-reported account.

Administrators identified lack of computer literacy as a problem among students, which caused students to struggle with e-registration. Although 17% indicated basic computer skills, there was no option on the questionnaire for “none”, which means that some of these students might very well have no computer skills whatsoever. However, first-hand information from administrators who deal with the students expressed lack of computer literacy as a major challenge to e-registration for students.

4.2.2 Access

That some students had no access to the Internet to register online arose often because CPUT enrolls students mostly from disadvantaged background, as mentioned by some interviewees.

Interviewee 2 stated:

...one problem is that students don't have money to go to Internet cafe', they don't have data to use, that is a major problem...

Interviewee 1 said:

...not all students have access to Internet for economic reasons...

Interviewee 5 mentioned that some of the students he spoke to did not have computers at home and had never seen or used a computer before and that their first sight and interaction with a computer was at CPUT.

Interviewee 5 added:

Some students come from small village locations where there are no computers and Internet facilities and they do not stay close to cities with Internet facilities to be able to register online. Hence, they come to campus to register. The students further mentioned that they did not have money to pay for Internet services due to economic reasons and that they were from poor backgrounds, which makes e-registration problematic for them.

It was noted that during e-registration, the system was very slow.

Interviewee 6, who is an IT Technician, said:

...the system hangs, none responsive, students can't continue to the next step...

Interviewee 10, another IT technician, stated:

One of the main incidents that hindered the registration process was the time it took for the system to load individuals when registering, which took longer than expected.

Another problem encountered by students during registration was that the website would crash while they were in the process of registering. This could be because the website was unable to cope with the large amount of traffic all at once, which could be contributed to the server that hosts the website.

Interviewee 7, an IT support technician, responded:

Students try to register the same time, system shuts down, then they can't register.

Interviewee 4, an administrator, said:

I would like the online registration to be more accessible to everyone, make it simple for students to register by lifting some certain blocks or advise students about the blocks on their accounts beforehand so they can sort it out before registering....

In addition to the blocks, IT technicians confirmed that they get queries from students that they are blocked from registering online.

For example, interviewee 8, who is an IT support technician, stated:

In some instances, some students are blocked on the system but they have pin number and student number but can't register. There is a thing called Web Registration (WEBR) which is sometimes a technical error attached to the student profile, we refer students to the faculty or contact centre.

Interviewee 8 added:

Returning students sometimes are blocked because they owe fees or books, we refer them to Student Accounts.

Interviewee 5 said:

...get the online registration glitches to change and to make sure the digital connection is sound for the online registration period.

The other access problem students face is that many stay in rural areas where there is no access to Internet.

Interviewee 7 said:

Students who stay in the rural areas have no access to register.

Other issues mentioned by technicians were that students lose their pin numbers and some of the pin numbers are blocked.

Interviewee 8 said:

Students need pin number, we generate pin number, some students forget their email address they used or phone number, under normal circumstances, pin number gets sent in a short while.

Figure 4.2 below illustrates students' responses to the remote accessibility of e-registration.

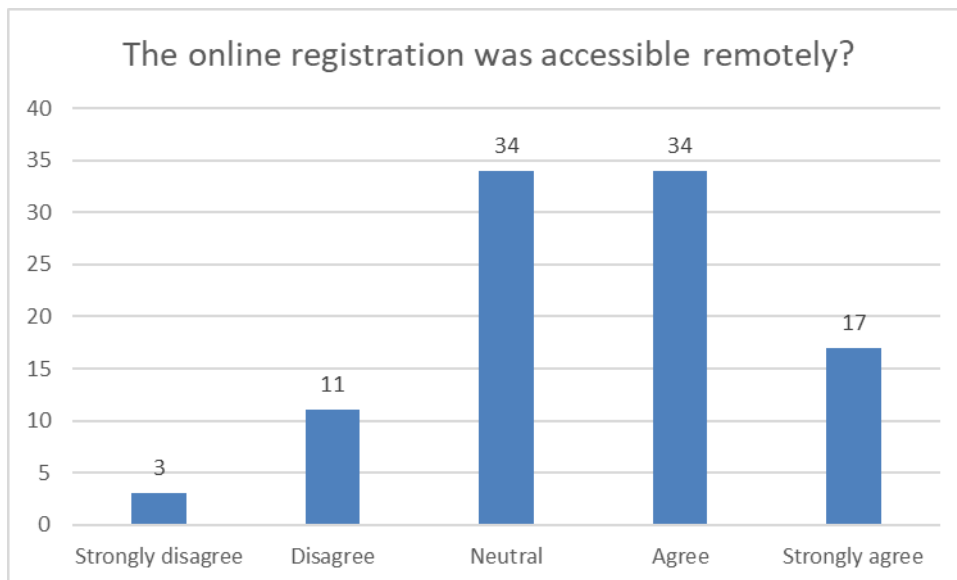


Figure 4.2: E-registration accessibility

Figure 4.2 shows that 34% and 17% of the respondents agreed and strongly agreed respectively that the ORS was accessible remotely, followed by 34% who remained neutral, 11% who disagreed and 3% who strongly disagreed with the proposition.

The above figure indicates that the majority concur that the system is accessible remotely and they did not necessarily have to go to the campus to register, they could register from anywhere. However, it is concerning that a combined 14% could not access the system remotely. This could be due to various reasons that contribute to the inaccessibility of the e-registration system by students.

The information provided by IT support technicians and administrators supports the notion of inaccessibility to e-registration by students because they are inundated with queries from students that they cannot register. IT technicians reported that some students lose their letters containing their student numbers which are necessary to generate their pin numbers.

Interviewee 8 stated:

Some students say they lost their letter of acceptance or can't find student number, the information technology system (ITS) does not have a system to check student number with ID, we refer them to the faculty for help.

Besides other factors beyond students' control, student negligence was reported.

According to an IT support technician:

Students lose their important documents containing their registration details, they forget their phone numbers and email address they used when they applied. This makes it difficult for the technicians to assist them in the event that they need a pin number because the pin number is sent to their phone and email.

Interviewee 9 stated:

Sometimes students make a payment but they leave a number from their student number or information, we ask for a proof of payment and correct the information.

This means that students will still have a financial block on their account until they bring a proof of payment to the Finance department to get their accounts cleared. Had they paid attention and acted responsibly, this situation would not have occurred. Students should take responsibility and retain their important documents to avoid unnecessary delays in the e-registration process.

4.2.3 Communication

Communication with regards to e-registration was reported to be unclear. Seven of the 10 interviewees stated that online registration instructions are not clear.

Interviewee 2 emphasised that:

I would like additional explanation to be put on the website.

Interviewee 1 said:

I would like a more user- friendly set-up for the actual ORS. I get complaints from both new and returning students on how to commence online registration.

Interviewee 1 added:

Students go on the Student Online System (SOS) but they don't know how to continue, and it is actually a confusing process. She would like more staff with ITS background to assist and not just "students' assistants" since a lot of queries have to be sorted on ITS.

Interviewee 3 mentioned:

Unclear communication for the online registration.

An IT support technician reported:

No information on the website to inform students what to do. Some students are in Namibia; they call to ask what to do to be able to register.

Interviewee 2 said:

The explanation where they (students) select subjects is not always clear and an additional explanation should be put on the website. Online registration is working well and got good feedback from students.

Interviewee 3 stated:

Communication is very vital, people don't understand this, it is assumed that I understand, communication must be clear e.g... this is what is going to happen, basic of all is communication...

More and clear communication about e-registration for both administrators and students is needed, according to data above.

4.2.4 Pre-existing conditions

There are pre-existing conditions that surfaced, which affect the smooth running of the e-registration process.

Extract from interviewee 4:

...hmmm, status not updated and students can't register... online registration not easy for many students, some are blocked from registering, it could help if they can get some of the blocks removed before registering...

Interviewee 3 said:

...the online registration wizard is not easy to access, students go to CPUT website to find it but it's not easy to find and it's not user-friendly...not easily accessible...

Interviewee 1 said

... here and there, there are technical problems...

According to interviewees, the ORS often clogs during the registration period.

Interviewee 2 said:

there are technical problems as the system gets busy; it gives problems that put pressure to all background setup... not all students have access to printers to print their proof of registration which is compulsory. If there is an error in set-up, it can hold back the process of the online registration or register for a wrong or incorrect subject that will as a result affect Blackboard.

One student respondent wrote extra notes on the questionnaire, sharing the same sentiments as above, saying:

Subjects should be automatically loaded to avoid students registering for more/less subjects.

Interviewee 5 said:

There are hiccups with the online registration and would like the glitches to be fixed and CPUT to make sure the digital connection is sound for the registration period.

Technicians reported that some students have a WEBR block which stops them from registering and that they refer the students to the faculty to get the WEBR removed.

Ummm!!! Like students got financial block from previous payments, they come to negotiate payments arrangements.

This was said by a finance administrator, meaning students have to physically go to campus to get the financial block removed before they could register.

The analysis above illustrates the pre-existing challenges of the e-registration process that greatly hinder the remote registration for students and defeats the purpose of registering from home.

4.2.5 Staff training

Staff training was another challenge that was reported. Both interviewees 1 and 2 said they were well trained with interviewee 1 adding that they do what they call Business Acceptance Testing (BAT) which is a programme that tests to check if the systems are working and that is when they pick up any problems. Interviewee 1 added that they do a dummy live registration on five students from different courses to check if the system is working and then cancel the registration on the same day, to allow the participating students to register.

However, staff training was sporadic and inconsistent. Interviewee 3 did not agree with interviewees 1 and 2.

Interviewee 3 stated:

There is no formal workshop as to how online registration works and I am not referring to BAT. A refresher course on e-registration should be offered when e-registration opens as I do not want to experience the same problems again.

Interviewees 1 and 2 added that there are allocated venues for online registration with trained staff to assist students. Interviewees 4, 5 and 6 said they did not receive any training.

Interviewee 5 mentioned:

I would like to be in the know so that I can assist students with the online registration if asked.

However, they could all assist with most of the queries.

Interviewee 1 stated:

Yes, fortunately I could assist, in most cases its standard queries, e.g....where do I go on the web? What do I do...? I don't have a pin number; how do I get a pin number...? etc. In most cases students are not captured to courses correctly and the system may indicate that student's study period is incorrect and this prevents students from completing registration process.

Interviewee 2 stressed that she could assist with the majority of the problems and that she would investigate a couple. She stated that some queries have to do with courses that might have technical problems or students who are admitted for a wrong course.

Interviewee 3's response was:

I wouldn't say I was able to help with all queries, its assumed that I am able to register, I would like to know what to do, what to lookout for, I would like to know those queries and answers in writing so that I know what to do, I could not assist with all queries.

Figures 4.3 and 4.4 below reflect students' views on the competency and helpfulness of administrators and technical staff during their e-registration experience.

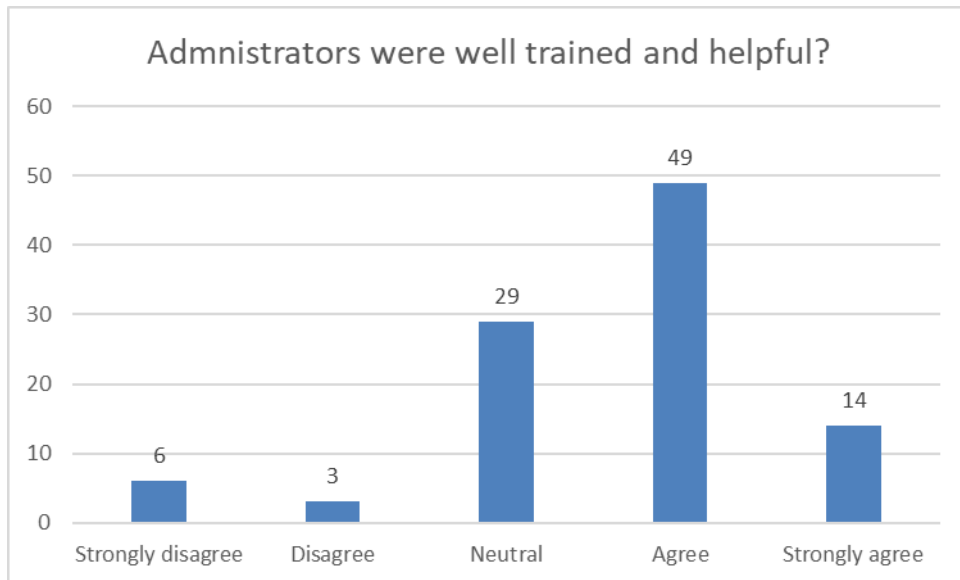


Figure 4.3: Competency of the administrative staff

An overwhelming combined 63% of respondents agreed that the administrators were competent, while 29% respondents remained neutral. A mere 6% and 3% strongly disagreed and disagreed respectively, with the proposition. The overall result shows that administrators are well trained and helpful to students.

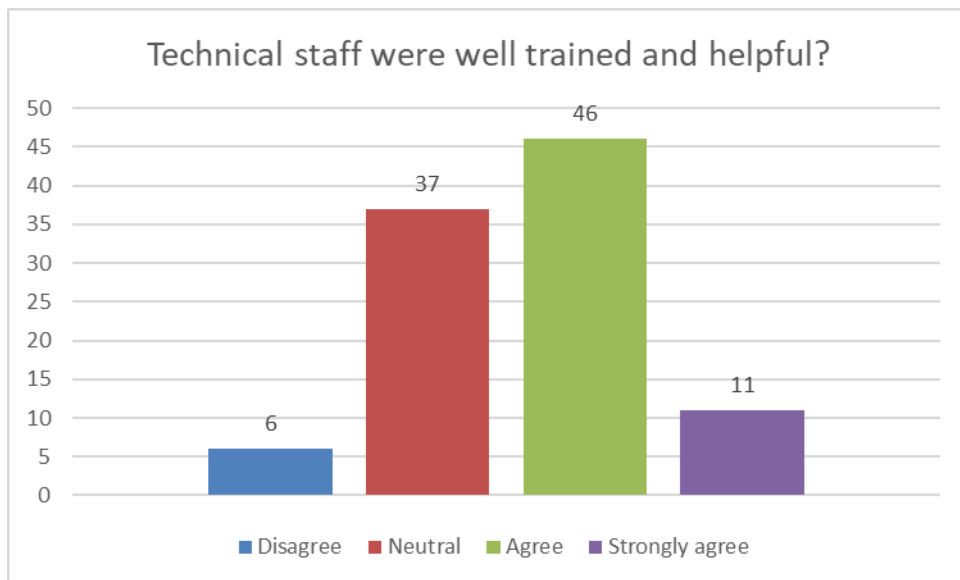


Figure 4.4: Competency of the technical staff

A very significant majority of respondents (46%) agree that the technical staff were well trained and helpful, while 11% strongly agreed with the statement. A mere 6% of respondents believed

that technical staff were not competent and helpful, while 37% remained neutral on the statement. A clear majority of respondents feel that CPU's technical staff were well trained and willing to assist during online registration.

Even though the majority of students were satisfied with the assistance they received from administrators and technicians, staff training appears to be inconsistent. Some administrators and technicians reported that they did not receive any form of training on e-registration and others reported that they were trained. Some mentioned that the training they received was not specifically for e-registration and that they needed a refresher course before registration. E-registration training should be offered to all the ground staff members who work with students.

4.2.6 Technology system

Technical issues were raised.

Interviewee 8, a technician, said:

... first browser related, it's a simple system but for some reasons Internet explorer causes problems... the accept button is sometimes greyed out completely, mostly technical issues, we refer to other department.

Some of the issues that were raised, which have been mentioned earlier, include no Internet access, system slows down during registration and students blocked from registering.

Interviewee 6 said:

The system should be able to handle everything at the same time and the load should be balanced for people traffic control. He further suggested user awareness. The analysis above simply shows the down side of technology, it is not always smooth even though most of the time it is regarded as useful and make life easier.

Interviewee 7 stated:

There are IT people who deal with network problems... we refer the query to the Network people.

4.2.7 Infrastructure for e-registration

Three interviewees alluded to the shortage of resources for the online registration at campus.

Interviewee 6 responded:

...there were not enough resources, more people are needed to help...could have done more.

When asked if there were enough resources for the online registration, interviewee 4 said:

...sjoee!!!...I don't think so, I think there could be more... there was one venue that even had problems.

Interviewee 3 said:

"I would not say there were enough resources, students got lost...okay...eeeh for example the University of Johannesburg (UJ) has a big section, anyone with online registration queries go there, CPUT does not have that kind of set-up. CPUT opens E-Learning, I am still called to the venue packed with students, software not working, system clogged... no one can do anything when the system is clogged.

Interviewee 10 stated:

The system slowed down during the registration process it was due to the influx of users that tried to access the website at a given time. This commonly occurred when websites receive large volumes of traffic at a specific time which the servers are unable to handle, this would cause the web server to crash. Adding more resources (servers) and incorporating load balancing features could greatly decrease the chances of the website crashing.

Figure 4.5 illustrates the views of students about computer availability, which forms part of the infrastructure.

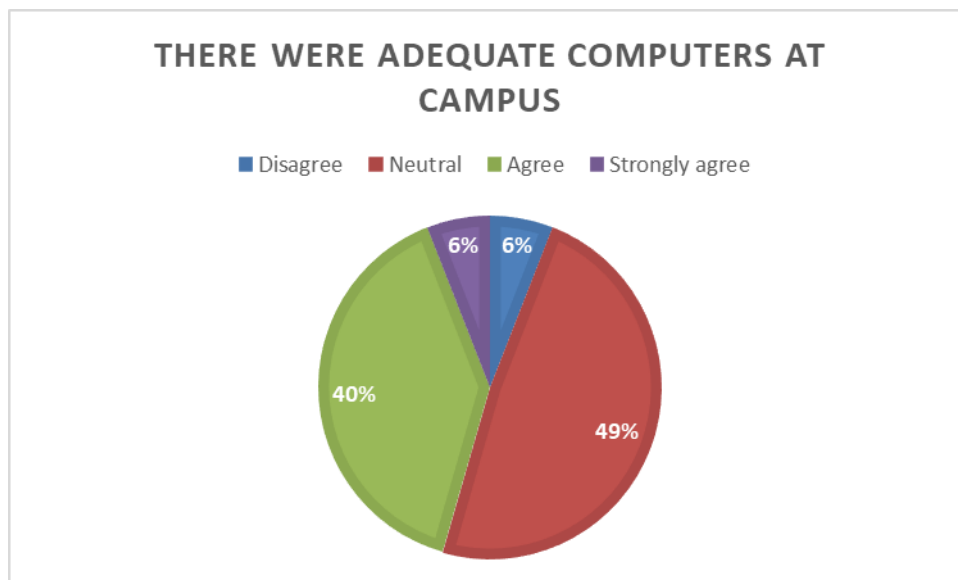


Figure 4.5: Adequate computers for e-registration

Regarding an adequate or inadequate number of computers on campus when respondents went to register online, the majority (49%) chose to remain neutral on this proposition. However, a substantial number of respondents (40%) agreed that there were adequate computers at campus and 6% strongly agreed with the statement. Only 6% disagreed with the proposition. Although 49% of respondents were neutral, a significant combined 46% of respondents agreed and strongly agreed that there was indeed an adequate number of computers at CPUT. In contrast, the administrators who handle e-registration at campus indicated a lack of e-registration facilities. Computers form part of the infrastructure of e-registration. However, it seems that a small minority is still disadvantaged.

Figure 4.6 below indicates the location from where students registered.

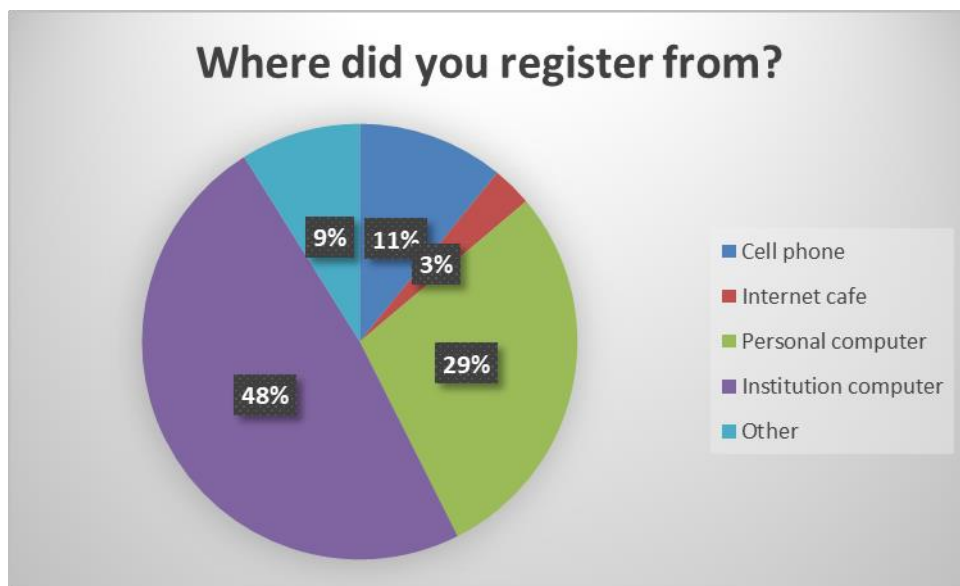


Figure 4.6: Respondents' location of registration

Nearly half of the respondents (48%) went to campus to register and used CPU T's computers. Of the balance, 29% of respondents used their personal computers to register, 11% registered on their cell phones, making use of the technology at their disposal, 9% registered on "other" devices and only 3% of the respondents registered in an Internet café. This shows the majority still went to campus to register, despite their computer skills and the fact that the system was accessible remotely.

It is concerning that the majority of students registered from campus. This could be the reason why there were long queues and inadequate facilities as reported by administrators earlier, saying there was a lack of infrastructure to service e-registration. The fact that the majority of students went to campus to register defeats the purpose of registering from anywhere. Students go to campus to get assistance from administrators.

Figure 4.7 below illustrates students' responses to the proposition that e-registration poses many challenges.

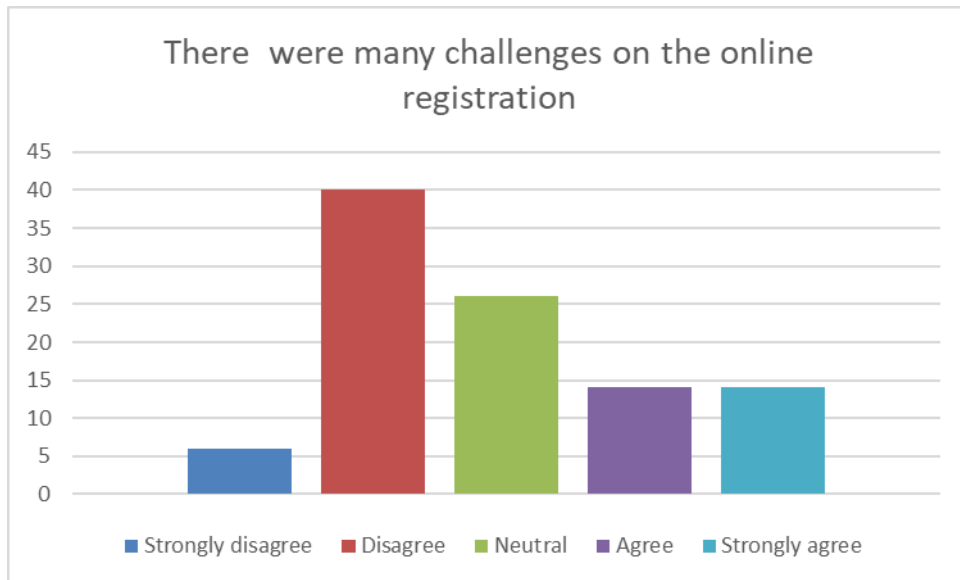


Figure 4.7: Challenges of e-registration

Figure 4.7 illustrates responses to the statement “There were many challenges on e-registration”. The majority of respondents (40%) disagreed and 6% strongly disagreed that there were challenges when they were registering online. This is followed by 26% who remained neutral, while 14% agreed and a further 14% strongly agreed with the statement, While the majority felt there were not many challenges with e-registration, it is still concerning that a combined 28% agreed or strongly agreed that there were challenges.

The above data indicate that students feel there are not many challenges, although information from administrators and technicians indicate the contrary. Again, it could be because the students’ responses are self-reported compared to the first-hand evidence provided by administrators who directly assist students with e-registration. Furthermore, most students went to register at campus where help was immediately available and received assistance to register.

4.3 Students’ experience of the e-registration process

The views of the administrators are from their own experiences as well as student experiences with the e-registration process, noting many challenges with the e-registration process.

Figure 4.8 below illustrates the students’ experiences of online registration.

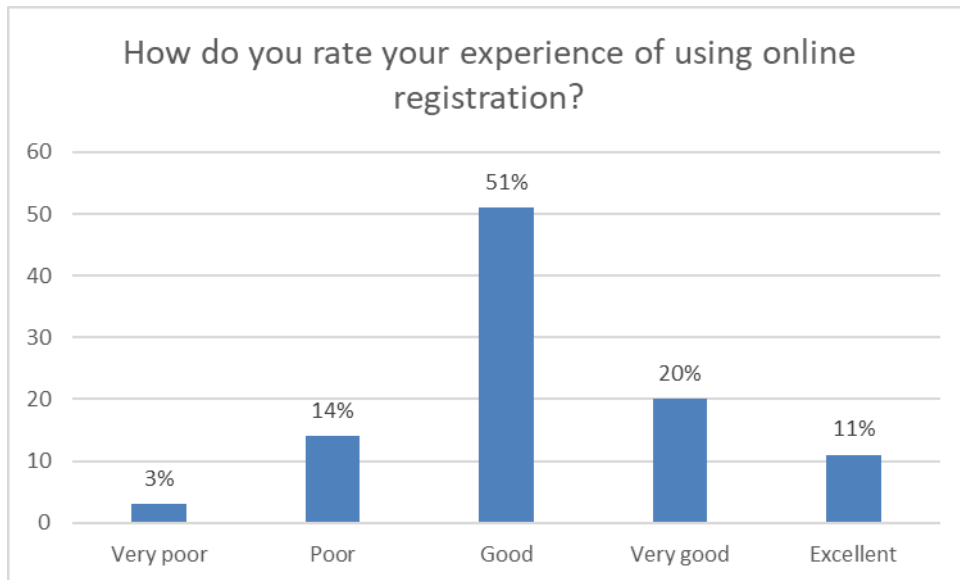


Figure 4.8: Experience of using e-registration

Figure 4.8 above indicates that the majority (51%) of the 35 student respondents rated their experience of using e-registration as good. This is followed by 20% of the respondents who rated their experience as very good, 14% rated their experience as poor, followed by 11% who had an excellent experience using e-registration. Only 3% rated their e-registration experience as very poor. These findings indicate that the e-registration experience of the respondents is generally good, even excellent to an extent. A small percentage indicates their experience of e-registration as poor to very poor. In general, it can be said most of the respondents had a good experience, given that the objective of this study is to investigate challenges faced by students when registering online.

In contrast, technicians and administrators indicated that the ORS is not user-friendly.

4.4 E-registration system efficiency

E-registration may be embedded with many challenges but it is far more efficient than the old traditional manual registration. The interviewees believed that e-registration is the way forward. They worked through its difficulties and managed to overcome a challenging process.

Figure 4.9 below is an indication of how students rated the effectiveness of e-registration.

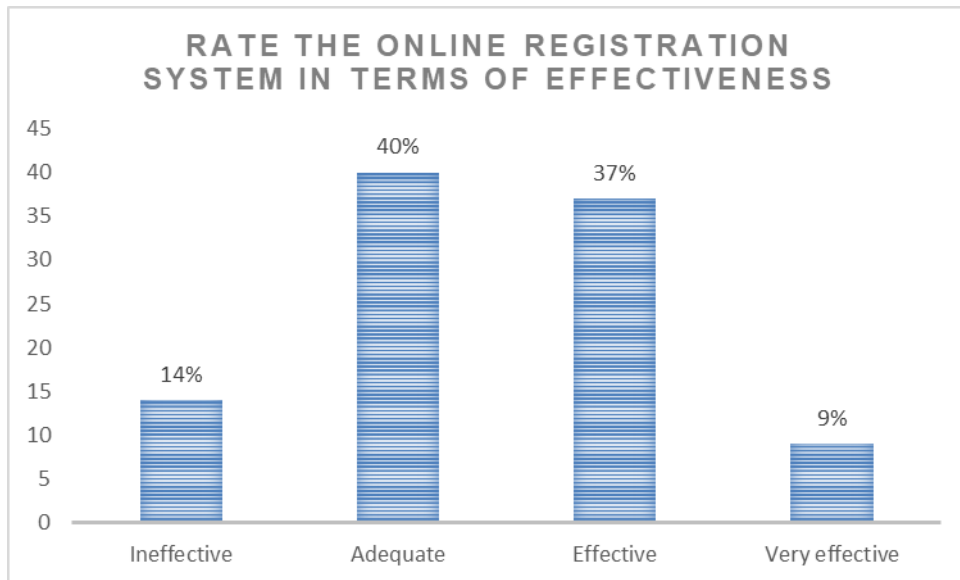


Figure 4.9: E-registration system and its effectiveness

The majority of the respondents (40%) rated the ORS as adequate, followed by 37% who rated it as effective, while 14% rated the e-registration system as ineffective. A mere 9% rated the ORS as very effective. The findings show that the general effectiveness of the ORS is adequate.

Figure 4.10 illustrates responses to the statement that log in procedures were clear.

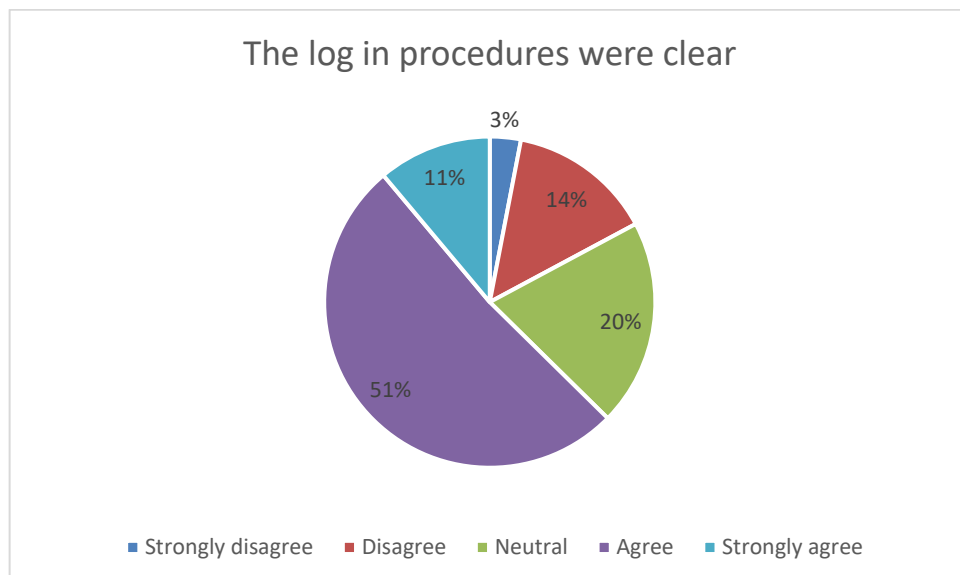


Figure 4.10: E-registration system log in procedures

Depicted above in Figure 4.10 is the analysis that informs if the log in procedures were clear. A very significant majority (62%) indicated that the log in procedures were clear, comprising 51% who agreed and 11% who strongly agreed. This is followed by 20% of the respondents who remained neutral, 14% of the respondents who disagreed with the statement and only 3% who strongly disagreed. Drawing from the above data, it is clear that the majority agreed that the log in procedures were clear.

Figure 4.11 shows responses as to whether there were long queues at campus for e-registration, which also contributes to the effectiveness of the e-registration process.

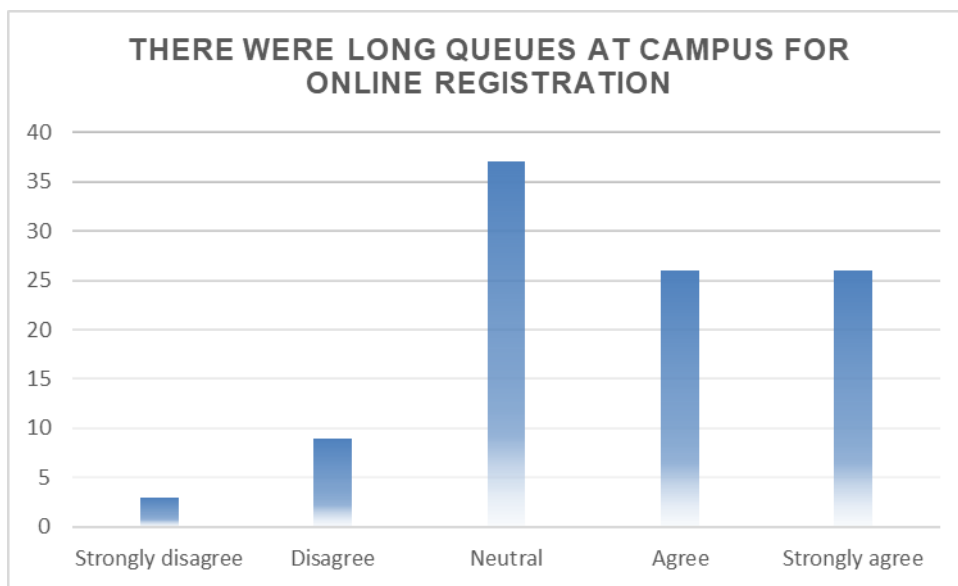


Figure 4.11: Online registration efficiency - long queues at campus for registration

On the statement of whether there were long queues at the campus for registration, 37% of respondents remained neutral, a combined 52% of respondents strongly agreed and agreed with the statement. Only 9% disagreed and 3% strongly disagreed that there were long queues at campus for registration. It is clear that the majority of respondents agreed with the long queue proposition, with very few that disagreed, meaning more students went to register at campus.

The majority of students confirmed that the e-registration process is effective, with the minority disputing that it is effective. This could be due to many reasons, including the challenges the minority encountered when registering online. Nevertheless, even though e-registration still has many challenges, the administrators reported that it is the way forward, compared to the old manual registration system that bears the risk of losing documents, among other issues.

4.5 Student experiences of the usability of the e-registration system

Some interviewees reported that the ORS is not user friendly, is not easily accessible and not everyone knows how to register online. They mentioned that students end up going to the faculty for assistance, putting more pressure on the skeleton staff due to the fact that some of the staff members are allocated to the registration venues to assist students with e-registration.

Interviewee 1 responded:

I spend half of my day explaining the manual on our website to students that they don't know about or they don't want to read it... manpower is a problem during registration period.

Interviewees 2, 3 and 5 mentioned similar challenges, stating that not all students have access to Internet due to economic reasons. One interviewee added that as a result, students come to the campus for assistance.

Figure 4.12 illustrates student responses to the proposition that the e-registration process was user-friendly.

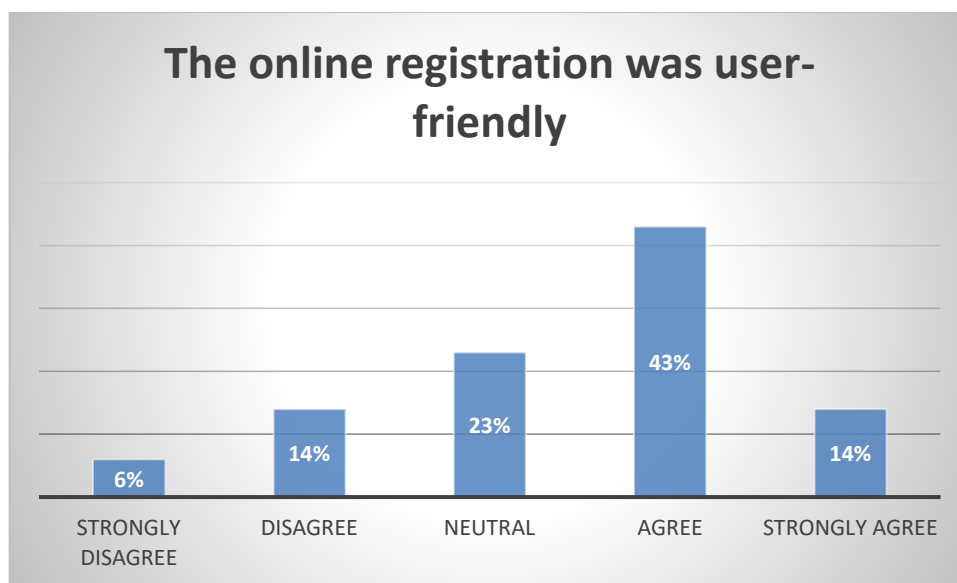


Figure 4.12: E-registration system user-friendliness

Most respondents (43%) agreed and 14% strongly agreed that the e-registration system is user-friendly. The neutral component comprised 23%, while 14% disagreed and 6% strongly disagreed with the statement and felt that the system was not user-friendly.

The overall finding is that the e-registration process is user-friendly. In contrast, data collected from interviews implies that the e-registration process is not user-friendly. The system is supposed to accommodate everyone but because it is new could be the reason there are still glitches that need to be ironed out, as suggested by some interviewees.

Figure 4.13 below is an indication of whether students need e-registration orientation.

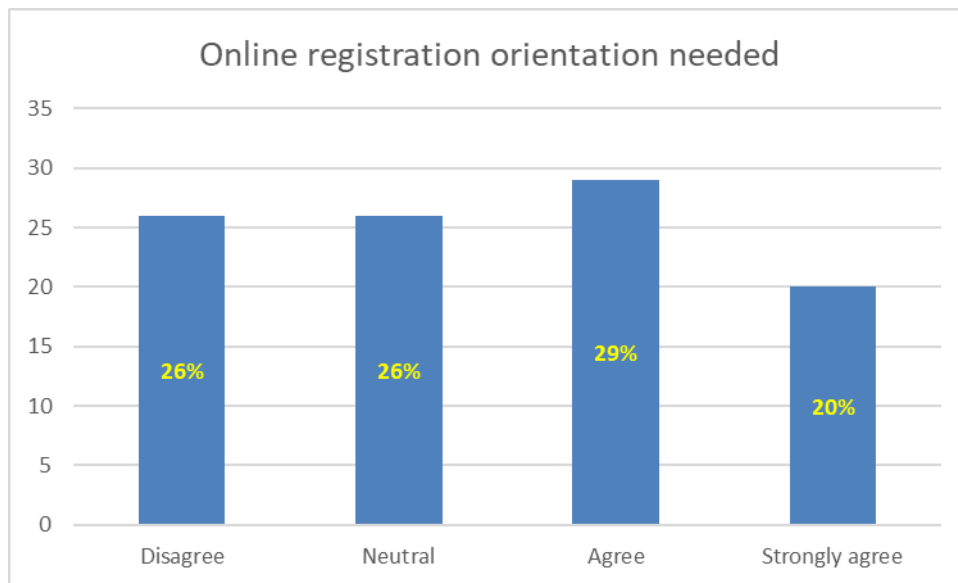


Figure 4.13: Orientation for the e-registration system

Figure 4.13 illustrates students' responses as to whether orientation on the e-registration system is needed by students prior to registering. A combined 49% majority of respondents (29% agree; 20% strongly agree) agree that orientation for e-registration is needed. This is followed by 26% respondents who disagree with the statement and 26% who remained neutral. It is clear that orientation for e-registration is needed by students prior to the actual registration. This is consistent with what the interviewees said about the necessity of e-registration orientation or refresher course prior to the commencement of e-registration. This will alleviate some of the problems and students will get to know what to expect when registering, which may put them a bit more at ease.

User-friendliness depends on whether the students were blocked from registering online or not. Figure 4.14 below is an analysis from the students' views.

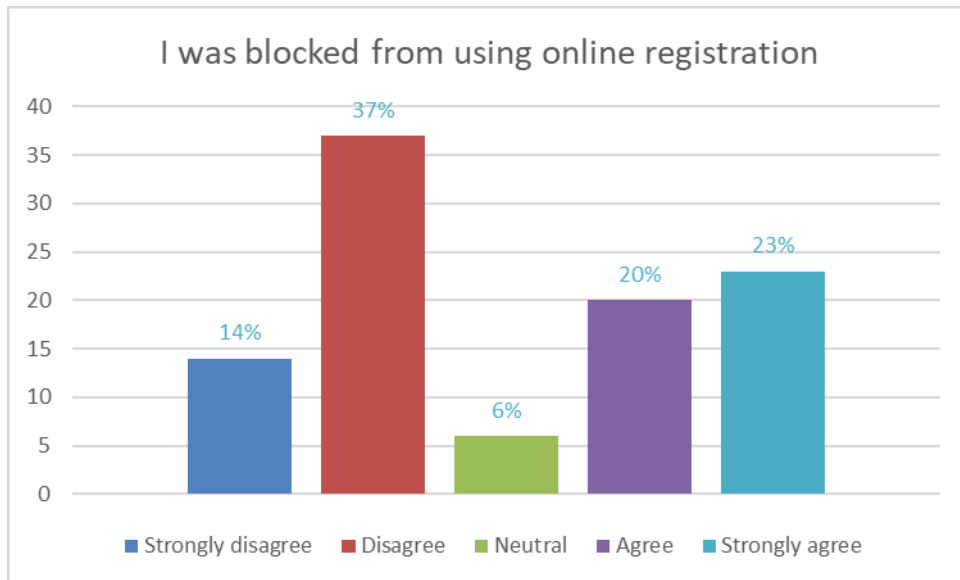


Figure 4.14: Accessibility of the e-registration system

Figure 4.14 above indicates whether the respondents had access to e-registration. A combined majority of 51% respondents disagree (37% disagree, 14% strongly disagree) that they were blocked from registering online, while 20% agree and 23% strongly agree that they were blocked from registering online. The balance of 6% remained neutral

The results above confirm the responses from interviewees relating to students being blocked from registering online, which defeats the objective of students being able to access the e-registration system and register themselves independently. The IT technicians, faculty administrators and finance administrators highlighted the problem that students are blocked from registering online, a not-so-user-friendly aspect of the e-registration system, which is confirmed by students. The reasons for being blocked range from owing books, owing fees and WEBR, students used a wrong reference when making a payment.

Interviewee 8 said:

Online registration is still fairly new... lot of things still need to be ironed out.

4.6 Advantages and disadvantages of using the e-registration system

Table 4.1 below depicts the advantages and disadvantages of the e-registration system.

Table 4.1: The advantages and disadvantages of using the e-registration system

Advantages	Disadvantages
<ul style="list-style-type: none"> • The process is quick compared to manual registration • Students can register from the comfort of their homes • Students can register when it suits them • Confidentiality and flexibility • Information is updated spontaneously • Real time system • Students get to capture their own information and can make changes • Students can call for help during working hours • Students can pay fees online • Students do not have to come to campus to register • No long queues • No conflict with staff • Process not stressful if one knows how to navigate the system • Students can familiarise with the system • Saves time • Less paper work 	<ul style="list-style-type: none"> • No person to assist and make students comfortable • Can be a lonely and intimidation experience for students • Lack of resources: • Lack of support • Lack of expertise • Reliability • Poor and slow network connectivity • Incompatible software between home and school • May turn expensive by students calling for assistance • Calls may go unanswered • May be frustrating not to be able to articulate the registration process on your own • Students may not be able to log in to the system • Network congestion may hinder the process • Students may not know how to rectify mistakes without having to ask for assistance • Students still have to go to the campus to get students cards • Students have to submit proof of registration to the Residence department in person for the accommodation to be issued • International students cannot register online • Students may not have access to computer • Not all students have access to computer or cell phone to be able to register • Some students are not computer literate

4.7 The interaction of systems at CPU

From the data gathered from the interviews, IT technicians and finance administrators indicated that the ORS interacts with other systems.

Interviewee 10, an IT technician, stated:

Online registration is linked to ITS, there is a financial aspect. ITS element regarding online registration kind of combines a range of things. Faculty needs to do documents. ITS with regards to payment of fees, finance linked to ITS.

Interviewee 8, also an IT technician, said:

We always refer to other sections should matters of finance or course related issues come up.

Interviewee 9, a finance administrator, responded:

Finance system links with ABSA BANK...ITS is linked with the bank. To allocate the money to the correct account, there is a programme used to link it.

Interviewee 10 said:

The main system that interfaces into the registration system would be ITS system, this system has both portals which integrates SOS which is the front facing portals for the students to manage their registration affairs. The other interface would be the ITS Financial system where the debtor's team could manage the students accounts.

Interviewee 7 stated:

Online registration is linked to finance, housing/res department. If student owing money, the student can't access res, otherwise no res. The student has to submit a proof of registration to the res department first. If a student did not pay fees, they can't register. They have to go to the Central Money Unit (CMU) to negotiate payments/debt order.

Interviewee 9 responded:

The system is also linked to Education department if we need Matric results.

Looking at the information provided above, the ORS interacts with other systems. It is linked to the ITS system, which is linked to Students' Account system that handles student payment information. It is also linked to the Residence department; students can only be accepted into the residence once they have been registered after paying fees. ITS is linked to the Education department, this is, for example, if Matric result are needed. ITS is also linked to the bank for fee payment transactions, as well as for the Faculty to remove the WEBR, to be able to view the courses for which the student is registered and information about the student's study history from the outset. If any of the subsystems linked to the e-registration system go down, the e-registration system will be affected. However, some of the systems miscommunicate or delay the communication between each other, which ends up delaying the registration process, causing numerous problems. The system is not fully automated.

4.8 Role of IT support system in monitoring the systems

When interviewee 9, a finance administrator, was asked what is the role of the IT technician in monitoring the e-registration system, the response was:

IT plays a biggest role, without IT we can't see the financial blocks, we can't see results etc. They (IT technicians) work throughout. There is nothing we can do if the system is down.

The IT technicians stated that the following are the roles they play during the e-registration period:

- Hardware maintenance and setting-up for a smooth ORS
- To make sure all configuration is set-up for the ORS
- Connecting hardware to the Internet for students to be able to register
- Manage and backs end-users
- Network section ensures the webpage is loading
- ITS checks if everything is fine with SOS; if there are network issues, they refer the query to the network section to check the servers, speed and firewall
- System developers are responsible for the pin number system
- Generate pin numbers for students to register
- Manage SOS, which is a three-way system. All three systems are reliant on each other; ITS checks if the website is up and running; system developers generate pin numbers and the network section checks if the network is working
- Pin number allocation if students have students' numbers, if they don't have student number, they will be referred to the faculty
- Help and guide students to different departments; Students' Accounts for financial block removal, faculty for WEBR removal
- Pin number unblocking

4.9 Technologies utilised in operating the systems

Interviewee 10, an IT technician, indicated:

The main software technology that is used that enables the system to seamlessly integrate is the Java Runtime Environment (JRE), this allows ITS to operate on all laptops and desktops.

Interviewee 10 added that another technology used was the web development model, which incorporates an application programming interface (API) that allows the different technologies to integrate and interface into each other without compromising the security of the individual applications. This, together with the Intranet, allows for ease of use between these applications.

Other technology included would be a web server, Internet service provider (ISP) to host the intranet and the website. Technologies that would most likely be used to create the front end of the website and the database management system (DBMS) are as follows:

Front end: Hypertext markup language (html), Cascading style sheets (css), Javascript

Dbms: MySQL

Interviewee 8 indicated coding and script writing and added that developers use Virtual Machine (VM) software for testing environment and run simulations.

4.10 Student data management by staff

Student data are managed via ITS that is linked to many facets of the system as indicated earlier. All student information is found on ITS via OPA or via SOS. Different departments and personnel have different rights to access, amend or view student information, according to data provided. ITS Students' Account system provides financial information or reports for the student fees accounts.

Interviewee 9 said:

I help them to remove the financial block because they can't register online with a financial block... I help them removing the financial block manually. There are a lot of issues. If a student pays through the bank, it takes 42 to 72 hours to clear. We allocate the money to the correct accounts.

Interviewee 9 continued:

We have two accounts, one general account where all the money comes in from ABSA BANK and then we allocate it to correct accounts. The other one is Student fee accounts...If a student pays the amount at the cashier, the financial block is automatically lifted.

4.11 Summary

This chapter discussed responses from the four teams that make the registration functional, namely, students, administrators, IT technicians/IT support and finance administrators. Their views were combined to get a clear picture of the challenges students encounter when registering online. The chapter also gives an overview of the system interaction and interface of the ORS.

The majority of students indicated that they did not experience much difficulty when registering online. However, to the contrary, responses from faculty administrators, IT technicians and finance administrators, confirm that there still many challenges with e-registration and system interaction thereafter. For example, the ITS Students' Account system does not communicate with the Residence department that a payment has been made. Instead, the student must produce a proof of registration before being allocated a room and the student must physically go to the Residence department with the proof of registration. Proof of registration is only obtained after a student has paid their fees. In addition, the bank transaction takes a long time

to reflect on the student's school account, meaning that the student cannot register until the financial block is lifted. The financial block sometimes has to be lifted manually, which suggests that the system is not fully automated.

The integrated data provided the researcher with clear insight into what transpires during the e-registration process.

CHAPTER 5

FINDINGS AND DISCUSSIONS

5.1 Introduction

The aim of the research was to investigate the challenges students face during e-registration and to explore the system interaction and interface of the e-registration system. This chapter discusses the findings from the integrated quantitative and qualitative data, as well as how research questions were answered, supported by the literature reviewed in Chapter 2.

5.2 How research questions were answered

5.2.1 Research question 1

5.2.1.1 Research sub-question 1a)

What are the challenges of the online registration by students?

Data collected indicated that administrators note that there are still many problems with e-registration, informed by the numerous queries they receive during the e-registration period. Most students seem to think that there were not many challenges but some felt there were challenges with the e-registration process. Administrators and IT support staff who deal directly with the e-registration process mentioned the challenges below.

- A)** Even though the 35 students who participated in this study indicated that they had some form of computer skills, lack of computer literacy was one of many challenges of e-registration. Qualitative data revealed a lack of computer literacy among students, which not only impedes the e-registration process but also places an extra burden on the administrators and impacts negatively on their workload because they spend most of their time assisting students who do not know how to do e-registration. Some of the students who sought assistance from administrators on e-registration had never used a computer before.

Mesfin et al. (2018:164) emphasise making computer literacy mandatory in high school curricula and making computer literacy a prerequisite for graduating from high school. They add that computer literacy is problematic in most local schools. Ukwoma et al. (2016:716) are also of the opinion that computer lessons should be embedded into high school curricula as they believe it is crucial for students to be computer literate in today's world. Mesfin et al. (2018:160) identify some of the factors that impede the implementation of computer literacy in many developing countries as low self-esteem in students on using computers, poor marketing strategy for computer training to students and insufficient technical support.

Manganello et al. (2019:45) opine that students need to be supported in the use of computer technology, they need to gain self-confidence and become self-motivated.

Ukwoma et al. (2016:708) and Mesfin et al. (2018:160) further indicate that some students feel intimidated by computers because of their lack of skills. However, contrary to the statement above, Cooner (2010:272) asserts that most students have access to computers and Internet at home and they have experience in using computers and navigating the Web to access study material. This implies that the level of technology usage is high among young people and they are familiar with online activities. In the current study, the data revealed that lack of computer skills is one reason why students relied on other people for assistance in registration.

- B)** Challenges to e-registration are stated as no access to Internet, lack of resources such as computers, money to access Internet, blocked from registering for various reasons such as owing fees, owing library books, having WEBR on their profile, website crashes and system clogs.
- C)** Lack of effective communication was stated as a hindrance to e-registration. It was reported that the e-registration instructions are unclear to both students and administrators. In addition, an IT technician reported that there is insufficient information on the website about e-registration, which makes it difficult for students to know what to do, considering some of them registered from home where there is no immediate assistance. Literature suggests that students need clear and simple guidelines on e-registration, the website should always be available, users should be comfortable using the system and realise the advantages of the system, the system should be flexible for students as well as being sustainable (Salisu, 2020:290).
- D)** There are numerous pre-existing conditions that affect a smooth e-registration process, including a student's application status not being up to date, for example, from "provisionally accepted" to "accepted", so that the student can proceed to register. In some instances, even though students are already accepted, sometimes the system still shows a different status, which is obviously not only confusing but also stressful to students and double work for administrators. In this situation, the student will not be able to register until the matter has been resolved, which usually involves the student having to physically go to campus to sort out the problem. Some students are blocked from registering online, in which case the students need to call IT support or physically go to campus for assistance. The e-registration wizard is reported to be difficult to access.

Students end up registering for wrong subjects, which requires a lot of energy and time to resolve the problem during the busy registration period. An option to accept the institution's terms and conditions section is said to be 'greyed out' most of the time, meaning students cannot continue with the registration process until they accept the terms and conditions. An issue of WEBR that can only be removed by the faculty

administrator was also reported. This is a block that is placed on a student's profile, blocking them from registering until certain criteria are met, for example payment of fees. This means a student with WEBR cannot proceed to register until this block has been lifted. Students must physically go to campus to get it removed or call the institution for assistance.

Furthermore, it is mandatory that students must obtain a proof of registration after successfully completing their e-registration. However, not all students have access to a printer, especially those registering from home. They have to source a printer, at an extra cost, or go to campus to get the proof of registration printed, which is costly for some students and time-consuming as well, considering transport costs to travel to campus.

- E) Some of the administrators who were interviewed raised concerns that they do not receive adequate e-registration training for them to be well prepared and able to assist students effectively. Instead, they get trained on testing if the system is working properly, which they call BAT testing, where they try to register selected students for the sake of testing the system and then deregister them immediately. Staff training is crucial. Onuka and Ajayi (2012:424) claim that training of staff improves the profits and effectiveness of an organisation and needs to be taken seriously. In previous research, students complained of technical issues and incompetency of technicians, extra costs and security issues and added that most students preferred manual registration (Udofia, 2015:91). Odero and Oloko (2013:119) suggest that training of technical staff is strongly advised so that they can handle technical queries and improve the efficiency of the e-registration process.
- E) Lastly, lack of infrastructure was identified as a problem. It was reported that there were long queues at campus for e-registration and that there were insufficient computers and venues for e-registration.

Some of the above challenges have been noted in previous research conducted outside of South Africa, meaning that e-registration challenges are not limited to CPUT but are globally relevant. The above is evidence that confirms that students face numerous challenges when using the ORS to enrol into their programmes. The fact that almost half of the students went to register at campus is concerning since it defeats the purpose of registering from home. However, students who go to campus to register get some assistance to register online. The technicians and administrators are readily available to assist, making the e-registration process seemingly easy and unchallenging for many students compared to those who attempt to register from home. The challenges above, confirmed by the current study, were also noted by numerous authors (Adepoju, 2010:196; Odero & Oloko, 2013:119; Bemile et al., 2014:322; Okoye, 2015:1; Abu Doush, 2019:1; Salisu, 2020:290).

For instance, Okoye (2015:1) found that most online registration problems are due to various challenges such as lack of Internet service, computer illiteracy, high cost of Internet, network problems, sporadic power supply and delays in bank transactions for payment of fees. Fahmy (2007:353) is adamant that the online registration problems are because numerous students access the website at the same time, causing network congestion, which is why the system should be able to accommodate many users at the same time. Bemile et al. (2014:322) note concerns raised by students about the use of online systems such as high costs of technology, Internet access and reliability of technology but Bemile et al. do acknowledge the fact that students appreciate the element of immediacy in getting responses from lecturers. On the other hand, the capability of online registration to accommodate large numbers of students is often not tested and is unable to provide a steady Internet connection to all students during registration (Darunday et al, 2016:1).

Yu and Brandenburg (2006:45) are of the opinion that pre-class sessions are essential for online learning because students get face-to-face experience that makes them comfortable and they can ask questions. This strengthens the notion that e-registration orientation is crucial to students before official e-registration. Administrative assistance and resources need to be increased for e-registration, as advocated by Ginn and Hammond (2012:263).

Adepoju (2010:203) argues that bandwidth can cause the server to respond slowly, which delays online registration. Adepoju recommends installing a large bandwidth that can accommodate all students at universities when registering online to avoid Internet congestion.

Ginn and Hammond (2012:248) list some of the online registration challenges as effectiveness, poor quality, technical issues, infrastructure issues, computer literacy, technological skills and reliability of technology. Ginn and Hammond (2012:249) add that many people view online education system as a difficult process embedded with many challenges though it is generally effective compared to manual registration where students must be at campus.

5.2.1.2 Research sub-question 1b)

How did students experience the e-registration process?

Considering that most students registered at campus, the majority of students indicated that they had a good experience registering online simply because assistance was readily available to them. According to observations, some students receive assistance with the actual registration by someone else doing the registration. This makes it easy for some students to indicate that the e-registration process was not a challenge because the staff that assist the students on campus are familiar with the system and the process, so it does not take long to register students. Odero and Oloko (2013:120) assert that some students are not diligent enough to take charge of their registration and depend on other people to help them. This results in errors because students do not check if the information entered by people helping

them is correct and some end up registering for wrong subjects. This was confirmed by the data collected. The registration period is stressful to administrators, IT support and finance administrators as they are inundated with problems relating to e-registration, to the extent that their normal workload increases greatly and their other duties lag behind.

However, Odero and Oloko (2013:120) opine that students with a high level of computer literacy will choose online registration rather than manual registration. Odero and Oloko further point out that social factors affect the use of online registration, for example some students may not have access to technology. Lee et al. (2011:6) agree that students who are comfortable with online technology experience less problems when using the ORS. Again, this could be because they have a high level of computer literacy.

5.2.1.3 Research sub-question 1c)

To what extent is the ORS effective?

Bemile et al. (2014:322) claim that the use of IT drives efficiency and effectiveness of the business process in an organisation. Shaltoni et al. (2015:84) argue that for university portals to be considered successful, they must be able to satisfy students as they are the primary clients of the universities. In the current study, it is CPUT's iEnabler ORS.

Even though numerous challenges were identified regarding the ORS, many students and administrators regarded the system to be effective. E-registration is superior to manual registration in that it makes management of student data easy, reduces the long queues, is less time-consuming and some students can register from home without going to campus, which is the major purpose of the ORS.

Previous research suggest that, regardless of its many advantages, students still consider e-registration to be ineffective because there is no face-to-face interaction between students and administrators. Students could not ask questions and get immediate answers and complained that the online system is stressful to use (Udofia, 2015:91). However, e-registration provides live updates on information captured and keeps student records from the outset, keeping their study history safe, which is difficult to do with manual registration considering the hard copy files that can so easily be misplaced or lost. In addition, e-registration reduces costs in that less human capital is needed and from the students' side, they do not necessarily have to go to campus to register. According to Odero and Oloko (2013:119), advantages of e-registration are that student records are easily accessible, it saves time, fewer errors occur, it is easy to capture data and students can register remotely.

According to Dar (2018:809), online registration is effective as well as significantly less time-consuming than manual registration is. The researcher agrees with this statement although some respondents in the current study still show negativity towards the ORS, despite its benefits.

5.2.1.4 Research sub-question 1d)

How do student experience the usability of the ORS application?

Almigheerbi et al. (2019:132) reports that students expect more from the online registration than initially perceived in terms of service and quality. In addition, students are concerned about how reliable and secure the ORS is. Almigheerbi et al. add that it is of paramount importance that security issues of the ORS be improved to improve the service.

The majority of students responded that although the ORS was user-friendly, e-registration orientation is still needed, which indicates a challenge. A minority of students, the staff who assist them to register online, as well as observations, reveal compelling evidence that e-registration is not user-friendly as students and staff battle with the system. Britto and Rush (2013:31) believe that orientation for online students boosts their confidence and gives them a sense of belonging in the institution and community. Britto and Rush add that orientation helps students with learning technical skills, assists them with online learning and gives them a sense of what computer skill, hardware and software is required of them. Odero and Oloko (2013:119) opine that online registration should be flexible, user-friendly and able to deal with vast numbers of students. The ORS should contain easy instructions in simple, easily understood language and online help (Odero & Oloko, 2013:19). It is of no use if the ORS is inaccessible to students to register from home.

It is worrisome that sometimes the website would crash and the system would freeze or hang while students were registering. Website accessibility is imperative for e-registration. According to Shaltoni et al. (2015:84), students are satisfied with the availability of service, system information quality and the usability of the system when they use it for purposes such as online registration, accessing libraries to find journals and other academic activities. Fauzy et al. (2018:46-47) add that the non-functional tests include security testing, load testing, compatibility and usability. Fauzy et al. add that usability testing of the ORS is to determine if productivity is increased by using the new developed online system and load testing is to assess the performance of the system under normal and stress circumstances.

5.2.1.5 Research sub-question 1e)

What are the advantages and disadvantages of using the ORS by the students during the registration period?

E-registration definitely has advantages but it has its disadvantages too.

Some e-registration advantages, as mentioned earlier, are that it is quick to register online, students can register remotely at any time that suits them during the registration period, it is flexible, it is real-time and data updates simultaneously, students can adjust their registration when they make an error, students can pay fees online and less paperwork is involved. On the downside, disadvantages of e-registration include nobody to assist students when registering remotely, it can be an intimidating and lonely process, lack of resources such as Internet,

computers and money, lack of expertise on how to register online, poor Internet connectivity, incompatible software, frustrating at times, log in issues. In addition, students who register remotely still have to go to campus to get their student cards and proof of registration to be able to access facilities and lack of computer skills is an impediment to successful online registration.

5.2.2 Research question 2

What is the interaction process between the e-registration system and Students' Account Systems?

The ORS is linked to the ITS, it interacts with the Students' Account system where students pay their fees and interacts with the bank when students pay their fees. Furthermore, the system interacts with the Department Education for the retrieval of Matric results if needed, as well as with the Faculty for the removal of WEBR, obtaining information about the student and data administration.

Alter (2018:239) describes system interaction as a one-way, two way or multiple way of interface or communication between work systems that may involve socio-technical and automated systems. According to Alter (2018:234), in enterprises that rely on IT, system interaction is crucial but could pose risks, even to well-constructed IT systems. Alter (2018:235) lists some problematic work system interaction errors such as work system operation at cross purposes, overlapping responsibilities in multiple work systems, inconsistent coding of information between systems, mutual interference when two work systems use the same infrastructure technology, deferring priorities in two work systems make the product of the one system less useful, problems in one work system degrade efficiency in the other, activities in one work system cause accidents in the other and faulty infrastructure maintenance system causes outage in the other system. These are some problems that affect system interaction of e-registration.

5.2.2.1 Research sub-question 2a)

How does the registration system interact with Students' Account system?

When a student pays fees using the correct reference, the Student' Account system updates the student's account for the student to be able to register. However, the system takes 42 to 72 hours to update if a student paid at the bank. When a student pays at the cashiers on campus, the financial block lifts automatically but most of the time an administrator must manually lift the block on the computer after a payment is made showing some inconsistency in the system interaction. If a student does not pay fees, the student will be blocked from registering until payment is made. The fact that financial administrators have to manually lift the financial block for the student to be able to register seems to imply that the e-registration system and its sub-systems are not fully automated. It may be too expensive for CPUT to fully automate the system due to budget constraints. This is a familiar problem at many universities

globally due to lack of budget, use of outdated technologies, lack of development time and lack of consultation regarding the user's requirements (Darunday et al. 2016:1). Alter (2018:234) describes a socio-technical system as a system that requires a person to manually enter information.

5.2.2.2 Research sub-question 2b)

What is the role of IT support system in monitoring the interaction between the registration and Students' Account systems?

IT is incomplete without technicians and IT support. The IT support system is the anchor of e-registration. IT support makes sure the e-registration hardware is correctly set up and is maintained, makes sure the configuration is correct, ensures that the network is running and the webpage is loading. Furthermore, IT support handles online security issues, generates student pin numbers and unblocks pin numbers so that students can register. The system has three elements—ITS, network and system developers. The three sections work hand-in-hand and each system element is dependent on the other. IT support receives calls, logs them and refers them to the relevant department, depending on the nature of the problem and if they are unable to assist with the call logged. This is according to the data collected in the study.

5.2.2.3 Research sub-question 2c)

What technologies are utilised for the integration of the registration and Students' Account systems?

Responses from participants indicate that the main software that enables the system to seamlessly integrate is the JRE, which enables ITS to operate on all laptops and desktops so that registration can be done from these devices. The web development model incorporates an API, which allows different technologies to integrate and interface with each other without compromising the security of the individual applications. The Intranet allows for easy use of applications connected to the ORS.

A web server and ISP are two of the technologies utilised to host the Intranet and the website for the e-registration process. Other technologies used to create the front end of the website and the DBMS are Front end, -html, css and javasript, as well as for data base management system, MySQL.

5.2.2.4 Research sub-question 2d)

How do the administrators and finance department reconcile student data between Students' Account and registration systems?

The finance administrators reconcile students' accounts when they get the money into their general account from the bank and allocate the money to students' correct accounts using the unique student number used by students as a reference when making a payment. In some cases, students must bring a proof of payment to the finance administrators if there is an error or missing information, to be able to allocate the money correctly. The financial block will then

be lifted, which enables the student to register once the account has been updated. Only once the payment has been made will the faculty be able to lift the WEBR block and permit the student to register. The Residence department is the students' last stop after registering. The Residence department requires proof of registration before they can allocate accommodation to the students. For the student to obtain the proof of registration, payment must first be made.

5.2.2.5 Research sub-question 2e)

How is student data managed between registration and Students' Account systems?

All student data are managed through ITS, which is linked to many facets of the system. All student information is found on ITS via OPA or via SOS. Different departments and personnel have different rights to access, amend or view student information, according to data provided. The ITS Students' Account system provides financial information. E-registration is made up of three parts, being the user interface, web server and database server (Dar, 2018:805). All the student information is saved on the database from the time the student first registers until the student graduates and beyond, for future reference purposes. Okoye (2015:2) indicates that once the student's information has been captured, it becomes a registration file, which can be retrieved at any time to review the student's details. These details include the course for which the student is registered, results, information about the student's accounts, where the student lives and other information about that is important to the institution for decision making (Salisu, 2020:290-291).

5.3 Summary

This chapter discussed the findings of the research, from the perspective of integrated qualitative and quantitative data and how research questions were answered. Several challenges inherent in the ORS were identified in this chapter. It was discovered that some students have WEBR on their accounts, which prevents them from registering. Not all students' statuses are updated, meaning students cannot register if their status does not show that they have been accepted to study. The process of accepting a student is done manually, which leaves room for error. Students misplace important information they need to register and sometimes enter wrong reference numbers when making payments at the bank, which means they are still blocked from registering. Students go to campus because they need help with registration from the administrators. The system is not fully automated, meaning that a financial block is lifted manually in many cases instead of being automatically lifted once the payment has been made. Some students rely on others to register them, which at times results in errors that require amendment of registration and students do not read e-registration instructions. Students must still go to campus to get their student cards and proof of registration after registering from home. There are many challenges, some of which originate from students themselves and some from the system interaction.

The next chapter, Chapter 6, concludes the study.

CHAPTER 6

RECOMMENDATIONS AND CONCLUSION

6.1 Introduction

The previous chapter, Chapter 5, discussed the findings of the research. Chapter 6 concludes the study. It revisits the research objectives, discusses the study's research contribution and its limitations. Further research is suggested and recommendations are made.

6.2 Research objectives revisited

6.2.1 Research objective i)

To investigate the challenges of e-registration by students

Interviews and surveys were conducted to ascertain the challenges students face when registering online. The literature reviewed played vital role in identifying and confirming some of the problems that were discovered in this study. It is evident that e-registration is embedded with numerous problems. However, some of the challenges are related to system interaction in the sense that the system is not fully automated and the human element is still visible when completing the e-registration process. For example, the financial block does not lift automatically when a payment is done and in most cases an administrator has to lift it manually. In addition, the system does not automatically communicate with, for example, the Residence department. Students must physically take their proof of registration to the Residence department as proof that they have paid their fees. The same applies with the WEBR; students must physically go to the faculty or call to get it removed, even after making payment. Bank transactions take about two to three days to clear. The finance administrators allocate the money paid through the bank into the correct account since the money is deposited into one general account at the bank. Students still must go to campus to resolve some of these issues. Technical issues torment the process for various reasons, such as system overload, which results in the system crashing, freezing or becoming very slow. Internet access, or rather lack thereof, makes smooth operation of the ORS impossible. Poor communication, lack of computer skills, pre-existing problems and many other issues were discovered.

On the other hand, students also contribute to the challenges of e-registration in the sense that, for example, some students do not read the e-registration instructions and end up asking for information that is clearly visible to them. Some students lose important information such as student numbers and pin numbers that are needed when registering. This means they cannot proceed with registration until this crucial information is recovered by either calling IT support for assistance or physically going to campus for assistance. Some students even insert wrong references when making payments at the bank, which results in them still being unable to register because the financial block will remain until proof of payment is provided. Some

students depend on other people to register them, resulting in registering for wrong courses or subjects, which creates extra work for administrators in trying to correct the registration. To some extent, students will not be able to attend classes until the amendment of registration has been corrected, meaning students may be missing lectures.

6.2.2 Research objective ii)

To investigate the students' experience during the e-registration process

Data gathered from the interviews and surveys helped to ascertain students' experiences with e-registration. This information was supported by the literature. Even though most students indicated that they had a good experience, a minority were left in tremendous distress. In addition, the fact that most students registered at campus and they received assistance may mean that the students indeed had a good experience because they were assisted to register. However, IT support and administrators were inundated by e-registration queries from students, which could suggest that these students did not have a good experience as they had to wait for a long time to be assisted. It was observed that students did not know where to go for assistance and ended up in various staff members' offices looking for assistance with e-registration. Furthermore, it was their first time on campus and were not familiar with the surroundings.

6.2.3 Research objective iii)

To determine the extent of e-registration system effectiveness

The interviews and surveys assisted in ascertaining whether e-registration was effective or not. The majority of students deemed e-registration to be effective, as did the administrators and IT support staff, even though there were many challenges. However, there remained a minority that perceived e-registration as ineffective.

6.2.4 Research objective iv)

To determine students' experience in using the e-registration system application

This objective was attained by conducting interviews with the staff that work directly with the ORS as well as from the survey questionnaires. Though most students indicated that e-registration was user-friendly, a minority of students and staff who assist students with e-registration indicated that it was not user-friendly. It is important to note that staff reported on both their own experiences and student experiences of using e-registration. Insufficient information was available on how to register on the website, accessibility issues were reported and that students struggled to log in.

6.2.5 Research objective v)

To investigate the advantages and disadvantages of using the e-registration system by students during their registration period

This objective was achieved through information gathered from interviews and surveys but most relevant data were gleaned from reviewing existing literature.

6.2.6 Research objective vi)

To investigate the interaction between e-registration and Students' Account Systems

Interviews with administrators and IT support staff assisted in shedding light on how the ORS interacts with the Students' Account system. The survey revealed the challenges that are caused by system interaction. For example, students are blocked from registering because the Students' Account System and registration system does not communicate effectively or it is not fully automated. If it were fully automated, there would be no need for someone to enter information manually into the system because a machine would perform the work automatically.

6.2.7 Research objective vii)

To investigate the role of IT support staff in monitoring the interaction between the registration and students' Account systems

This was achieved by conducting interviews with IT support staff who clarified their roles and functions in monitoring system interaction. Through these interviews, it was discovered that IT support has three sections that work closely with each other, namely the ITS section, software development and network section. Administrators and students noted the assistance they receive from IT support during registration. It is imperative to note that IT support staff play a major role in ensuring that the e-registration system is functioning correctly and that students are able to register.

6.2.8 Research objective viii)

To investigate the technologies used to integrate the registration and Students' Account systems

The interviews conducted with IT support staff provided invaluable information to the researcher to understand some of the technology used in the operating systems of e-registration.

6.2.9 Research objective ix)

To investigate the extent administrators and Finance department reconcile students' data between Students' Account systems

All the information about students is on ITS. Access to student information is granted, depending on what the staff member's role is. Finance administrators have access to student accounts. They reconcile student accounts after payment has been processed so that the students can register since the system may take time to update information. Administrators from the faculty are dependent on the Students' Account system in the sense that they can only give permission to students to register once the payment has been processed.

6.2.10 Research objective x)

To investigate how student data are managed between registration and Students' Account systems

Reviewed literature contributed significantly in giving insight on how student data are stored on the database from the time the student registers or applies for the first time at the institution. Information about students continually grows and is managed by different departments. The information is updated as the student progresses. Different departments have access to certain information that they need to make informed decisions. Some staff members can only view the information but cannot amend it, while some staff can amend the information. Access to student information requires a password, which ensures accountability and security of student information.

6.3 Research contribution

6.3.1 Findings

Even though most of the online registration challenges discovered in this research were noted in existing research, a few new challenges were identified, which adds to the existing body of knowledge. The findings below are discussed in more detail in Chapters 4 and 5 of this study.

Finding 1

The findings suggest that the ORS at CPUT is not fully automated. For instance, students remain blocked from registering online even after paying fees, which is a common problem in many universities. Previous research focused mainly on general challenges of the e-registration system but did not include the ORS interaction that contributes significantly to some of the problems. For example, the e-registration and Students' Account systems do not communicate immediately, necessitating students going to campus to get the financial block manually lifted by the administrator. Alter (2018:234) states that a system that requires a person to enter information manually is a socio-technical system.

Similar research did not cover system interaction or full automation of the ORS, which assisted to identify gaps in existing research. If the system were fully automated, students would not have to go to campus to complete the e-registration process as is the current situation. The systems do not speak to each other and require manual completion.

Fully automating the ORS will eliminate some major problems of the students' e-registration process. Students can fully take advantage of registering remotely and staff can focus on other duties than dealing with queues of students.

Finding 2

Some students use wrong student numbers as references when they make a payment, which results in students remaining blocked from registering. This is not identified in the literature.

Although the literature revealed that some students are blocked from registering, the researcher could not ascertain why. However, the findings in the current research identified reasons why some students are blocked from registering. These include using an incorrect reference when making a payment, owing library books, losing pin numbers and losing student numbers. This contributes to the body of knowledge and further research can be done on how to solve these issues.

Finding 3

The current research found that students require e-registration orientation. Online learning orientation is suggested in previous research but the current research discovered that orientation of the actual e-registration process is needed. It will assist CPUT to better prepare students for online registration and familiarise students with the process prior to registration. E-registration orientation will assist students to understand the process and the information required from them in the process, as well building their confidence and enabling them to commence their own e-registration process.

Finding 4

It was found that a reason students still queue at campus for registration is because they are unaware of information they should have on hand for the e-registration process. They lose crucial information such as pin numbers and student numbers that they need to commence the e-registration process. This results in queues, delays and frustration. The literature mentioned long queues at campus for e-registration but did not elaborate on what caused the queues.

Finding 5

Students themselves also cause e-registration problems by not reading the instructions. This creates difficulties as they do not know the process. The e-registration process is delayed and students end up going to campus to get assistance, which defeats the purpose of registering remotely. Literature reviewed did not mention that students also form part of the challenges of e-registration as discovered in this study.

Finding 6

The theory and findings suggested using multimedia to make it simple for the student to understand the e-registration process. The use of emojis would make the instructions and process interesting and less intimidating.

Finding 7

Inadequate staff training was profound in this study, with staff having to figure out for themselves how to assist students with online registration, while some staff had never received any training at all. The researcher strongly advocates for proper training of frontline staff who

work directly with e-registration. It was found that the only training they received was for testing the system and not the actual e-registration process.

Finding 8

Lack of effective communication was a hindrance to e-registration. It was reported that the e-registration instructions are unclear, not only to students but to the administrators as well. An IT technician stated that there is insufficient information on the website about e-registration, which makes it difficult for students to know what to do, considering that some of them register from home where there is no immediate assistance. The literature suggests that students need a clear and simple online environment, the site should be always available, users should be comfortable using the system and realise the advantages of the system, the system should be flexible for students as well as sustainable (Salisu, 2020:290).

Finding 9

There are numerous pre-existing conditions that affect a smooth e-registration process, including that a student's application status is not updated, for example, from "provisionally accepted" to "accepted", so that the student can proceed to register. In some instances, even though some students are already accepted, the system shows a different status, which is obviously not only confusing but also stressful to students and double the work for administrators. Once there is such a discrepancy, the student will not be able to register until the matter has been resolved. This usually requires the student to physically go to campus to sort out the problem. Some students are blocked from registering online, as mentioned before, in which case the students have to call for IT support or physically go to campus for assistance. In addition, the e-registration wizard is reportedly not easily accessible.

6.3.2 Practical contribution

The practical contribution of this study is the discovery of the challenges encountered by students when registering online, which contribute to the existing body of knowledge. These challenges provide insight into what students experience when registering online. CPUT will benefit from this research by resolving the identified challenges to uphold their good reputation and promote good service. It was found that some students do not read the instructions on the website on how to register online and some students lose their pin and student numbers that are necessary for registration. The ORS should be fully automated to negate students from going to campus to finalise their registration process. For the institution to benefit fully from this technology, measures should be put in place to encourage students to read instructions on how to register online. This will reduce the number of students thronging at the faculties to ask for assistance on how to register online. Because of students descending on campus, the administrators and technicians are inundated by queries during the e-registration period and are unable to focus on their other duties.

One of the suggestions on how to encourage students to read the e-registration instructions was to make instructions interesting, colourful, interactive and visual. This may attract students' attention, making them comfortable and simplifying the e-registration process. Eight e-registration steps must be completed by students for successful online registration (see Table 2.1). On the other hand, there are only six steps to complete in manual registration, which is thought to take longer than e-registration. Even though most participants found the e-registration effective and user-friendly, it is the challenges faced by respondents that are the topic of this research. The system must be accommodative in every aspect to every student who registers online. It is recommended that administrators undergo comprehensive training on the ORS as inconsistency in staff training was discovered. This will enable the administrators to assist students properly. One of the administrators pointed out that it was assumed that she knows how the ORS works but that she could not assist with all queries during the e-registration period.

It was mentioned by one of the administrators interviewed that student assistants need to have ITS skills so that they can assist with all e-registration queries and not just the basics. Student respondents and the administrators suggested that e-registration orientation must be offered prior to registration. As a community service, the researcher suggested that CPUT constructs community halls equipped with computers with the ORS loaded. Instead of students flocking to campus, they can register at a community hall where skilled students from CPUT will assist them, as a project for community work. Since the institution has all the geographical details of every student, it makes it easy to ascertain where most students live and where the community halls can be erected or even rented for e-registration purposes.

Ukwoma et al. (2016:716) suggest embedding computer skills into high school curricula. This research is intended to benefit students who are determined to further their studies at university. It will help students to prepare beforehand and familiarise themselves with the computer skills required to execute the e-registration task, which is the first step to gaining access to class. CPUT will benefit from the recommendations of this research because it is a leading institution in terms of technology and efficiency and is the only UOT in the Western Cape Province. This research will bring a better understanding of how to execute e-registration and result in better service delivery by involving the community and schools to build computer competency and skills of potential students.

Although the research focussed only on CPUT, other traditional institutions, which are still using manual registration and facing similar problems, will gain insight from this research. It will be a pathway to a smooth e-registration process. Tools and techniques will be available for them when they get to the stage of implementing the ORS as challenges would have been dealt with to improve the process. Administration and technical staff will benefit since there will be a diminished paper trail. Online registration brings new skills to all parties involved,

upskilling them to participate in this digital era. Furthermore, it will add to the effectiveness of the institution as it brings a real-time perspective to the business by enabling students to register at any time around the world with no hindrances, once the problems are resolved. This will be cost-effective for students, whereby they will only need to go to campus once classes commence.

Students will not have to pay for accommodation before classes commence after registering, which is the standard practice at CPUT. It will benefit the community as computer-training centres could be established, resulting in job creation and enhancing knowledge of technological aspects. This study will assist the university by encouraging the university to improve the algorithms of the ORS and make its features more easily usable (Estevez et al., 2014:52).

It is evident that there is scarcity of technical skills in South Africa as Strauss and du Toit (2010:303) pointed out. There is a need for training and development of the staff working with the ORS, as well as considering implementation of recruitment and selection and training processes to have skilled staff to operate the system.

6.3.3 Methodological contribution

A mixed methodology was employed in this research because the researcher wanted to collect rich and comprehensive data (Wisdom & Creswell, 2013:1). Six administrators and four IT technicians were interviewed (qualitative) and 35 students completed a survey questionnaire (quantitative).

Integrated data of mixed methodology proffers an in-depth understanding of the phenomenon under study. Previous research employed a single methodology, which sets this research study apart.

6.4 Recommendations

- i) The institution should consider fully automating the ORS to improve system interaction and to synchronise the e-registration sub-systems. This will obviate the need for students having to go to campus to remove the blocks and to complete the registration process because systems will communicate immediately when a request is made and produce a desired output instantly.
- ii) E-registration orientation should be provided to novice students and returning students who need it to prepare them for registration. The orientation should educate students about the correct information they need to retain for e-registration and how to go about it. This suggestion came from both students and administrators in this research. The ORS is live and everything that is captured is recorded in real time, even if it is incorrect. Given that, perhaps a mock registration system should be set up on which students could

practice before they go live during orientation. Voice message prompts with language preference may be of assistance with the instructions when registering online. Students could choose their language preference for voice prompts for better understanding.

- iii) Multimedia function should be embedded in the ORS for it to be interactive and interesting, include clear instructions and entertaining visuals and emojis. This may encourage students to read the instructions and make the process less intimidating, more user-friendly and less confusing. Students who go to register at campus should be encouraged to register on their own by following the prompts of the e-registration instructions. Otherwise, more work is created for the Faculty and more staff members will be needed. Technology is expected to make work easier and even replace people, so that they can focus on other functionalities. Yu and Brandenburg (2006:46) support additional multi-media instructions to ease the online environment.
- iv) Based on the results of the data collected, more staff with ITS skills should be trained to assist with e-registration queries and not just students who assist with directions on how to register. CPUT should consider erecting clear, large signage that indicates e-registration venues to prevent students wandering around aimlessly and ending up in various offices seeking registration assistance. In addition, the e-registration instructions should be in multiple languages to make it easier for those whose first language is not English.
- v) Since technical and administrative staff are only available during working hours, research needs to investigate economical means to provide support staff needs so that support is available twenty-four-seven, to ensure the human element exists during e-registration for students.
- vi) Informative e-registration workshops should be held for faculty staff members who assist students with e-registration and a refresher workshop on e-registration should be offered before e-registration opens. A knowledgeable team to handle the ORS should be appointed so that the Faculty office staff is not burdened beyond their normal duties.
- vii) An electronic proof of registration and electronic student card should be introduced and automatically sent to students as soon as they complete the registration process. This will negate students physically going to campus and queuing for their proof of registration and student cards. Biometrics to identify registered students should be introduced at all campuses so that students do not always have to produce their student cards to gain access to campus facilities. Electronic proof of registration and electronic student cards should be considered as part of 'saving the planet' instead of printing plastic cards that can easily get lost or misplaced.

- viii) As part of community service, the institution should consider setting up community centres equipped with computers and printers with free Internet access in areas where most students reside. Novice and returning students can go and register online at these community centres and may feel less intimidated. If necessary, the costs could be built into the fee structure. Competent students who are well acquainted with the ORS should be deployed to these community centres to assist their fellow students with e-registration. Their service can be converted into assignment projects or portfolios that will contribute towards their marks as part of their community work.
- ix) Nunan (2002:618) and Adepoju (2010:204) indicate that inadequate bandwidth is a massive hindrance and appropriate bandwidth should be installed. Nunan (2002:618) adds that some students spend over an hour trying to log in. CPUT remains committed to e-registration, with no intention of reverting to traditional manual registration. Hence, it is imperative that CPUT invests more in the stability of the e-registration system and puts appropriate measures in place, which will benefit both students and CPUT, keep all its customers happy and enjoy the benefits of technology.
- x) Computer skills classes should be mandatory at all schools since we are living in a digital era.
- xi) Ginn and Hammond (2012:263) suggest the appointment of more administrators to assist with online registration, thereby alleviating the burden on faculty staff.
- xii) Adding more resources (servers) and incorporating load-balancing features could greatly decrease the chances of the website crashing.

6.5 Limitations and further research

As mentioned before, due to time constraints, the case study was limited to the Media department. Experiences of students from other faculties and universities in the Western Cape Province were not considered. Only 35 student respondents were randomly selected and six administrators and four IT support staff were interviewed.

Further research should be conducted, incorporating all faculties and programmes offered at CPUT to gain a broader understanding of e-registration challenges. Furthermore, research could be conducted at all the universities in South Africa that migrated to e-registration to ascertain if they are facing similar issues and arrive at solutions to mitigate such challenges. The outcomes of this study are limited to CPUT. Some universities might not be facing same challenges and therefore it cannot be concluded that all universities face the same problems as identified in this study.

The questionnaire should have provided an option for students who lack computer skills, to gain a better understanding of the calibre of students attracted to this university. Instead, there were only three options to rate students' computer literacy, which were basic, intermediate and advanced and yet the qualitative data revealed that some students had no computer skills at all.

Further research needs to be conducted to identify network and system interaction issues and solutions implemented. At times, the network slows to a crawl, mostly during the e-registration period. Broadband limits at universities need to be increased to facilitate smooth online registration operation so that every student benefits fully from it. All identified problems should be resolved to improve system efficiency.

6.6 Conclusions

It is apparent that the ORS comes with its own challenges and CPUT faces similar problems as those previously stated. System interaction management needs to be improved and fully automated to avoid unnecessary delays, though it comes at a cost to the institution. However, the findings of this research indicate that most students perceive the e-registration process as effective and they had a good experience using it. It is worth noting that the data collected from administrative and IT support staff reveal that there are more challenges with e-registration than what students think. This is because administrative and IT support are at the forefront of the e-registration process and provided the researcher with first-hand experience and information as compared to the self-report from students.

Even though this was simply a case study in the Media department, chances are most of the students at CPUT face the same predicament. It is imperative for the institution to pay attention and fix those problems that arose from this research to accommodate all end-users and to offer quality service. Organisations have become dependent on technology and it has become the core of many organisations. It impacts the operation of their business, hence it needs to be flawless. E-registration has overtaken the traditional manual registration in hopes of reducing the paper trail, improving record-keeping and improving efficiency. However, technology has its own challenges, in this case, technical challenges, including system interaction problems faced by students when registering online. Students must read instructions and they need orientation. Previous research has pinpointed network and broadband as the main challenges to e-registration. In addition, lack of communication was noted as one of the many challenges. Some issues noted in previous research as an impediment to e-registration are lack of technological skills, unreliability of technology and lack of twenty-four-seven technical support, which is another problem at CPUT. However, it is imperative to note that the challenges arise from a combination of aspects of the whole ORS, of which students and system interaction are part.

The framework of this study was a case study. A case study gives an in-depth understanding of a study by carrying out focus group interviews as well as one-on-one interviews to gather opinions, perceptions and attitudes from the sample selected (Kumar, 2019:123).

The literature chosen in this research contributed significantly by giving insight into the topic under study, findings and outcomes from previous research conducted on the challenges of e-registration. This enabled the researcher to identify the kind of challenges embedded in the e-registration process and to understand that this is a global challenge because the literature was a combination of local and international. The literature assisted by providing direction in terms of expectations and recommendations. Without the existing literature and findings from previous research, the researcher would not have been able to complete this research. The literature informed this research in terms of type of data to be collected, a suitable methodology and the variables to apply in this research.

REFERENCES

- Abu Doush, I. 2019. *Evaluating the web accessibility of university online registration system: Case study Jordan*.
https://www.researchgate.net/publication/333480292_Evaluating_the_Web_Accessibility_of_University_Online_Registration_System_case_study_Jordan [12 June 2019].
- Active Network. n.d. *The top 10 benefits of online registration for you and your participants*.
<http://www.activenetwork.co.za/event-management-resources/articles/top-10-benefits-of-online-registration.htm> [7 July 2017].
- Adams, D.R., Powers, M.J. & Owles, V.A. 1985. *Computer information systems development: Design and implementation*. Mason, OH: South-Western Thomson Learning.
- Adepoju, S.A. 2010. Challenges of students online registration system in Nigeria- A case of Federal University of Technology Minna. *Journal of Technological Research*, 5(1):196-203.
- Ahmad, M.E., Rashid, A.S.K., Abdullah, A.A. and Abdulla, R.M., 2018. The role of information technology on teaching process in education: An analytical prospective study at University of Sulaimani. *International Journal of Advanced Computer Science and Applications*, 9(11):512-521.
- Akhtar, D.M.I., 2016. Research design. *Research in Social Science: Interdisciplinary Perspectives*, 68-84. https://www.academia.edu/30071609/Research_Design [27 September 2020].
- Almigheerbi, T.S., Ramsey, D. & Lamek, A. 2019. Using the SERVQUAL model to assess service quality and students' satisfaction: (an empirical study of the online registration system at the University of Tripoli). In *Proceedings of the 3rd International Conference on Business and Information Management*: 130-133.
- Alter, S. 2018. System interaction theory: Describing interactions between work systems. *Communications of the Association for Information Systems*, 42(Article 9): 233-267.
https://pdfs.semanticscholar.org/6449/717b4598e12ff435d16afde80bf6ad374909.pdf?_ga=2.194217444.874960168.1600609022-1035146154.1595413324 [23 June 2019].
- Atkinson, J.D. 2017. *Journey into social activism: Qualitative approaches*. New York: Fordham University Press.
- Avison, D. & Fitzgerald, G. 2003. *Information systems development: Methodologies, techniques and tools*. New York: McGraw-Hill.
- Awwad, M.S. & Al-Mohammad, S.M. 2010. Assessing online registration system's (ORS) success: An application of DeLone and McLean's model of information systems success. *Studies in Business and Economics*, 15(2):5-23. <https://doi.org/10.29117/sbe.2010.0053>
- Baghdadi, Y. 2002. Web-based interactions support for information systems. *Informing Science: The International Journal of an Emerging Transdiscipline*, 5:49-65.
- Bala, J. 2016. Contribution of SPSS in social sciences research. *International Journal of Advanced Research in Computer Science*, 7(6):250-254.
<https://doi.org/10.26483/ijarcs.v7i6.2773>
- Baldauf, K. & Stair, R. 2010. *Succeeding with technology*. Boston, MA: Cengage Learning.

- Barkley, A. 2019. *Writing a discussion chapter with mixed method approach*. <https://www.theacademicpapers.co.uk/blog/2019/11/06/writing-a-discussion-chapter-with-mixed-method-approach/> accessed [13 July 2020].
- Bemile, R.K., Gborgla, J., Mensah, P.O., Boateng, V., Ansa, H.O. & Twum, E.G. 2014. Online registration system (a case of Methodist University College, Ghana). *International Journal of Research in Information Technology*, 2(9):321-333.
- Bharamagoudar, S.R., Geeta, R.B. & Totad, S.G. 2013. Web based student information management system. *International Journal of Advanced Research in Computer and Communication Engineering*, 2(6):2342-2348.
- Bhardwaj, R.K. & Walia, P.K. 2012. Web based information sources and services: A case study of St. Stephen's College, University of Delhi. *Library Philosophy and Practice*, 768:1-18. <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1842&context=libphilprac> [8 September 2018].
- Bhatti, N.B., Siyal, A.A., Qureshi, A.L. & Bhatti, I.A. 2019. Socio-economic impact assessment of small dams based on T-paired sample test using SPSS software. *Civil Engineering Journal*, 5(1):153-164.
- Braun, V. & Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2):77-101.
- Britto, M. & Rush, S. 2013. Developing and implementing comprehensive student support services for online students. *Journal of Asynchronous Learning Networks*, 17(1):29-42.
- Bubel, D. & Cichoń, S. 2017. Role of information in the process of effective management of the university. *International Journal of Innovation and Learning*, 21(1):114-125.
- Cape Peninsula University of Technology (CPUT). 2017a. *2017 Registrations*. https://www.cput.ac.za/storage/students/registration/registration_booklet_27012017.pdf [21 June 2020].
- Cape Peninsula University of Technology (CPUT). 2017b. *2017 Annual Report*. https://www.cput.ac.za/storage/about/annual_reports/CPUT_ANNUAL_REPORT_2017-WEB.pdf [19 July 2018].
- Chipeperekwa, S.C. 2017. Challenges and success factors in introducing information systems for students' online registration: A case study of a university of technology. Unpublished Master's dissertation. CPUT, Cape Town.
- Cooner, T.S. 2010. Creating opportunities for students in large cohorts to reflect in and on practice: Lessons learnt from a formative evaluation of students' experiences of a technology-enhanced blended learning design. *British Journal of Educational Technology*, 41(2):271-286.
- Creswell, J.W. & Clark, V.L.P. 2017. *Designing and conducting mixed methods research*. Thousand Oaks, CA: SAGE.
- Creswell, J.W. 2009. *Research design: Qualitative, quantitative and mixed methods approaches*. Thousand Oaks, CA: SAGE.

- Dailey, W. 1994. Rutgers' Touchtone Registration System receives high grades. *Campus-Wide Information Systems*, 11(4):12-13.
- Dar, S.A. 2018. An implementation of an online registration system in J&K State Board of Technical Education for Polytechnics. *International Journal of Scientific Research in Computer Science, Engineering and Information Technology*, 3(1):805-809.
- Darunday, J.K., Melarpis, F.L., Monserrat, T.J.K. & Recario, R.N. 2016. *Flash crowd online student enrollment system*.
https://www.researchgate.net/profile/Jan_Keith_Darunday/publication/325644413_Flash_Crowd_Online_Student_Enrollment_System/links/5b1a29c8a6fdcca67b660d5d/Flash-Crowd-Online-Student-Enrollment-System.pdf May [12 May 2018].
- Dawson, C. 2002. *Practical research methods: A user-friendly guide to mastering research techniques and projects*. Oxford, UK: How to Books Ltd.
- Department of Higher Education and Training (DHET). 2018. *Statistics on post-school education and training in South Africa: 2016*. Pretoria: DHET.
<https://www.dhet.gov.za/SiteAssets/Statistics%20on%20Post-School%20Education%20and%20Training%20in%20South%20Africa%2C%202018.pdf> [18 July 2-18].
- Diem, K.G. & Burgess, T. 2001. *A general introduction to the design of questionnaires for survey research*. <https://nats-www.informatik.uni-hamburg.de/pub/User/InterculturalCommunication/top2.pdf> [12 June 2019].
- Drahos, P. (ed). 2017. *Regulatory theory: Foundations and applications*. Canberra: Australian National University Press. <http://dx.doi.org/10.22459/RT.02.2017>
- Estevez, R., Rankin, S. & Silva, R. 2014. A model for web-based course registration systems. *International Journal of Web Information Systems*, 10(1):51-64.
<https://doi.org/10.1108/IJWIS-05-2013-0014>
- Etikan, I., Musa, S.A. & Alkassim, R.S. 2016. Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1):1-4.
- Fade, S. 2004. Using interpretative phenomenological analysis for public health nutrition and dietetic research: A practical guide. *Proceedings of the Nutrition Society*, 63(4):647-653.
- Fahmy, M. 2007. Automated students courses registration using computer-telephony integration. *International Arab Journal of Information Technology*, 4(4):353-358.
- Fauzy, F.A.A., Shah, Z.A., Saedudin, R.R., Kasim, S., Azadin, A.A., Ahmar, A.S. & Hidayat, R. 2018. Registration system and UTM games decision using the website application. *International Journal of Engineering and Technology*, 7(2):45-47.
- Ginn, M.H. & Hammond, A. 2012. Online education in public affairs: Current state and emerging issues. *Journal of Public Affairs Education*, 18(2):247-270.
- Joshi, A., Kale, S., Chandel, S. & Pal, D.K. 2015. Likert scale: Explored and explained. *Current Journal of Applied Science and Technology*, 7(4):396-403.
- Kohlbacher, F. 2006. The use of qualitative content analysis in case study research. *Forum: Qualitative Social Research*, 7(1):1-30.

- Kothari, C.R. 2004. *Research methodology: Methods and techniques*. New Delhi: New Age International.
- Kumar, R. 2019. *Research methodology: A step-by-step guide for beginners*. Thousand Oaks, CA: SAGE.
- Lee, S.J., Srinivasan, S., Trail, T., Lewis, D. & Lopez, S. 2011. Examining the relationship among student perception of support, course satisfaction, and learning outcomes in online learning. *The Internet and Higher Education*, 14(3):158-163.
- Little, M.C., Wheeler, S.M., Ingham, D.B., Snow, C.R., Whitfield, H. & Shrivastava, S.K. 2000. The university student registration system: A case study in building a high-availability distributed application using general purpose components. In *Advances in distributed systems*. Berlin: Springer: 453-471.
- Litwin, M.S. 1995. *How to measure survey reliability and validity*. Thousand Oaks, CA: SAGE. DOI: <https://dx.doi.org/10.4135/9781483348957>
- Lubanga, S.C., Chawinga, W.D., Majawa, F. Kapondera, S. 2018. *Web based student information management system in universities: Experiences from Mzuzu University*. https://www.researchgate.net/publication/325106323_WEB_BASED_STUDENT_INFORMATION_MANAGEMENT_SYSTEM_IN_UNIVERSITIES_EXPERIENCES_FROM_MZUZU_UNIVERSITY [16 May 2019].
- Mackey, A. & Gass, S.M. 2015. *Second language research: Methodology and design*. London: Routledge.
- Madigan, E. M., Goodfellow, M. & Stone, J.A., 2007. Gender, perceptions and reality: Technological literacy among first-year students. *ACM SIGCSE Bulletin*, 39(1):410-414.
- Maguire, M. & Delahunt, B. 2017. Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars. *All Ireland Journal of Higher Education*, 9(3):1-14.
- Manganello, F., Falsetti, C. & Leo, T. 2019. Self-regulated learning for web-enhanced control engineering education. *Journal of Educational Technology & Society*, 22(1):44-58.
- Mashabela, F. & Pillay, A.S. 2017. Effectiveness of an integrated tertiary software mobile information system for student registration and admission at a university in Gauteng. *Expert Journal of Business and Management*, 5(1):32-49.
- Mashenene, R.G. 2019. Effect of service quality on students' satisfaction in Tanzania higher education. *Business Education Journal*, 1(1): 1-8.
- Mesfin, G., Ghinea, G., Grønli, T. M. & Hwang, W.Y. 2018. Enhanced agility of e-learning adoption in high schools. *Journal of Educational Technology & Society*, 21(4):157-170.
- Mohapatra, S.C. & Chamola, S.K. 2020. Basic concepts in estimating sample size. *Journal of Advanced Research in Medical Science & Technology*, 7(1):17-21.
- Ndlovu, N.P. 2015. The role of management information systems in measuring organisational performance in the KwaZulu-Natal Department of Art and Culture. Unpublished Doctoral dissertation, Stellenbosch University, Stellenbosch.
- Nunan, D. 2002. Teaching MA-TESOL Courses online. *TESOL Quarterly*, 36(4):617-621.

- Oates, B.J. 2005. *Researching information systems and computing*. Thousand Oaks, CA: SAGE.
- Odero, T.A. & Oloko, M.A. 2013. Effect of online registration on exam performance in Kenya Certificate of Secondary Education enrolment. A case of Sotik District, Kenya. *American International Journal of Contemporary Research*, 3(7):117-127.
- Okoye, C.O. 2015. Online registration challenges faced by open and distance Learners of National Open University of Nigeria: A case study of Enugu Study Centre. *Journal of Qualitative Education*, 11(1):1-7.
- Onuka, A.O. & Ajayi, K.O. 2012. Effect of manpower development on workers' job performance. *European Journal of Educational Studies*, 4(3):423-433.
- Paltridge, B. & Phakiti, A. (eds). 2015. *Research methods in applied linguistics: A practical resource*. London: Bloomsbury Publishing.
- Pintello, T. 2013. *Introduction to Networking with Network +*. Hoboken, NJ: John Wiley.
- Plano Clark, V.L. & Ivankova, N.V. 2016. *Mixed methods research: A guide to the field*. Thousand Oaks, CA: SAGE.
- Pollard, E., Huxley, C., Martin, A., Takala, H. & Byford, M. 2019. Impact of the student finance system on participation, experience and outcomes of disadvantaged young people. *Literature Review*, May 2019:1-118.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/909623/Impact_of_the_student_finance_system_on_disadvantaged_young_people.pdf [23 May 2019].
- Raja, R. & Nagasubramani, P.C. 2018. Impact of modern technology in education. *Journal of Applied and Advanced Research*, 3(1):33-35.
- Ritchie, J., Lewis, J., Nicholls, C.M. & Ormston, R. (eds). 2013. *Qualitative research practice: A guide for social science students and researchers*. Thousand Oaks, CA: SAGE.
- Rowley, J. 2014. Designing and using research questionnaires. *Management Research Review*, 37(3):308-330.
- Salisu, S.J. 2020. Challenges and prospect of e-registration in Ahmadu Bello University, Zaria, Nigeria. *KIU Journal of Social Sciences*, 5(4):289-293.
- Sandelowski, M. 2000. Combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-method studies. *Research in Nursing & Health*, 23(3):246-255.
- Sang, L.T., Mail, R., Abd Karim, M.R., Ulu, Z.K.A.B., Mufli, M. & Lajuni, N. 2017. Pretesting and piloting the research instrument to examine the central roles of risk perception and attitude towards financial investment behavioural intention among Malaysians. *Journal of the Asian Academy of Applied Business (JAAAB)*, 4:97-108
- Santos, J.L.G.D., Erdmann, A.L., Meirelles, B.H.S., Lanzoni, G.M.D.M., Cunha, V.P.D. & Ross, R. 2017. Integrating quantitative and qualitative data in mixed methods research. *Texto & Contexto-Enfermagem*, 26(3):1-9. https://www.scielo.br/pdf/tce/v26n3/en_0104-0707-tce-26-03-e1590016.pdf [26 September 2020].

- Satzinger, J.W., Jackson, R.B. & Burd, S.D. 2011. *Systems analysis and design in a changing world*. Boston, MA: Cengage Learning.
- Shaltoni, A.M., Khraim, H., Abuhamad, A. & Amer, M. 2015. Exploring students' satisfaction with universities' portals in developing countries: A cultural perspective. *The International Journal of Information and Learning Technology*, 32(2):82-93.
- Shelly, G.B. & Rosenblatt, H.J. 2012. *System analysis and design*. 9th ed. Boston MA: Cengage Learning.
- Siddiaquah, A. & Salim, Z. 2017. The ICT facilities, skills, usage, and the problems faced by the students of higher education. *Journal of Mathematics Science and Technology Education*, 13(8):4987-4994.
- Taylor, S.J., Bogdan, R. & DeVault, M., 2015. *Introduction to qualitative research methods: A guidebook and resource*. Hoboken, NJ: John Wiley & Sons.
- Tongco, M.D.C. 2007. Purposive sampling as a tool for informant selection. *Ethnobotany Research and Applications*, 5:147-158.
- Udofia, N.A. 2015. An evaluation of students' responses to online registration. *American Journal of Engineering, Technology and Society*, 2(4):90-92.
- Ukwoma, S.C., Iwundu, N.E. & Iwundu, I.E. 2016. Digital literacy skills possessed by students of UNN, implications for effective learning and performance. *New Library World*, 117(11/12):702-720. <https://doi.org/10.1108/NLW-08-2016-0061>
- University of Illinois Springfield. 2020. *Strengths and weaknesses of online learning*. <https://www.uis.edu/ion/resources/tutorials/online-education-overview/strengths-and-weaknesses/> [21 June 2020].
- Welman, J.C., Kruger, F. & Mitchell, B. 2005. *Research methodology*. Cape Town: Oxford University Press.
- Willits, F.K., Theodori, G.L. & Luloff, A.E., 2016. Another look at Likert scales. *Journal of Rural Social Sciences*, 31(3):126-139.
- Wisdom, J. & Creswell, J.W. 2013. *Mixed methods: Integrating quantitative and qualitative data collection and analysis while studying patient-centered medical home models*. <https://pcmh.ahrq.gov/page/mixed-methods-integrating-quantitative-and-qualitative-data-collection-and-analysis-while> [27 March 2019].
- Yu, C. & Brandenburg, T. 2006. I would have had more success if...: The reflections and tribulations of a first-time online instructor. *Journal of Technology Studies*, 32(1):43-52.

APPENDICES

APPENDIX A: CPUT ETHICAL CLEARANCE



P.O. Box 1906 • Bellville 7535 South Africa • Tel: +27 21 4603534 • Email: majamanin@cput.ac.za
Symphony Road Bellville 7535


Office of the Chairperson Research Ethics Committee	Faculty: BUSINESS AND MANAGEMENT SCIENCES
--	--

At a meeting of the Research Ethics Committee on 15 August 2017, Ethics Approval
was granted to Naomi Rice (210076569) for research activities
Related to the MTech/DTech: Mtech Business Administration at the Cape Peninsula University of
Technology

Title of dissertation/thesis/project:	ONLINE REGISTRATION CHALLENGES FACED BY STUDENTS AT A SELECTED UNIVERSITY IN THE WESTERN CAPE Lead Researcher/Supervisor: Dr BS Ngcamu
---------------------------------------	---

Comments:

Decision: **APPROVED**

	15 August 2017
Signed: Chairperson: Research Ethics Committee	Date

Clearance Certificate No | 2017FBREC465

APPENDIX B: CPUT PERMISSION TO CONDUCT RESEARCH




27 July 2017

I Johannes Cronjé in my capacity as Dean at Faculty of Informatics and Design give consent in principle to allow Naomi Rice, a student at the Cape Peninsula University of Technology (CPUT), to collect data in this faculty as part of her Master of Technology research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate).

	Thesis	Conference paper	Journal article	Research poster
Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


Johannes Cronjé (Prof)

26 July 2017

Date

APPENDIX C: LETTER OF INFORMED CONSENT FOR SURVEY

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: _____ Date: _____

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Phone: 021469 1042

APPENDIX D: QUESTIONNAIRE

QUESTIONNAIRE

PLEASE TICK THE APPROPRIATE BOX FOR EACH QUESTION

SECTION A

1. How do you rate your experience of using the online registration?

1	2	3	4	5
Very poor	Poor	Good	Very good	Excellent

2. Rate the online registration system in terms of effectiveness

1	2	3	4	5
Very ineffective	Ineffective	Adequate	Effective	Very Effective

3. The log in procedures were clear

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

SECTION B

	1	2	3	4	5
	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
4. The online registration system was user-friendly					
5. The online registration system was accessible remotely					
6. There were long queues at campus for online registration					
7. Administrators were well trained and helpful					
8. Technical staff were well trained and helpful					

9. There were many challenges on the online registration					
10. There were adequate computers at campus					
11. Online registration orientation needed					
12. I was blocked from using online registration					

SECTION C: BIOLOGICAL DETAILS

Male	1	Female	2
------	---	--------	---

1. Race

African	1
White	2
Coloured	3
Indian	4

2. Citizenship

South African	1	Foreign	2
---------------	---	---------	---

3. Year of study

1 Diploma	2 BTECH	3 MTECH	4 DTECH
--------------	------------	------------	------------

4. How do you rate your level of computer literacy

1 Basic	2 Intermediate	3 Advanced
------------	-------------------	---------------

5. Where did you register from?

Cell phone	1
Internet Cafe	2
Personal computer	3
Institution computer	4
Other	5

6. Since the implementation of online registration at CPUT, how many times have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

APPENDIX E: FACULTY ADMIN STAFF INTERVIEW SCHEDULE

Interview questions for Administrative personnel who work directly with the online registration

1. What are some of the challenges of the online registration that you came across?
2. Were you well trained for the online registration system?
3. Were you able to assist with all queries that you came across during the registration period?
4. Were there enough resources for the online registration?
5. What changes would you like to see regarding the online registration process?
6. Did you find online registration more effective compared to manual registration?

APPENDIX F: FINANCE DEPARTMENT INTERVIEW SCHEDULE

Finance Admin interview schedule

1. From the Finance perspective, how does the online registration system interface or interact with the Students' Account system? What is the role of the IT technician or IT development software in monitoring online registration system and Students' Account system interactions between each other?
2. What other system interact or interface with online registration system besides Students' Account system?
3. Which software technologies are used to enable these systems interact and interface?
4. Explain the incidents/queries that are related to system interaction or interface during online registration.

APPENDIX G: IT SUPPORT INTERVIEW SCHEDULE

IT Support interview schedule

- 1) What is the role of the IT technician or IT software developer in monitoring these systems interactions between each other? e.g. online registration system and Students' Account system?

- 2) From an IT perspective, how does the online registration system interface or interact? For instance, Students' Account system and online registration system? Or from IT perspective, how does online registration system interact or interface with Students' Account system?

- 3) What other systems interact or interface with online registration system?

- 4) Which software technologies are used to enable these systems to interact and interface?

- 5) Explain the incidents/queries that are related to system interaction or interface and what causes the system to slow down during registration and what should be done?

APPENDIX H: **GRAMMARIAN CERTIFICATE**

22 Krag Street

Napier

7270

Overberg

Western Cape

4th October 2020

LANGUAGE & TECHNICAL EDITING

Cheryl M. Thomson

**THE CHALLENGES AND INTERACTIONS OF E-REGISTRATION SYSTEM
PRACTICE ENVIRONMENT AT A SELECTED UNIVERSITY OF TECHNOLOGY**

Supervisor: Dr Michael Twum-Darko

This is to confirm that I, Cheryl Thomson, executed the language and technical editing of the above-titled Master's dissertation of NAOMI RICE, at the CAPE PENINSULA UNIVERSITY OF TECHNOLOGY in preparation for submission of this dissertation for assessment.

Yours faithfully



CHERYL M. THOMSON

Email: cherylthomson2@gmail.com

Cell: 0826859545

69
6635

PR-BTech #1

Annexure A: Cover letter

Informed Consent for participation in Questionnaire survey

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: *[Handwritten Signature]*
Date: 01 Feb 2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice
Email: Ricen@cput.ac.za
Contact num: 021 469 1042

Section A

1 How do you rate your experience of using the online registration?

Very poor	Poor	Good	Very good	Excellent!
-----------	------	------	-----------	------------

2. Rate the online registration system in terms of effectiveness

1	2	3	4	5
Very ineffective	Ineffective	Adequate	Effective	Very Effective

3 The logging procedures were clear

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree!

Section B

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
4. The online registration system was user friendly				
5. The online registration system was accessible remotely				
6. There were long queues at campus for online registration				
7. Administrators were well trained and helpful				
8. Technical staff were well trained and helpful				
9. There were many challenges on the online registration				
10. There were adequate computers at campus				
11. Online registration orientation needed				
12. I was blocked from using online registration				

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1	White	2	Coloured	3	Indian	4
---------	---	-------	---	----------	---	--------	---

2. Citizenship

South African	1	International	2
---------------	---	---------------	---

3. Year of study

Diploma	1	BTECH	2	MTECH	3	DTECH	4
---------	---	-------	---	-------	---	-------	---

4. How do you rate your level of computer literacy

None	1	Basic	2	Intermediate	3	Advanced	4
------	---	-------	---	--------------	---	----------	---

5. Where did you register from?

Cell phone	1	Internet Cafe	2	Personal computer	3	Institution computer	4	Other	5
------------	---	---------------	---	-------------------	---	----------------------	---	-------	---

6. Since the implementation of online registration at CPU, how many times

have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

34
123
H

07
02 Great
A

Annexure A: Cover letter
Informed Consent for participation in Questionnaire survey

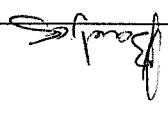
Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 01.02.2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice
Email: Ricen@cput.ac.za
Contact num: 021 469 1042

Section A

1 How do you rate your experience of using the online registration?

Very poor	Poor	Good	Very good	Excellent
-----------	------	------	-----------	-----------

2. Rate the online registration system in terms of effectiveness

1	2	3	4	5
Very ineffective	Ineffective	Adequate	Effective	Very Effective

3 The logging procedures were clear

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

Section B					Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
4. The online registration system was user friendly								X	
5. The online registration system was accessible remotely							X		
6. There were long queues at campus for online registration							X		
7. Administrators were well trained and helpful								X	
8. Technical staff were well trained and helpful							X		
9. There were many challenges on the online registration						X			
10. There were adequate computers at campus							X		
11. Online registration orientation needed								X	
12. I was blocked from using online registration						X			

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1
White	2
Coloured	3
Indian	4

2. Citizenship

South African	1	International	2
---------------	---	---------------	---

3. Year of study

Diploma	1	BTECH	2	MTECH	3	DTECH	4
---------	---	-------	---	-------	---	-------	---

4. How do you rate your level of computer literacy

None	1	Basic	2	Intermediate	3	Advanced	4
------	---	-------	---	--------------	---	----------	---

5. Where did you register from?

Cell phone	1
Internet Cafe	2
Personal computer	3
Institution computer	4
Other	5

6. Since the implementation of online registration at CPU, how many times have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

74
78
33

Annexure A: Cover letter

Informed Consent for participation in Questionnaire survey

Dear Participant

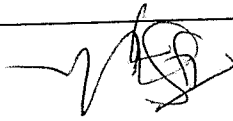
Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: _____
Date: 01 Feb 2018



Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

RE RECH PT
A

Section A

1 How do you rate your experience of using the online registration?

Very poor	Poor	Good	Very good	Excellent
-----------	------	------	-----------	-----------

2 Rate the online registration system in terms of effectiveness

1	2	3	4	5
Very ineffective	Ineffective	Adequate	Effective	Very Effective

3 The logging procedures were clear

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

Section B

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
4. The online registration system was user friendly			✓	
5. The online registration system was accessible remotely				✓
6. There were long queues at campus for online registration			✓	
7. Administrators were well trained and helpful			✓	
8. Technical staff were well trained and helpful			✓	
9. There were many challenges on the online registration		✓		
10. There were adequate computers at campus			✓	
11. Online registration orientation needed			✓	
12. I was blocked from using online registration			✓	

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1
White	2
Coloured	3
Indian	4

2. Citizenship

South African	1
International	2

3. Year of study

Diploma	1
BTECH	2
MTECH	3
DTECH	4

4. How do you rate your level of computer literacy

None	1
Basic	2
Intermediate	3
Advanced	4

5. Where did you register from?

Cell phone	1
Internet Cafe	2
Personal computer	3
computer Institution	4
Other	5

6. Since the implementation of online registration at CPU, how many times

have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

Annexure A: Cover letter
Informed Consent for participation in Questionnaire survey

72
69
32

Dear Participant

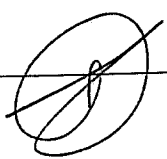
Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: _____
Date: 01 Feb 2018



Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section A

1 How do you rate your experience of using the online registration?

Very poor	Poor	Good	Very good	Excellent
-----------	------	------	-----------	-----------

2. Rate the online registration system in terms of effectiveness

1	2	3	4	5
Very ineffective	Ineffective	Adequate	Effective	Very Effective

3 The logging procedures were clear

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

Section B					Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
4	The online registration system was user friendly								X
5	The online registration system was accessible remotely								X
6	There were long queues at campus for online registration							X	
7	Administrators were well trained and helpful							X	
8	Technical staff were well trained and helpful							X	
9	There were many challenges on the online registration				X				
10	There were adequate computers at campus							X	
11	Online registration orientation needed							X	
12	I was blocked from using online registration				X				

Section C: Biological details: Please tick the appropriate box

Male	1	Female	<input checked="" type="checkbox"/>
------	---	--------	-------------------------------------

1. Race

African	1
White	2
Coloured	<input checked="" type="checkbox"/> 3
Indian	4

2. Citizenship

South African	<input checked="" type="checkbox"/> 1	International	2
---------------	---------------------------------------	---------------	---

3. Year of study

Diploma	1
BTECH	<input checked="" type="checkbox"/> 2
MTECH	3
DTECH	4

4. How do you rate your level of computer literacy

None	1
Basic	2
Intermediate	<input checked="" type="checkbox"/> 3
Advanced	4

5. Where did you register from?

Cell phone	1
Internet Cafe	2
Personal computer	3
computer Institution	4
Other	<input checked="" type="checkbox"/> 5

6. Since the implementation of online registration at CPU, how many times have you registered online?

1	<input checked="" type="checkbox"/>
2	
3	
4	
5	
6	

71
68
31

PR Best PT A

Annexure A: Cover letter
Informed Consent for participation in Questionnaire survey

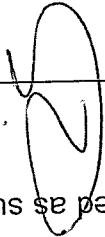
Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: 
Date: 01-02-18

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section A

1 How do you rate your experience of using the online registration?

Very poor	Poor	Good	Very good	Excellent
-----------	------	------	-----------	-----------

2. Rate the online registration system in terms of effectiveness

1	Very ineffective	2	Ineffective	3	Adequate	4	Effective	5	Very Effective
---	------------------	---	-------------	---	----------	---	-----------	---	----------------

3 The logging procedures were clear

1	Strongly disagree	2	Disagree	3	Neutral	4	Agree	5	Strongly Agree
---	-------------------	---	----------	---	---------	---	-------	---	----------------

Section B		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
4	The online registration system was user friendly					
5	The online registration system was accessible remotely					
6	There were long queues at campus for online registration					
7	Administrators were well trained and helpful					
8	Technical staff were well trained and helpful					
9	There were many challenges on the online registration					
10	There were adequate computers at campus					
11	Online registration orientation needed					
12	I was blocked from using online registration					

Section C: Biological details: Please tick the appropriate box

Male	<input checked="" type="checkbox"/>	Female	<input type="checkbox"/>
	1		2

1. Race

African	<input checked="" type="checkbox"/>	White	<input type="checkbox"/>	Coloured	<input type="checkbox"/>	Indian	<input type="checkbox"/>
	1		2		3		4

2. Citizenship

South African	<input checked="" type="checkbox"/>	International	<input type="checkbox"/>
	1		2

3. Year of study

Diploma	<input type="checkbox"/>	BTECH	<input checked="" type="checkbox"/>	MTECH	<input type="checkbox"/>	DTECH	<input type="checkbox"/>
	1		2		3		4

4. How do you rate your level of computer literacy

None	<input type="checkbox"/>	Basic	<input type="checkbox"/>	Intermediate	<input checked="" type="checkbox"/>	Advanced	<input type="checkbox"/>
	1		2		3		4

5. Where did you register from?

Cell phone	<input type="checkbox"/>	Internet Cafe	<input type="checkbox"/>	Personal computer	<input checked="" type="checkbox"/>	Institution computer	<input type="checkbox"/>	Other	<input type="checkbox"/>
	1		2		3		4		5

6. Since the implementation of online registration at CPU, how many times

have you registered online?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6

Informed Consent for participation in Questionnaire survey

Annexure A: Cover letter


Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 01.02.2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

70
67
30

A

PR
BTECH
PT

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2 <input checked="" type="checkbox"/>
------	---	--------	---------------------------------------

1. Race

African	1 <input checked="" type="checkbox"/>	White	2	Coloured	3	Indian	4
---------	---------------------------------------	-------	---	----------	---	--------	---

2. Citizenship

South African	1 <input checked="" type="checkbox"/>	International	2
---------------	---------------------------------------	---------------	---

3. Year of study

1	2 <input checked="" type="checkbox"/>	3	4
Diploma	BTECH	MTECH	DTECH

4. How do you rate your level of computer literacy

1	2	3	4
None	Basic	Intermediate	Advanced <input checked="" type="checkbox"/>

5. Where did you register from?

1 <input checked="" type="checkbox"/>	2	3	4	5
Cell phone	Internet Cafe	Personal computer	Institution	Other computer

6. Since the implementation of online registration at CPU, how many times have you registered online?

1	2 <input checked="" type="checkbox"/>	3	4	5	6
---	---------------------------------------	---	---	---	---

Annexure A: Cover letter
Informed Consent for participation in Questionnaire survey
29

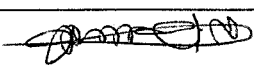
Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 1-Feb-2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

PR Breat PT
A

25

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2 <input checked="" type="checkbox"/>
------	---	--------	---------------------------------------

1. Race

African	1 <input checked="" type="checkbox"/>
White	2
Coloured	3
Indian	4

2. Citizenship

South African	1 <input checked="" type="checkbox"/>
International	2

3. Year of study

Diploma	1
BTECH	2 <input checked="" type="checkbox"/>
MTECH	3
DTECH	4

4. How do you rate your level of computer literacy

None	1
Basic	2
Intermediate	3 <input checked="" type="checkbox"/>
Advanced	4

5. Where did you register from?

Cell phone	1
Internet Cafe	2
Personal computer	3
Institution computer	4 <input checked="" type="checkbox"/>
Other	5

6. Since the implementation of online registration at CPU, how many times have you registered online?

1	2 <input checked="" type="checkbox"/>	3	4	5	6
---	---------------------------------------	---	---	---	---

Annexure A: Cover letter
Informed Consent for participation in Questionnaire survey

73
70
28

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: _____
Date: 1/02/2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice
Email: Ricen@cput.ac.za
Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2 <input checked="" type="checkbox"/>
------	---	--------	---------------------------------------

1. Race

African	1 <input checked="" type="checkbox"/>
White	2
Coloured	3
Indian	4

2. Citizenship

South African	1 <input checked="" type="checkbox"/>	International	2
---------------	---------------------------------------	---------------	---

3. Year of study

Diploma	1	BTECH	2 <input checked="" type="checkbox"/>	MTECH	3	DTECH	4
---------	---	-------	---------------------------------------	-------	---	-------	---

4. How do you rate your level of computer literacy

None	1	Basic	2	Intermediate	3	Advanced	4 <input checked="" type="checkbox"/>
------	---	-------	---	--------------	---	----------	---------------------------------------

5. Where did you register from?

Cell phone	1
Internet Cafe	2
Personal computer	3 <input checked="" type="checkbox"/>
Institution computer	4
Other	5

6. Since the implementation of online registration at CPU, how many times

have you registered online?

1	2 <input checked="" type="checkbox"/>	3	4	5	6
---	---------------------------------------	---	---	---	---

Handwritten initials/signature

PHOTO 3R 2R A

Handwritten initials/signature

Informed Consent for participation in Questionnaire survey

Annexure A: Cover letter

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: _____ Date: 15.02.2018

Handwritten signature

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	<input checked="" type="checkbox"/>	Female	2
------	-------------------------------------	--------	---

1. Race

African	1
White	2
Coloured	<input checked="" type="checkbox"/> 3
Indian	4

2. Citizenship

South African	<input checked="" type="checkbox"/> 1	International	2
---------------	---------------------------------------	---------------	---

3. Year of study

Diploma	1	BTECH	2	MTECH	3	DTECH	4
--------------------	---	-------	---	-------	---	-------	---

4. How do you rate your level of computer literacy

None	1	Basic	2	Intermediate	3	Advanced	4
------	---	------------------	---	--------------	---	----------	---

5. Where did you register from?

Cell phone	<input checked="" type="checkbox"/> 1	Internet Cafe	2	Personal computer	3	Institution computer	4	Other	5
------------	---------------------------------------	---------------	---	-------------------	---	----------------------	---	-------	---

6. Since the implementation of online registration at CPU, how many times

have you registered online?

1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6
---	-------------------------------------	---	-------------------------------------	---	--------------------------	---	--------------------------	---	--------------------------	---

Phyllis Zand Jr. D

79

25

Annexure A: Cover letter

Informed Consent for participation in Questionnaire survey

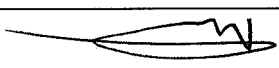
Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 15/02/2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1
White	2
Coloured	3
Indian	4

2. Citizenship

South African	1	International	2
---------------	---	---------------	---

3. Year of study

Diploma	1	BTECH	2	MTECH	3	DTECH	4
---------	---	-------	---	-------	---	-------	---

4. How do you rate your level of computer literacy

None	1	Basic	2	Intermediate	3	Advanced	4
------	---	-------	---	--------------	---	----------	---

5. Where did you register from?

Cell phone	1
Internet Cafe	2
Personal computer	3
Institution computer	4
Other	5

6. Since the implementation of online registration at CPU, how many times

have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

85
87
26

Annexure A: Cover letter

Informed Consent for participation in Questionnaire survey


Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 15/2/18

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice
Email: Ricen@cput.ac.za
Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	<input checked="" type="checkbox"/>	Female	<input type="checkbox"/>
------	-------------------------------------	--------	--------------------------

1. Race

African	<input type="checkbox"/>	1
White	<input type="checkbox"/>	2
Coloured	<input checked="" type="checkbox"/>	3
Indian	<input type="checkbox"/>	4

2. Citizenship

South African	<input checked="" type="checkbox"/>	1
International	<input type="checkbox"/>	2

3. Year of study

Diploma	<input checked="" type="checkbox"/>	1
BTECH	<input type="checkbox"/>	2
MTECH	<input type="checkbox"/>	3
DTECH	<input type="checkbox"/>	4

4. How do you rate your level of computer literacy

None	<input type="checkbox"/>	1
Basic	<input type="checkbox"/>	2
Intermediate	<input type="checkbox"/>	3
Advanced	<input checked="" type="checkbox"/>	4

5. Where did you register from?

Cell phone	<input type="checkbox"/>	1
Internet Cafe	<input type="checkbox"/>	2
Personal computer	<input type="checkbox"/>	3
Institution computer	<input checked="" type="checkbox"/>	4
Other	<input type="checkbox"/>	5

6. Since the implementation of online registration at CPU, how many times have you registered online?

1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input checked="" type="checkbox"/>
4	<input type="checkbox"/>
5	<input type="checkbox"/>
6	<input type="checkbox"/>

27

89
85

Phd 3273 A

Informed Consent for participation in Questionnaire survey

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: _____
Date: _____

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section A

1 How do you rate your experience of using the online registration?

Very poor	Poor	Good X	Very good	Excellent
-----------	------	--------	-----------	-----------

2. Rate the online registration system in terms of effectiveness

1	2	3	4	5
Very ineffective	Ineffective	Adequate X	Effective	Very Effective

3 The logging procedures were clear

1	2	3	4	5
Strongly disagree	Disagree	Neutral X	Agree	Strongly Agree

Section B					Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
4	The online registration system was user friendly			X					
5	The online registration system was accessible remotely			X					
6	There were long queues at campus for online registration			X					
7	Administrators were well trained and helpful							X	
8	Technical staff were well trained and helpful							X	
9	There were many challenges on the online registration			X					
10	There were adequate computers at campus			X					
11	Online registration orientation needed			X					
12	I was blocked from using online registration			X					X

Section C: Biological details: Please tick the appropriate box

Male	1	Female	<input checked="" type="checkbox"/>
------	---	--------	-------------------------------------

1. Race

African	1
White	2
Coloured	3 <input checked="" type="checkbox"/>
Indian	4

2. Citizenship

South African	<input checked="" type="checkbox"/>
International	2

3. Year of study

1	Diploma <input checked="" type="checkbox"/>
2	BTECH
3	MTECH
4	DTECH

4. How do you rate your level of computer literacy

1	None
2	Basic
3	Intermediate <input checked="" type="checkbox"/>
4	Advanced

5. Where did you register from?

1	Cell phone
2	Internet Cafe
3	Personal computer <input checked="" type="checkbox"/>
4	Institution
5	Other

6. Since the implementation of online registration at CPU, how many times

have you registered online?

1	2	3	4	5	6
		<input checked="" type="checkbox"/>			

67
16 64
23

Annexure A: Cover letter
Informed Consent for participation in Questionnaire survey

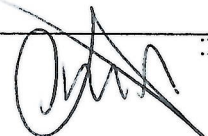
Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: 
Date: 06/03/2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice
Email: Ricen@cput.ac.za
Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	<input checked="" type="checkbox"/>	Female	<input type="checkbox"/>
	1		2

1. Race

African	<input checked="" type="checkbox"/>	White	<input type="checkbox"/>	Coloured	<input type="checkbox"/>	Indian	<input type="checkbox"/>
	1		2		3		4

2. Citizenship

South African	<input checked="" type="checkbox"/>	International	<input type="checkbox"/>
	1		2

3. Year of study

Diploma	<input checked="" type="checkbox"/>	BTECH	<input type="checkbox"/>	MTECH	<input type="checkbox"/>	DTECH	<input type="checkbox"/>
	1		2		3		4

4. How do you rate your level of computer literacy

None	<input type="checkbox"/>	Basic	<input type="checkbox"/>	Intermediate	<input type="checkbox"/>	Advanced	<input checked="" type="checkbox"/>
	1		2		3		4

5. Where did you register from?

Cell phone	<input type="checkbox"/>	Internet Cafe	<input type="checkbox"/>	Personal computer	<input checked="" type="checkbox"/>	Institution computer	<input type="checkbox"/>	Other	<input type="checkbox"/>
	1		2		3		4		5

6. Since the implementation of online registration at CPUT, how many times have you registered online?

1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input checked="" type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>
---	--------------------------	---	--------------------------	---	-------------------------------------	---	--------------------------	---	--------------------------	---	--------------------------

Subjects should be automatically loaded to avoid student verification for mor/less subjects

6 March 2018
6-3
62
20

Annexure A: Cover letter

Informed Consent for participation in Questionnaire survey

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:

Date: 6 March 2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	1	<input checked="" type="checkbox"/>
Female	2	<input type="checkbox"/>

1. Race

African	1	<input type="checkbox"/>
White	2	<input type="checkbox"/>
Coloured	3	<input checked="" type="checkbox"/>
Indian	4	<input type="checkbox"/>

2. Citizenship

South African	1	<input checked="" type="checkbox"/>
International	2	<input type="checkbox"/>

3. Year of study

Diploma	1	<input checked="" type="checkbox"/>
BTECH	2	<input type="checkbox"/>
MTECH	3	<input type="checkbox"/>
DTECH	4	<input type="checkbox"/>

4. How do you rate your level of computer literacy

None	1	<input type="checkbox"/>
Basic	2	<input type="checkbox"/>
Intermediate	3	<input type="checkbox"/>
Advanced	4	<input checked="" type="checkbox"/>

5. Where did you register from?

Cell phone	1	<input type="checkbox"/>
Internet Cafe	2	<input type="checkbox"/>
Personal computer	3	<input checked="" type="checkbox"/>
computer institution	4	<input type="checkbox"/>
Other	5	<input type="checkbox"/>

6. Since the implementation of online registration at CPU, how many times

have you registered online?

1	2	3	4	5	6
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

61
58
21

Annexure A: Cover letter

Informed Consent for participation in Questionnaire survey

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 06 March 2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1	White	2	Coloured	3	Indian	4
---------	---	-------	---	----------	---	--------	---

2. Citizenship

South African	1	International	2
---------------	---	---------------	---

3. Year of study

Diploma	1	BTECH	2	MTECH	3	DTECH	4
---------	---	-------	---	-------	---	-------	---

4. How do you rate your level of computer literacy

None	1	Basic	2	Intermediate	3	Advanced	4
------	---	-------	---	--------------	---	----------	---

5. Where did you register from?

Cell phone	1	Internet Cafe	2	Personal computer	3	Institution computer	4	Other	5
------------	---	---------------	---	-------------------	---	----------------------	---	-------	---

6. Since the implementation of online registration at CPU, how many times

have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

Annexure A: Cover letter
Informed Consent for participation in Questionnaire survey

65
64
62
22

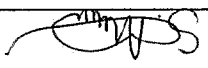
Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 06/03/2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1	X
White	2	
Coloured	3	
Indian	4	

2. Citizenship

South African	1	X
International	2	

3. Year of study

Diploma	1	X
BTECH	2	
MTECH	3	
DTECH	4	

4. How do you rate your level of computer literacy

None	1	
Basic	2	
Intermediate	3	X
Advanced	4	

5. Where did you register from?

Cell phone	1	
Internet Cafe	2	
Personal computer	3	
Institution computer	4	X
Other	5	

6. Since the implementation of online registration at CPU, how many times

have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

X

Informed Consent for participation in Questionnaire survey

Annexure A: Cover letter

Dear Participant

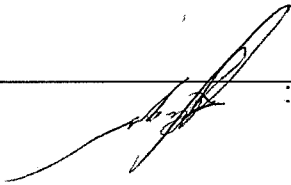
Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: _____
Date: _____



Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

37
19

A

print 2nd

2020

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1
White	2
Coloured	3
Indian	4

2. Citizenship

South African	1	International	2
---------------	---	---------------	---

3. Year of study

1	Diploma
2	BTECH
3	MTECH
4	DTECH

4. How do you rate your level of computer literacy

1	None
2	Basic
3	Intermediate
4	Advanced

5. Where did you register from?

1	Cell phone
2	Internet Cafe
3	Personal computer
4	Institution computer
5	Other

6. Since the implementation of online registration at CPU, how many times

have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

50
49
17

A

PR 2nd

Informed Consent for participation in Questionnaire survey

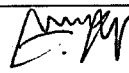
Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: 

Date: 05 February 2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	<input checked="" type="checkbox"/>	1
Female	<input type="checkbox"/>	2

1. Race

African	<input type="checkbox"/>	1
White	<input type="checkbox"/>	2
Coloured	<input checked="" type="checkbox"/>	3
Indian	<input type="checkbox"/>	4

2. Citizenship

South African	<input checked="" type="checkbox"/>	1
International	<input type="checkbox"/>	2

3. Year of study

Diploma	<input checked="" type="checkbox"/>	1
BTECH	<input type="checkbox"/>	2
MTECH	<input type="checkbox"/>	3
DTECH	<input type="checkbox"/>	4

4. How do you rate your level of computer literacy

None	<input type="checkbox"/>	1
Basic	<input checked="" type="checkbox"/>	2
Intermediate	<input type="checkbox"/>	3
Advanced	<input type="checkbox"/>	4

5. Where did you register from?

Cell phone	<input type="checkbox"/>	1
Internet Cafe	<input type="checkbox"/>	2
Personal computer	<input type="checkbox"/>	3
Institution computer	<input type="checkbox"/>	4
Other	<input checked="" type="checkbox"/>	5

6. Since the implementation of online registration at CPU, how many times

have you registered online?

<input checked="" type="checkbox"/>	1
<input type="checkbox"/>	2
<input type="checkbox"/>	3
<input type="checkbox"/>	4
<input type="checkbox"/>	5
<input type="checkbox"/>	6

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2 <input checked="" type="checkbox"/>
------	---	--------	---------------------------------------

1. Race

African	1 <input checked="" type="checkbox"/>	White	2	Coloured	3	Indian	4
---------	---------------------------------------	-------	---	----------	---	--------	---

2. Citizenship

South African	1	International	2 <input checked="" type="checkbox"/>
---------------	---	---------------	---------------------------------------

3. Year of study

Diploma	1 <input checked="" type="checkbox"/>	BTECH	2	MTECH	3	DTECH	4
---------	---------------------------------------	-------	---	-------	---	-------	---

4. How do you rate your level of computer literacy

None	1	Basic	2	Intermediate	3 <input checked="" type="checkbox"/>	Advanced	4
------	---	-------	---	--------------	---------------------------------------	----------	---

5. Where did you register from?

Cell phone	1	Internet Cafe	2	Personal computer	3	Institution computer	4 <input checked="" type="checkbox"/>	Other	5
------------	---	---------------	---	-------------------	---	----------------------	---------------------------------------	-------	---

6. Since the implementation of online registration at CPU, how many times have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

Informed Consent for participation in Questionnaire survey

Annexure A: Cover letter

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: *Murug* Date: *06/02/2018*

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Photo 1st A

22 10

22

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1	White	2
Coloured	3	Indian	4

2. Citizenship

South African	1	International	2
---------------	---	---------------	---

3. Year of study

Diploma	1	BTECH	2
	X	MTECH	3
		DTECH	4

4. How do you rate your level of computer literacy

None	1	Basic	2
		Intermediate	3
		Advanced	4
			X

5. Where did you register from?

Cell phone	1	Internet Cafe	2
	X	Personal computer	3
		computer institution	4
		Other	5

6. Since the implementation of online registration at CPU, how many times have you registered online?

1	2	3	4	5	6
X					

Dear Participant

Informed Consent for participation in Questionnaire survey

Annexure A: Cover letter

17
16
11

A

Phd st

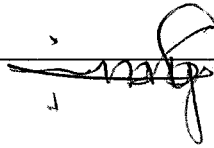
Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:



Date:

6 February 2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cpu.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1
White	2
Coloured	3
Indian	4

2. Citizenship

South African	1
International	2

3. Year of study

Diploma	1
BTECH	2
MTECH	3
DTECH	4

4. How do you rate your level of computer literacy

None	1
Basic	2
Intermediate	3
Advanced	4

5. Where did you register from?

Cell phone	1
Internet Cafe	2
Personal computer	3
Institution computer	4
Other	5

6. Since the implementation of online registration at CPU, how many times have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

12
18
18

photo 18
A

Annexure A: Cover letter
Informed Consent for participation in Questionnaire survey

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 06-02-2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice
Email: Ricen@cput.ac.za
Contact num: 021 469 1042

Section A

1 How do you rate your experience of using the online registration?

Very poor	Poor	Good <input checked="" type="checkbox"/>	Very good	Excellent
-----------	------	--	-----------	-----------

2. Rate the online registration system in terms of effectiveness

1	2	3	4	5
Very ineffective	Ineffective	Adequate <input checked="" type="checkbox"/>	Effective	Very Effective

3 The logging procedures were clear

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree <input checked="" type="checkbox"/>	Strongly Agree

Section B					Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
4.The online registration system was user friendly							<input checked="" type="checkbox"/>		
5.The online registration system was accessible remotely							<input checked="" type="checkbox"/>		
6.There were long queues at campus for online registration									<input checked="" type="checkbox"/>
7. Administrators were well trained and helpful									<input checked="" type="checkbox"/>
8. Technical staff were well trained and helpful									<input checked="" type="checkbox"/>
9. There were many challenges on the online registration							<input checked="" type="checkbox"/>		
10. There were adequate computers at campus								<input checked="" type="checkbox"/>	
11. Online registration orientation needed							<input checked="" type="checkbox"/>		
12. I was blocked from using online registration								<input checked="" type="checkbox"/>	

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1	X
White	2	
Coloured	3	
Indian	4	

2. Citizenship

South African	1	X
International	2	

3. Year of study

1	Diploma	X
2	BTECH	
3	MTECH	
4	DTECH	

4. How do you rate your level of computer literacy

1	None	
2	Basic	
3	Intermediate	X
4	Advanced	

5. Where did you register from?

1	Cell phone	
2	Internet Cafe	
3	Personal computer	
4	Institution computer	X
5	Other	

6. Since the implementation of online registration at CPU, how many times have you registered online?

1	
2	
3	X
4	
5	
6	

to 13

A

13 photo

Annexure A: Cover letter

Informed Consent for participation in Questionnaire survey

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: _____ Date: 06/02/2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	<input checked="" type="checkbox"/>	Female	<input type="checkbox"/>
	1		2

1. Race

African	<input type="checkbox"/>	White	<input type="checkbox"/>	Coloured	<input checked="" type="checkbox"/>	Indian	<input type="checkbox"/>
	1		2		3		4

2. Citizenship

South African	<input checked="" type="checkbox"/>	International	<input type="checkbox"/>
	1		2

3. Year of study

Diploma	<input checked="" type="checkbox"/>	BTECH	<input type="checkbox"/>	MTECH	<input type="checkbox"/>	DTECH	<input type="checkbox"/>
	1		2		3		4

4. How do you rate your level of computer literacy

None	<input type="checkbox"/>	Basic	<input type="checkbox"/>	Intermediate	<input type="checkbox"/>	Advanced	<input checked="" type="checkbox"/>
	1		2		3		4

5. Where did you register from?

Cell phone	<input type="checkbox"/>	Internet Cafe	<input type="checkbox"/>	Personal computer	<input checked="" type="checkbox"/>	Institution computer	<input type="checkbox"/>	Other	<input type="checkbox"/>
	1		2		3		4		5

6. Since the implementation of online registration at CPU, how many times have you registered online?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6

44
43
14

Annexure A: Cover letter

Informed Consent for participation in Questionnaire survey


Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: 
Date: _____

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Hand 2nd
A

1/3

Section C: Biological details: Please tick the appropriate box

Male	1	<input checked="" type="checkbox"/>	Female	2
------	---	-------------------------------------	--------	---

1. Race

African	1	<input type="checkbox"/>
White	2	<input type="checkbox"/>
Coloured	3	<input checked="" type="checkbox"/>
Indian	4	<input type="checkbox"/>

2. Citizenship

South African	1	<input checked="" type="checkbox"/>
International	2	<input type="checkbox"/>

3. Year of study

Diploma	1	<input checked="" type="checkbox"/>
BTECH	2	<input type="checkbox"/>
MTECH	3	<input type="checkbox"/>
DTECH	4	<input type="checkbox"/>

4. How do you rate your level of computer literacy

None	1	<input type="checkbox"/>
Basic	2	<input checked="" type="checkbox"/>
Intermediate	3	<input type="checkbox"/>
Advanced	4	<input type="checkbox"/>

5. Where did you register from?

Cell phone	1	<input type="checkbox"/>
Internet Cafe	2	<input type="checkbox"/>
Personal computer	3	<input type="checkbox"/>
Institution computer	4	<input checked="" type="checkbox"/>
Other	5	<input type="checkbox"/>

6. Since the implementation of online registration at CPU, how many times have you registered online?

1	2	<input checked="" type="checkbox"/>
3	4	<input type="checkbox"/>
5	6	<input type="checkbox"/>

Informed Consent for participation in Questionnaire survey

Annexure A: Cover letter

15
4H
4Z

Phyllis 2nd A

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: *Stevens* Date: *14 Feb 2018*

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1	White	2
Coloured	3	Indian	4

2. Citizenship

South African	1	International	2
---------------	---	---------------	---

3. Year of study

Diploma	1	BTECH	2
MTECH	3	DTECH	4

4. How do you rate your level of computer literacy

None	1	Basic	2
Intermediate	3	Advanced	4

5. Where did you register from?

Cell phone	1	Internet Cafe	2
Personal computer	3	Institution computer	4
Other	5		

6. Since the implementation of online registration at CPU, how many times

have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

38
16

Annexure A: Cover letter

Informed Consent for participation in Questionnaire survey

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: *[Handwritten Signature]*
Date: 13/02/18

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section A

1 How do you rate your experience of using the online registration?

Very poor	Poor	Good	Very good	Excellent
-----------	------	------	-----------	-----------

2. Rate the online registration system in terms of effectiveness

1	2	3	4	5
Very ineffective	Ineffective	Adequate	Effective	Very Effective

3 The logging procedures were clear

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

Section B

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
4. The online registration system was user friendly				
5. The online registration system was accessible remotely				
6. There were long queues at campus for online registration				
7. Administrators were well trained and helpful				
8. Technical staff were well trained and helpful				
9. There were many challenges on the online registration				
10. There were adequate computers at campus				
11. Online registration orientation needed				
12. I was blocked from using online registration				

Section C: Biological details: Please tick the appropriate box

Male	<input checked="" type="checkbox"/>	1	Female	<input type="checkbox"/>	2
------	-------------------------------------	---	--------	--------------------------	---

1. Race

African	<input checked="" type="checkbox"/>	1	White	<input type="checkbox"/>	2
Coloured	<input type="checkbox"/>	3	Indian	<input type="checkbox"/>	4

2. Citizenship

South African	<input checked="" type="checkbox"/>	1	International	<input type="checkbox"/>	2
---------------	-------------------------------------	---	---------------	--------------------------	---

3. Year of study

Diploma	<input checked="" type="checkbox"/>	1	BTECH	<input type="checkbox"/>	2
MTECH	<input type="checkbox"/>	3	DTECH	<input type="checkbox"/>	4

4. How do you rate your level of computer literacy

None	<input type="checkbox"/>	1	Basic	<input type="checkbox"/>	2
Intermediate	<input checked="" type="checkbox"/>	3	Advanced	<input type="checkbox"/>	4

5. Where did you register from?

Cell phone	<input type="checkbox"/>	1	Internet Cafe	<input type="checkbox"/>	2
Personal computer	<input type="checkbox"/>	3	Institution computer	<input checked="" type="checkbox"/>	4
Other	<input type="checkbox"/>	5			

6. Since the implementation of online registration at CPU, how many times

have you registered online?

<input type="checkbox"/>	1	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6
--------------------------	---	-------------------------------------	---	--------------------------	---	--------------------------	---	--------------------------	---	--------------------------	---

captured

①

Annexure A: Cover letter

A

02 15 18

Informed Consent for participation in Questionnaire survey

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:

Date:

3/02/18

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1
White	2
Coloured	3
Indian	4

2. Citizenship

South African	1	International	2
---------------	---	---------------	---

3. Year of study

Diploma	1	BTECH	2	MTECH	3	DTECH	4
---------	---	-------	---	-------	---	-------	---

4. How do you rate your level of computer literacy

None	1	Basic	2	Intermediate	3	Advanced	4
------	---	-------	---	--------------	---	----------	---

5. Where did you register from?

Cell phone	1
Internet Cafe	2
Personal computer	3
Institution computer	4
Other	5

6. Since the implementation of online registration at CPU, how many times have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

4
2

Annexure A: Cover letter

Informed Consent for participation in Questionnaire survey


Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 15/02/2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	<input checked="" type="checkbox"/>	1
Female	<input type="checkbox"/>	2

1. Race

African	<input checked="" type="checkbox"/>	1
White	<input type="checkbox"/>	2
Coloured	<input type="checkbox"/>	3
Indian	<input type="checkbox"/>	4

2. Citizenship

South African	<input checked="" type="checkbox"/>	1
International	<input type="checkbox"/>	2

3. Year of study

Diploma	<input checked="" type="checkbox"/>	1
BTECH	<input type="checkbox"/>	2
MTECH	<input type="checkbox"/>	3
DTECH	<input type="checkbox"/>	4

4. How do you rate your level of computer literacy

None	<input type="checkbox"/>	1
Basic	<input checked="" type="checkbox"/>	2
Intermediate	<input type="checkbox"/>	3
Advanced	<input type="checkbox"/>	4

5. Where did you register from?

Cell phone	<input type="checkbox"/>	1
Internet Cafe	<input type="checkbox"/>	2
Personal computer	<input type="checkbox"/>	3
Institution computer	<input checked="" type="checkbox"/>	4
Other	<input type="checkbox"/>	5

6. Since the implementation of online registration at CPUT, how many times have you registered online?

1	<input checked="" type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4	<input type="checkbox"/>
5	<input type="checkbox"/>
6	<input type="checkbox"/>

3
3

A

pc 1st

5/15

Informed Consent for participation in Questionnaire survey

Annexure A: Cover letter

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: _____ Date: 15 May 2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;


Naomi Rice
Email: Ricen@cput.ac.za
Contact num: 021 469 1042

Section A


1 How do you rate your experience of using the online registration?










Very poor	Poor	Good 	Very good	Excellent
-----------	------	--	-----------	-----------

2. Rate the online registration system in terms of effectiveness

1	2	3	4	5
Very ineffective	Ineffective	Adequate 	Effective	Very Effective

3 The logging procedures were clear

1	2	3	4	5
Strongly disagree	Disagree	Neutral 	Agree	Strongly Agree

Section B				
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
				
4. The online registration system was user friendly				
5. The online registration system was accessible remotely				
6. There were long queues at campus for online registration				
7. Administrators were well trained and helpful				
8. Technical staff were well trained and helpful				
9. There were many challenges on the online registration				
10. There were adequate computers at campus				
11. Online registration orientation needed				
12. I was blocked from using online registration				

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1
White	2
Coloured	3
Indian	4

2. Citizenship

South African	1	International	2
---------------	---	---------------	---

3. Year of study

Diploma	1	BTECH	2	MTECH	3	DTECH	4
---------	---	-------	---	-------	---	-------	---

4. How do you rate your level of computer literacy

None	1	Basic	2	Intermediate	3	Advanced	4
------	---	-------	---	--------------	---	----------	---

5. Where did you register from?

Cell phone	1
Internet Cafe	2
Personal computer	3
Institution computer	4
Other	5

6. Since the implementation of online registration at CPUT, how many times

have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

**Annexure A: Cover letter
Informed Consent for participation in Questionnaire survey**


Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 15 Feb 2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

5

A

PR 1st

1/2

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2 <input checked="" type="checkbox"/>
------	---	--------	---------------------------------------

1. Race

African	1
White	2
Coloured	3 <input checked="" type="checkbox"/>
Indian	4

2. Citizenship

South African	1 <input checked="" type="checkbox"/>	International	2
---------------	---------------------------------------	---------------	---

3. Year of study

1	Diploma <input checked="" type="checkbox"/>
2	BTECH <input checked="" type="checkbox"/>
3	MTECH
4	DTECH

4. How do you rate your level of computer literacy

1	None
2	Basic
3	Intermediate
4	Advanced <input checked="" type="checkbox"/>

5. Where did you register from?

1	Cell phone
2	Internet Cafe
3	Personal computer <input checked="" type="checkbox"/>
4	Institution computer
5	Other

6. Since the implementation of online registration at CPUT, how many times have you registered online?

1	<input checked="" type="checkbox"/>
2	
3	
4	
5	
6	

Informed Consent for participation in Questionnaire survey

Annexure A: Cover letter

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:



Date: 15 Feb 2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

3

A

1st 802

2018

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2
------	---	--------	---

1. Race

African	1
White	2
Coloured	3
Indian	4

2. Citizenship

South African	1	International	2
---------------	---	---------------	---

3. Year of study

Diploma	1
BTECH	2
MTECH	3
DTECH	4

4. How do you rate your level of computer literacy

None	1
Basic	2
Intermediate	3
Advanced	4

5. Where did you register from?

Cell phone	1
Internet Cafe	2
Personal computer	3
Institution computer	4
Other	5

6. Since the implementation of online registration at CPU, how many times

have you registered online?

1	2	3	4	5	6
---	---	---	---	---	---

Annexure A: Cover letter
Informed Consent for participation in Questionnaire survey

29
28
29


Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 13/02/2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice
Email: Ricen@cput.ac.za
Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	1	<input checked="" type="checkbox"/>	Female	2
------	---	-------------------------------------	--------	---

1. Race

African	1	<input checked="" type="checkbox"/>
White	2	<input type="checkbox"/>
Coloured	3	<input type="checkbox"/>
Indian	4	<input type="checkbox"/>

2. Citizenship

South African	1	<input checked="" type="checkbox"/>
International	2	<input type="checkbox"/>

3. Year of study

Diploma	1	<input checked="" type="checkbox"/>
BTECH	2	<input type="checkbox"/>
MTECH	3	<input type="checkbox"/>
DTECH	4	<input type="checkbox"/>

4. How do you rate your level of computer literacy

None	1	<input type="checkbox"/>
Basic	2	<input type="checkbox"/>
Intermediate	3	<input type="checkbox"/>
Advanced	4	<input checked="" type="checkbox"/>

5. Where did you register from?

Cell phone	1	<input type="checkbox"/>
Internet Cafe	2	<input type="checkbox"/>
Personal computer	3	<input type="checkbox"/>
Institution computer	4	<input checked="" type="checkbox"/>
Other	5	<input type="checkbox"/>

6. Since the implementation of online registration at CPU, how many times have you registered online?

<input checked="" type="checkbox"/>	1
<input type="checkbox"/>	2
<input type="checkbox"/>	3
<input type="checkbox"/>	4
<input type="checkbox"/>	5
<input type="checkbox"/>	6

30
34
8

Informed Consent for participation in Questionnaire survey

Annexure A: Cover letter

A

5/12/15

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant: S. B. La
Date: 13-02-17

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section A

1 How do you rate your experience of using the online registration?

Very poor	Poor	Good	Very good	Excellent
-----------	------	------	-----------	-----------

2. Rate the online registration system in terms of effectiveness

1	2	3	4	5
Very ineffective	Ineffective	Adequate	Effective	Very Effective

3 The logging procedures were clear

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

Section B				
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
			✓	
4. The online registration system was user friendly				✓
5. The online registration system was accessible remotely		✓		
6. There were long queues at campus for online registration				✓
7. Administrators were well trained and helpful				✓
8. Technical staff were well trained and helpful				✓
9. There were many challenges on the online registration			✓	
10. There were adequate computers at campus				✓
11. Online registration orientation needed				✓
12. I was blocked from using online registration			✓	

Annexure A: Cover letter
Informed Consent for participation in Questionnaire survey

32
31
32
7

A

FIM 1st

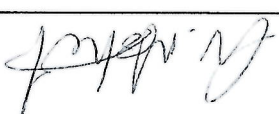
Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 13/02/2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	1	Female	2 <input checked="" type="checkbox"/>
------	---	--------	---------------------------------------

1. Race

African	1 <input checked="" type="checkbox"/>
White	2
Coloured	3
Indian	4

2. Citizenship

South African	1 <input checked="" type="checkbox"/>	International	2
---------------	---------------------------------------	---------------	---

3. Year of study

1	2	3	4
Diploma <input checked="" type="checkbox"/>	BTECH	MTECH	DTECH

4. How do you rate your level of computer literacy

1	2	3	4
None	Basic	Intermediate <input checked="" type="checkbox"/>	Advanced

5. Where did you register from?

1	2	3	4	5
Cell phone	Internet Cafe	Personal computer	Institution computer <input checked="" type="checkbox"/>	Other

6. Since the implementation of online registration at CPU, how many times have you registered online?

1 <input checked="" type="checkbox"/>	2	3	4	5	6
---------------------------------------	---	---	---	---	---

30
30
6

Annexure A: Cover letter
Informed Consent for participation in Questionnaire survey

Dear Participant

Participation request in questionnaire survey

The main objective of this study is to investigate challenges that are faced by students when registering online.

This questionnaire is to investigate online registration challenges faced by students. Please note that this is anonymous and you may not put your name on the questionnaire. All answers will be treated with confidentiality and your participation is voluntary. Your participation is highly valuable and appreciated in order to gain insight to the challenges of the online registration and for the researcher to give recommendations thereafter.

Should you wish to withdraw for any reasons at any time, you are welcome to do so without any objection to your decision. Your information provided on this questionnaire is confidential and shall be treated as such.

Signature of participant:  Date: 13 Feb 2018

Thank you for your participation. For more information or queries, please feel free to contact the researcher on details below;

Naomi Rice

Email: Ricen@cput.ac.za

Contact num: 021 469 1042

Section C: Biological details: Please tick the appropriate box

Male	1	<input checked="" type="checkbox"/>	Female	2
------	---	-------------------------------------	--------	---

1. Race

African	1	<input checked="" type="checkbox"/>
White	2	
Coloured	3	
Indian	4	

2. Citizenship

South African	1	<input checked="" type="checkbox"/>	International	2
---------------	---	-------------------------------------	---------------	---

3. Year of study

Diploma	1	<input checked="" type="checkbox"/>	BTECH	2	MTECH	3	DTECH	4
---------	---	-------------------------------------	-------	---	-------	---	-------	---

4. How do you rate your level of computer literacy

None	1	2	3	4
Basic			<input checked="" type="checkbox"/>	
Intermediate				
Advanced				

5. Where did you register from?

Cell phone	1	
Internet Cafe	2	<input checked="" type="checkbox"/>
Personal computer	3	
Institution computer	4	
Other	5	

6. Since the implementation of online registration at CPU, how many times have you registered online?

1	<input checked="" type="checkbox"/>	2	3	4	5	6
---	-------------------------------------	---	---	---	---	---



Explanatory file

In this research, questionnaire was designed and utilised as a data collection tool for quantitative research component (see Appendix D), comprising open- and closed-ended questions. Section A comprised students' experience of using the online registration and was ranked from 1 to 5 for easy analysis. Section B comprised user-friendliness of the online registration and ranges from Strongly Disagree to Strongly Agree with 1 being the lowest and 5 being the highest. Section C comprised the biographical details of the respondents and consisted of closed-ended questions only. The participants were asked to indicate their answers in the boxes provided.

For the quantitative component, telephonic semi-structured interviews were conducted with the administrators and IT technicians (see Appendices E, F and G) and responses were captured verbatim during the interviews to ensure data accuracy. (see Appendices E and F) and IT support staff (see Appendix G) The interviewees work directly with the ORS. Data from interviews were coded and themes were derived from categories formed.

Themes

It is worth noting that during interviews, the interviewees mentioned online registration challenges that both they and the students faced during online registration

Theme 1: Students

- Computer illiteracy
- Access to online IT& IS systems
- Communication
- Pre-Existing conditions

Theme 2: Staff Training

Theme 3: Online Registration System analysis and design

Theme 4: Technology system

Theme 5: Infrastructure for the online registration

ADDENDUM

Color coding representation

Bright Green – Lack of resources for students

Turquoise - Registration software is difficult for students to find and to use

Blue- - Lack of interest in students for not reading online registration instructions

Yellow – Technical problems

Green- Staff workload increases

Dark Red -computer illiterate, no computer skills

Violet-Inconsistent training for staff involved with online registration / ill prepared , -training system BAT,, -BAT

required for audit

Grey – 25% - Wrong subjects preselected by the system

BLACK-staff could assist with some of the queries of the online registration/ -staff uncertain on what to do to /-

Inconsistence in assisting students

Dark Yellow - inadequate resources for students at campus though some dispute it

Red -Long queues

Pink - Online registration system not user-friendly/ User awareness needed/ flexibility needed/ Lack of communication

with regards to the online registration among staff

Grey- 50%- Online registration way to go/more effective than manual registration/ Students can register 24hrs

CODING

Question 1	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Sub themes
What are some of the challenges of the online registration did you come across?	Students don't have money to go to internet café -they don't have data	-Not all students have access to internet for economic reasons	-there is a general problem, online registration wizard is not easy to access	-status of students not updated -students can't register -accepted students	-online registration hassle free to majority -some students not very	-system hangs, none responsive -people can't continue to	-Lack of resources for students Registration software is difficult for students to find and to use

<p>students come to campus as a result</p> <p>-allocated staff to assist with registration process</p> <p>-allocated venues</p> <p>-it takes manpower</p> <p>-students don't know how to register online</p> <p>-they don't know where to go</p> <p>-I spend my half day explaining the manual on our website to students who don't know about it or they</p>	<p>-Here and there are technical problems</p> <p>-unbelievably busy it can give problems</p> <p>-it puts more pressure to the background set up</p> <p>-not all student have access to printers</p> <p>-error with set up can hold the process</p> <p>--registered for wrong subjects</p>	<p>-students go to CPUT website but it's not easy to find</p> <p>-not user friendly</p> <p>-students are more dependent on the faculty to help</p> <p>-online registration for me is easy, -one has to read, students don't want to read instruction</p>	<p>not informed</p> <p>-online registration not easy for many students</p> <p>-some are blocked from registering, it could be better if blocks are removed before registering</p> <p>--</p>	<p>computer literate</p> <p>-no data</p> <p>-have limited money</p> <p>-have no computer at home</p> <p>-no easy access to computer</p> <p>-come from small villages</p> <p>-no facilities</p> <p>-no basic computer skills</p>	<p>the next step</p>	<p>Lack of interest in students for not reading online registration instructions</p> <p>Technical problems</p> <p>Staff workload increase</p> <p>-computer illiterate</p> <p>-no basic computer skills</p>
---	---	--	---	---	----------------------	--

	<p>don't want to read, it has picturers and instructions</p> <p>-culture of not reading</p> <p>-we have many queries</p> <p>-I think it is contributed by type of students</p> <p>CPUT attracts from disadvantage d background</p>						
Question 2	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Sub themes
Were you well trained for the online registration system	<p>-yes, I did receive extensive training</p>	<p>--yes, we did what we call BAT (Business Acceptance Testing), it's a requirement</p>	<p>-we faculties are called for training but it's not formal</p> <p>-no formal workshop, I am not talking about BAT</p>	<p>To be honest, I never got any training</p>	<p>No training as an academic</p> <p>-no official training</p>	<p>no, no information was sent to users</p> <p>-iEnabler has problems, if you forgot</p>	<p>-Inconsistent training for staff involved with online registration/ ill prepared</p>

		<p>for auditors, we do live registration then cancel it the same day</p>	<p>-no online registration workshop -I feel we should be given a refresher. I don't want to experience same problems again</p>			<p>your pin, you set on your own and put ID and full name, it's a security risk -subjects are not what they want to select -students go to faculty or manual adding subjects</p>	<p>-training system BAT -BAT required for audit Wrong subjects preselected by the system</p>
Question 3	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Sub themes
Were you able to assist with all queries that you came across during registration period?	<p>-yes... I could assist most cases its standard queries e.g. where do I go, what do I do, I don't have pin</p>	<p>-majority of queries we could assist Some queries has to do with course that might have</p>	<p>-I wouldn't say I was able to help with all queries, it is assumed I am able to register, I would like to</p>	<p>I will say I was able to assist more with my students than others -many queries</p>	<p>I made it my business to know, assisted with queries as an academic -I can assist with registration</p>	<p>-not all of them, I refer students to go to the lab or faculty -there is queue</p>	<p>-staff could assist with some of the queries of the online registration -staff uncertain on what to do -Inconsistence in assisting students</p>

	number, how do I get it (pin number) -students not captured to courses correctly, this prevent students completing online registration	technical problems or they are admitted for wrong courses	know what to do, what to look out for..	could only be resolved by the faculty or registration stations		-internet goes slow...	
Question 4	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Sub title
Were there enough resources for the online registration?	-we do not have extra PC in our office but at E-Learning -staff available to assist with online registration	-yes, there were enough resources and specific venues with computers -we have trained staff members to	I would not say there were enough resources -students got lost unclear communication -CPUT open E-Learning but	I don't think so, I think there could be more, there was one venue that even had problems	There were stunning detailed booklets facilities and resources for them (students) CPUT has delegated staff to help	There is not enough resources, more people needed to help, could have done more	-inadequate resources for students at campus though some dispute it Long queues

		assist students	I am still called to assist, -the venue is packed with students, - software not working -system clogged		students and refer students in the book -CPUT has contingency plan- E- Learning		
Question 5	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Sub theme
What changes would you like to see regarding the online registration process?	-less feet at campus (less students at campus) -more user-friendly set-up for the actual registration system, it is actually confusing (the process) -we need more staff with	- Explanation where they (students) have to select subjects is not clear, we would like additional explanation on the website	-If I may say, communication is very vital, communication must be clear e.g. what is going to happen, basic of all is communication	-make online registration easy and more accessible to everyone -make it simple for students to register by lifting some of the blocks	-I think there are hiccups -students can't register, can't get online -glitches to change to make sure our digital communication is sound for registration	-link the system to handle everything at the same time -load balancing in the people traffic -user awareness needed -students must be	Online registration system not user-friendly User awareness needed/ flexibility needed Lack of communication with regards to the online registration among staff

	ITS background -	-otherwise online registration working well..got good feedback from students		before registration -registration ends up being extended		able to select what they want	
Question 6	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Sub themes
Did you find online registration more effective compared to manual registration ?	-online registration is the way to go -it creates more admin queries -manual was straight forward but more labor intense, long queues part-time students had to take time off to	Yes, online registration more effective than the manual registration -students do not have to stand in queues, they can register anytime of	...first day..saver is not gonna handle it, it clogs, the system clogs and people say manual registration is better.. -I say online registration is the way to go	-online could be more effective, saves time, paper and I think it would also save university some money by not employing	-online registration definitely more effective -manual registration much nicer, more human and warmer - online more streamlined, much better, easier and effective	More queries on manual registration -online registration better, could register at home -flexibility of selecting subjects needs to improve for	Online registration way to go/more effective than manual registration Students can register 24hrs

	<p>come to the day campus... (24hrs) sometimes left -problem without being with able to students is register they would start the process (online registration) and do not finish it and think they have finished, this leads into registration problems</p>		<p>more people -if set up properly, it would be quick to register online -can be done anywhere as long as you have internet connection</p>		<p>online registration s</p>	
--	--	--	--	--	--------------------------------------	--

Questions	Categories	
<p>Question 1 What are some of the challenges of the online registration</p>	<p>-Lack of resources for students -Registration software is difficult for students to find and to use</p>	

<p>did you come across?</p>	<ul style="list-style-type: none"> -Lack of interest in students for not reading online registration instructions -Technical problems -Staff workload increases -computer illiterate -no basic computer skills 	
<p>Question 2</p>	<p>Categories</p>	
<p>Were you well trained for the online registration system</p>	<ul style="list-style-type: none"> -Inconsistent training for staff involved with online registration /staff ill prepared for the online registration -training system BAT -BAT required for audit -Wrong subjects preselected by the system 	
<p>Question 3</p>	<p>Categories</p>	
<p>Were you able to assist with all queries that you came across during registration period?</p>	<ul style="list-style-type: none"> staff could assist with some of the queries of the online registration -staff uncertain on what to do to -Inconsistence in assisting students 	
<p>Question 4</p>	<p>Categories</p>	

Were there enough resources for the online registration?	-inadequate resources for students at campus though some dispute it -Long queues	
Question 5	Categories	
What changes would you like to see regarding the online registration process?	-Online registration system not user-friendly -User awareness needed/ flexibility needed -Lack of communication with regards to the online registration among staff	
Question 6	Categories	
Did you find online registration more effective compared to manual registration?	Online registration way to go/more effective than manual registration Students can register 24hrs	

Categories and Themes

Categories	Theme 1
-Registration software is difficult for students to find and to use -Technical problems	Online registration technical problem TECHNOLOGY ISSUE

-Wrong subjects preselected by the system	
Categories	Theme 2
Lack of resources for students Long queue inadequate resources for students at campus though some dispute it	Lack of online registration resources, infrastructure STUDENTS
Categories	
Lack of interest in students for not reading online registration instructions	Theme 3 Student culture of not reading instructions STUDENTS
Categories	Theme 4
computer illiterate -no basic computer skills	Lack of computer skills STUDENT
Categories	Theme 5
Inconsistent training for staff involved with online registration /staff ill prepared for the online registration -training system BAT -BAT required for audit	Inconsistency in BAT system staff training TRAINING
Categories	Theme 6

<p>staff could assist with some of the queries of the online registration</p> <p>-staff uncertain on what to do to</p> <p>-Inconsistence in assisting students</p>	<p>Inconsistency in staff assisting students</p> <p>COMMUNICATION</p>
<p>Categories</p>	<p>Theme 7</p>
<p>Online registration system not user-friendly</p> <p>-User awareness needed/ flexibility needed</p> <p>-Lack of communication with regards to the online registration among staff</p>	<p>Online registration not user friendly</p> <p>TECHNOLOGY</p>
<p>Categories</p>	<p>Theme 8</p>
<p>Online registration way to go/more effective than manual registration</p> <p>Students can register 24hrs</p>	<p>Online registration more effective than manual registration</p> <p>ACCESS</p>

Interviewee 1

1. What are some of the challenges of the online registration did you come across?

Response

“Not all students have access to internet for economic reasons, it disadvantages them. Ummmm....trying to think...here and there, there are technical problems, unbelievably busy, it can give problems.”

It puts more pressure to all the background set-up, not all students have access to printers to print proof of registration which is compulsory. If there is an error with the set-up, it can hold the process of the online registration or register for wrong or incorrect subjects that will affect Blackboard.”

2. Were you well trained for the online registration system?

Response

“Yes, we were, we do what we call BAT – Business Acceptance, Testing. It’s a requirement for Auditors. It tests if the systems are working, that’s when we pick any problems. In January, we do dummy registration, we do live registration, we chose 5 students from different courses, and we register them and do same day cancellation so that they can be able to register. We have to have permission from students because of protection of information.”

3. Were you able to assist with all queries that you came across during registration period?

Response

“Majority of the queries we could assist, a couple we may have had to investigate. Some queries have to do with courses that might have technical problems or they are admitted for wrong courses.”

4. Were there enough resources for the online registration?

Response

“Yes, there were enough resources and specific venues with computers for those who do not have access to computers. We have trained staff members and assistant students.”

5. What changes would you like to see regarding the online registration process?

Response

“Tricky one, Ummmm... where they have to select subject is not always clear. We would like additional explanation to be put up on the website. Otherwise online registration is working well, we got good feedback from students.”

6. Did you find manual registration more effective compared to manual registration?

Response

I would say YES! The online registration is more effective than the manual one for the following reasons: students do not have to stand in queues, they can register anytime of the day (24 HOURS). Sometimes the problem with students is that they would start the process and do not finish it and think they have finished. This will lead into registration problems. However, the online registration put a lot of pressure on faculty staff while we have to deal with the public, we also have to attend to the students' queries.

End of interview

Interviewee 2

1. What are some of the challenges of the online registration did you come across?

Response

“One of the problem is that students don’t have money to go to the internet café, they don’t have data to use, that is a major problem, I say that because as a result, they come to the campus for assistance. During the registration period we do have an allocated time and staff to assist hands-on with online registration process. We have allocated venues for those students who come. The problem is it takes manpower from the Faculty office. Students don’t know how to register online, they don’t know where to go, I spend half of my day explaining the manual on our website to students that they don’t know about or they don’t want to read it, it has pics and instructions but it is my assumption that students don’t read or there is a culture of not reading. We have many queries, Matriculates who were rejected but now passed etc, manpower is a problem during registration period.

My opinion is the whole purpose of online registration is for students to register in the comfort of their homes and it defeats the purpose of online registration. I think it is contributed with the type of students that CPUAT attract from disadvantaged backgrounds or areas.”

2. Were you well trained for the online registration system?

Response

“Yes, I did receive extensive training, YES!!! With emphasis!”.

3. Were you able to assist with all queries that you came across during registration period?

Response

“Yes, fortunately I could assist, I am going to elaborate, in most cases, its standard queries, in other words, e.g. where on the web do I go, what do I do, I don’t have pin number, how do I get one (pin number) etc.

In some cases, students are not captured to courses correctly. Course may still say the student period is not correct, this will prevent students completing online registration process, but we can assist.”

4. Were there enough resources for the online registration?

Response

"We do NOT have extra PCs in our offices but at the E-Learning. Staff is available to assist students with online registering."

5. What changes would you like to see regarding the online registration process?**Response**

"Less feet at campus, in other words, less students at campus, more user-friendly set-up for the actual online registration system. We get many complains from new and returning students on how to commence online registration. They go to SOS but they don't know how to continue. It is actually confusing (the process. More staff needed to assist. We need more staff with ITS background, not just students. A lot of queries one has to go to ITS to be able to assist."

6. Did you find manual registration more effective compared to manual registration?**Response**

"Online approach is the way to go but it has created more admin queries for us (Faculty staff). Manual registration was straight forward but more labour intensive. Long queues, part-time students had to take time off to come to the campus to register and sometimes left without being able to register. Not sure if we are still in the teething process but it has been three years now of the online registration".

End of interview

Interviewee 3

1. What are some of the challenges of the online registration did you come across?

Response

“Ummm, okay, the issue of the online registration is, there is a general problem, Online registration wizard is not easy to access, students go to CPUT website to find it but it’s not easy to find, not user-friendly, I am familiar with it but not user-friendly, not easily accessible. Students are more dependent on Faculties to help, if students want to know where to go, they tend to go to the faculties instead of Admission office, not sure who is responsible, Admissions office or faculties, online itself for me is easy, one has to read, students don’t want to read the (instructions).”

2. Were you well trained for the online registration system?

Response

“Uuum...this is CPUT, ummm..., we faculties are called for training but it’s not formal, we taught that this is online registration, no formal workshop on how online registration works, I am not talking about BAT where we test if students can register, no online registration workshop, I feel we should be given a refresher when online registration opens, I don’t want to experience the same problems again.”

3. Were you able to assist with all queries that you came across during registration period?

Response

“I wouldn’t say I was able to help with all queries, it is assumed that I am able to register, I would like to know what to do, what to look out for, would like to know those queries and answers in writing so that I know what to do, I could not assist with all queries.”

4. Were there enough resources for the online registration?

Response

“I would not say there were enough resources, students got lost, unclear communication. Okay eeeeh, for example UJ has a big section, anyone with online registration problems go there, CPUT does not have that kind of set-up, CPUT open E-Learning, I am still called to the venue packed with students, software not working, system clogged, no one can do anything when the system is clogged.”

5. What changes would you like to see regarding the online registration process?

Response

“If I may say, communication is very vital, people don’t understand this. It is assumed that I understand, communication must be clear e.g. this is what is going to happen, basic of all is communication.”

6. Did you find online registration more effective compared to manual registration?

Response

“Uuum, okay... when these problems, like on the first day of registering, I would say don’t register today (on the first day of registration), the saver is not *gonna* handle it, it clogs, the system clogs, and people say manual registration is better when this happens. I say online registration is the way to go, manual easier but at this day and age it’s not ideal but this year was the worst during the first days.”

End of interview

Interviewee 4

1. What are some of the challenges of the online registration did you come across?

Response

“Umm, status of students not updated, and students can’t register.

Accepted students are not informed, they will accept other positions with other universities and therefor will not register

Online registration not easy for many students, some are blocked from registering. It would help if they can get some of the blocks removed before registering.”

2. Were you well trained for the online registration system?

Response

“To be honest, I never got any training.”

3. Were you able to assist with all queries that you came across during registration period?

Response

“I will say yes I was able to assist more with my own student than others. Also, many queries could only be resolved with the faculty or registration stations.”

4. Were there enough resources for the online registration?

Response

“Sjo!!!, that’s a very good question. I don’t think so, I think there could be more. There was one venue that even had problems.”

5. What changes would you like to see regarding the online registration process?

Response

“Umm, ok, to make the online registration easy and more accessible to everyone.

Make it simple for students to register by lifting some certain blocks or advise students about the blocks on their accounts beforehand so they can sort it out before registering because registrations end up being extended.”

6. Did you find manual registration more effective compared to manual registration?

Response

“Umm! Ok, online registration could be more effective, save time, paper and I think it would also save university some money by not employing more people. If set up properly, it would be quick to register

Maybe online registration could be better, can be done anywhere as long as you have internet connection.”

End of interview

Interviewee 5

1. What are some of the challenges of the online registration did you come across?

Response

“As an academic, challenges, you know what, I can’t think of many but for perspective students, biggest challenges in the era of digital, many people may want to see online registration as progress, the great way is to streamline the process. To majority of students its hassle free. Some students are not very computer literate, no data and have limited money. A fair number of students I have spoken to have no computer, no easy access to computers, come from a small village, no facilities or money, facilities are not close to home even in the city, no computer in their homes. I spoke to students to check if they have basic computer skills, who at school used a computer, a significant number does not have home computer at all, it is their first time to see a computer at CPUT. Some schools have no computers, but we expect students to register online.”

2. Were you well trained for the online registration system?

Response

“No training as an academic, I prefer to be in the know whatever as a special personal skill to help students, I would like to help. I actually register a student. No official training.”

3. Were you able to assist with all queries that you came across during registration period?

Response

“Yes, I made it my business to know, assisted with queries as an academic. I am not tied to registration but involved with applications. I have given a sympathetic ear to students as an academic. I can assist with registration.”

4. Were there enough resources for the online registration?

Response

“There were stunning detailed booklets, facilities and resources for them. CPUT has delegated staff to help students and refer students in the book. CPUT has contingency plan – E-Learning.”

5. What changes would you like to see regarding the online registration process?**Response**

“Oh Naomi, I think there are hiccups, students say we can’t register, can’t get online, glitches to change, to make sure that our digital communication is sound for the registration period. I don’t have a big picture of the system.”

6. Did you find online registration more effective compared to manual registration?**Response**

“I remember the good old days. Online is definitely more effective. I come from the time of manual registration. Manual registration was nicer, more human and warmer way of interacting with students. Academics were more hands on with students then. On that particular day, we had to be there, and we met students in person face to face with students. Everything happened nicely. We basically handed the form and assisted students right there and there, directed the students to the faculty. It was more hands-on. We met students before registering but online process is more streamlined, much better, easier and effective.”

End of interview

Interviewee 6

1. What are some of the challenges of the online registration did you come across?

Response

“The fact that the system hangs, none response, people can’t continue to the next step.”

2. Were you well trained for the online registration system?

Response

“No, no information was sent to end users. iEnabler has problems, if you forgot pin, you set your own pin and put your ID and full name, it is a security risk as anyone can reset. Subjects are not what you want to select, students go to the faculty or manually add the subjects.”

3. Were you able to assist with all queries that you came across during registration period?

Response

“Not with all of them, I refer students to go to the lab or faculty, I refer students to go and print their proof of registration, there is queue, internet goes slow.”

4. Were there enough resources for the online registration?

Response

“There is not enough resources, more people needed to help, could have done more.”

5. What changes would you like to see regarding the online registration process?

Response

“At least link the system to handle everything at the same time, load balancing in the people traffic needed. User awareness needed. Students must be able to select what they want to add. Info needed...”

6. Did you find online registration more effective compared to manual registration?

Response

“There were more queues, lecturers used to inform students on subjects to select on manual registration but online, no lecturer no need. Online registration is better, could register at home if possible. Flexibility of selecting subjects needs to improve for the online registration.”

End of interview

Interviewee 7

1. What is the role of IT technician or IT software developer in monitoring these systems interactions between each other? E.g., online registration system and Students' Account system.

Response

"If the network is down, there is IT people to help."

2. From IT perspective, how does the online registration system interface or interact? For instance, Students' Account system and online registration system? Or from IT perspective, how does online registration system interact or interface with Students' Account system?

Response

"Online registration is linked to finance, housing/res department."

3. What other system interact or interface with online registration system?

Response

"Online registration is linked to finance, housing/res department. If student owing money, the student can't access res, otherwise no res. The student has to submit a proof of registration to the res department first. If a student did not pay fees they can't register. They have to go to CMU to negotiate payments/debt order."

4. Which software technologies are used to enable these systems interact and interface?

Response

"Not sure"

5. Explain the incidents/queries that are related to system interaction or interface. What causes the system to slowdown during registration and what should be done?

Response

- "Students try to register the same time, system shuts down then they can't register
- Amendment of registration, some students want to amend their registration, they have to go to the faculty. I have to find contact details for the faculty to refer the students

- SOS pin, once it is blocked, students contact us to unblock, I unblock the pin
- Network problems, there are IT network people who deals with that. We refer the query to the Network people
- Students who stay in the rural area have no access to registers
- WEBR, sometimes students still have WEBR even after paying fees. We refer them to the faculty to get it removed. No information on the website to inform students what to do. Some students are in Namibia.
- I refer some calls to Call centre to get contact details for the respective faculty
- Only queries not related to CTSHelp desk I refer to CALL Centre
- some I refer to relevant people.”

End of interview

Interviewee 8

1.What is the role of IT technician or IT software developer in monitoring these systems interactions between each other? E.g., online registration system and Students' Account system.

Response

-“In that instance, ITS guys manage and backs end-user, Network section insure webpage loading, System Developers pin number system
SOS is managed by ITS, it is a three-fold system. All three systems are reliant on each other.
ITS checks if the website is up and running
System Developers generate pin numbers
-Network section ensure checks if the network is slow”

2. From IT perspective, how does the online registration system interface or interact? For instance, Students' Account system and online registration system? Or from IT perspective, how does online registration system interact or interface with Students' Account system?

Response

“Am not too certain about point 2. We always refer to other sections should matters of finance or course related issues come up.”

3.What other system interact or interface with online registration system?

Response

-“I am not too sure, maybe Admissions office verify, ID system is separate from ITS. I have no knowledge of that, sorry.”

4.Which software technologies are used to enable these systems interact and interface?

Response

“Not sure but coding and script writing, it has a lot with coding, not sure of the software. Developers use Virtual Machine software (VM) for testing environment and run simulations.”

5.Explain the incidents/queries that are related to system interaction or interface.

Response

-“first browser related, it’s a simple system but for some reasons internet explorer causes problems, the acceptance of the terms and conditions – the accept button is sometimes greyed out completely, mostly technical issues, we refer to other department. Yes, we get many queries.

Some students say they lost their letter of acceptance or can’t find student number, ITS does not have a system to check student number with ID, we refer them to the faculty for help

-Student need pin number, we generate pin number, some students forget their email address they used or phone number, under normal circumstances, pin number gets sent in a short while.

-Pin number / OPA or ITS

-We refer some queries to Admissions office, we don’t work with ID number

-In some instances, some students are blocked on the system, but they have pin number and student number but can’t register. There is a thing called WEBR which is sometimes a technical error attached to the student profile, we refer students to the faculty or contact centre

-Returning students sometimes are blocked because they owe fees or books, we refer them to Student Accounts

-International format of ID a problem, we use passport numbers, the system is a bit finicky.

-We refer International student to International Office

-WEBR to the faculties

-Financial blocks to Students Accounts (Finance department)

-Student Online Service (SOS) is two-fold, issues first go to ITS guys, to check if all fine, (SOS is checked by ITS Planning). If there a problem with the network, they send to network section.

-Network section checks servers, speed and firewall.

-in conjunction with OPA system we generate pin numbers, System Development Team generate pin number on OPA. There are three sections, Software Development Team, ITS and Network sections

SYSTEM IS SYSTEM IS THREE-FOLD

-Software Development Team -Generates Pin numbers

-ITS section checks SOS

-Network section checks network issues

-We help with Pin number allocation if students have student numbers, if they don’t have student numbers, we refer them to the faculty

-We help and guide the students and refer them to different departments

End of interview

Interviewee 9

1. From Finance perspective, how does the online registration system interface or interact with the Students' Account system? What is the role of IT technician or IT development software in monitoring online registration system and Students' Account system interactions between each other?

Response

"Online registration is still fairly new, we have now had it for the past three years. A lot of things still need to be ironed out. I don't work directly with online registration but other students come to me and I help them to remove the financial block because they can't register online with a financial block. I help them removing the financial block manually. There are a lot of issues. If a student pays through the bank, it takes 42 to 72 hours to clear. We allocate the money to the correct accounts.

- Finance system links with ABSA.

-We have two accounts, one general account where all the money comes sin from ABSA and then we allocate it to correct accounts. One Student fee accounts.

-We have country account for foreign students. They will send us an email with their details.

-If a student pays the amount at the cashier, the financial block is automatically lifted.

-IT plays a biggest role, without IT we can't see the financial blocks, we can't see results etc. They work throughout (IT technicians). There is nothing we can do if the system is down".

2. What other system interact or interface with online registration system besides Students' Account System?

Response

"Umm no, except ITS is linked with the bank. In order to allocate the money to the correct account, there is a programme used to link it".

3. Which software technologies are used to enable these systems interact and interface?

Response

"I don't know but system the system is also linked to Education department if we need Matric results".

4. Explain the incidents/queries that are related to system interaction or interface during online registration.

Response

-“Ummm!!! Like students got financial block from previous payments, they come to negotiate payments arrangements. They sign for a debt arrangement.

-Sometimes students make a payment but they leave a number from their student number or information, we ask for a proof of payment and correct the information.

End of interview

Interviewee 10

1.What is the role of IT technician or IT software developer in monitoring these systems interactions between each other? E.g., online registration system and Students' Account system.

Response

-“hardware maintenance and set up for the smooth online registration system
-to make sure all configuration is set up for the system, hardware connecting to the internet in order for students to be able to register.”

2.From IT perspective, how does the online registration system interface or interact? For instance, Students' Account system and online registration system? Or from IT perspective, how does online registration system interact or interface with Students' Account system?

Response

-“Online registration is linked to ITS, there is a financial aspect. ITS element regarding online registration kind of combines a range of things. Faculty needs to do documents. ITS with regards to payment of fees, finance linked to ITS.”

3 What other system interact or interface with online registration system?

Response

“The main system that interfaces into the registration system would be ITS system, this system has both portals which integrates SOS which is the front facing portals for the students to manage their registration affairs. The other interface would be the ITS Financial system where the debtors team could manage the students accounts.”

4.Which software technologies are used to enable these systems interact and interface?

Response

“The main software technology that I'm aware of that enables the system to seamlessly integrate would be the Java JRE, this allows ITS to operate on all the laptops and desktops.

Another technology that was used was the web development model which incorporates an API which allows for the different technologies to integrate and interface into each other without compromising the security of the individual applications.

This accompanied with an intranet allows for the ease of use between these applications being used.

Other technology also included would be a web server, ISP and to host the intranet and the website.

Other technologies that would most likely be used to create the front end of the website and the DBMS (database management system) are as follows:

Front end

- html
- css
- javascript

Dbms

- MySQL.”

5. Explain the incidents/queries that are related to system interaction or interface.

Response

“One of the main incidents that hindered the registration process was the time it took for the system to load individuals when registering, which took longer than expected.

Other issues students encountered while registering was that the website would crash while they were in the process of registering. This issue would most likely be that the website wasn't able to cope with the large amount of traffic all at once which could be contributed to the server that's hosted the website.”

5.1 What causes the system to slowdown during registration and what should be done?

Response

“As previously mentioned, in my opinion the main cause as to why the system slowed down during the registration process was due to the influx of users that tried to access the website at a given time. This is common occurrence when websites receive large volumes of traffic at a specific time which the servers unable to handle, this would cause the web server to crash, by adding a more resources(servers) and incorporating load balancing features could greatly decrease the chances of the website crashing.

Other minor issues at the CPUT registration sites were the erratic internet connectivity issues, these weren't as common and were due to global issues and not specific to the registration site."

End of interview