



**CHALLENGES AND SUCCESS FACTORS IN INTRODUCING
INFORMATION SYSTEMS FOR STUDENTS' ONLINE REGISTRATION:
A CASE STUDY OF A UNIVERSITY OF TECHNOLOGY.**

by

SHARON CHIRONZIWA CHIPEPEREKWA

**Dissertation submitted in partial fulfillment of the requirements for
the degree**

**Master of Technology: Business Administration in Project
Management**

**in the Faculty of Business and Management Sciences
at the Cape Peninsula University of Technology**

Supervisor: Stanely Fore

Cape Town

Date submitted: November 2017

CPUT copyright information

The dissertation/thesis may not be published either in part (in scholarly, scientific or technical journals), or as a whole (as a monograph), unless permission has been obtained from the University.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, Sharon Chironziwa Chi peperekwa, declare that the contents of this thesis represent my own unaided work, and that the thesis 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.



Signed

13 November 2017

Date

ABSTRACT

The beginning of the 2011 academic year in South Africa saw a number of Institutions of Higher Learning introducing online registration for their students. The efficiency and effectiveness of Information Systems is increasingly becoming a necessity and not an option for many organizations. An information system should be able to allow end users to access information easily and navigate with ease. The selected University of Technology (UoT) in this research is one of the largest public institution of higher learning in the Western Cape Province and boasts of an enrolment of more than 30 000 students per academic year. An observation was made that, during registration students stand in long queues waiting to register or for assistance to register. The system tends to 'freeze' whilst students are registering and students are in most cases unfamiliar with the system interface. They constantly have to enquire what to do next when going through online registration process. This study adopted a quantitative approach. The study uses constructs of the updated DeLone and McLean IS success model (2003) to analyse and explain the student's perceptions of the online registration system.

The research was undertaken to establish the student's perceptions of the online registration system. This research identifies the challenges and success factors of introducing an online registration system, from a students' perspective, whilst highlighting the extent to which this system has been able to solve problems associated with the manual registration era. The study seeks to assist management and those responsible for managing the current system to determine how well the system is working or not working to achieve user satisfaction. It will also assist them going forward on what to consider before, during and after implementation of an information system. Stemming from the findings of this study, recommendations were made such as making online registration available on mobile devices, online registration orientation can assist students navigate the system easily. The UoT should also consider thorough training for staff that assist students during registration to ensure good service quality.

Key words: Online registration, information systems, University of Technology, End-Users

ACKNOWLEDGEMENTS

I wish to thank:

- My God, for giving me strength to complete this work.
- My Family: Dad, Mum, Ephraim, Tatenda and Tafadzwa for their unwavering support.
- My Supervisor, Mr. Stanely Fore who continued to encourage and have patience with me through this journey
- Dr. Corrie Uys for statistical assistance

DEDICATION

I would like to dedicate this to my father and mother who have always believed in me and supported all my endeavours. To my siblings, Ephraim, you always bring out the best in me, your encouragement means a lot. Tatenda, you paved the way, thank you for teaching me in your silence, hardwork and determination. Tafadzwa, young man you inspire me to keep pushing because I know you are looking up to me.

To Mr. Stanely Fore, who encouraged me to push beyond my comfort zone. Thank you!

GLOSSARY

BPR	Business Process Re-engineering
ERP	Enterprise Resource Planning
ICT	Information Communication Technology
IS	Information Systems
ITS	Integrated Tertiary Software
MIS	Management Information System
SaaS	Software as a Service
SOS	Student online Services
SPSS	Statistical Package for Social Science
UoT	University of Technology

TABLE OF CONTENTS

ABSTRACT	3
ACKNOWLEDGEMENTS.....	4
DEDICATION.....	5
GLOSSARY	6
CHAPTER ONE.....	11
1.1. INTRODUCTION	11
1.2. BACKGROUND TO THE RESEARCH PROBLEM.....	11
1.3. STATEMENT OF THE RESEARCH PROBLEM	13
1.4. THE RESEARCH QUESTION	14
1.4.1. Investigative questions.....	14
1.5. RESEARCH OBJECTIVES	14
1.5.1. Primary objectives.....	14
1.5.2. Secondary objectives.....	14
1.6. PURPOSE AND SIGNIFICANCE OF THE RESEARCH.....	14
1.7. DELINEATION OF THE STUDY.....	15
1.8. RESEARCH DESIGN AND METHODOLOGY	15
1.8.1. Target Population	15
1.8.2. Sampling methods.....	15
1.8.3. Sample size	16
1.8.4. Research Instrument.....	16
1.8.5. Data Analysis.....	16
1.9. ETHICAL CONSIDERATIONS	16
1.10. VALIDITY AND RELIABILITY	17
1.11. STRUCTURE AND OVERVIEW OF THE CHAPTERS	17
1.12. CONCLUSION	18
CHAPTER TWO	19
CHAPTER 2: LITERATURE REVIEW.....	19
2.1. INTRODUCTION	19
2.2. INFORMATION SYSTEMS	19
2.3. SIGNIFICANCE OF INFORMATION SYSTEMS FOR ORGANIZATIONS ..	21
2.4. TYPES OF INFORMATION SYSTEMS	21

2.5.	ERP SYSTEMS	22
2.6.	MANAGEMENT OF INFORMATION SYSTEMS	24
2.6.1.	Implementation Aspects	24
2.6.2.	Success Factors of an Information System	25
2.6.3.	Challenges of Introducing an Information System	26
2.6.4.	Management of an Implemented Information System	27
2.7.	INFORMATION SYSTEMS IN DIFFERENT INSTITUTIONS	28
2.7.1.	Use of IS in Government	28
2.7.2.	Use of IS n Corporate Companies	28
2.8.	INFORMATION SYSTEMS IN TERTIARY INSTITUTIONS	29
2.9.	THE CONCEPT OF IS in UoT's	31
2.9.1.	Implementation Aspects In Tertiary Institutions.	31
2.9.2.	Key Issues For Implementation Success In Tertiary Institutions.....	32
2.9.3.	Implementation Challenges in Tertiary Institutions.	36
2.10.	CHAPTER SUMMARY	37
	CHAPTER THREE	38
	CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY	38
3.1.	INTRODUCTION	38
3.2.	RESEARCH PROBLEM.....	38
3.3.	RESEARCH QUESTIONS AND SUB-OBJECTIVES	38
3.4.	RESEARCH DESIGN	39
3.5.	QUANTITATIVE RESEARCH	41
3.6.	TARGET POPULATION	42
3.7.	SAMPLE SIZE.....	43
3.8.	SAMPLING TECHNIQUE.....	43
3.8.1.	Purposive Sampling.....	43
3.9.	DATA COLLECTION	43
3.9.1.	Questionnaires	44
3.10.	DELINEATION OF THE STUDY.....	44
3.11.	DATA ANALYSIS.....	44
3.12.	DATA VALIDITY AND RELIABILITY	45
3.13.	ETHICAL CONSIDERATIONS	45
3.14.	Purpose and Significance of the Research	46
3.15.	EXPECTED OUTCOMES AND CONTRIBUTIONS OF THE RESEARCH	46

CHAPTER FOUR.....	47
CHAPTER 4: DATA PRESENTATION AND DISCUSSION OF FINDINGS	47
4.2. THE RESEARCH QUESTIONNAIRE	47
4.3. ANALYSIS.....	47
4.4. SUMMARY OF FINDINGS: SECTION ONE	58
4.5. ADDITIONAL COMMENTS OBTAINED FROM QUESTIONNAIRES.....	91
4.6. SUMMARY OF FINDINGS: SECTION TWO	96
4.7. RELIABILITY TESTING	97
4.8. CONCLUSION	100
CHAPTER FIVE.....	101
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS.....	101
5.1. INTRODUCTION	101
5.2. SUMMARY OF PREVIOUS CHAPTERS.....	101
5.3. REVISITING THE RESEARCH PROBLEM.....	102
5.4. REVISITING THE RESEARCH QUESTIONS: MAIN QUESTION.....	103
5.5. REVISITING THE INVESTIGATIVE QUESTIONS	104
5.6. REVISITING THE RESEARCH OBJECTIVES.....	104
5.7. RECOMMENDATIONS AND FURTHER RESEARCH	105
5.8. CONCLUSION	107
REFERENCES.....	108
APPENDICES.....	114
APPENDIX A: QUESTIONNAIRE	115
APPENDIX B: ETHICAL CLEARANCE	120
APPENDIX C: CONSENT LETTER	121
APPENDIX D: RELIABILITY TABLES	122
APPENDIX E: GRAMMARIAN CERTIFICATE.....	126

LIST OF FIGURES

Figure 2.1 Conceptual information system processing flow.....	20
Figure 2.2 Business Information Systems.....	22
Figure 2.3 Updated DeLone and McLean IS success model.....	33
Figure 4.1: Year of Study.....	51
Figure 4.2: Gender.....	51
Figure 4.3: Age Group.....	52
Figure 4.4: Awareness of online registration system.....	53

Figure 4.5: Experience in technology usage.....	54
Figure 4.6: Knowledge of the system.....	55
Figure 4.7: Respondents rating of the system.....	56
Figure 4.8: Online registration support.....	57
Figure 4.9: - 4.17: Systems Quality.....	70
Figure 4.18: - 4.21 Information Quality.....	79
Figure 4.22: - 4.25 Service Quality.....	83
Figure 4.26: - 4.29 Technological & Infrastructural issues.....	87

LIST OF TABLES

Table 1.1 ERP Pros and Cons Olson.....	12
Table 2.1: Advantages and Disadvantages of ERPs.....	23
Table 3.1: Clarification of Research Question.....	39
Table 4.1: Year of Study.....	48
Table 4.2: Gender.....	48
Table 4.3: Age Group.....	48
Table 4.4: Awareness of online registration system.....	49
Table 4.5: Experience in technology usage.....	49
Table 4.6: Knowledge of the system.....	49
Table 4.7: Respondents rating of the system.....	50
Table 4.8: Online registration support.....	50
Table 4.9: - 4.17: Systems Quality.....	59
Table 4.18: - 4.21 Information Quality.....	63
Table 4.22: - 4.25 Service Quality.....	65
Table 4.26: - 4.29 Technological & Infrastructural issues.....	68
Table 4.30: Cronbach Alpha.....	98
Table 4.31: TTest.....	98
Table 4.32: Independent Samples Test.....	99

1.1. INTRODUCTION

Information systems exist for the purpose of processing information (Mallach, 2016). The functionality of information systems has become a necessity and not an option for many organizations. Kornkaew (2012) emphasizes the aspect of competitiveness in defining an information system (IS). He discusses that an IS can allow an organization to increase effectiveness whilst at the same time acquiring better information for decision-making. Berg (2001) goes on to highlight that it is important to involve users in the design process in order to achieve a user interface that is friendly. Despite years and years of history and countless methodologies, advice and books, Information Technology (IT) projects keep failing. This echoes with Tost (2010) who states: “technologies that are new to an organization present a number of issues simply because they are new.” Implementing an IS is a path full of risks for any organization, the decision to implement an IS normally follows the need for the organization to improve the effectiveness and efficiency.

1.2. BACKGROUND TO THE RESEARCH PROBLEM

The selected University of Technology (UoT) in this research boasts of more than 30 000 local and international students. The UoT has five campuses, which are located in Bellville, Cape Town, Granger Bay, Mowbray, Athlone and Wellington respectively. There are also satellite campuses at Tygerberg Hospital, Groote Schuur Hospital and Media City. The main campus for the UoT is in Bellville, which is in the northern suburbs of Cape Town. In order to collect data from the selected research population, this study was carried out at the Cape Town campus. For the purpose of this research the terms online registration and e-registration will be used interchangeably. Students' e-registration process at the UoT is administered via the Student Online Services (SOS). The UoT uses the Integrated Tertiary Software (ITS) as an enterprise resource planning (ERP) system that assimilates different key operational units onto a central integrated system. ITS (online) as cited by Irakoze (2015) “the ITS system operates on an Oracle database that can be accessed via any browser through either Intranet or Internet.” This means that end-users are able to access and utilize the system from within

the university environment or at a different location such as internet cafes or at home.

According to Pinar, Mehtap and Erzengin, (2012) a number of models and theories that are used to measure end users reactions to technologies exist. Models such as, Technology Acceptance Model (TAM), Social Cognitive Theory (SCT) and Theory of Planned Behavior (TPB). This research seeks to understand the students' perceptions of the online registration system and the model chosen to highlight this is the updated DeLone and McLean IS success model (2003). Throughout this study this model will be referred to updated D&M IS success model. In comparison to other models such as the TAM, this would be ideal to use where one wants to determine to what extent end-users have adapted to a technology.

Organizations are likely to opt to move from a manual system to a computerized system in order to speed up service provided to customers, cut down usage of paper, 'go green' and enhance overall business processes. The ERP system used by the UoT provides better ways of doing things. Fig 1.1 below illustrates pros and cons of an ERP that an organization should be cognizant of.

Factor	Pro	Con
System Integration	Improved understanding across users	Less flexibility
Data Integration	Greater accuracy	Harder to make corrections
Best Practices	More efficient methods	Imposition of how people do their work
		Less freedom and creativity
Cost of Computing	More efficient system planned	Changing needs Under budgeted training expense
		Hidden costs of implementation

Table 2.1 ERP Pros and Cons Olson (2004)

E-registration was first introduced at the UoT in 2014. According to the Newsflash sent to students in preparation to start online registration, the UoT indicated that the process to register online would take 10 minutes. The following were listed as added bonus, "payment of fees online, checking results, updating of personal information and printing proof of

registration” (Communications Office, 2013). 2017 therefore marks the fourth year the UoT has been registering students online. Four years later after the introduction of the system long queues are still observed during the registration period. Introduction of the online registration system was aimed at achieving quicker and efficient means for students to register. This meant the ability to register from the comfort of one’s home, in essence less queues during the registration period.

This research seeks to identify and analyze the challenges and success factors associated with the introduction of an online registration system. The research also highlights the extent to which this system has been able to solve the numerous problems associated with the manual era. Students’ perceptions on e-registration, the challenges and successes they have experienced will be investigated. This thesis has been conducted by studying general background literature of information systems, ERP systems, successes and challenges encountered in using information system and aspects of introducing an information system for e-registration. The method used to successfully complete the research was a study of a selected UoT, through collection of data through questionnaires completed by end-users of the system. Very limited studies have been conducted to assess the challenges and successes of an online registration system.

1.3. STATEMENT OF THE RESEARCH PROBLEM

It was observed that during registration students’ stand in long queues waiting for assistance to register and the system tends to ‘freeze’ whilst students are registering. In most cases students are unfamiliar with the interface, as they constantly have to enquire what to do next when going through online registration. This problem was used to highlight aspects of information quality, service quality and system quality. Using the updated D&M IS success model (2003), this research will highlight the students’ perceptions of the online registration system.

1.4. THE RESEARCH QUESTION

The research question is essentially the description of the problem statement; it helps to give the study direction on the scope of the study. The research question here is:

- Has online registration made any difference in the student registration process?

1.4.1. Investigative questions

The investigative questions are listed below:

- What are the student's perceptions about online registration?
- What challenges are associated with online registration?
- What are some success factors of using online registration?
- Does the UoT have adequate systems to register students?

1.5. RESEARCH OBJECTIVES

1.5.1. Primary objectives

To establish the student's perceptions of the online registration system.

1.5.2. Secondary objectives

- To determine whether online registration makes registration easier for the users – the student.
- To identify the challenges and success factors of using an online registration system.

1.6. PURPOSE AND SIGNIFICANCE OF THE RESEARCH

The research is conducted to understand the issues arising from an information system introduced by the UoT. The updated DeLone and McLean IS success model used in the research assists one to understand the challenges and successes that have been noted in the last few years since the online registration system was introduced. This will be of

importance to management to establish how best to curb current problems students face. Understanding the students' perceptions of the system, will assist in providing a much better user experience. According to the UoT's Research, Technology and Innovation (RTI) strategy, one of the key principles and objectives to support achieving its vision is to promote excellence by developing cutting-edge facilities, RTI capabilities and outputs that gain recognition (The selected UoT: Online)

1.7. DELINEATION OF THE STUDY

Due to time constraints within which the research was carried out the survey was limited to first year Management and BTech Project Management full time and part-time students in the faculty of Business and Management Sciences at the selected UoT. Other first year and BTech students within this faculty were not investigated.

1.8. RESEARCH DESIGN AND METHODOLOGY

1.8.1. Target Population

Target population was from the Management and Project Management department in the Business and Management Sciences faculty. First year management and BTech full time and part time students at the UoT were interviewed. The study compared the responses of the first year and fourth year students. A comparative study according to Flick (2011) is used to observe a multiplicity of cases, focusing on particular aspects. The reason for selecting this study population is that, first year students used the system for the first time this year in 2017 and fourth year students have used the online registration system over the past few years. This will therefore be comparison between new and old users.

1.8.2. Sampling methods

Purposive sampling according to (Oppong, 2013) is based on the researcher's judgment, whereby the participants are selected based on the knowledge of the researcher. Purposive sampling, is a type of non-probability sampling, it was adopted for this study to obtain data from respondents.

1.8.3. Sample size

This study made reference to Isaac and Michael (1981) table for determining needed sizes of a chosen sample size. The table describes N =population size and S =Sample size, therefore where $N=200$, $S=131$ and where $N=300$, $S=169$. For this study, 500 questionnaires were printed and administered to the students.

1.8.4. Research Instrument

The questionnaire included closed questions, open ended questions and questions where respondents had to provide a rating on a given scale (Likert style). The varying types of questions were utilized in order to gather as much information as possible. Flick (2011:106) notes that, the manner in which the questions are worded should allow the researcher to collect, directly or indirectly the respondents' reasons for a specific behavior or attitude.

1.8.5. Data Analysis

Statistical Package for Social Sciences (SPSS) has two primary functions: (1) as a data analyst, and (2) as a data organizer and manager, Kulas (2009:4). This software has the ability to perform descriptive and inferential analysis. Once the students had completed the survey, data analysis was done using the SPSS, which is a popular statistical package, that is able to perform highly complex data manipulation, as well as analyzing simple instructions.

1.9. ETHICAL CONSIDERATIONS

Terre Blanche, Durrheim and Painter (2006: 61) discuss that in reference to research, ethics should involve more than an emphasis on the well-being of research partakers but that it should extend to areas such as scientific misbehavior and plagiarism. In light of this an ethical clearance certificate was sought from the Faculty of Business & Management Sciences before any data collection was done. Respondents were informed of the objectives of the research and their consent over participating in the research was sought. In addition, anonymity and confidentiality was guaranteed to the respondents.

Based on the above mentioned, the ensuing ethical considerations were applied to the study:

- **Informed consent and Protection from harm:**

Participation is not compulsory it is voluntary and participants can withdraw from the study at any time they wish to.

- **Right to privacy:**

All information gathered from respondents was kept strictly confidential and respondents remained anonymous.

- **Involvement of the research:**

Information provided was strictly used for research purposes only and all participants were treated fairly.

1.10. VALIDITY AND RELIABILITY

Weiner (2007:7) defines validity as the extent to which any measurement tool succeeds in describing the purpose for which it is made for. Reliability on the other hand is concerned with the extent to which the measurement technique used can be relied on to get consistent results based on a constant application *ibid*...Conducting a pilot study ensured reliability in this research. Questionnaires were distributed to BTech and first year students in the Management and Project Management department. The questionnaire once returned was assessed and six questions were either corrected or removed. Validity was ensured through a supervisor who assisted the apprentice researcher.

1.11. STRUCTURE AND OVERVIEW OF THE CHAPTERS

Chapter One: This chapter presents the study and provides the background. The research problem and the questions relating to the research are described. The concepts used are defined and the objectives of the study are outlined. The significance of the study and the research design and methodology used are discussed.

Chapter Two: This chapter focuses on the literature reviewed. The literature reviewed highlighted research conducted on information systems, specifically enterprise resource planning systems (ERP). Literature was drawn from similar research carried out internationally in UK, USA and Australia.

Chapter Three: In this chapter the research methodology used to conduct the survey is discussed. This chapter provides clarity on the methodology applied. Detailed explanations are given of the process and why the quantitative method was chosen for collecting data.

Chapter Four: The focus of this chapter is to report on the data collected. The data was collected through self-administered questionnaires. The findings of this study were analyzed and presented using tables, pie charts and graphs. These findings were discussed and compared with literature.

Chapter Five: This chapter provides a summary of the findings. The research problem, research question and objectives of the study are revisited. Recommendations are suggested to those who manage the online registration at the UoT. A conclusion of the study is then given.

1.12. CONCLUSION

It is clear that there is a need to understand the value and efficacy of information systems. Measuring IS success allows for this value to be realized. The updated DeLone and McLean IS success model is a representative model that measures the success level of an IS implementation within an organization. Tertiary institutions in South Africa are clearly becoming more aware of the importance of being part of the global trend in information technology. This digital revolution will continue to transform the manner in which students learn and interact with technology. The main objective of this research was to highlight students' perceptions of the current online registration system with the aim of establishing better and improved ways for students to interact with these systems. The study used a quantitative approach and questionnaires were administered to the respondents. The quantitative data from the questionnaires was analyzed using Statistical Package for Social Sciences (SPSS) software.

CHAPTER TWO

CHAPTER 2: LITERATURE REVIEW

2.1. INTRODUCTION

Information systems provide businesses with a competitive edge, there have been arguments in IS studies that, it is not the IS solution but the use thereof that provides organizations with the competitive advantage. It is clear that these systems are continuously advancing which can be costly for organizations as they endeavor to keep up. In order to reduce costs incurred organizations need to identify aspects affecting the success of their information systems. Organizations have the opportunity to make profits from information communication technology; this is a concept that was first observed in manufacturing enterprises. Higher education institutions have since caught on to the benefits of using ICT. They are not only incorporating this in education and research but have endeavored for an integration that is inclusive of their functional areas. The introduction of ERP systems within the higher education context is a means to improve operations by making them transparent and more manageable. This study made use of the updated DeLone and McLean IS success model (2003) in order to determine the students' perceptions of the online registration system.

The sections below discuss the significance of information systems for different organizations, types of information systems, a brief overview of ERP systems, key issues and successes in relation to the updated DeLone and McLean IS model (2003) and the management thereof of such systems incorporating the challenges and success factors of an ERP.

2.2. INFORMATION SYSTEMS

Research information and literature on IS emerged in the early 1980s. We are continuously interacting with information systems in our day-to-day lives. This can be when booking a flight, banking, managing hotel bookings or requesting a concierge service. This shows that we are living in the information age where we can acquire service by manipulating an IS (Moses,2014). This echoes the following definition of IS "Inter-disciplinary systems that can be described as interrelated information and knowledge

components with identifiable boundary, working together for some purpose” (Sabry & AlShawi, 2009:164). These systems are considered to be interrelated and working together because in most cases in order to book a flight or make a hotel booking one has to make a payment (banking) online and this is made possible via their banks.

Information systems are introduced in order to improve the proficiency and efficacy within an organization. Piccoli (2012:29) highlights that an information system has four components namely, “technology, process, structure and people”. It’s vital for these components to work together in order to allow an organization to achieve and fulfill its information needs. The role of information systems as Hardcastle (2011:8) advances is to allow management to gain information that assists them in decision making for IS processes across the organization. This is similar to what Wognum in Jern (2009:6) notes that, the purpose of information systems is to provide support to companies in their information needs. An example of such an information system examined is an Enterprise Resource Planning system. Dudas in (Moses,2014:16) notes that information systems form a fundamental component of an organizations system by creating value. The graphical presentation below of a conceptual information system processing flow allows one to understand activities involved in processing information.



Fig 2.1 Conceptual information system processing flow Mallach (2016:8)

A new IS for any organization is considered a large investment, however Stair, Reynolds and Chesney (2012:30) highlight that it is difficult to measure how successful a system is. It is essential in this era for organizations to invest in information technology and information systems because the markets have become competitive and more and more businesses are adopting new technologies. However, one of the challenges organizations continue to face is the high IT project failure rate. Jern (2009) notes that best practices are still being developed in order to curb such challenges.

2.3. SIGNIFICANCE OF INFORMATION SYSTEMS FOR ORGANIZATIONS

Organizations implement information systems in order to fulfill their information needs, however implementation can also be done to fulfill external requirements such as tax regulations (Picolli, 2012:33). Hevner, March and Park (2004:76) support this by stating that, organisations implement information systems in order to grow their value and efficacy. The extent to which this can be achieved is determined by, the utility of the information system and characteristics of the organisation, work systems, its human resource and its growth and application of methodologies (Hevner et al., 2004). The uniqueness of organisations therefore means that information system needs will differ from one organization to the other. Some organizations are adapting to cloud computing in order to have software provided according to their needs. Software as a Service (SaaS) is one such example of cloud computing. As Cusumamo (2010:29) discussed, SaaS replaces the traditional software though it is highly unlikely to eliminate it soon. Adapting to use SaaS means that vendors make certain applications available to a user over the Internet, targeting specific needs of that customer or user.

In the research background of this study it was noted that the selected UoT uses the ITS as an ERP system to assimilate key operational units. There is therefore a need to elaborate the concept of ERP systems to allow the reader to understand how an ERP system can be used to replace a lot of applications with a single unified set of programs (Stair et al., 2012). This unifying of applications is done to allow an organisations system to be easy to use whilst at the same time being effective. The section below will introduce the different types of Information systems and will then have a detailed focus on ERP's.

2.4. TYPES OF INFORMATION SYSTEMS

As far back as the 1950s computers were being used to perform different business applications. The following pyramid shows business information systems that are integrated into each other to carry out operational activities.

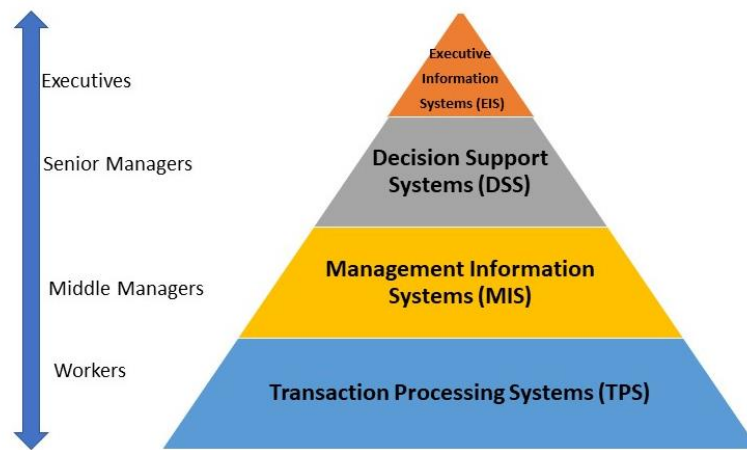


Figure 2.2 Business Information Systems (Piccoli, 2012: 57)

The transactional processing systems (TPS) are at the operational level of the organization and these are mainly used for short-term activities daily. Piccoli (2012:56) emphasizes that transactional processing should therefore be done under a restricted degree of ambiguity. The decision support systems (DSS) and management information systems (MIS) are used by managers and decision makers at different levels. MIS has a focus on operational proficiency whilst the DSS has a focus on effective decision making which means as Stair *et al.* (2012:18) prove, “MIS helps organizations do things right, DSS help managers do the right thing”. This means the MIS has a focus on organizational efficiency whilst the DSS focuses on the effectiveness thereof. The executive information system (EIS) is a type of MIS because it is used by executives for decision making and deducing how the firm ought to react to trends in the market place. According to Stair *et al.* (2012:13) these integrated programs form what is referred to as an ERP. However not all organizations implement all these systems which means these systems can be used in their own right. The following section discusses the concept of ERP systems.

2.5. ERP SYSTEMS

Yares (2010:1) highlights that ERPs are software solutions that can be configured in order to integrate information from different departments within an organization to allow the sharing of information. This is achieved on a single integrated platform. Business departments such as, but not limited to, sales and marketing, human resources and finance are areas

where an ERP system can be implemented. This concurs with Al-Fawaz, Al-Salti and Eldabi (2008:1) who note, that an ERP system basically assimilates and controls an organization's entire business processes. In higher education institutions these systems can be implemented for as the purpose of student administration, personnel management and finance management. Yares (2010:2) establishes that ERP solutions that are often used by schools are referred to as student information systems (SIS).

The SIS systems can at times be inclusive of all modules used or have a specific module for student administration (Yares, 2010:2). The implementation of ERP systems was swift in the mid-1990s and this resulted in ERP vendors enjoying success stories within IT (Nielsen, 2002: 14). These vendors then began to expand their services into other industries they had not catered for before. As much as vendors were enjoying these success stories Doom et al.,(2010:378) establishes that ERP systems for an organization result in huge investments in software and in package customization. This is because an ERP system has inherent business processes which leaves organizations to decide whether, to use the system as-is, configure the system to match some or most of its way of doing things or essentially customize the ERP system by adding on what matches their business processes. The table below outlines advantages and disadvantages of implementing and utilizing an ERP system.

Advantages	Disadvantages
Improvement of work processes	Standardization and flexibility
Responsiveness	Strategic clashes
Knowledge infusion	High costs and time to implement
Adaptability	Uncertainty of embedded industry best practices
Improved access to data	Difficult to integrate with other systems
Eliminates costly legacy systems	Risks in using one vendor
Improvement of work processes	Risks of implementation failure
Upgrade of Technology infrastructure	Difficulty in loading data into new ERP system

Table 2.1: Advantages and Disadvantages of ERPs (Piccoli, 2012: 73–77; Stair et al., 2012: 192–194)

2.6. MANAGEMENT OF INFORMATION SYSTEMS

2.6.1. Implementation Aspects

Significant value through best business practices can be realised by an organisation through their implementation of an ERP system. However, “ERP implementations are complicated projects”(Mushavhanamadi & Mbohwa,2013). Davenport in Jagoda and Samaranayake (2017:93) suggests a rational approach to ERP implementation with two key aspects which are preparation of people and technical system. However, Nielsen (2002:15) notes that, the manner in which an organisation will implement an ERP system will depend but is not limited to factors such as organisational structure, time constraints, complexity of the organization. The complexity of ERP systems therefore requires substantial investment of capital and time (Jagoda & Samaranayake, 2017). It is therefore important to select the correct ERP system according to the needs of an organisation and conduct ERP evaluation because of the high costs involved. Bingi, Sharma and Godla in Ngai, Law and Wat (2008:551) highlight that implementation of an ERP to any organization often requires business process re-engineering (BPR) to take place. This is to ensure that the software is compatible with the needs and processes of an organization. BPR can therefore be considered a critical success issue that plays a significant role in ERP implementation. Jagoda and Samaranayake (2017: 92) noted that, there are still some pre-implementation activities which have not been deliberated in the past and are prospective contenders for additional studies for better ERP implementation results. It is therefore clear that the need to augment current implementation practices is stronger than before if organizations are to realize their intended outcomes.

There is need for an ERP implementation cycle to evaluate the extent to which an organization is ready for implementation so as not to bypass the feasibility study (Jagoda & Samaranayake, 2017:95). Jagoda and Ramanathan (2005) developed a stage-gate model for ERP system implementation. This model consists of three levels which are pre-implementation, implementation cycle and post-implementation. The concept behind this stage gate is to enhance the outcomes of ERP implementation by carrying out evaluations and making decisions at the

gates before moving to the next stage. The gates are controlling points before moving to the next stage. This can be viewed as an iterative approach. The model can be viewed as an assimilated methodology to the planning and implementation of ERP projects. The stage-gate model assumes that it is possible to implement the first two stages of the pre-implementation roadmap simultaneously as long as they are completed before proceeding to the readiness assessment stage. The post-implementation stage is there to assist with evaluating how the ERP system impacts the organisation. It also determines whether upgrades or maintenance will be needed. This model is enhanced by incorporating the analytical hierarchy process (AHP).

2.6.2. Success Factors of an Information System

Numerous studies to identify critical success factors for ERP implementation have been carried out. However there is no literature that explains why the factors are considered critical to successful implementation (Nandi & Kumar, 2016: 729). Kim, Lee and Gosain in Jagoda *et al* (2017:93) remark that, most success factors are linked to functional organization problems. “Factors that constantly appear as critical success factors for information systems projects are: top management support; client consultation (user involvement); and clear project objectives” Olson (2004:5). However Petter, DeLone and McLean (2008: 10) argue that, the success of an information system is a challenge to define because there exists different dimensions in this field. In the 1990s DeLone and McLean introduced a model for defining information system success. The DeLone and McLean model as highlighted in Mardiana, Tjakraatmadja and Aprianingsih (2015:173) measures system quality, a determination of whether good information is being produced owing to its characteristics, information quality and service quality. As noted by Ngai *et al* (2008:551) an understanding of the organizational structure allows an organization to achieve effective execution of an ERP system. It is also important to have a change management strategy in place that indicates how changes will be managed after implementation. Samaranayake in Jagoda *et al* (2017:93) establishes that there is a need not to treat ERP implementation projects as IT only projects because as much as ERP systems are supported by new IT, they are not IT systems but application systems.

Giachetti and Truex (2010) observe the following as critical success factors of ERP implementation:

- “Commitment from top management”;
- “Empowered teams with ability to make decisions”;
- “Strong project management leadership and project management skills”;
- “Adaptable organization that can respond to challenges”;
- “Defined business direction-know the goals of the project”; and
- “Best people = best results”

Umble, Haft, Umble, Silva, Rahimi, Bansal & Argarwal (2003) also suggested that clear goals must be identified and stated to realize efficacious implementation. System features such as price, the language used and data accuracy are also highlighted as critical. Critical factors also suggested in past studies include implementation method (phased or big bang approach) (Yusuf et al., 2006) and organizational culture. There is therefore a noticeable common thread in the literature of ERP implementation, which is the role top management plays which reinforces the importance of the ERP projects Nandi & Kumar (2016:729) and the need to define and understand business information needs.

2.6.3. Challenges of Introducing an Information System

In a study carried out by Mushavhanamadi and Mbohwa (2013:4) the areas that were highlighted problematic with ERP implantation are: inadequate financial research, time limitations and skill constraints. However Jagoda and Samaranayake (2017:94) suggests that the lack of an organizations willingness and weaknesses of the implementation cycle are problematic areas. As alluded in the preceding text it is essential to determine whether BPR is a critical factor to ERP implementation, Vaughan (2001:1) also goes on to discuss that the implementation itself of a system tends to leave an organization susceptible to realignments which are likely to be enforced as a result of system design. Challenges of introducing an information system can drain an organization of people, vitality and funds. Sommers, Nelson and Ragowsky as cited by Ngai *et al.* (2008:551) also discuss that, there is a need to first better understand the process of implementing an ERP in

order to decrease failure rate.

One of the challenges an organization is likely to face is resistance by users of the system. These views indicate that the issues associated with ERP implementation cannot be entirely technological but also involve the end-users. Markus in Vaughan (2001:4) noted three theories of why resistance may occur. He discusses that an individual is likely to resist due to factors unique to them or factors that exist in a group. Resistance may also occur as a result of features in the system that has been implemented and it can be that end users of the system were never involved in the process. Ensuring that there is effective change management becomes an important issue especially when dealing with people issues that result from behavioral changes (Jagoda & Samaranayake, 2017). There is also a need to assess current legacy systems of an organization because the more complex a legacy system is the more technological and organizational changes are required.

2.6.4. Management of an Implemented Information System

The quality of information a system can provide is dependent on a system that is well designed. Organizations that recognize the crucial role of IS in their success generally establish an IS steering committee to oversee those systems on behalf of top management Mallach (2016:346). Committees are usually set up to ensure that any investments made with regard to information systems will benefit the whole organization. Kroenke as cited by Kornkaew (2012:7) states that, “management information system (MIS) has three key elements including: development and use, information systems and business goals and objectives”. This asserts what Mallach (2016:346) infers that, IS steering committees are appointed to decide what systems to develop, to review plans for major systems and appoints sub committees to carry out more detailed reviews as it sees the need. It is clear from this that it is vital for organizations to have set procedures in place on how to manage their information systems.

The selected UoT in this research has a web page where students who are experiencing issues with online registration can post questions. This can be viewed as one way to manage the system to achieve user satisfaction. Das as cited by Kornkaew (2012:7) discusses the efficiency of an MIS as one

that encompasses transparency, system capability, support from suppliers and online proficiency.

2.7. INFORMATION SYSTEMS IN DIFFERENT INSTITUTIONS

The purpose served by information systems within government and in business entities can be debated to be parallel to that of higher education institutions. This research first discusses information systems in government and corporate business before arguing how they apply in higher education institutions. Abugabah & Sanzogni (2010: 1) establish that there has not been a lot of research done on information systems implementation in tertiary institutions. Therefore, due to this there was a need to draw on research that was carried out in business and government. This section covers the use of information systems in government and in the corporate sector.

2.7.1. Use of IS in Government

Governments around the world are adapting and embracing the digital revolution and in so doing there exists reports, publications and other online government services. Wang and Liao (2008:718) state that, government makes use of ICT in order to improve access and provision of government information to its citizens, its business partners and other agencies it is involved with. Government therefore makes use of three general types of systems, which are government to government (G2G), government to citizen (G2C) and government to business (G2B).

2.7.2. Use of IS n Corporate Companies

Information system needs of an organization will differ from one organization to the next. As Mushavhanamadi and Mbohwa (2013:4) establish, it is vital for organizations to know whether the way they do business will indeed fit in with an ERP system before implementation takes place. In corporate companies' information systems such as ERP are used for forecasting sales, human resource management, finance management and other administrative tasks. Younis (2005:54) highlights that the optimal utilization of a system can be hindered by things such as "lack of skilled staff, shortages of fund and insufficient hardware". This concurs with

Stevenson in Mushavhanamadi and Mbohwa (2013:4) the biggest motivation for companies to walk away from immensely invested ERP projects is that, they find out that the intended software does not align with one or more of their business processes. Therefore, if an organization is to achieve maximum utilization of the implemented system it is first necessary to define what the needs of the business are and how these needs will be addressed. The next section discusses ERP as an information system in tertiary institutions.

2.8. INFORMATION SYSTEMS IN TERTIARY INSTITUTIONS

In South Africa the organization that specializes in the provision of integrated software that allows the support of administrative functions in higher education is known as Integrated Tertiary Software (Pty) Ltd. This organization offers support, training and consultation to its clients in order to facilitate knowledge transfer. According to (AdaptIT:n.d.) an inexpensive integrated solution is available for tertiary institutions whereby they are able to use the best of breed implementation method resulting in them only licensing functional components as per the institutions requirements. Some of the benefits realized from utilizing ITS are, “self-service for students and staff, mobile apps for students, online support services, availability of system from any location, online help and user manuals”. The core technology used by the ITS is Oracle which is “a relational database management system” (AdaptIT:n.d.).

Gable in Irakoze (2015:10) recommends that there is a need to evaluate an information system and how it impacts an institution and its end-users. This is done in order to substantiate the value of these information systems and how they contribute to productivity, quality, performance and competitiveness. “The role of Information and Communication Technology (ICT) in tertiary education is expanding and changing” (Aitken, 2007:1). This step in South Africa indicates that tertiary institutions are aware of the importance to join the global trends in information technology. This proves what Oluwatobi, Yemisi and Christopher (2014:492) who note that, the use of the internet at tertiary institutions in this digital revolution has led to a transformation in the way things are done. However, Moses (2014) points out that tertiary institutions are not well known for their speed when it comes to change. Lubbe and Bopape (2011:251) highlight that tertiary educational

institutions have had many IS developed and implemented for the use of end users. Tertiary institutions have therefore adopted carrying out their administrative and academic functions via electronic portals. Functions such as student admission, student registration and staff recruitment are just a few of the many functions carried out via electronic portals. One software used at tertiary institutions for student registration, organizing student timetables among other things is the ITS. As indicated in the preceding text, this is an ERP system and therefore as Lubbe and Bopape (2011:251) discuss, challenges of an ERP system will apply to the ITS in terms of implementation, operating the system and how selection of the ERP system is done to match business needs. Higher education institutions are clearly being influenced strongly by international trends to embrace new technologies (Abugabah, Sanzogni & Alfarraj, 2015:46).

An ERP system is considered the leading software application to be adopted by universities which means substantial investments when implementing such a system (Abugabah & Sanzogni, 2010:395). These researchers also go on to note that, universally, there has been little research done on ERP systems at tertiary institutions. Originally student registration was done by completing forms, which students had to take to different service points until they were registered. However in the hope to cope with the ever-changing global environment tertiary institutions have resorted to utilizing ERPs (Abugabah & Sanzogni, 2010:395). Universities are considered information centric environments and there is therefore a challenge for them to produce information that is accurate (Moses, 2014). This information can include, but is not limited to, the number of student enrolment for the academic year per faculty, enrolment by gender and by graduate status. This is of importance because where information is inaccurate and insufficient the consequence is that it will lead to poor decision making (Zhuang & Peng, 2011:72). The implementation of IT technologies in higher education and other business sectors is likely to be hindered by resource shortages. Even though higher education institutions do recognize the need to implement technological changes according to Jaffer in Moses (2014:13) the South African education sector faces challenges such as large class sizes, multilinguism and student academic unpreparedness where funding is linked to graduate throughput?, thereby putting pressure on the educational institutions.

ICT utilization and application are enhanced through the use of the online registration system. Udofia (2015:90) highlights that the online registration system at a university permits the students to register, drop or add courses during a specified registration period. Some advantages for students when utilizing such a system include but not limited to online payment of fees from the comfort of their home, no queuing for the registration process and it takes a shorter time (Udofia, 2015:91). However as much as online registration is fast growing in developing economies, too much indulgence in modern technology is likely to result in people being jobless (Adeloye in Oladunjoye & Omemu, 2013:9). Some disadvantages of utilizing such a system are that there lacks quality and credibility because this process does not allow students to interact face-to-face with faculty members (Allen & Seaman as cited by Udofia, 2015:91). Ephraim in Udofia (2015:91) states that the need for face-to-face interaction can be viewed as necessary because where questions are asked immediate feedback is received. Another benefit for online registration is that it provides data for planning, once students have registered, timetable planners are able to know the type of classroom that can accommodate a specific number of students (Oladunjoye & Omemu, 2013:10).

2.9. THE CONCEPT OF IS in UoT's

2.9.1. Implementation Aspects In Tertiary Institutions.

Rabaa'i (2009) established that, the need to implement ERP systems in tertiary institutions has led to ERP vendors ensuring that the products are tailor made to accommodate this new market. A fairly large body of literature exists on studies that focus on ERP implementation in originations and not so much for higher educational institutions. Abugabah and Sanzogni (2010:395) note that, the influence of ERPs is not realized in higher education because there have been very few effective implementations. The introduction of ERP systems to tertiary institutions initially began in the United States of America (USA) and this was as a response to similar problems that had led the private sector to implement ERPs (Fisher, 2006:18). There is therefore likely to be issues that tertiary institutions will face when adopting the ERP system since it was initially designed to be

used in corporate companies. The need for tertiary institutions to implement ERP systems can be considered to stem from a need to update old systems with new, more efficient systems. Kumar and van Hillegersberg in Yare (2010:3) note that as far back as the 1960s ERP systems were being used in different industries and methods were being developed in order to integrate an organizations data into one system. By the 1980s and 1990s ERP solutions that could integrate solutions in one place were being created (Yares, 2010:4). This in essence meant organizations were able to improve their core business processes. Davenport in Jern (2009:7) reports that one of the effects of implementing an information system is that they are used to support operating practices between the companies' business units.

A study similar to this one done in Nigeria by Oladunjoye and Omemu (2013:13) concluded that online registration saved time and costs, easy storage and access of information and that there is much more ease completing a form online, however errors made whilst completing are difficult to rectify. This conclusion is in line with a study conducted by Allen and Kern in Abugabah and Sanzogni (2010:396) on the effect of ERP systems on business processes and performance in higher education which resolved that ERP systems possibly advance business performance in higher education by augmenting services presented to students, faculty and staff. This was a study conducted in four universities in the United Kingdom (UK). It is clear that businesses that successfully implement ERP systems benefit in terms of improved access to precise and timely information. However, according to Abugabah & Sanzogni (2010:395) tertiary institutions are most likely not to experience the impact of ERP systems due to few successful implementations and adoption.

2.9.2. Key Issues For Implementation Success In Tertiary Institutions.

Estevez, Rankin and Silva (2014:52) propose that usability; learnability and memorability are attributes an online registration system must possess. The factors that will be highlighted here will include those experienced in the introduction and implementation of an ERP system. ERP systems in tertiary institutions integrate administrative functions such as student administration and human resources, this allows the institutions to be relevant in their marketplace and gain strategic advantage. DeLone and McLean (1992)

carried out a thorough study focused on practitioner and academic opinions on IS success and its achievement. These researchers found six concepts in order to view the success of an IS which are: “system quality, information quality, use, user satisfaction, individual impact, and organizational impact”(DeLone & McLean, 2003:12). System quality looks at the characteristics of the system, whilst information quality deals with the desired form of the information and its characteristics. Use/user satisfaction deal with the communication of the system with the end users. Individual impact looks at the impact from the information product and how it influences managerial decisions. The organizational impact aspect relates to the outcome of the information product on organizational performance.

An updated DeLone and McLean IS success model was later developed due to difficulties in understanding multidimensional facets of “use” which is now referred to as “intention to use”. Intention to use was viewed as incorporating attitude and behavioral aspects. Whilst some studies have argued against including “use”, DeLone and McLean (2003:16) stress that using a system is indeed an applicable measure of success in most cases. The updated model also features system quality whilst individual and organizational impacts are now referred to as net benefits. Net benefits, according to DeLone and McLean (2003:22) raise issues in that there is a need to determine to whom the benefits are intended, what qualifies as a benefit and there needs to be clarity as to whether the benefits are measured from the individuals’ perspective or industry perspective. Therefore, this shows that the dimension of net benefits is broad and should be applied accordingly subject to the context of the study.

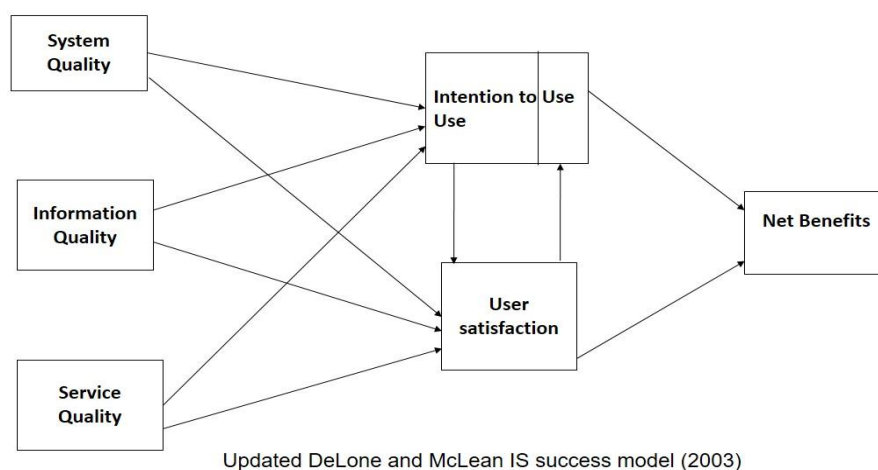


Fig.2.3 Updated DeLone and McLean IS success model (DeLone & McLean, 2003: 12)

DeLone and McLean (2003) debated that their D&M model was not a general model for measuring IS success. They urged researchers to extend and decrease the number of dimensions in order for it to be relevant to their context of study. Studies conducted on eLearning systems have increased the need to extend the D&M model to measure the success of these systems in different educational settings. The recent studies that have extended the constructs of the D&M model include (Hassanzadeh et al., 2012; Holsapple & Lee-Post, 2006; Ozkan & Koseler, 2009). The majority of these models were validated in higher education institutions in USA, UK and Iran. The extents of D&M model extension were different from each study. For example, Holsapple et al. (2006) divided D&M model in three stages: design, delivery and outcome. The design stage consists of service quality, system quality, and information quality while delivery stage consists of system use, and user satisfaction. Similarly, the net benefits construct was assimilated into the outcome stage. The model was validated using a sample of 369 students who were using Blackboard system. The model was found to be a good tool to assess LMS through an iterative process of diagnosing, action planning, action taking, evaluating, and learning. Another recent study to extend the D&M model for eLearning context was proposed by Hassanzadeh et al. (2012).

Net benefits into three new constructs: loyalty to system, goals achievement and educational system quality. They also split intention to use and system use to become two different constructs. They renamed system quality to technical system quality, and information quality to content and information quality. Their new model consisted of ten constructs in total. This model was validated using a sample 2,858 students, 470 alumni and 270 instructors across five universities. The ten constructs in the model were found useful in measuring eLearning system success. Despite several attempts to extend an updated D&M model to develop eLearning system success models, most of these studies have been carried out in western institutions. However, Mtebe and Raisamo (2014:3) note that as tertiary institutions in Sub-Saharan countries are progressively adopting LMS, a model to assess effectiveness of these systems is urgently needed.

Due to the number of measures proposed in different studies there is no ultimate definition of IS success. The D&M IS success model was introduced as a structure for conceptualizing and operationalizing IS success. It was created from a process of understanding IS and their impacts. According to DeLone and McLean (2003:16) the process model consists of three components, which are: "creation of a system, the use of the system and consequences of this system use". Measuring IS success or its effectiveness is important in that it allows an understanding to be gained in terms of the value and efficacy of IS management actions and IS investments (DeLone & McLean, 2003:10). For this study the updated D&M model can be used to provide answers as to how students perceive the online registration system. Seddon as cited in DeLone and McLean (2003:16) argued that, the D&M IS success model combined process and causal explanations of IS success which can lead to potentially confusing meanings. In this regard Seddon went on to suggest a re-specified variance model of IS success to which DeLone and McLean (2003:16) argued that it would further complicate the success model thereby defeating the intended purpose of the original model. The constructs of the D&M model are interrelated and cannot be studied in isolation. This results in a model, which indicates that "causality flows in the same direction as the information process". Zaied (2012:814) in a study where the dimensions of the TAM and D&M IS success model were modified found that the dimension with the most significant influence on IS success was information quality whilst the least one was user involvement. Investing in ERP is considered a dependent variable in terms of whether this investment would lead or not lead to improved information quality (DeLone & McLean 2003:17).

King in Rabaa'i (2009) noted the following as the main advantages of ERP systems for tertiary institutions: (1) Augmented access to information used for planning and organizing the institution (2) students, employees and faculty enjoy improved information services (3) Risk of the business is reduced (4) Efficiency of the system results in a decrease in expenses and an increase in income. These advantages indicate that if tertiary institutions are able to implement ERP systems successfully their business will be efficacious.

2.9.3. Implementation Challenges in Tertiary Institutions.

The existing literature does not broadly address the challenges related to the implementation of information systems in tertiary institutions. Tertiary institutions run legacy systems and therefore the transition to ERP has been considered difficult. Allen and Kern in Abugabah and Sanzogni (2010:396) in a study of four tertiary institutions in the United Kingdom (UK) concluded that the academic culture of these institutions made it difficult to implement ERP systems. This supports a study by Abugabah et al (2015:47) who established that it can be extremely difficult to implement an ERP system at a tertiary institution as with any other organization. This is similar to what Gates, van Hellens and Boonstra in Fisher (2006:20) advance that, implementing ERP software has inherent challenges, because it is a packaged software, an organization would therefore be faced with adjusting its business processes in order to fit the ERP system. Tertiary institutions are therefore considered difficult for a dynamic element like IT because of their legacy systems and their unhurried way to acclimate and react to the changing world around them. An implementation failure can be attributed to the information systems incapability to meet the anticipations of the stakeholder groups (Abugabah & Sanzogni, 2010: 395). This indicates the need to determine first the need of users in line with the ERP system to be implemented to avoid a mismatch.

A mismatch can also result in an organization having to spend more than the initial estimated cost. In a study to address the problem of ERP implementation within a department of a Spanish tertiary institution, Esteves and Pastor in Hellens, Nielsen and Beekhuyzen (2005:75) concluded that most ERP implementation challenges are in fact not technological factors but organizational factors. A similar study at a college in the USA concluded that merging an old system and having to retrain staff were challenging areas. The reason behind this could be that the staff assumed the system was complex before trying it. Students are end users of such systems in tertiary institutions; however, there have not been a lot of studies done to determine their perceptions on usability of such systems. This shows that there is need for organizations to create an environment where ideas and implementation considerations are pulled from the bottom up which allows input from staff, students and the system implementers.

2.10. CHAPTER SUMMARY

Since ERP is considered an IS that assimilates a wide range of business processes, the DeLone and McLean IS Model (2003) will be a worthy starting point to analyze the challenges and success factors in introducing information systems for students' online registration. Understanding the success of an information system is an ongoing area of interest to practitioners, stakeholders and the researcher. Research in this field assists with highlighting the value of the system and can serve as a basis for subsequent decisions regarding such systems. Fulfilling information needs in order to be effective and efficient is one of the main reasons organizations implement ERP systems. Mining, pharmaceuticals, aerospace and tertiary institutions are just a few of the organizations that make use of ERP systems. There is a clear exponential growth in the use of information systems to cater for growing businesses and customer needs. Organisations are more open to information systems that will allow them to reduce costs, gain competitive advantage in the market place, provide improved access to information for end users and reduce overall business risk. IS and IT projects for any organization are undoubtedly considered large investments that may end up exceeding estimated costs if proper implementation procedures are not followed. Literature on ERP system implementation highlights among other things the importance of involving end users in the entire process. However, these studies have not highlighted the perceptions of students as end users of these systems. The need for this stems from the observation that, in the ever changing global environment where tertiary institutions are making use of more technologies students are the largest body of beneficiaries.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1. INTRODUCTION

Welman & Kruger (2001: 46) explain that research is conducted in order to investigate a research question or a hypothesis through data collection from the objects of enquiry. This indicates that the results obtained should be able to answer the question or shed some light on the hypothesis. This section will therefore provide the sequence of activities that shows the approach used in order to address the research questions, explanation of the choice of research methodology and how data collected was analyzed.

3.2. RESEARCH PROBLEM

An observation was made that during registration students stand in long queues waiting for assistance to register. The system tends to 'freeze' whilst students are registering. Students are unfamiliar with the interface, as they constantly have to enquire what to do next when going through online registration.

3.3. RESEARCH QUESTIONS AND SUB-OBJECTIVES

The above-mentioned problems were used to highlight aspects of information quality, service quality and system quality of an information system. Using the updated DeLone and McLean IS success model (2003) this research highlighted students' perceptions of the current online registration system as well as the challenges and success factors of managing the online registration system. In order to address the research problem, this study used a quantitative research approach. The table below clarifies the research question and sub-questions, the research objectives and the techniques used to gather data.

Research Question	Has online registration made any difference in the student registration process?	
Research Sub-question	Research Method (s)	Objectives
What are the students' perceptions of online registration?	Questionnaires	To establish students' perceptions of the online registration system.
What are the success factors of using online registration? What challenges are associated with online registration?	Questionnaires	To determine if the online registration makes registration easier for the users – students.

Table 3.1: Clarification of Research Question

3.4. RESEARCH DESIGN

According to Welman & Kruger (2001:46) “A research design is the plan according to which we obtain research participants (subjects) and collect information from them.” Flick (2011:65), explains that, in using a specific research design there is a need to make the answering of the research question possible. This research was a comparative study. It compared the perceptions of fourth year and first year students regarding the online registration system. Mills, van de Bunt and de Bruijn (2006: 621) explain that, the objective of a comparative analysis is to search for likeness and difference. Distinguishing research design and research methodology at this stage will assist with better understanding going forward. Research methodology, according to Leedy and Ormrod (2001:14) is the approach that the researcher undertakes to perform the research project; therefore, prescribing the tools that will be used. The research methods address the ‘how’ aspect of doing the research. This is, procedures and techniques of sampling, collecting, analyzing and interpreting data. The research methodology that was used in this study followed a quantitative approach. This quantitative approach focuses on numeric and unchanging data as well as detailed convergent reasoning than divergent reasoning (Babbie,2010).

This study used constructs of the updated DeLone and McLean IS success model (2003) to analyze and explain the perceptions of students. Creation of a system, use of a system and the consequences of system use are the three main components that led to the creation of the D&M IS success model (DeLone & McLean, 2003:16). According to DeLone and McLean (2003:10) the main purpose of the original model was to combine previous research on IS success into a more coherent body of knowledge. This was done to provide a guide for future researchers in the field of IS success. In the DeLone and McLean IS success model “systems quality” measure technical success; “information quality” measures semantic success and use, user satisfaction, individual impacts and “organizational impacts” measure effectiveness success (DeLone & McLean, 2003:10). It is important to note that, individual impacts and organizational impacts were combined to become net benefits in the update model.

In a study to extend the D&M model within the eLearning context, net benefits were split into three new constructs: loyalty to system, goals achievement and educational system quality. Intention to use and system use were also split into two different constructs. They renamed system quality to technical system quality, and information quality to content and information quality. Their new model consisted of ten constructs in total. This model was validated using a sample of 2,858 students, 470 alumni and 270 instructors across five universities. The ten constructs in the model were found useful in measuring eLearning system success (Hassanzadeh et al., 2012). Despite several attempts to extend an updated D&M model to develop eLearning system success models, most of these studies have been carried out in western institutions. However, Mtebe and Raisamo (2014:3) note that as tertiary institutions in Sub-Saharan countries are progressively adopting LMS, a model to assess effectiveness of these systems is urgently needed.

According to DeLone and McLean (2003:13), in a study of 104 users of a university system conducted by Seddon and Kiew (1994) they found significant relationships between system quality, user satisfaction and individual impact. Their study aimed at validating the D&M IS success model. Shannon and Weaver (1949) reported that the dimensions of the D&M IS success model are based on a process model to which DeLone

and McLean (2003:15) argue that these are interrelated dimensions in a success model. They view this interrelatedness as an indicator for causality flows in the same direction as the information process.

The use of the D&M IS success model for this study adopted a survey-based research methodology. A questionnaire was administered to students to determine their perceptions in terms of system quality, information quality and service quality. This was done in order to highlight whether these dimensions' result in intention to use/use and user satisfaction.

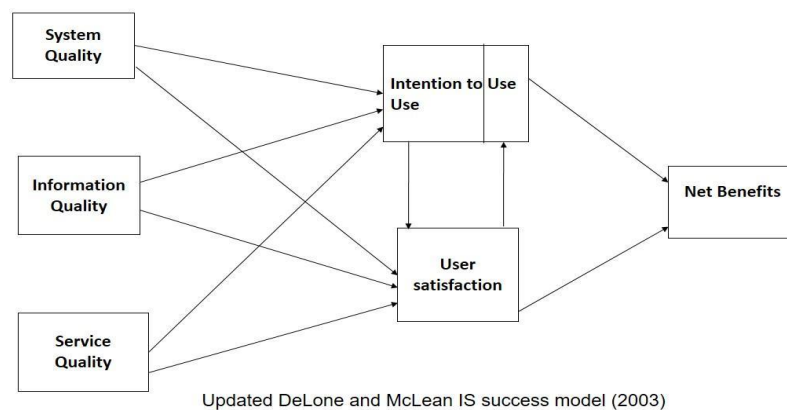


Figure 3.1: Updated DeLone and McLean IS success model (DeLone & McLean, 2003: 12)

3.5. QUANTITATIVE RESEARCH

This approach, according to Creswell (2014:31) is used to test objective theories by examining the relationship among variables. This research method is also known as the positivist approach. Variables can be measured with instruments such as questionnaires and analyzed using statistical procedures. The respondents in this approach are however not free to convey what they want as they are controlled by the data collection methods. This indicates that this approach has a greater focus on examining as opposed to understanding the phenomena. This method allowed the researcher to gather data by distributing questionnaires to respondents, which means a large sample that is representative had to be sought. This makes the approach more detached, as the researcher is not involved with the research process. Qualitative research on the other hand is based on a holistic picture and is conducted in a natural setting (Creswell, 2014:32). This is also known as an interpretive approach because the

process is conducted within a natural setting with a focus on the process rather than the outcome. Qualitative methods generally focus on a smaller sample compared to the quantitative methods. Quantitative research study can be used to simplify concepts more widely or examine causal relationships (Bryman & Bell, 2007:154). In order for this to be possible the researcher should therefore have a clearly defined research question to which objective answers are sought. Nykiel (2007:55) notes the following as some advantages of using quantitative research:

- Large volume of data can be collected through questionnaires from participants that are dispersed;
- Researcher is able to easily analyze the questionnaire; and
- Questionnaires are cost effective.

3.6. TARGET POPULATION

Powers in De Vos, Strydom, Fouche and Delport (2001:193) define a population as “a set of entities in which all the measurements of interest to the researcher are represented”. The population under study can therefore be referred to as the sampling frame. A sample of the population is studied in an effort to understand the population from which it was drawn. The study population was from the Project Management and Management Department in the Business and Management Sciences Faculty. The study compared the responses of the first year and fourth year students. The reason for selecting this study population was, first year students are first-time users and are likely to encounter different or similar challenges compared to returning students. Determining the perceptions of the first years allowed the researcher to get perceptions of a first time user in comparison to those who have used the system before. The target population was 500 students comprising of First year Management students (200) and BTech Project Management full time and part-time students (300). Considering the different faculties at the UoT, this population was chosen to allow the research to be carried out within the stated time constraints. The population was also easily accessible for the researcher.

3.7. SAMPLE SIZE

Seaberg in De Vos *et al.* (2001:195) notes that, where there is a greater probability of sample error the sample should be larger. This shows that representativeness is an important aspect of sampling. The size of the sample is influenced by factors such as, resources available, sample type, heterogeneity of the population (Singleton in De Vos *et al.*, 2001:195). It is important to note from this that, the sample size of respondents chosen should be representative of the target population. In order to determine a sample size that is representative, this study made reference to Isaac and Michael (1981) table for determining needed sizes of a chosen sample size. The table describes N =population size and S =Sample size, therefore where $N=200$, $S=131$ and where $N=300$, $S=169$. For this study, 500 questionnaires were printed and administered to the students.

3.8. SAMPLING TECHNIQUE

Sampling generally ensures the researcher has a sample size that is well representative of the target population. The size of a population usually makes it impractical and uneconomical to involve all the members of the population in a research project (Welman & Kruger, 2001:46). Therefore, data obtained from a defined sample size is relied on. This research makes use of a non-probability sampling technique discussed below.

3.8.1. Purposive Sampling

Non-probability sampling means that the units of analysis within the population do not have an equal chance of being included (Fox & Bayat, 2007:58). It is a convenient and inexpensive method of sampling. Purposive sampling, is a non-probability technique based on the researcher's judgment, whereby the researcher determines a sample that has the most typical attributes of the population (De Vos *et al.*, 2001:202). Fox and Bayat (2007:59) state that this judgment is done according to the researchers "expert opinion of the population".

3.9. DATA COLLECTION

According to Kumar (2011:138) two major approaches to gather information exist, primary and secondary. Primary data is that which is collected for the first time whilst secondary data has already been collected and analyzed by

someone else. In light of this, the primary data collection methods for this study were self-administered questionnaires. The questionnaire included closed questions, open ended questions and questions where respondents had to provide a rating on a given scale (Likert style). The varying types of questions were being utilized in order to gather as much information as possible. Questionnaires were distributed to the students at the beginning of a lecture and collected at the end of the lecture.

3.9.1. Questionnaires

According to Babbie & Mouton (2001:233), where a researcher aims to determine the respondent's attitudes or perspectives, the typical questionnaire would contain as many statements as questions. Questionnaires are used to receive comparable answers from all participants. Flick (2011:106) notes that, the manner in which the questions are worded should allow the researcher to collect, directly or indirectly the respondents' reasons for a specific behavior or attitude. The positioning of questions on a questionnaire is important because questions may influence each other. How one question is responded to may be influenced by the question asked directly before. This is referred to as the 'halo effect'. Flick (2011:111) goes on to suggest that, it will be appropriate to use questionnaires when a large number of participants will be involved.

3.10. DELINEATION OF THE STUDY

Due to time constraints the research was limited to first year Management and BTech Project Management, full time and part time students. This was from the faculty of Business and Management Sciences at the selected UoT. Other first year and BTech students within this faculty were not investigated.

3.11. DATA ANALYSIS

Statistical Package for Social Sciences (SPSS) has two primary functions: (1) analyzing data, and (2) organizing and managing data, Kulas (2009:4). This software has the ability to perform descriptive and inferential analysis. Once the students had completed the survey, data analysis was done using the SPSS, which is a popular statistical package, that is able to perform highly complex data manipulation, as well as analyzing simple instructions.

3.12. DATA VALIDITY AND RELIABILITY

The consistency or stability of a measuring instrument whereby it is able to measure exactly the same way each time it is used, is referred to as reliability (Jackson, 2009:65). Different types of reliability exist, which are, test/retest reliability, alternate forms reliability, split half reliability and interrater reliability. Reliability in this research will be ensured through a properly worded questionnaire that was administered in a consistent manner. In addition to reliability, measures must also be valid. Weiner (2007:7) defined validity as the extent to which a measurement tool succeeds in describing the purpose on which it was made for. In other words, as noted by Jackson (2009:70), a determination of whether the measure is truthful or genuine. Different types of validity exist and these are, content validity, criterion validity and construct validity. For the purpose of this study, a pilot study was carried out, where a sample questionnaire was administered, adjusted, before administering the final questionnaire. According to Jackson (2009:72) a relationship between reliability and validity exist in that, a test can be reliable and not valid. However, if the test is valid it becomes reliable by default.

3.13. ETHICAL CONSIDERATIONS

Terre Blanche, Durrheim and Painter (2006: 61) highlight that, when it comes to research ethics should involve more than an emphasis on the well-being of research partakers but that it should extend to areas such as scientific misbehavior and plagiarism. An ethical clearance certificate was sought from the Faculty of Business & Management Sciences before any data collection was done. Respondents were informed of the objectives of the research and their consent over participating in this research was sought. In addition, anonymity and confidentiality was guaranteed to the respondents.

Based on the abovementioned, the following ethical considerations were applied to this study:

- **Informed consent and Protection from harm:**

Participation is not compulsory it is voluntary and participants can

withdraw from the study at any time they wish to.

- **Right to privacy:**

All information gathered from respondents will be kept strictly confidential and respondents will remain anonymous.

- **Involvement of the research:**

Information provided will be strictly used for research purposes only and all participants will be treated fairly.

3.14. Purpose and Significance of the Research

The research WAS conducted to understand the issues arising from an information system introduced by the UoT. Utilizing the updated DeLone and McLean IS success model assisted in gaining an understanding into the challenges and successes that have been experienced in the last few years since the online registration system was introduced. This will be of importance to management to establish how best to curb current problems students face. Understanding the students' perceptions of the system, assisted in providing a much better user experience. According to the UoT's Research, Technology and Innovation (RTI) strategy, one of the key principles and objectives to support its vision is to promote excellence by developing cutting-edge facilities, RTI capabilities and outputs that gain recognition (UoT: Online)

3.15. EXPECTED OUTCOMES AND CONTRIBUTIONS OF THE RESEARCH

Highlighting the perceptions of the students on the current online registration system will assist management to determine whether the system has been able to achieve user satisfaction. It will also assist them going forward on what to consider before, during and after implementation of a new system for a large body of students. Given that there has not been much research done to investigate information systems introduced at institutions of higher education in South Africa, the research will add to the body of knowledge and can be used for future referencing by other academics. In terms of service quality the research will assist in the rethinking and reshaping of technologies used at higher education institutions in South Africa.

CHAPTER 4: DATA PRESENTATION AND DISCUSSION OF FINDINGS

4.1. INTRODUCTION

Ader, Mellenbergh and Hand (2008) define data analysis as a process of information gathering and transformation into data that is useful for research. This chapter will discuss the statistical analysis of responses obtained from the questionnaires administered to respondents. The questionnaires were administered in order to draw from users their perceptions of the online registration system. This section therefore presents the results from statistically analysed data received from completed and submitted questionnaires. Statistical Package for Social Science (SPSS) was used for data capturing and analysis.

4.2. THE RESEARCH QUESTIONNAIRE

The questionnaire was divided into two sections. Section one, covered biographic information and determining if the respondents were aware of the online registration system. Questions from this section also helped draw from the respondents their overall knowledge of the system and technology in general. Section two, elicited students' perceptions of the online registration system. Section two highlighted constructs of the updated D&M IS success model (2003), information quality, system quality and service quality. This was to determine whether these constructs would lead to intention to use and user satisfaction. Questions 26-29 in section two dealt with technological and infrastructural issues.

4.3. ANALYSIS

The researcher administered questionnaires to 500 respondents. From these, 171 were received from the BTech students and 135 from first year students. 11 (6 BTech and 5 first year) of these questionnaires were not used because they were not completed correctly. These questionnaires would not have been useful in determining the students' perceptions of the online registration system. The analysis of data was therefore carried out on a total of 295 questionnaires, 165 BTech responses and 130 first year responses. The following are descriptive statistics and frequencies conducted for these responses. Considering that this was a comparative study, the analysis of the responses was split to indicate the responses of

the first years and BTech students separately. This was done to determine whether there are any similarities or differences in the responses.

Descriptive statistics – Frequency tables for Section One

Which year of study are you currently?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1st year	130	44.1	44.1	44.1
	BTech	165	55.9	55.9	100.0
	Total	295	100.0	100.0	

Table 4.1: Year of Study

What is your gender?						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Female	80	61.5	61.5	61.5
		Male	50	38.5	38.5	100.0
		Total	130	100.0	100.0	
BTech	Valid	Female	78	47.3	47.3	47.3
		Male	87	52.7	52.7	100.0
		Total	165	100.0	100.0	

Table 4.2: Gender

Which age group do you belong to?						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	18-20	86	66.2	66.2	66.2
		21-24	38	29.2	29.2	95.4
		25-34	6	4.6	4.6	100.0
		Total	130	100.0	100.0	
BTech	Valid	18-20	1	.6	.6	.6
		21-24	38	23.0	23.0	23.6
		25-34	91	55.2	55.2	78.8
		35 and above	35	21.2	21.2	100.0
		Total	165	100.0	100.0	

Table 4.3: Age Group

Are you aware of the online registration system at the university?						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Yes	122	93.8	93.8	93.8
		No	8	6.2	6.2	100.0
		Total	130	100.0	100.0	
BTech	Valid	Yes	161	97.6	97.6	97.6
		No	4	2.4	2.4	100.0
		Total	165	100.0	100.0	

Table 4.4: Awareness of Online System Existence

With regards to technology in general how would you describe yourself?						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Novice user	22	16.9	16.9	16.9
		Intermediate user	73	56.2	56.2	73.1
		Advanced user	35	26.9	26.9	100.0
		Total	130	100.0	100.0	
BTech	Valid	Novice user	16	9.7	9.7	9.7
		Intermediate user	82	49.7	49.7	59.4
		Advanced user	67	40.6	40.6	100.0
		Total	165	100.0	100.0	

Table 4.5: Experience in Technology Usage

Table 4.6: Knowledge of the System

How would you rate your knowledge of the online registration system?						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Very Good	14	10.8	10.8	10.8
		Good	50	38.5	38.5	49.2
		Fair	52	40.0	40.0	89.2
		Poor	14	10.8	10.8	100.0
		Total	130	100.0	100.0	
BTech	Valid	Very Good	26	15.8	15.8	15.8
		Good	57	34.5	34.5	50.3
		Fair	72	43.6	43.6	93.9
		Poor	8	4.8	4.8	98.8
		Very Poor	2	1.2	1.2	100.0
		Total	165	100.0	100.0	

How would you rate the current system used for registration?						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Very Good	12	9.2	9.2	9.2
		Good	48	36.9	36.9	46.2
		Fair	43	33.1	33.1	79.2
		Poor	23	17.7	17.7	96.9
		Very Poor	4	3.1	3.1	100.0
		Total	130	100.0	100.0	
BTech	Valid	Very Good	17	10.3	10.3	10.3
		Good	61	37.0	37.0	47.3
		Fair	54	32.7	32.7	80.0
		Poor	29	17.6	17.6	97.6
		Very Poor	4	2.4	2.4	100.0
		Total	165	100.0	100.0	

Table 4.7: Respondents Rating of the System

Are you familiar with the online registration support provided by the university?						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Yes	83	63.8	63.8	63.8
		No	47	36.2	36.2	100.0
		Total	130	100.0	100.0	
BTech	Valid	Yes	111	67.3	67.3	67.3
		No	54	32.7	32.7	100.0
		Total	165	100.0	100.0	

Table 4.8: Online Registration Support

The following diagrams draw from the above tables

Year of Study

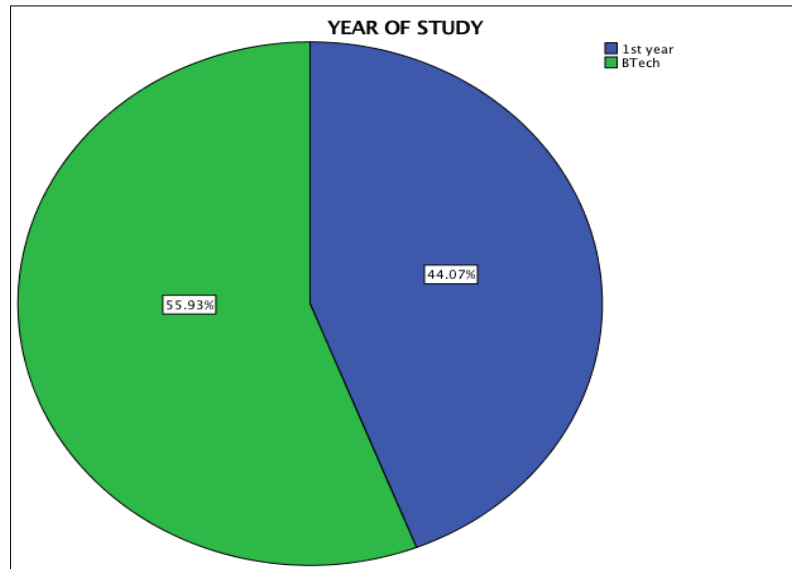


Figure 4.1

Figure 4.1 shows the number of respondents in this study. 165 BTech responses were captured which is 55.93%. 130 first year responses captured represents 44.07%. The target population of BTech respondents meant this sample size would be larger than that of the first year respondents. In terms of the findings, this will allow the researcher to gauge user satisfaction of the system especially from the old system users (BTech).

Gender

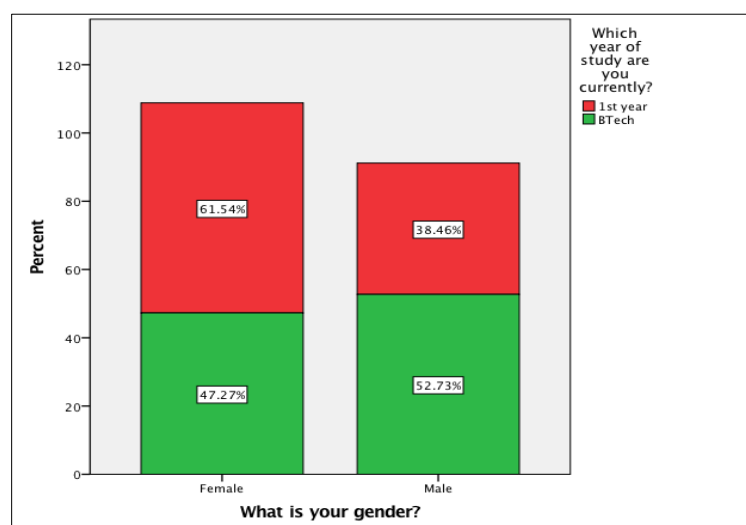


Figure. 4.2

Figure 4.2 above shows the differences in gender for BTech and first year respondents. There were more female first year respondents, 61.54%

compared to the female BTech respondents, 47.27%. However there were more BTech male respondents, 52.73%, compared to the first year male respondents, 38.46%. As indicated on the enrolment by gender facts and statistics of the UoT, more female students were enrolled in the current academic year compared to males (CPUT:online). Gender was considered relevant for this study because men and women are likely to behave or have different attitudes towards a phenomenon. However in a study by Oladunjoye and Omemu (2013) they discovered that there was no significant difference in the perceptions of female and male students regarding manual and online registration systems.

Age Group

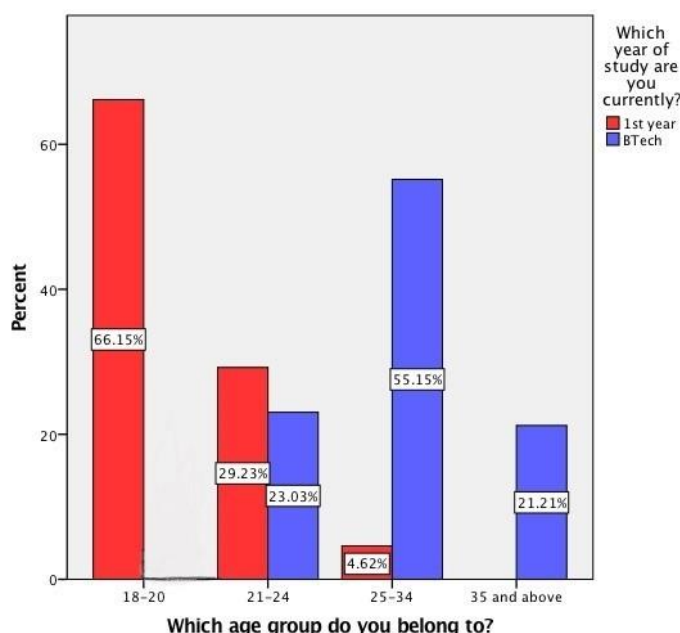


Figure. 4.3

Figure 4.3 shows the respondents by age group. The majority of the first year students, 66.15% are between 18-20 years, 29.23% first year and 23% BTech respondents are between the ages of 21-24 years. Only 4.62% first year indicated that they were between the ages of 25-34 whilst the majority of BTech respondents fall with this age range. 21.21% BTech respondents indicated that they are 35 and above, with no first years in this category.

Awareness of Online System Existence

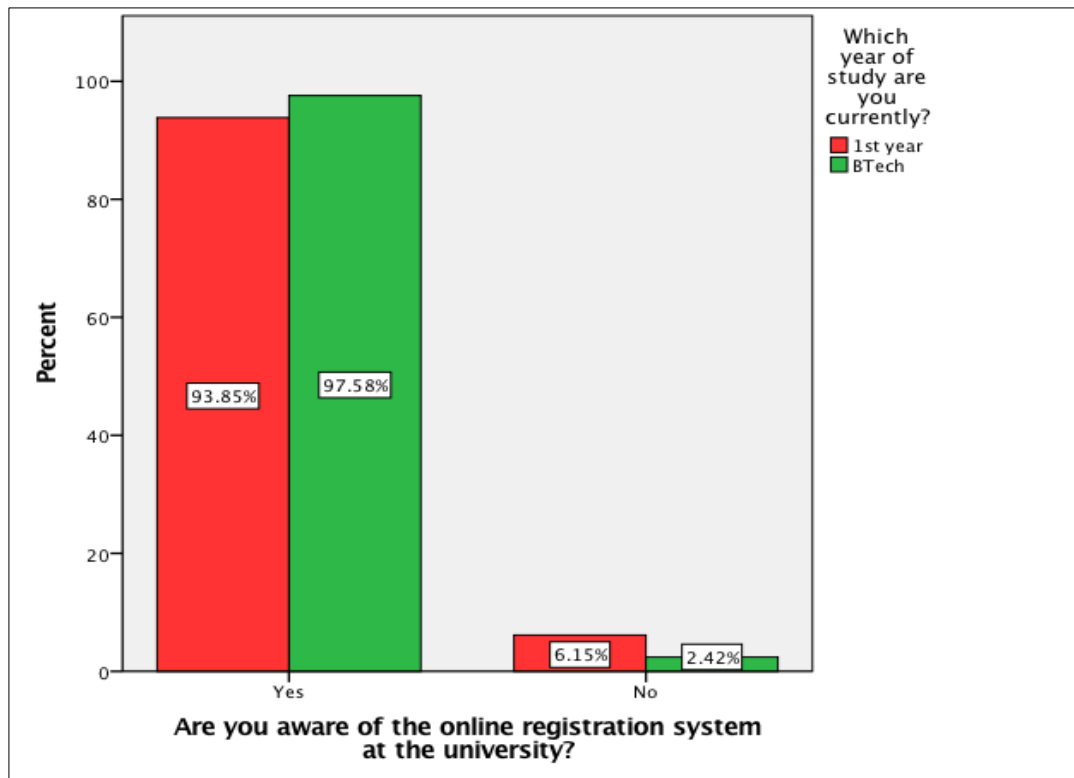


Figure. 4.4

Figure 4.4 above shows that a high percentage of the respondents from both groups, 93.85% first years and 97.58% BTech, indicated that they were aware of the online registration system at the UoT. Abugabah *et al.* (2015) notes that, to cope with the changing environment, universities have turned to using ERP systems. From the results, it is therefore likely that the UoT ensures that the students are aware of the online registration system. However, a small number of respondents from both groups, 6.15% first year and 2.42% BTech respondents indicated that they were not aware of the online registration system. BTech students who indicated that they were not aware of the online registration system are likely to have enrolled at the UoT for the first time in 2017. This could likely have an effect on their view of the online registration system.

Experience in Technology Usage

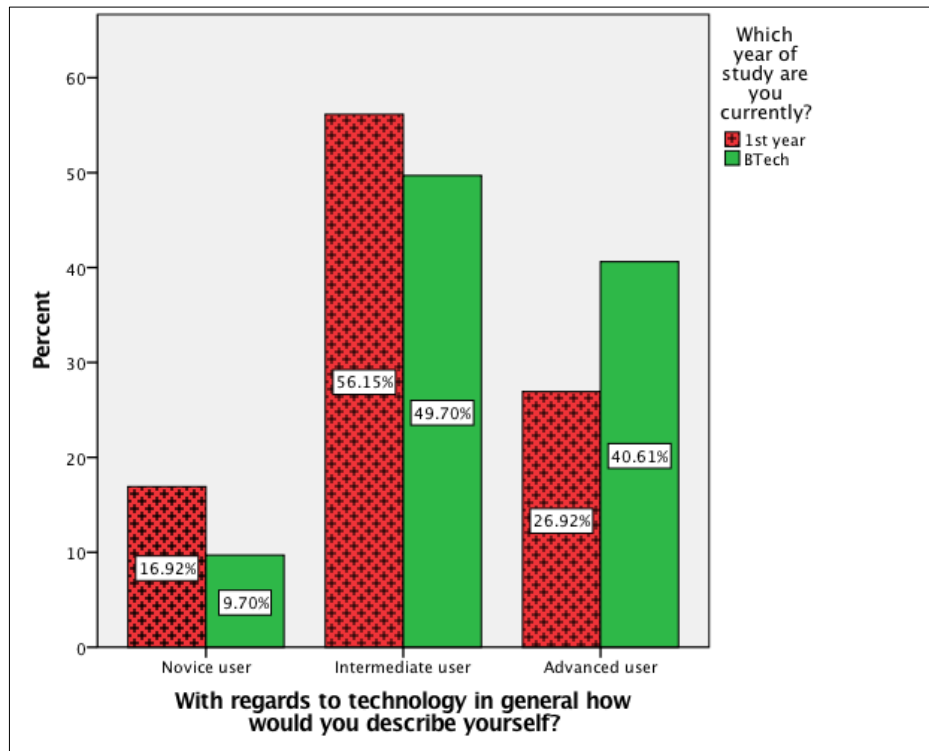


Figure 4.5

With regards to technology in general Figure 4.5 shows a comparison of novice, intermediate and advanced users. This question was asked because the researcher considered that all respondents have a different background with technology. As Paras in Jaffer, Ng'ambi and Czerniewicz (2007) explains, in South Africa most students enter tertiary institutions under-prepared which results in them needing more support to bridge gaps in the fundamental knowledge and skills. The responses show that there are high percentages in both groups for Intermediate users, 56.15% first years, 49.7% BTech. Compared to the first years, the BTech respondents had more advanced users, 40.61% whilst first year advanced users were 26.92%. Both groups had low respondents who were novice users, 9.7% for BTech and 16.92% for first years. The result of more advanced users in the BTech group can be because of exposure in the workplace and university, for example through e-learning. The first year respondents, considering they are coming from high school may not have been exposed to technology as much as the BTech students. The use of online registration therefore allows the students to be familiar with ICT (Udofia, 2015)

Knowledge of the System

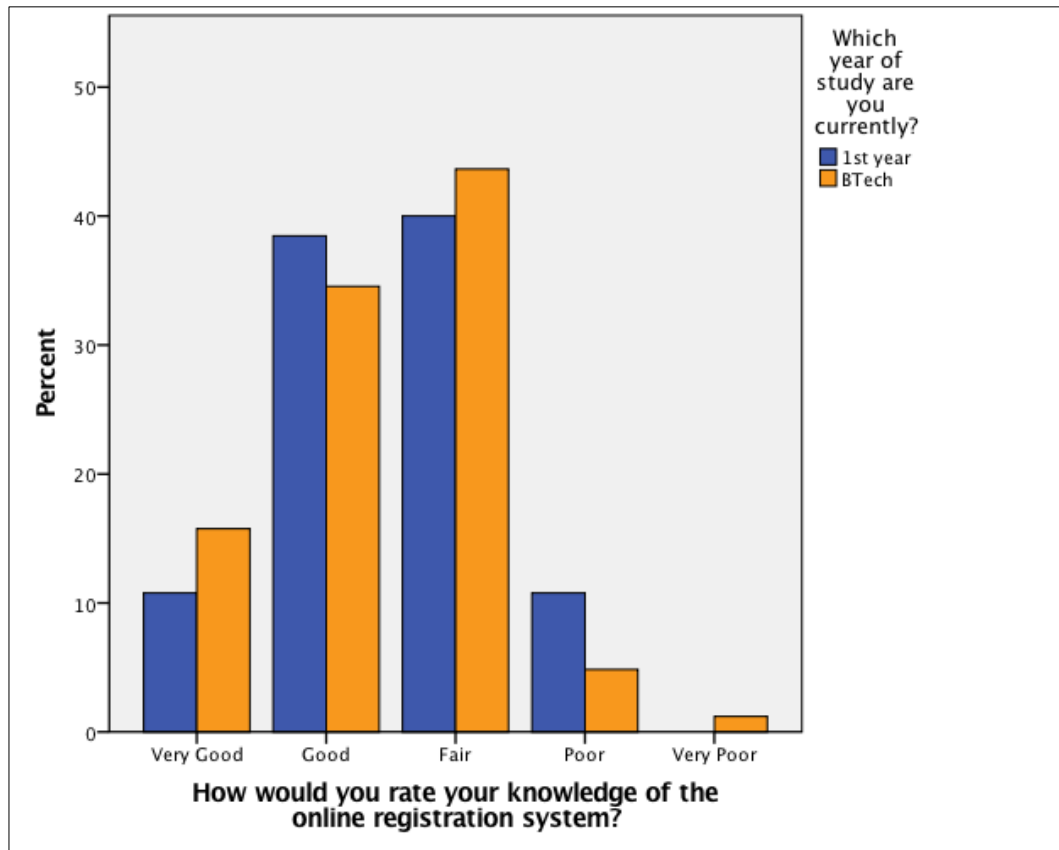


Figure 4.6

Figure 4.6 above indicates the respondents' knowledge of the online registration system. 10.77% of the first years and 15.76% BTech respondents indicated that their knowledge of the online registration system was Very Good. Considering they used the online registration system for the first time this year, first year students had a slightly higher percentage of 38.46% respondents who rated their knowledge as Good. BTech had 34.55% of respondents who rated Good. Both groups had more respondents that rated their knowledge as Fair, 40% first years and 43.64% BTech respondents. 10.77% of first year respondents rated their knowledge as Poor and 4.8% for BTech respondents. The reason for this difference could be that the BTech respondents have used the online registration for the past few years since it was implemented. There were no respondents from the first year group who indicated that they had Very Poor knowledge, however 1.2% of the BTech respondents did. This can be because a small number of BTech students may have started their first year of study at the UoT in this current year and therefore they would not have the same knowledge of the system as the other BTech respondents.

Respondents Rating of the System

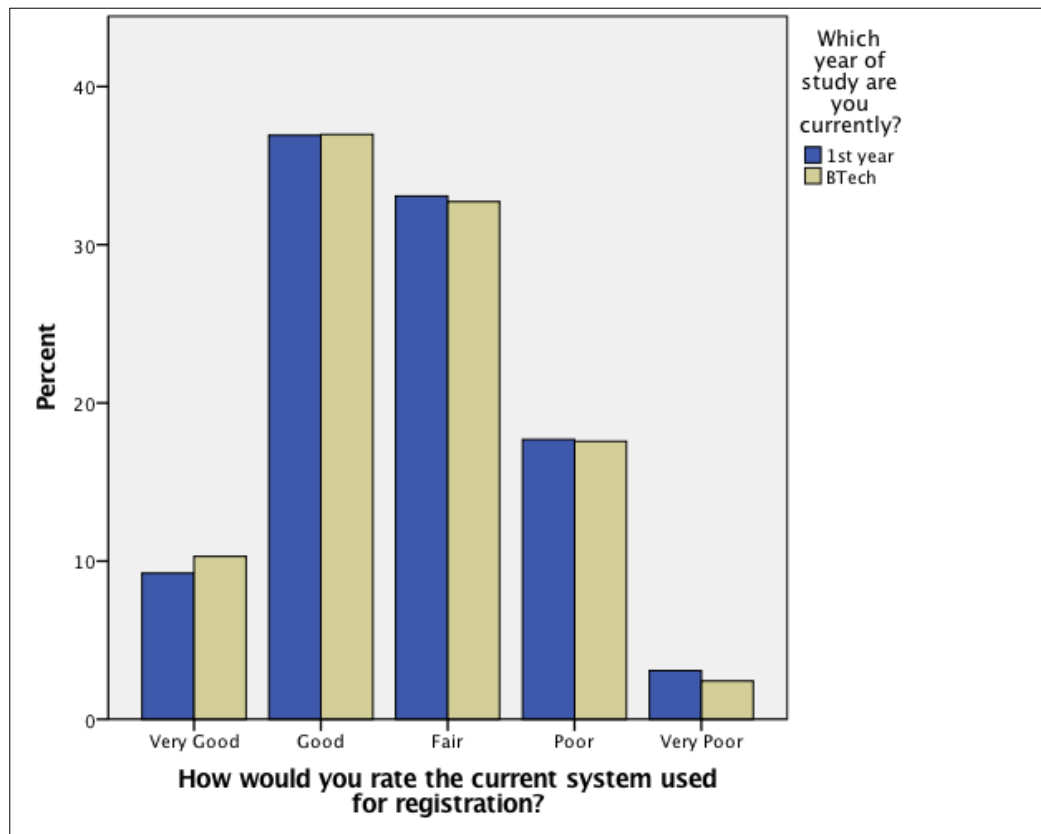


Figure 4.7

Figure 4.7 indicates how the respondents rated the current online registration system. The responses to this question were almost similar from both groups. First year 9.23% and BTech 10.3% rated very good. 36.92% first year and 36.97% BTech respondents indicated that the current system is good. An almost similar number of respondents from both groups found the current system to be fair. On fairness, first years rated 33.08% and 32.73% Btech. Similarly, in terms of the system being poor or very poor there was a similar number of respondents from both groups. 17.69% first years and 17.58% BTech respondents indicated the system is poor. 3.08% first years and 2.42% BTech indicated that the current system is very poor. Pinar et al. (2012) in their study to determine the effect of end user perceptions of IT on the information sharing found that, users refuse to use or do not use information systems efficiently when they have negative perceptions for IT. These responses will therefore likely have a reflection on the ease of use of the system.

Online Registration Support

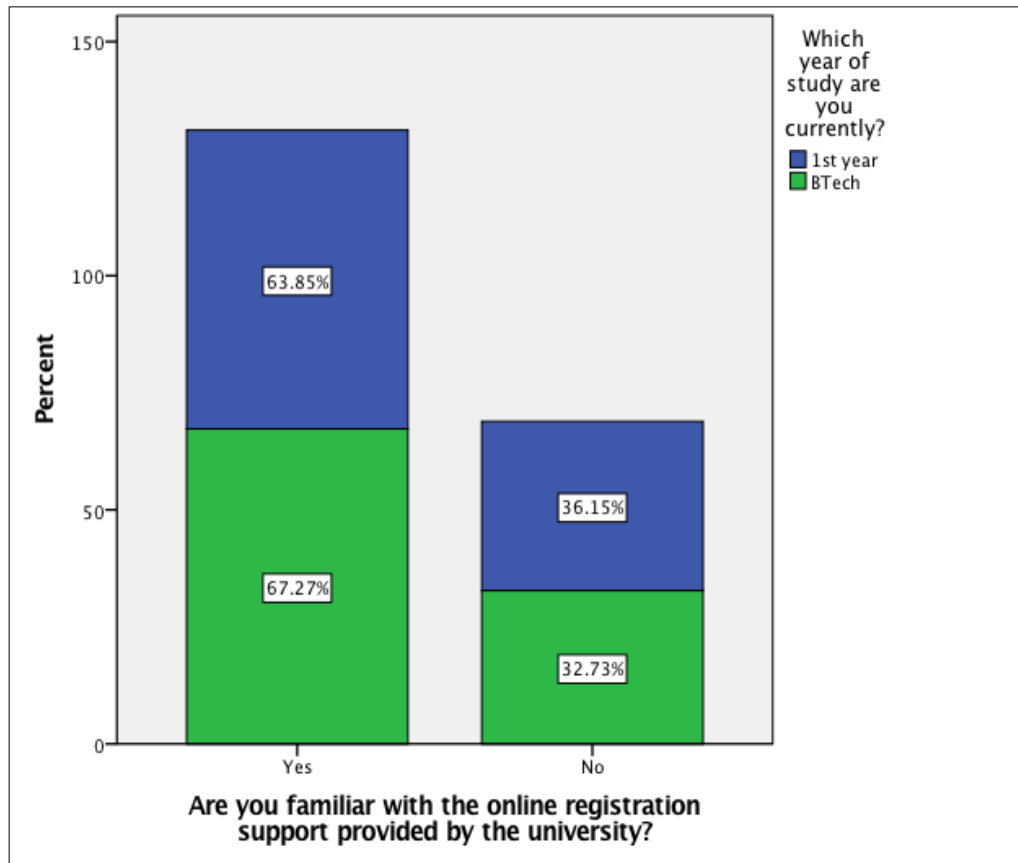


Figure 4.8

Figure 4.8 indicates whether or not the respondents were familiar with the online registration support provided by the UoT. As in the previous question, the responses to this question are also almost similar. 63.85% first years and 62.27% BTech indicated that they were familiar with the support provided. Considering that the first years used the system for the first time this year, 2017, it is evident from these responses that the UoT put in considerable effort in ensuring that support was available for first time and old users. However, both groups had almost a similar number of respondents who indicated that they were not familiar with the support provided by the UoT, 36.15% first years and 32.73% BTech students. The possible reason for these students not being aware of the support is that some are part-time students who go to campus after work, support staff usually present during the day or these students did not familiarize themselves with the support provided by the UoT.

4.4. SUMMARY OF FINDINGS: SECTION ONE

- There were more female students enrolled at the UoT which attributed to the gender difference in the findings.
- More first year students fell in the 18-20 age group, as this is the general university starting age once one has completed secondary education.
- There is a very high awareness amongst the students from both groups that the UoT uses online registration.
- The study took into consideration that not all respondents have the same ICT background. The results highlight this as there are novice users from both groups. The majority of respondents from both groups were either intermediate or advanced users.
- There exist similarities in the responses from both groups regarding their knowledge of the online registration system.
- The respondents' perceptions on how they rated the online registration system were similar. This indicated that there was no significant difference noted between new and old users.
- There was no substantial difference in the students' perceptions regarding their knowledge of online registration support provided by the UoT. Almost similar respondents from both groups indicated they were aware or not aware of the support provided.

Descriptive statistics – Frequency tables for Section two

Systems Quality: Tables 4.9 - 4.17

The online registration system is easy to use						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	7	5.4	5.4	5.4
		Disagree	9	6.9	6.9	12.3
		Neutral	46	35.4	35.4	47.7
		Agree	56	43.1	43.1	90.8
		Strongly Agree	12	9.2	9.2	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	4	2.4	2.4	2.4
		Disagree	13	7.9	7.9	10.3
		Neutral	59	35.8	35.8	46.1
		Agree	68	41.2	41.2	87.3
		Strongly Agree	21	12.7	12.7	100.0
		Total	165	100.0	100.0	

Table 4.9

I am satisfied with the response rate of the system during registration						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	15	11.5	11.5	11.5
		Disagree	21	16.2	16.2	27.7
		Neutral	45	34.6	34.6	62.3
		Agree	43	33.1	33.1	95.4
		Strongly Agree	6	4.6	4.6	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	2	1.2	1.2	1.2
		Disagree	37	22.4	22.4	23.6
		Neutral	55	33.3	33.3	57.0
		Agree	57	34.5	34.5	91.5
		Strongly Agree	14	8.5	8.5	100.0
		Total	165	100.0	100.0	

Table 4.10

Table 4.11

Interacting with the online registration system is often frustrating						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	7	5.4	5.4	5.4
		Disagree	25	19.2	19.2	24.6
		Neutral	42	32.3	32.3	56.9
		Agree	43	33.1	33.1	90.0
		Strongly Agree	13	10.0	10.0	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	10	6.1	6.1	6.1
		Disagree	34	20.6	20.6	26.7
		Neutral	53	32.1	32.1	58.8
		Agree	59	35.8	35.8	94.5
		Strongly Agree	9	5.5	5.5	100.0
		Total	165	100.0	100.0	

Table 4.12

The online registration system is rigid and inflexible to interact with						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	9	6.9	6.9	6.9
		Disagree	34	26.2	26.2	33.1
		Neutral	56	43.1	43.1	76.2
		Agree	24	18.5	18.5	94.6
		Strongly Agree	7	5.4	5.4	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	7	4.2	4.2	4.2
		Disagree	38	23.0	23.0	27.3
		Neutral	71	43.0	43.0	70.3
		Agree	44	26.7	26.7	97.0
		Strongly Agree	5	3.0	3.0	100.0
		Total	165	100.0	100.0	

It is easy for me to remember how to use the online registration system						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	1	.8	.8	.8
		Disagree	17	13.1	13.1	13.8
		Neutral	53	40.8	40.8	54.6
		Agree	37	28.5	28.5	83.1
		Strongly Agree	22	16.9	16.9	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	5	3.0	3.0	3.0
		Disagree	11	6.7	6.7	9.7
		Neutral	62	37.6	37.6	47.3
		Agree	75	45.5	45.5	92.7
		Strongly Agree	12	7.3	7.3	100.0
		Total	165	100.0	100.0	

Table 4.13

My interaction with the online registration system is clear and understandable						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	1	.8	.8	.8
		Disagree	8	6.2	6.2	6.9
		Neutral	49	37.7	43.8	44.6
		Agree	57	43.8	43.8	88.5
		Strongly Agree	15	11.5	11.5	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	3	1.8	1.8	1.8
		Disagree	12	7.3	7.3	9.1
		Neutral	70	42.4	42.4	51.2
		Agree	65	39.4	39.4	90.9
		Strongly Agree	15	9.1	9.1	100.0
	Total		165	100.0		

Table 4.14

I find it takes a lot of effort to know how to use the online registration						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	9	6.9	6.9	6.9
		Disagree	31	23.8	23.8	30.8
		Neutral	53	40.8	40.8	71.5
		Agree	34	26.2	26.2	97.7
		Strongly Agree	3	2.3	2.3	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	7	4.2	4.2	4.2
		Disagree	64	38.8	38.8	43.0
		Neutral	55	33.3	33.3	76.4
		Agree	34	20.6	20.6	97.0
		Strongly Agree	5	3.0	3.0	100.0
		Total	165	100.0	100.0	

Table 4.15

I find it easy to get the online registration system to do what I want it to do						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	7	5.4	5.4	5.4
		Disagree	33	25.4	25.4	30.8
		Neutral	54	41.5	41.5	72.3
		Agree	33	25.4	25.4	97.7
		Strongly Agree	3	2.3	2.3	100.0
		Total	130	100.0	100.0	
BTech	Valid	Disagree	20	12.1	12.1	12.1
		Neutral	75	45.5	45.5	57.6
		Agree	57	34.5	34.5	92.1
		Strongly Agree	13	7.9	7.9	100.0
		Total	165	100.0	100.0	

Table 4.16

I am satisfied with how quick the online registration page loads						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	12	9.2	9.2	9.2
		Disagree	19	14.6	14.6	23.8
		Neutral	50	38.5	38.5	62.3
		Agree	34	26.2	26.2	88.5
		Strongly Agree	15	11.5	11.5	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	6	3.6	3.6	3.6
		Disagree	44	26.7	26.7	30.3
		Neutral	61	37.0	37.0	67.3
		Agree	44	26.7	26.7	93.9
		Strongly Agree	10	6.1	6.1	100.0
		Total	165	100.0	100.0	

Table 4.17

Information Quality: Tables 4.18 – 4.21

Information displayed on the online registration system is easy to understand						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	4	3.1	3.1	3.1
		Disagree	10	7.7	7.7	10.8
		Neutral	48	36.9	36.9	47.7
		Agree	52	40.0	40.0	87.7
		Strongly Agree	16	12.3	12.3	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	1	.6	.6	.6
		Disagree	14	8.5	8.5	9.1
		Neutral	70	42.4	42.4	51.5
		Agree	69	41.8	41.8	93.3
		Strongly Agree	11	6.7	6.7	100.0
		Total	165	100.0	100.0	

Table 4.18

The information on the online registration system is always accurate						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	4	3.1	3.1	3.1
		Disagree	14	10.8	10.8	13.8
		Neutral	63	48.5	48.5	62.3
		Agree	33	25.4	25.4	87.7
		Strongly Agree	16	12.3	12.3	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	2	1.2	1.2	1.2
		Disagree	30	18.2	18.2	19.4
		Neutral	83	50.3	50.3	69.7
		Agree	39	23.6	23.6	93.3
		Strongly Agree	11	6.7	6.7	100.0
		Total	165	100.0	100.0	

Table 4.19

The information on the online registration system is always timely						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	3	2.3	2.3	2.3
		Disagree	19	14.6	14.6	16.9
		Neutral	65	50.0	50.0	66.9
		Agree	32	24.6	24.6	91.5
		Strongly Agree	11	8.5	8.5	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	2	1.2	1.2	1.2
		Disagree	24	14.5	14.5	15.8
		Neutral	82	49.7	49.7	65.5
		Agree	52	31.5	31.5	97.0
		Strongly Agree	5	3.0	3.0	100.0
		Total	165	100.0	100.0	

Table 4.20

The information on the online registration system is usually relevant						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Disagree	9	6.9	6.9	6.9
		Neutral	50	38.5	38.5	45.4
		Agree	61	46.9	46.9	92.3
		Strongly Agree	10	7.7	7.7	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	1	.6	.6	.6
		Disagree	12	7.3	7.3	7.9
		Neutral	78	47.3	47.3	55.2
		Agree	63	38.2	38.2	93.3
		Strongly Agree	11	6.7	6.7	100.0
		Total	165	100.0	100.0	

Table 4.21

Service Quality: Tables 4.22 – 4.25

Support on how to use the online registration system is readily accessible						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	5	3.8	3.8	3.8
		Disagree	20	15.4	15.4	19.2
		Neutral	57	43.8	43.8	63.1
		Agree	41	31.5	31.5	94.6
		Strongly Agree	7	5.4	5.4	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	7	4.2	4.2	4.2
		Disagree	35	21.2	21.2	25.5
		Neutral	74	44.8	44.8	70.3
		Agree	42	25.5	25.5	95.8
		Strongly Agree	7	4.2	4.2	100.0
		Total	165	100.0	100.0	

Table 4.22

The support staff that assist with online registration are very reliable						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	13	10.0	10.0	10.0
		Disagree	28	21.5	21.5	31.5
		Neutral	51	39.2	39.2	70.8
		Agree	28	21.5	21.5	92.3
		Strongly Agree	10	7.7	7.7	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	11	6.7	6.7	6.7
		Disagree	30	18.2	18.2	24.8
		Neutral	91	55.2	55.2	80.0
		Agree	32	19.4	19.4	99.4
		Strongly Agree	1	.6	.6	100.0
		Total	165	100.0	100.0	

Table 4.23

The support staff are quick to respond to complaints						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	23	17.7	17.7	17.7
		Disagree	29	22.3	22.3	40.0
		Neutral	53	40.8	40.8	80.8
		Agree	17	13.1	13.1	93.8
		Strongly Agree	8	6.2	6.2	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	12	7.3	7.3	7.3
		Disagree	47	28.5	28.5	35.8
		Neutral	80	48.5	48.5	84.2
		Agree	21	12.7	12.7	97.0
		Strongly Agree	5	3.0	3.0	100.0
		Total	165	100.0	100.0	

Table 4.24

The support staff are technically competent to attend to issues that arise						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	8	6.2	6.2	6.2
		Disagree	20	15.4	15.4	21.5
		Neutral	61	46.9	46.9	68.5
		Agree	32	24.6	24.6	93.1
		Strongly Agree	9	6.9	6.9	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	8	4.8	4.8	4.8
		Disagree	27	16.4	16.4	21.2
		Neutral	96	58.2	58.2	79.4
		Agree	30	18.2	18.2	97.6
		Strongly Agree	4	2.4	2.4	100.0
		Total	165	100.0	100.0	
	Total		165	100.0		

Table 4.25

Technological and Infrastructural Issues: Tables 4.26 – 4.29

Unstable power supply is a major challenge during registration						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	9	6.9	6.9	6.9
		Disagree	35	26.9	26.9	33.8
		Neutral	43	33.1	33.1	66.9
		Agree	22	16.9	16.9	83.8
		Strongly Agree	21	16.2	16.2	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	13	7.9	7.9	7.9
		Disagree	51	30.9	30.9	38.8
		Neutral	66	40.0	40.0	78.8
		Agree	25	15.2	15.2	93.9
		Strongly Agree	10	6.1	6.1	100.0
		Total	165	100.0	100.0	

Table 4.26

Lack of ample internet facilities around the university affects user satisfaction						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	3	2.3	2.3	2.3
		Disagree	18	13.8	13.8	16.2
		Neutral	44	33.8	33.8	50.0
		Agree	31	23.8	23.8	73.8
		Strongly Agree	34	26.2	26.2	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	8	4.8	4.8	4.8
		Disagree	11	6.7	6.7	11.5
		Neutral	31	18.8	18.8	30.3
		Agree	76	46.1	46.1	76.4
		Strongly Agree	39	23.6	23.6	100.0
		Total	165	100.0	100.0	

Table 4.27

Poor internet connection during registration limits user satisfaction						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	6	4.6	4.6	4.6
		Disagree	10	7.7	7.7	12.3
		Neutral	31	23.8	23.8	36.2
		Agree	37	28.5	28.5	64.6
		Strongly Agree	46	35.4	35.4	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	9	5.5	5.5	5.5
		Disagree	17	10.3	10.3	15.8
		Neutral	27	16.4	16.4	32.1
		Agree	70	42.4	42.4	74.5
		Strongly Agree	42	25.5	25.5	100.0
		Total	165	100.0	100.0	

Table 4.28

Slow system speed is a challenge during registration						
Which year of study are you currently?			Frequency	Percent	Valid Percent	Cumulative Percent
1st year	Valid	Strongly Disagree	5	3.8	3.8	3.8
		Disagree	9	6.9	6.9	10.8
		Neutral	25	19.2	19.2	30.0
		Agree	41	31.5	31.5	61.5
		Strongly Agree	50	38.5	38.5	100.0
		Total	130	100.0	100.0	
BTech	Valid	Strongly Disagree	7	4.2	4.2	4.2
		Disagree	9	5.5	5.5	9.7
		Neutral	27	16.4	16.4	26.1
		Agree	68	41.2	41.2	67.3
		Strongly Agree	54	32.7	32.7	100.0
		Total	165	100.0	100.0	

Table 4.29

The diagrams that follow draw from the above tables for section two of the questionnaire. The questions in this section were split to represent system quality, information quality, service quality and technological and infrastructural issues. The diagrams below were split to represent the respondents' perceptions of these constructs.

System Quality – Question 9-17

Question 9.

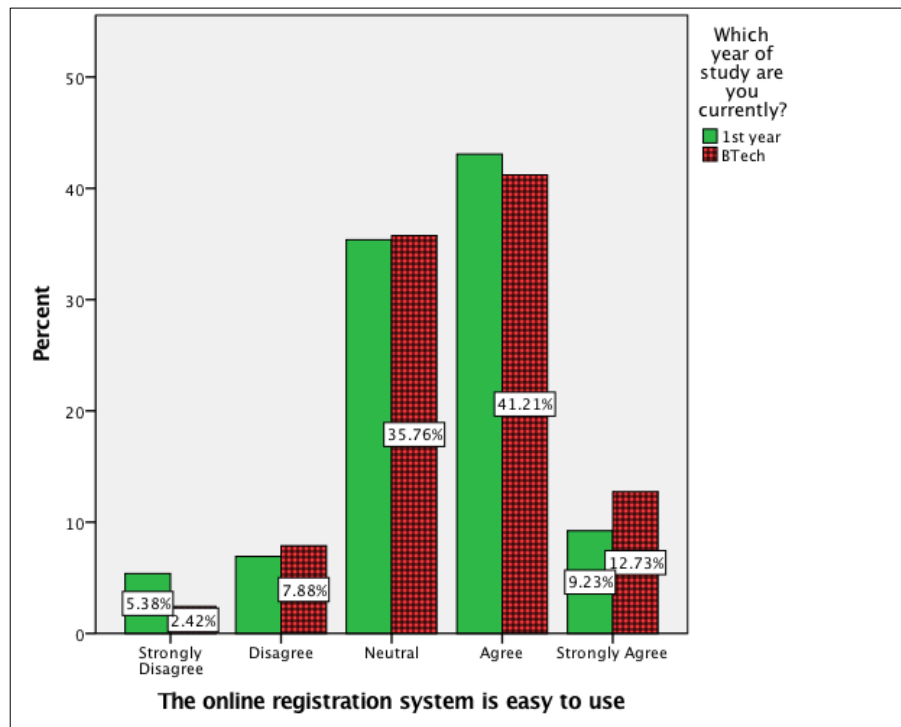


Figure 4.9

Figure 4.9 above shows the respondents perceptions regarding ease of use of the online registration system. The DeLone & McLean (2003) updated IS success model highlights system quality in terms of the characteristics of the system. The results show differences in perceptions on both extremes, strongly disagree and strongly agree. Most of the respondents however, for both groups have responded with either Neutral or Agree. The respondents who indicated that they agreed are more compared to those who disagreed. 43.1% of first years and 41.2% BTech respondents agreed that the system was easy to use. A correlation can be derived from Figure 4.5 that describes the users experience with technology in general where more first year and BTech respondents indicated that they are either intermediate or advanced users. The online registration system can therefore be considered easy to use for the intermediate and advanced users. Udofia (2015) in her findings revealed that the use of online registration had a potential to greatly enhance ICT knowledge of students. 16.92% first year and 9.7% BTech respondents indicated that they were novice users which can be the reason why 5.4% first year and 2.4% of BTech respondents Strongly Disagree with

ease of use of the system. In a similar study to assess manual and online course registration students indicated that online registration was easy to use though they preferred manual registration for correction of information as they found it difficult to do online (Oladunjoye & Omemu, 2013).

Question 10.

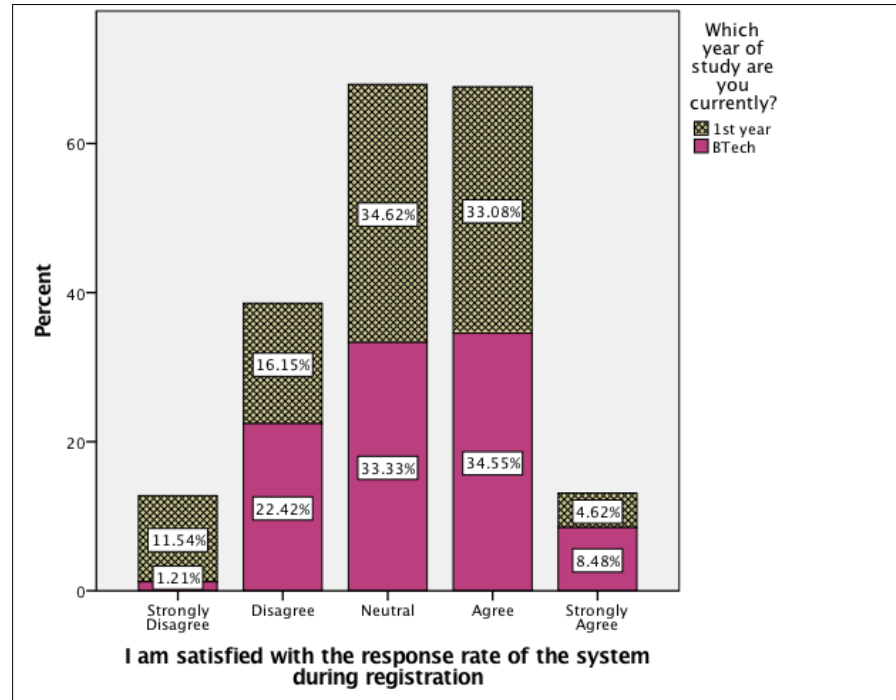


Figure 4.10

Regarding system quality, figure 4.10 above shows the respondents perceptions of the response rate whilst using the system to register. In this study, the response rate as a characteristic of the system is considered as how well the online registration system responds during use. In terms of being satisfied with the response rate, more first year and BTech respondents indicated that they were either neutral or agreed. 33.1% first year and 34.5% BTech respondents agreed, this means they were satisfied with the response rate of the system. The response rate is considered an indicator of technical system quality (Hassanzadeh et al., 2012, Ozkan & Koseler, 2009). First year, 16.1% and BTech respondents, 22.4% indicated that they disagreed and therefore were not satisfied with the response rate of the online registration system. From both groups, those who either strongly agreed or agreed were more than those who strongly disagreed or disagreed. 34.6% first year and 33.3% BTech respondents provided neutral responses. From this the researcher concluded that these are neither satisfied nor unsatisfied with the response rate of the system.

Question 11.

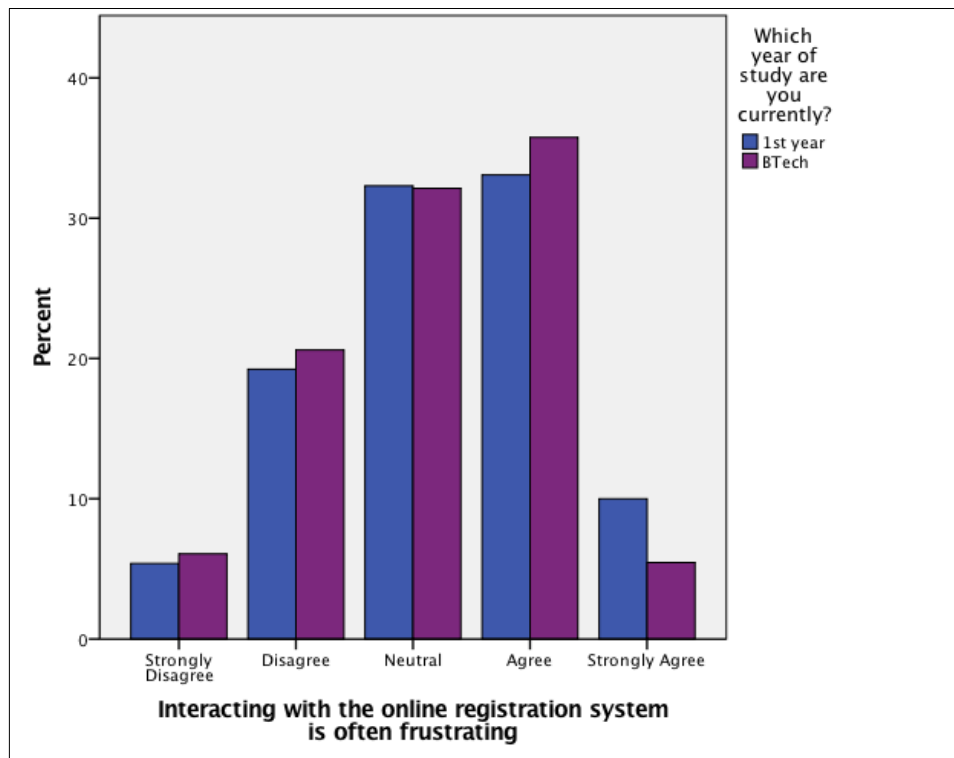


Figure 4.11

The above figure 4.11 shows respondents' perceptions regarding their interaction with the online registration system. 5.4% first year and 6.1% BTech respondents indicated that they strongly disagreed. On the other extreme, 10% first year and 5.5% BTech respondents strongly agreed that the system was often frustrating. Both groups, 33.1% first years and 35.8% BTech respondents indicated that they agreed to the system being frustrating during registration. A similar number of students from both groups marked their response as neutral. 19.2% first year and 20.6% BTech respondents disagree to the system being frustrating during registration. This similarity of respondents who disagree to the system being frustrating can be related to figure 4.9 where respondents from both groups agreed that the online registration was easy to use. This highlights a high level of satisfaction in terms of system ease of use. This concurs with Ozkan & Koseler (2009), Chen, Lambert and Guidry (2010) who highlighted interactivity as a measure for technical system quality. In a study to assess implementation of a student MIS at an institute of Technology in Ireland, it was discovered that there arose a tendency to blame the system for any complaints of the students. In the same study the system was found not to be user-friendly in nature (Carcary, Long & Remenyi, 2007).

Question 12.

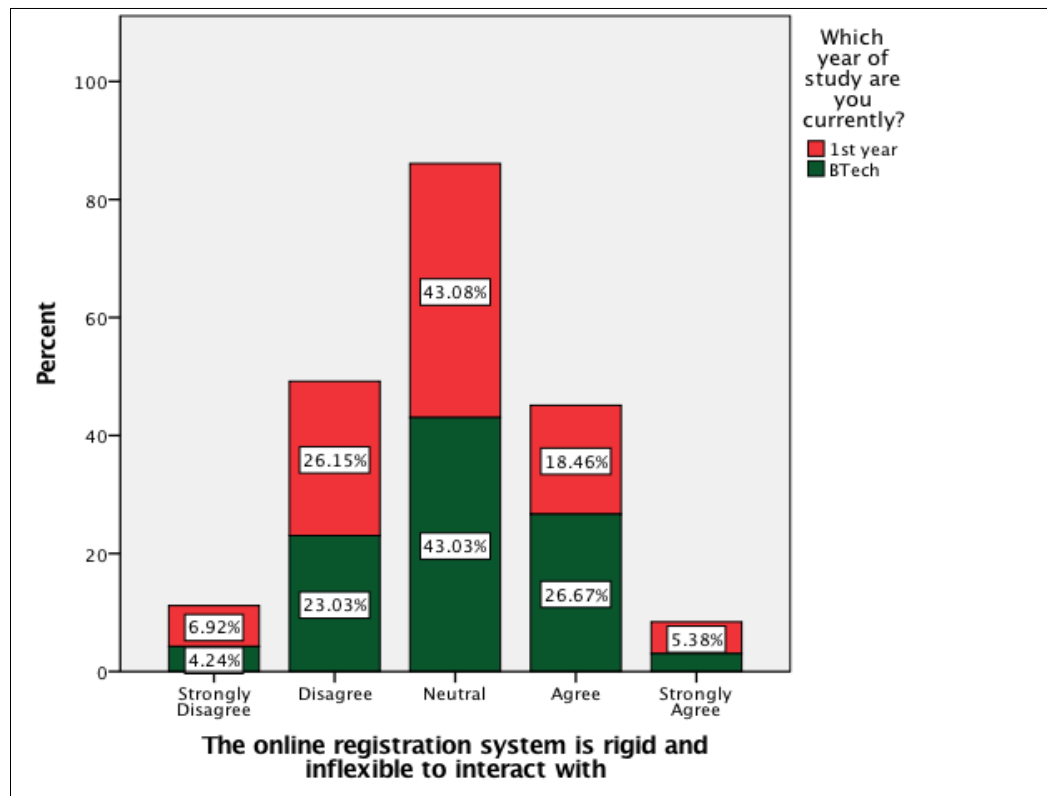


Figure 4.12

Regarding the online registration system being rigid and inflexible to interact with, figure 4.12 shows that a similar number of respondents 43% from both groups were neutral. This means they neither agreed nor disagreed. 6.92% first year and 4.24% BTech respondents indicated that they strongly disagreed. Also, 26.15% first year and 23.03 BTech respondents disagreed. 18.5% first year and 26.7% BTech agreed, whilst 5.4% first year, 3% BTech strongly agreed that the system is rigid and inflexible to interact with. This can be said to relate to the number of respondents from figure 4.11 who found interacting with the online registration system often frustrating. As suggested in the findings of Oladunjoye & Omemu (2013) , where the online registration system is considered inflexible to interact with there is a high possibility of students making errors. The interactivity of the system is highlighted as an indicator for technical system quality. (Chen et al., 2010, Ozkan & Koseler 2009).

Question 13.

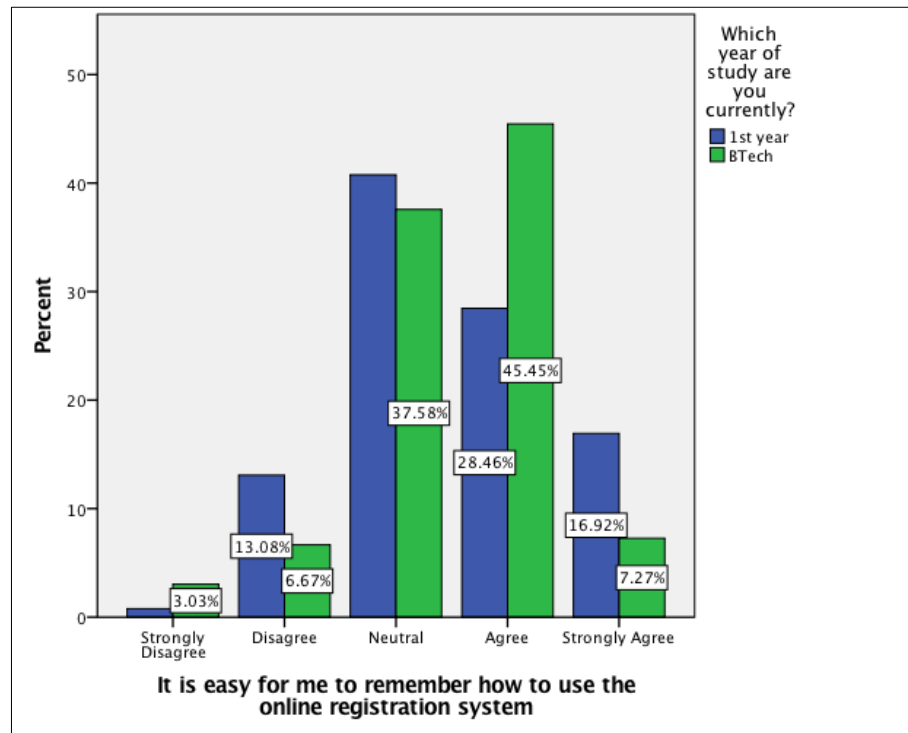


Figure 4.13

The respondents' perceptions in figure 4.13 shows that 0.8% first year 3% BTech respondents strongly disagree whilst 13% first year, 6.7% BTech disagree. This shows that these respondents do not find it easy to remember how to use the system. 40.8% first year and 37.6 BTech respondents were neutral. The first year respondents were mostly neutral to this question, this can be attributed to them having used the system for the first time. 28.46% first year, 45.45% BTech respondents agreed that it was easy to remember how to use the system. 16.92% first year and 7.27% BTech respondents indicated that they strongly agreed. More BTech respondents agreed compared to the first years. This could be because they are old users of the system and now know how to navigate it. These findings support an earlier study by Oladunjoye & Omemu (2013) who discovered that there is ease of completion of form using the online registration system. The findings also support, Shee & Wang (2010) Wang, Wang & Shee (2007), who found ease of use to be an indicator of system quality.

Question 14.

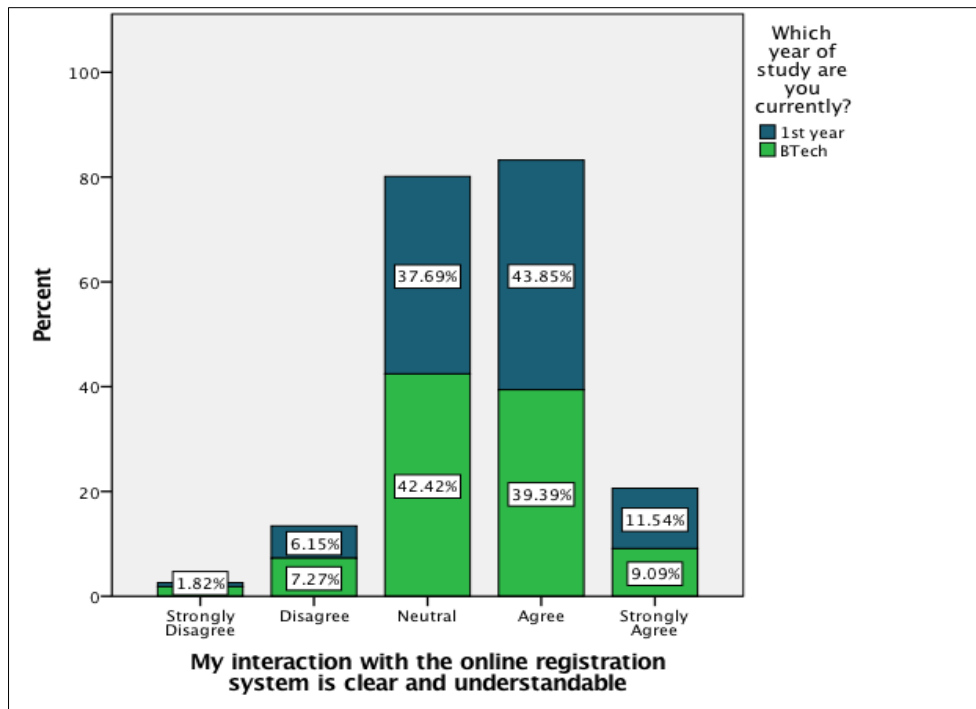


Figure 4.14

Fig 4.14 shows respondents' perceptions when interacting with the online registration system. A small number of the respondents either strongly disagreed or disagreed. 0.8% first year and 1.8 BTech strongly disagreed, 6.15% first year and 7.3% BTech disagreed. In terms of system quality this can be because these respondents found the system to be rigid and inflexible as depicted in figure 4.12. Most of the respondents from both groups were either neutral or agreed that their interaction with the system was clear and understandable. An almost similar number of respondents, 11.5% first year and 10% BTech respondents indicated that they strongly agreed. In terms of system quality this can relate to ease of use of the system where respondents from both groups indicated that they were neutral or agreed that the system was easy to use figure 4.9. As noted in similar studies, ease of use and interactivity are necessary factors for system quality (Ozkan & Koseler, 2009, Wang et al., 2007, Shee & Wang, 2010).

Question 15.

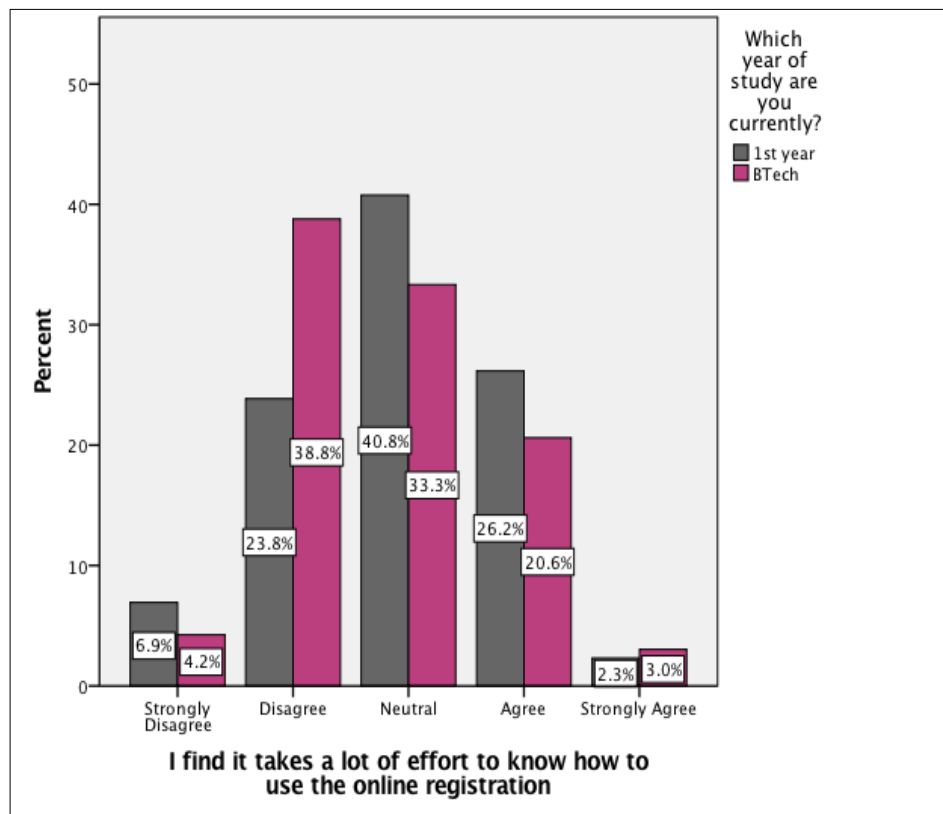


Figure 4.15

The results of figure 4.15 above can be considered related to figure 4.14, 6.9% first year and 4.2% BTech respondents strongly disagree whilst 23.8% first year and 38.8% BTech respondents disagreed that it takes a lot of effort to know how to use the online registration system. In relation to figure 4.14 the respondents from both groups indicated that the system was clear and understandable and therefore as seen in these results of figure 4.15 it does not take a lot of effort to know how to use the system. 40.8% first year and 33.3% BTech respondents were neutral. Some of the respondents however indicated that it takes a lot of effort to know how to use the system. 26.2% first year, 20.6% BTech, agreed whilst 2% and 3% first year and BTech respondents respectively strongly agreed. Those who either agreed or strongly agreed could be because it is not easy for them to remember how to use the system as depicted by the results in figure 4.13. Similarly, Ajayi in Oladunjoye & Omemu (2013) noted that those students who experience difficulty or who are prone to errors when using the online registration system are highly likely not to have a solid background with computers in general.

Question 16.

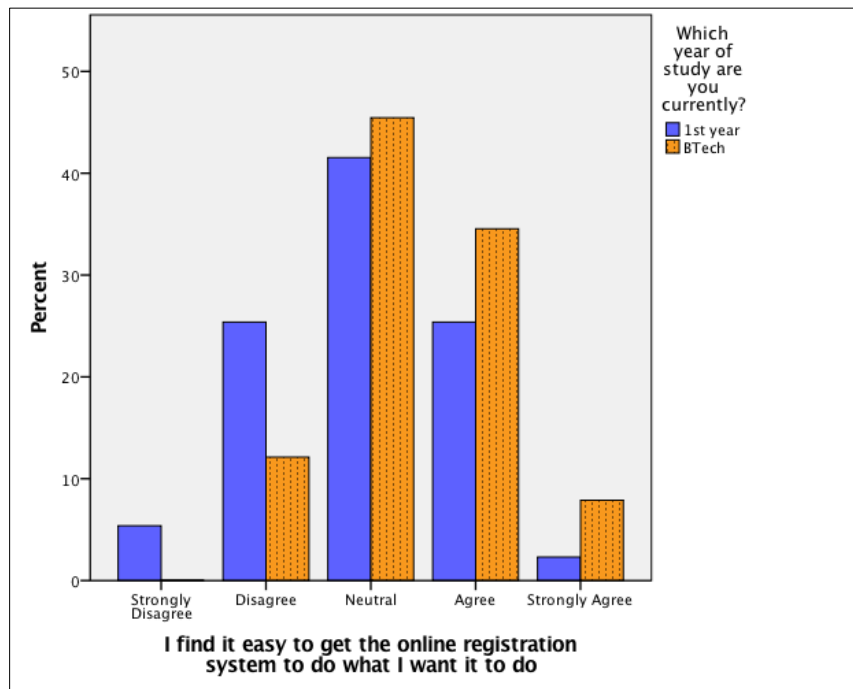


Figure 4.16

Figure 4.16 shows the respondents perceptions regarding whether they find it easy to get the online registration system to do what they want it to do. 5.4% first year respondents strongly disagreed, none of the BTech respondents strongly disagreed to this question. 25.4% first year and 12.1% BTech respondents disagreed, indicating that at some point in using the online registration system they could not get it to do what they wanted. This can be attributed to the response rate of the system, which would result in them finding the system frustrating to use. Most of the respondents from both groups were neutral, 41.5% first year and 45.5% BTech respondents. More BTech respondents, 34.5% and 7.9% indicated that they agreed and strongly agreed whilst 25.4% and 2.3% first year agreed and strongly agreed. In terms of system quality this can be considered ease of use Wang *et al.* (2007), those who either agreed or strongly agreed are more likely to enjoy the response rate of the system as seen in figure 4.10.

Question 17.

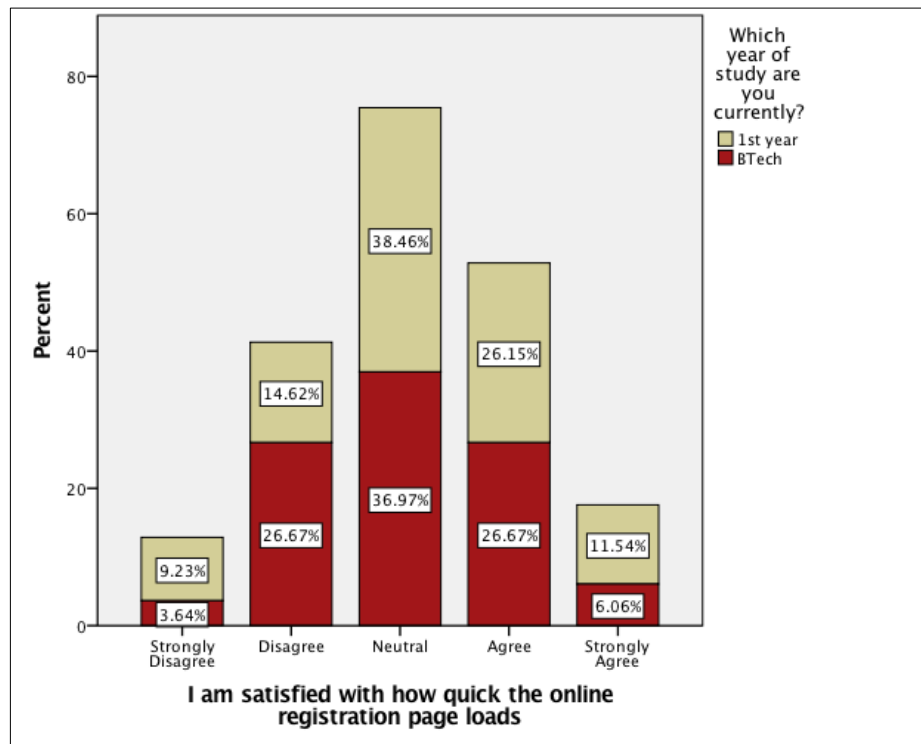


Figure 4.17

Regarding the respondents' satisfaction with how satisfied they were with how quick the online registration page loads, the results in figure 4.17 above shows that 9.2% first year and 3.6% BTech respondents strongly disagreed. 14.6% first year and 26.7% BTech respondents disagreed. These respondents' perceptions indicate that they were not satisfied with the response rate of the online registration system. There can be said to be a correlation with figure 4.10 where an almost similar number of respondents indicated that they were not satisfied with the response rate of the online registration system. More respondents from groups, 38.5% first year and 37% BTech indicated that they were neutral. A similar number of respondents from both groups, 26% first year and 27% BTech agreed that they were satisfied. More first year respondents 11.5% indicated that they strongly agreed whilst 6.1% BTech respondents strongly agreed. It is most likely that the first year students found the online registration system easy to use as indicated by the results in figure 4.9.

Question 18

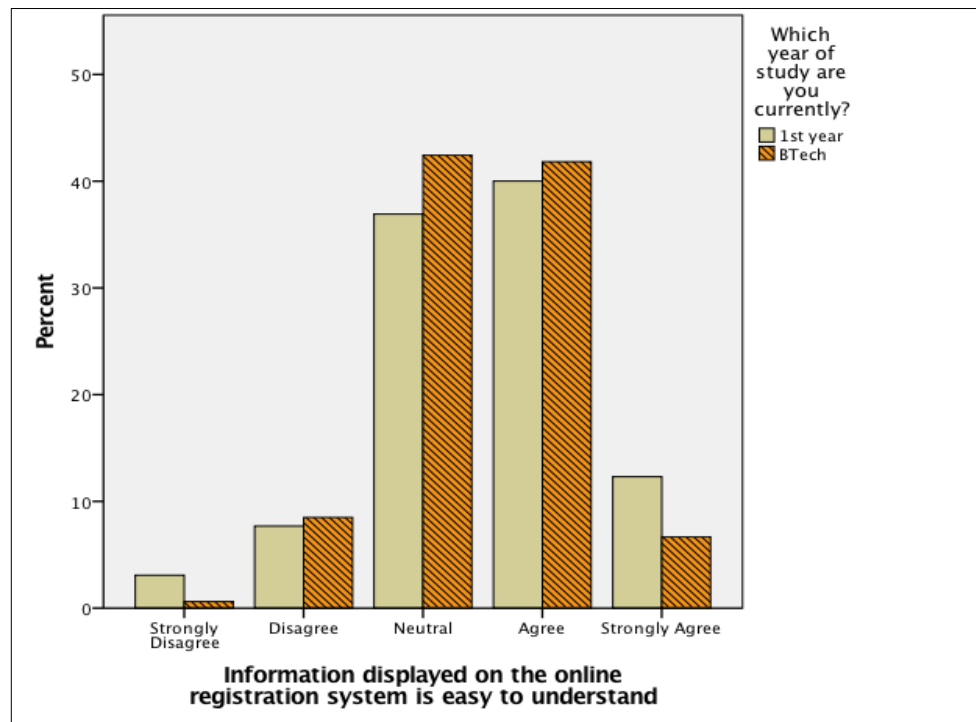


Figure 4.18

Figure 4.18 above shows respondents' perceptions regarding how information displayed on the online registration system is easy to understand. From both groups a small number of respondents either strongly disagreed or disagreed. 3.1% first year, 0.6% BTech respondents strongly disagreed. 7.7% first year and 8.5% BTech respondents disagreed. These respondents have indicated that the information on the online registration system is not easy to understand. This can be attributed to their experience with technology in general. Most of the respondents from both groups were either neutral or agreed that the information displayed was easy to understand. 12.3% first year and 6.7% BTech respondents strongly agreed to this question. As most of the students from both groups agreed or were neutral it is likely that the information on the online registration system is easy to understand. In a study by Ozkan & Koseler (2009), they indicated that information on a system should be organized content that the user clearly understands.

Question 19

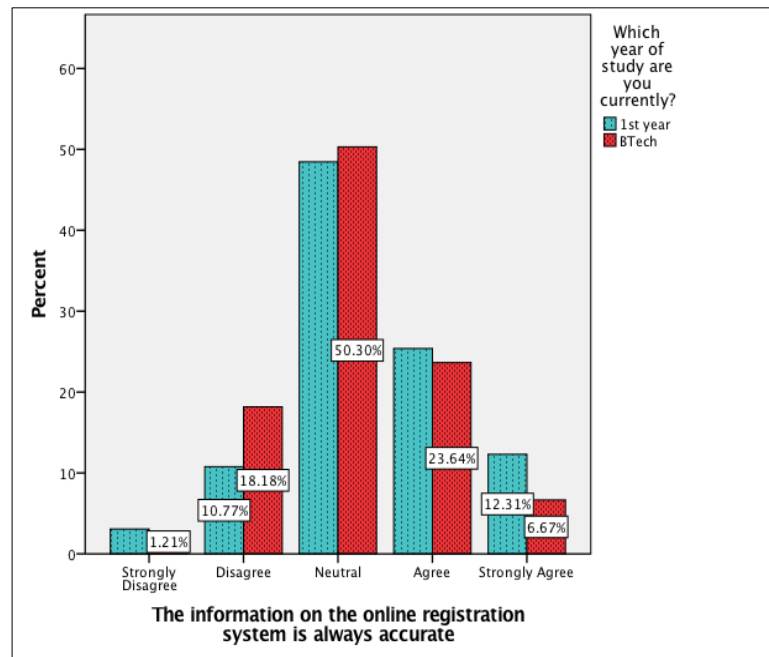


Figure 4.19

Figure 4.19 above shows respondents' perceptions regarding the accuracy of the information displayed on the online registration system. Accuracy in this regard is determining whether the information is reliable for the user (Markgraf, n.d.). 3.1% first year, 1.2% BTech respondents strongly disagreed. 10.8% first year and 18.2% BTech respondents disagreed. These respondents have indicated that the information on the online registration system is not always accurate. According to (Markgraf, n.d.) the data source always determines whether the information is reliable or not. These students are most likely to have disagreed because the information displayed would not have been up to date. Most of the respondents from both groups maintained a neutral position regarding the question whether the information displayed was always accurate. 48.5% first year and 50.3% BTech respondents were neutral. 25.4% first year, 23.6% BTech respondents agreed that the information was always accurate. 12.3% first year and 6.7% BTech respondents strongly agreed to this question. In terms of the secondary objective, to determine if online registration makes registration easier for users, information accuracy would allow the students to register with ease. As stated by Lin (2007), Wang & Wang (2009) accurate content and information are essential, this limits any confusion for the end user.

Question 20

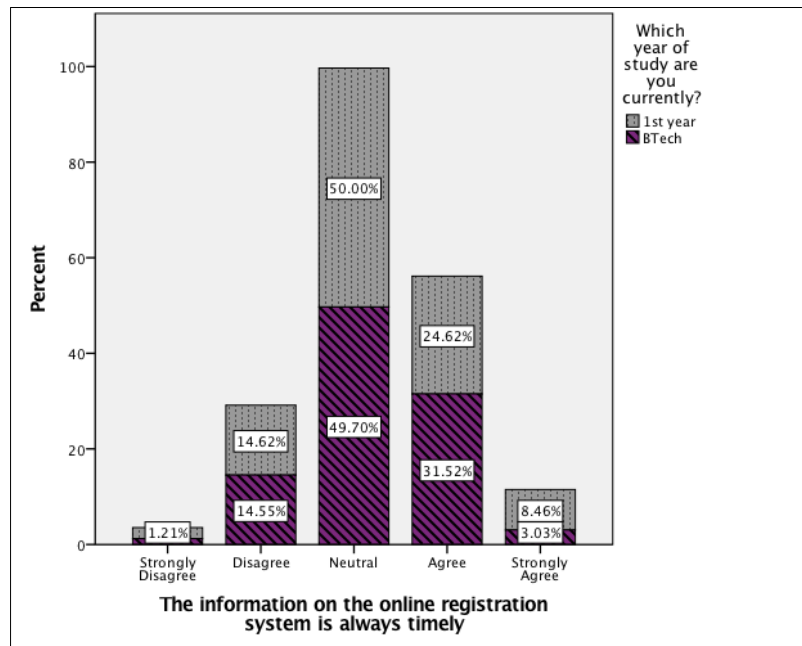


Figure 4.20

The timeliness of an information system means the output is current. The information the students view such as, program of study, modules, tuition fees should be current. Figure 4.20 above shows respondents perceptions regarding timeliness of the information on the online registration system. 2.3% first year, 1.2% BTech respondents strongly disagreed. 14.6% first year and 14.5% BTech respondents disagreed. These respondents have indicated that the information on the online registration system is not always timely. When information is not current it results in students having to get this amended before proceeding with online registration which in turn results in the students being frustrated. This becomes one of the challenges associated with online registration. As indicated by Wang *et al.* (2007) timely content and information are indicators for measuring information quality. Most of the respondents from both groups were neutral that the information on the system was always timely 50% first year and 49.7% BTech respondents were neutral. 24.6% first year, 31.5% of BTech respondents agreed that the information was always timely. 8.5% first year and 3% BTech respondents strongly agreed to this question.

Question 21.

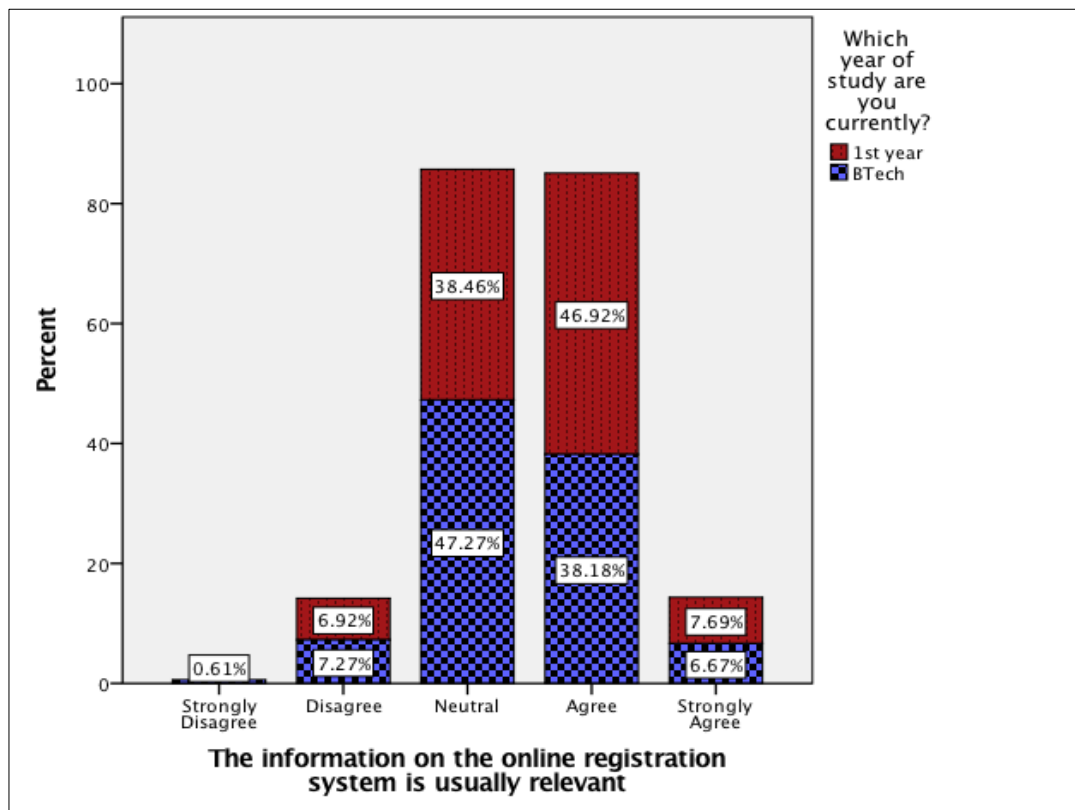


Figure 4.21

Figure 4.21 above shows respondents' perceptions regarding the relevance of the information on the online registration system. From both groups, a small number of respondents either strongly disagreed or disagreed. None of the first-year respondents strongly disagreed, whilst 0.6% BTech respondents strongly disagreed. 6.9% first-year and 15.4% BTech respondents disagreed. These respondents have indicated that the information on the online registration system is not usually relevant. 38.5% first-year and 47.3% BTech respondents were neutral. 46.9% first-year, 38.2% BTech respondents agreed that the information was usually relevant. 7.7% first-year and 6.7% BTech respondents strongly agreed to the information on the online registration system being relevant. Information quality on the updated D&M IS success model measures "semantic success," which is the quality of information stored and produced. According to DeLone & McLean (2003), information quality has an effect on user satisfaction and the user's intention to use the system. Lin (2007), Wang *et al.* (2007) also state that the system should have useful content and information for its end-users.

Question 22.

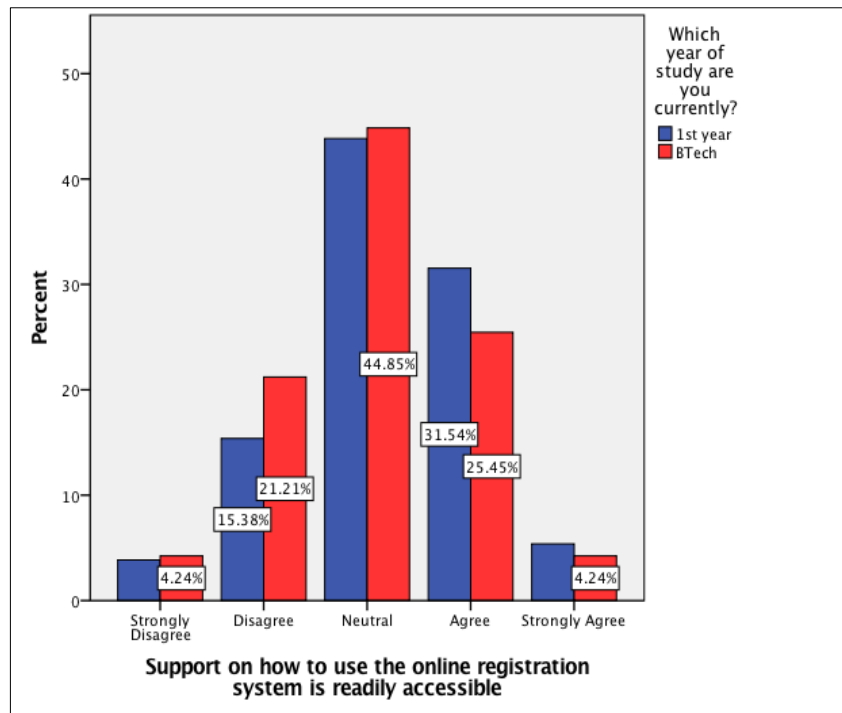


Figure 4.22

Figure 4.22 above shows respondents perceptions on how accessible the online registration support is for the students. From both groups a small number of respondents strongly disagreed, 3.8% first year and 4.2% BTech respondents. 15.4% first year and 21.2% BTech respondents disagreed to this meaning that they did not think that the support on how to use the online registration system was readily accessible. This can be in relation to the students who indicated that they were not familiar with the online registration support provided by the UoT. In figure 4.8 some students from both groups indicated that they were not familiar with the support provided and therefore if this is the case they are most likely to strongly disagree or disagree to this question. 43.8% first year and 44.8% BTech respondents were neutral in their responses to this question. 31.54% first year and 25.5% BTech respondents agreed that the support is readily accessible, whilst 5.4% first year and 4.2% BTech respondents strongly agreed. It is most likely that those who were either, neutral, agreed or strongly agreed were familiar with the support provided by the UoT. This is because from the results obtained in figure 4.8 more than half of the respondents from both groups indicated that they were familiar with the support provided by the UoT.

Question 23

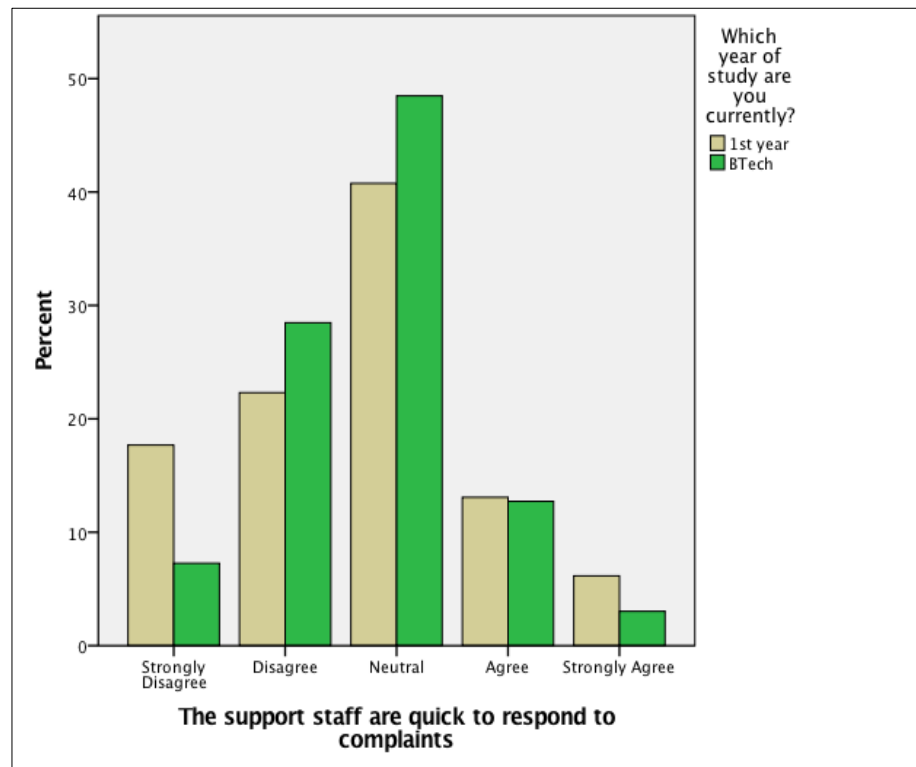


Figure 4.23

This question attempted to determine speed at which support was provided. Figure 4.23 above shows respondents perceptions regarding whether the support staff are quick to respond to complaints. More first year students strongly disagreed 17.8% compared to BTech students, 7.3%. 22.3% first years and 28.5% BTech students disagreed to this question. This means that they did not think that the support staff were quick to respond to their complaints. This can be because the support staff that are stationed at the registration points are not enough to meet the number of students that are registering at a given time. The speed at which service is provided is important as this is one of the aspects to determine user satisfaction (Lin, 2007). 40.8% first year and 48.5% BTech respondents were neutral in their responses to this question. It is clear from figure 4.23 above that both groups had low numbers of students who either agreed or strongly agreed to the support staff being quick in their response. 13.15% first year and 12.7% BTech students agreed, whilst 6.2% first year and 3% BTech students strongly agreed. In terms of service quality this highlights a need to be quicker in responding to the end users in order to achieve user satisfaction. According to DeLone & McLean (2003) service quality, along with system quality and information quality have an impact on user satisfaction with the system.

Question 24

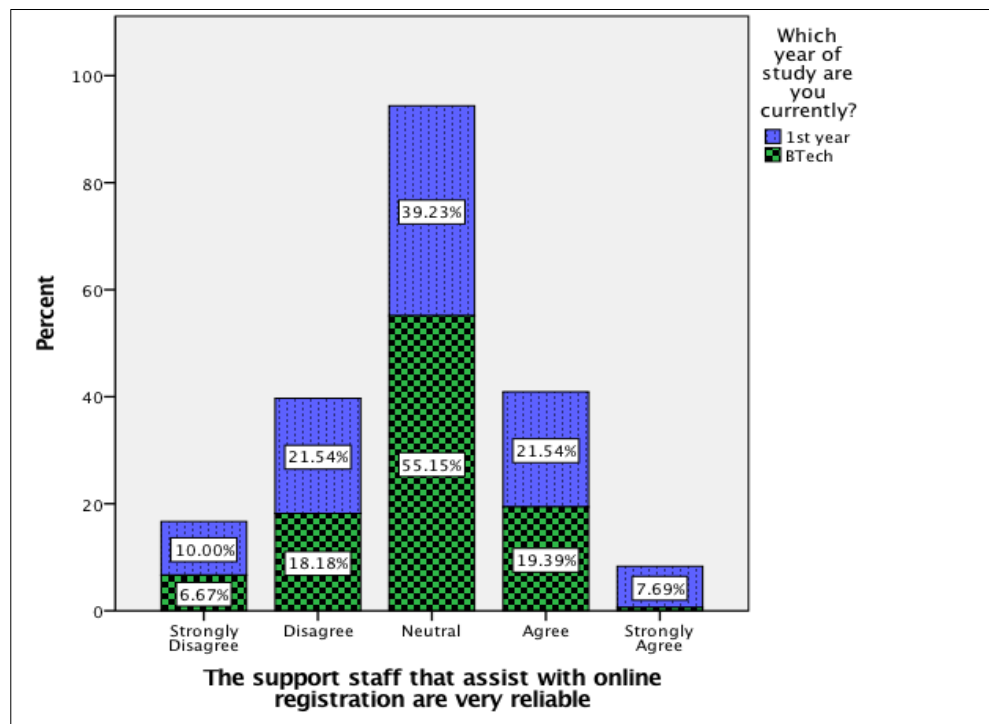


Figure 4.24

Figure 4.24 above shows respondents perceptions regarding the reliability of the support staff during registration. 10% first year and 6.7% BTech students strongly disagreed. 21.5% first year and 18.1% BTech students disagreed, meaning that they did not find the support staff to be reliable during the registration period. This reliability can be in terms of questions asked to the support staff or as indicated in figure 4.22 the staff is not easily accessible. 39.2% first year and 55.15% BTech respondents were neutral in their responses to this question. 21.5% first year and 19.4% BTech students agreed whilst 7.7% first year and 0.6% BTech students strongly agreed. A correlation between the respondents who either agreed or strongly agreed that the staff was reliable with those who indicated in figure 4.23 that the staff are quick to respond to complaints. The staff being quick to respond to complaints can be considered a way of being reliable, as noted by Wang et al., (2007), Ozkan & Koseler (2009) therefore able to provide guidance.

Question 25.

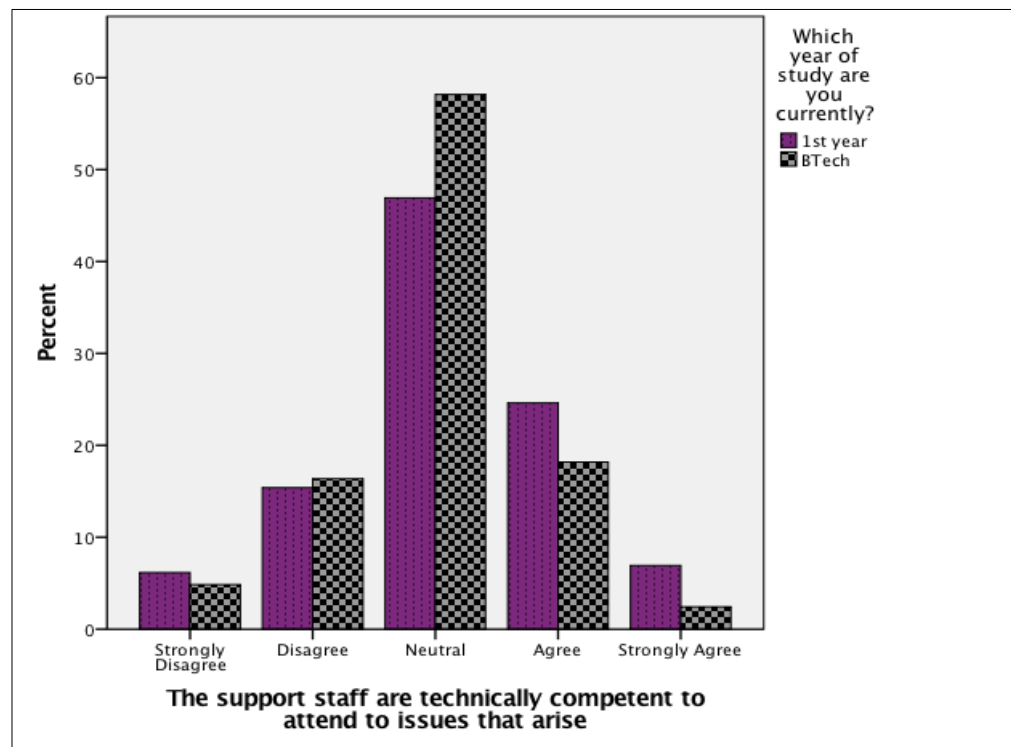


Figure 4.25

Figure 4.25 above, attempted to highlight the student's perceptions regarding the competency of the support staff during registration. 6.2% first year and 4.8% BTech students strongly disagreed. 15.4% first year and 16.4% BTech students disagreed, meaning that they did not find the support staff to be competent to attend to issues that arise during registration. These perceptions can be as a result of staff not being well trained as to how they can handle issues. However, it is also evident from the results that 24.6% first year and 18.2% BTech students agree whilst 6.9% first year and 2.4% BTech strongly agreed. This is slightly more compared to the students who indicated that they either strongly disagree or disagreed. In terms of the training provided for the support staff by the university this shows that there is competency in handling issues that arise. The responsiveness of the staff to issues that arise DeLone & McLean (2003) can be considered a form of reliability. Where the staff is competent they are able to provide a reliable service to the users to ensure user satisfaction.

Question 26.

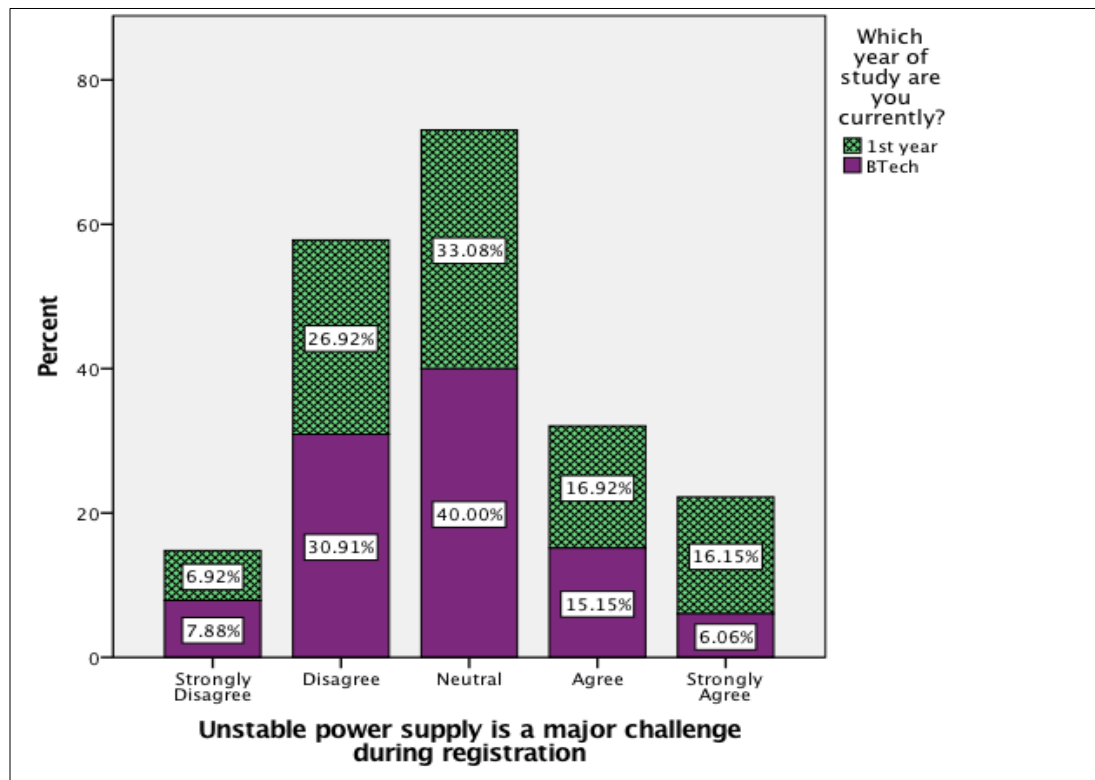


Figure 4.26

Figure 4.26 above, highlights the student's perceptions regarding unstable power supply as a challenge during registration. 6.9% first year and 7.8% BTech students strongly disagreed. 26.9% first year and 30.9% BTech students disagreed, meaning that they did not find unstable power supply as a major challenge during registration. It is likely that an institution this big has backup generators should there be unstable power supply. Most of the respondents were neutral in their perceptions, 33.8% first year and 40% BTech students. However, it is also evident from the results that 17% first year and 15% BTech students agree whilst 16.5% first year and 6% BTech strongly agreed. More of the first time users either agreed or strongly agreed compared to the old users of the system.

Question 27.

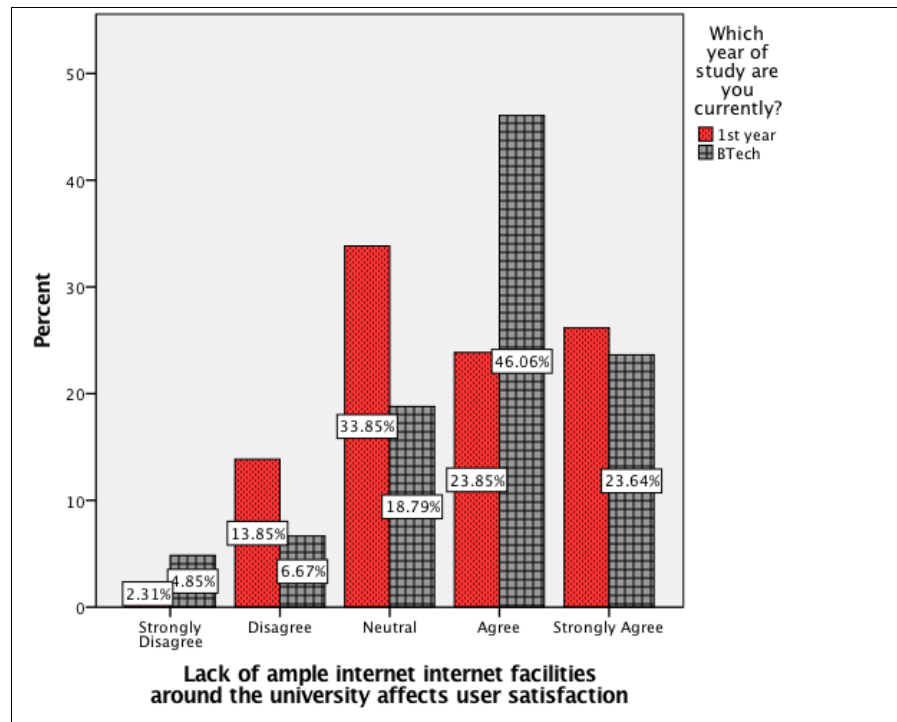


Figure 4.27

Figure 4.27 above, highlights the student's perceptions regarding the availability of internet facilities used for students' registration. From both groups there were a small number of students who either disagreed or agreed to this notion. 2.3% first year and 4.8% BTech students strongly disagreed whilst 13.8% first year and 6.7% BTech students disagreed. The reason behind this could be that, some of these students managed to register off campus and therefore would not have thought there was a lack of internet facilities. This can also be a reflection of those students who indicated that it took them less effort to use the online registration system (figure 4.15) therefore they would have gone through the online registration much quicker. 33.8% first year and 18.8% BTech students were neutral in their responses. More BTech students 46% compared to first year students 23.8% agreed that there was a lack of internet facilities around the university. Despite that the first year students were allowed to register before returning students the results show that 26.2% first year and 23.5% BTech students strongly agreed. This can be said to be one the result in the queues observed during registration. These findings are similar to a study done by Udofia (2015) who suggested that students should have a personal computer to aid quick and convenient access to the university website for online registration and other purposes. However, it is important to consider

that not all the students would be able to afford a laptop. Laptop facilities could be introduced by the university.

Question 28.

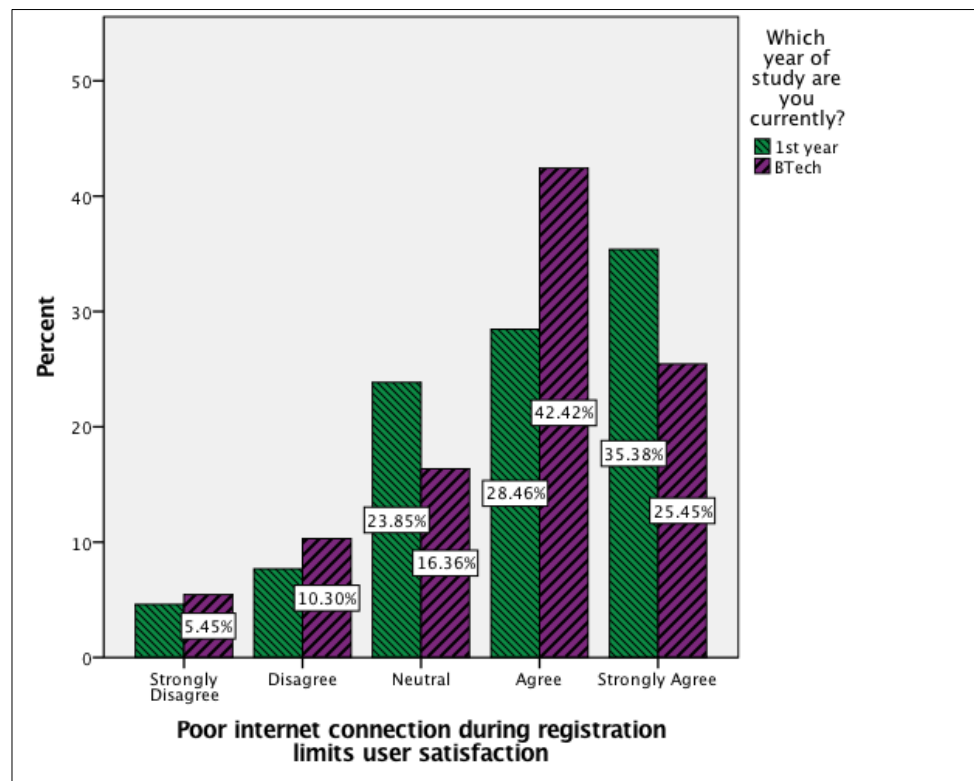


Figure 4.28

Figure 4.28 above, highlights the student's perceptions regarding internet connection during registration. From both groups a small number of students either disagreed or agreed to this view. 4.6% first year and 5.5% BTech students strongly disagreed whilst 7.7% first year and 10.3% BTech students disagreed. The reason behind this could be as suggested above that, some of these students managed to register off campus. These results can also be a reflection of those students who indicated that they were satisfied with the response rate of the system (figure 4.10). 23.8% first year and 16.4% BTech students were neutral in their responses. More BTech students 42.4% compared to first year students 28.5% agreed that poor internet connection during registration limits user satisfaction. 35.4% first year and 25.5 BTech students strongly agreed. The results show that most of the students from both groups either agreed or strongly agreed. Poor internet connection can be caused by router configuration errors, internet worms – this requires the antivirus to always be updated, applications that run in the background (Mitchell, 2017).

Question 29

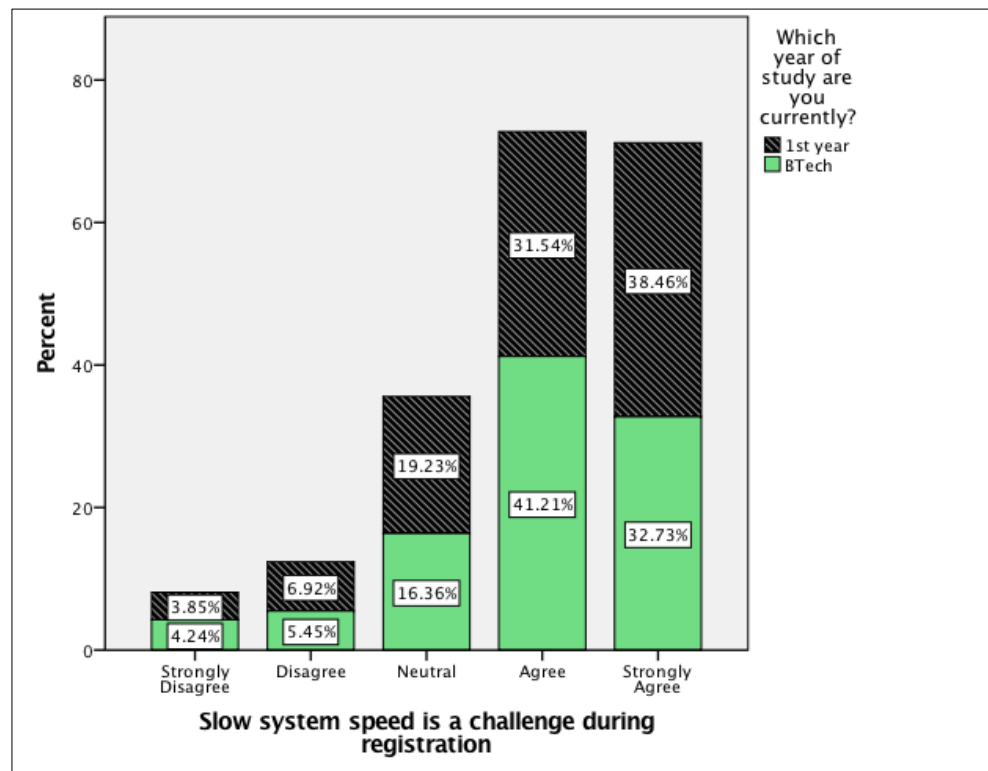


Figure 4.29

Figure 4.29 above, highlights the student's perceptions regarding slow system speed during registration. From both groups there were small number of students who either disagreed or agreed to this view. 3.9% first year and 4.2% BTech students strongly disagreed whilst 6.9% first year and 5.4% BTech students disagreed. The reason behind this could be that the students registered off campus. As suggested above this can be a reflection of those students who indicated that they were satisfied with the response rate of the system (figure 4.10). 19.2% first year and 16.4% BTech students were neutral in their responses. From both groups there is a similarity in the responses obtained from those who either agreed or strongly agreed. 31.5% first year and 41.2% BTech students agreed. 38.5% first year and 32.7% BTech students strongly agreed to this notion. This can be because the number of students that are using the system is more than the system can accommodate. Slow system speed can be caused by applications that run in the background, hardware conflicts and outdated drivers or outdated software(Mitchell, 2017).

4.5. ADDITIONAL COMMENTS OBTAINED FROM QUESTIONNAIRES

Below are comments that appeared on some of the questionnaires were students were asked to provide suggestions or comments on the online registration system. These were copied verbatim. The aim was to get more insight from the respondents regarding their perceptions.

First year comments/suggestions

Online registration is very easy and the assistance are very helpful

I am a first year and I found it very poor because I experienced the difficulties

Online registration is not a hussle (sic) to use

Have an effective system that is easily accessible and usable

The system is very slow

Online registration makes it easy to apply and it reduces cost to go to varsity to apply. Online registration is easy because you can do it at home where all documents required are.

Fixing or amending the registration alone will make no change to what we experience here when it comes to registration process. Changing the whole management and systems of CPUT will be useful. Everything must be changed now

Online registration should also be done on smart phones as well

It is better to teach and every student on how to register online more particularly the first year students and ensure the system during registration is always available and running fast.

Online registration is good method of registering and it helps to understand how to register and know what questions are asked when you do registration

I think the online registration system is effective and registration easy for students

Online registration takes time. It is inflexible

Online registration is efficient because it makes things easier

The online registration is very good but sometimes is very slow and it save time and you do it quickly

The online registration is very effective and time efficient despite the lack of ample internet facilities which affect the user satisfaction

Add more internet facilities man! Or open up one at least where its the years (1st year week,2nd year week etc)

CPUT should advance their technology more

It is more accessible and I wish the university can enhance that as it will be more effective for the students

The online registration for me is fair at CPUT

It should be end-user friendly

The university should give us the correct link that directs us to the correct page for the online registration

The system should be much quicker in terms of speed

It is good I am satisfied

Online registration is not time consuming. It is one of the excellent system.
Good

They need to have more support system for the user to improve speed

Feedback must be given as soon as possible

The registration was too confusing and complicated

It cannot be trusted

The website needs to be updated more often

It is quick but the queue is too long

Online registration makes things easy especially by the assistance of those who helped us in the registration field

It is new in South Africa a third world country

BTech comments/suggestions

CPUT has to put more effort in improving their online registration or systems. There is a lot of students who are paying a lot of money for poor services. The staff is not friendly at all very ignorant and taking their own sweet time to deal with queries.

It is easier when you are technological advanced. However not every student is technological advanced

There is always room for improvement in the system, thus the challenges are not as bad as other institutions

Issue with online registration is the system

Online should be smoother and more reliable

It is not user friendly

We have not try yet some of the questions as if we doing it

I would advise the institution to provide more internet services for more

access otherwise online registration is wonderful

I was not aware of the support staff for online registration

More Pc's should be available and working during an online registration because usually they are few that are working and you spend hours on long queues outside

The online registration system was easy to apply but it's much better if they do more clear for international students

It's very complicated and challenging for international students. Takes a lot of time and effort

During registration we stand in long queues for hours but we still say that we are registering online. Suppose we don't even stand on queues; suppose you just go to a lab then you register. The system has some challenges and at CPUT if its offline then that's not good as is sometimes

Very challenging for international students. Almost impossible and time consuming

We still stand in long lines during registration

Very frustrating at times, take too long to load to new page

The university should work on the issue of slow system speed and also having more technical staff to help that will aid in the registration process time taken

The university has poor internet connection which delays the online registration

It is very poor and disorganized which disadvantages people who are far from campus

Used online registration from office. Did not experience online registration

on campus. I did however find that the student card process was slow.

They must make sure that it works properly during registration

The interface could be made more mobile friendly. The support staff needs to be more available online and friendlier

Online registration in order to understand you suppose to have computer basics, if you don't have basics is not right for you

It saves time and the effort to give the whole day at school

System is really a challenge/slow

Call center must help with online registration

More computers and staff, make permit confirmation as well as medical check online to avoid queues, quicker respond to faculty online access problems, easier password reset functions-allow us to make our own passwords

Maybe registration process must take place in one area instead of e-learning-engineering-commerce top floor-admin for the whole day. The up and down needs to stop now guys asseblief

Answer people on time to avoid lines

The university need to update the internet connections during registration. There must be more computers available for students to avoid long queues

It is not reliable and not easy to use. The system needs proper improvement and enough computer access

Support staff are usually difficult to be found, should be more readily available. Otherwise online registration works sufficiently

Should decrease lag, easier instructions-dates, time-should make wifi and

more computers available

If all documents are done correctly before then registration is easy. If something is missing or wrong it is difficult to correct. I did registration off campus

How to get a new student card after registering online is not clear and easy.

The whole system is flawed in a way and not self-explanatory. A big issue for me personally is the collection of student cards which is useless.

4.6. SUMMARY OF FINDINGS: SECTION TWO

- The majority of respondents from both groups agreed that the system was easy to use. Only a small number of respondents disagreed with this.
- An almost similar number of respondents from both groups indicated that they were not satisfied with the rate at which the system responded during use.
- There were almost similar responses from both groups regarding their interaction with the online registration system. More respondents agreed that the system was frustrating, 33% first year, 36% BTech compared to those who disagreed.
- Most respondents were neutral regarding the inflexibility of the system. However, 18.5% first year, 26.7% BTech found the system inflexible to interact with, this has an effect on their interaction with the system. Those who disagreed with this notion were more than those who agreed.
- Respondents indicated that it was easy for them to remember how to use the system. This highlights ease of use. However, 13% first year, 7% BTech disagreed.
- More BTech 39%, than first year 24% indicated that they disagreed that it takes a lot of effort to know how to use the system. However, there are some respondents from both groups who agreed and found that it took a lot of effort using the system.
- More first year respondents, 25% compared to BTech 12% disagreed. They did not find it easy to get the online registration system to do what they want. However, more BTechs 36% agreed to this notion.

- Most respondents from both groups found the information easy to understand. Only a small number (8%) from both groups disagreed with this view.
- 11% first year, 18% BTech disagreed on the information displayed being accurate. The majority of respondents were neutral. 15% first year & BTech disagreed and indicated the information on the online registration system was not timely.
- Respondents agreed that the information is usually relevant. However, a small number from both groups disagreed, 7%.
- Respondents indicated that support was accessible, however 15% first year, 21% BTech disagreed that support was easily accessible which in turn affects user satisfaction.
- Respondents indicated that the support staff were not quick to respond to complaints and were not very reliable.
- Unstable power supply is not considered a major challenge during registration.
- More BTech respondents agreed that lack of ample facilities affect user satisfaction. This is because the first year registration period was different from the BTech students. More students agreed to this question compared to those who disagreed.
- The majority of respondents from both groups agreed that poor internet connection limits user satisfaction
- Respondents from both groups consider slow system speed a huge challenge.

4.7. RELIABILITY TESTING

Reliability statistics that were performed grouped the questions in section two into different scale categories. The categories are; Support, Ease of use, Barriers, Information, Complex to use and Various. According to (UCLA, n.d.) Cronbach's alpha is a measure of internal constancy, this is, how closely correlated a set of items are as a group. It is therefore considered to be a measure of scale reliability. Cronbach's alpha coefficient was applied to statements consisting of Likert Scale responses in section two of the questionnaire. The Cronbach alpha for Complex to use and Various are below the acceptable range of reliability coefficient. Complex to use has reverse statements relating to the use of the online registration system. This can be the reason why it has a low Cronbach alpha. These

reverse questions were asked in order to minimize bias. When measuring the Cronbach alpha, a reliability coefficient of .70 or higher is considered acceptable. Below is a table of scale items with the Cronbach alpha values, a more detailed overview can be found in appendix E. The appendix also shows item total statistics tables, which show the Cronbach alpha if an item is deleted. Deleting an item, which contributes to a low Cronbach alpha, will sometimes increase the coefficient, however this is not always true as can be seen with complex to use scale. The Cronbach alpha remains low even if the reverse questions are deleted.

SCALE	CRONBACHS ALPHA	NO OF ITEMS
Support	.758	5
Ease of use	.667	4
Barriers	.819	3
Information	.655	3
Complex to use	.540	3
Various	.387	3

Table 4.30

T-Test

Group Statistics					
	S1_Q8	N	Mean	Std. Deviation	Std. Error Mean
D1	Yes	194	3.04	.647	.046
	No	101	2.90	.707	.070
D2	Yes	194	3.50	.627	.045
	No	101	3.27	.582	.058
D3	Yes	194	3.74	.941	.068
	No	101	3.90	.907	.090
D4	Yes	194	3.36	.620	.045
	No	101	3.21	.642	.064
D5	Yes	194	2.92	.702	.050
	No	101	3.15	.651	.065
D6	Yes	194	3.21	.662	.048
	No	101	3.08	.656	.065

Table 4.31

This test provided basic information about the group comparisons, including the sample size (n), mean, standard deviation and standard error mean. The above group statistics are in reference to S1_Q8, this question sought to find out if the students were aware of the online registration support provided by the UoT. 194 respondents indicated that they were aware of the support provided whilst 101 indicated that they were not aware of the support. The mean show the differences between conditions and also show which group has a higher or lower mean. For those who responded 'Yes',

five of the groups have a neutral or positive assertion. This shows that there was a high awareness of the online registration system from the respondents. For those who responded 'No', one group, D1 (support) had a negative assertion, most likely because the respondents were not satisfied or unaware of the support provided. D2, D4, D5 and D6 had neutral assertions whilst D3 (barriers) is the only group that had positive assertions. The positive assertions in the D3 grouping shows that the respondents considered barriers high to their usage of the online registration system. The standard deviations of this test are all above 0.05 which implies that there exists a positive correlation amongst the groupings.

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	p-value	t	df	p-value. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
D1	Equal variances assumed	.119	.730	1.733	293	.084	.142	.082	-.019	.303
	Equal variances not assumed			1.685	187.730	.094	.142	.084	-.024	.308
D2	Equal variances assumed	2.632	.106	3.082	293	.002	.231	.075	.084	.379
	Equal variances not assumed			3.154	216.245	.002	.231	.073	.087	.376
D3	Equal variances assumed	1.225	.269	-1.422	293	.156	-.162	.114	-.387	.062
	Equal variances not assumed			-1.438	209.250	.152	-.162	.113	-.384	.060
D4	Equal variances assumed	.017	.897	1.922	293	.056	.148	.077	-.004	.300
	Equal variances not assumed			1.901	196.587	.059	.148	.078	-.006	.302
D5	Equal variances assumed	2.409	.122	-2.729	293	.007	-.229	.084	-.395	-.064
	Equal variances not assumed			-2.795	216.670	.006	-.229	.082	-.391	-.068
D6	Equal variances assumed	.001	.982	1.613	293	.108	.131	.081	-.029	.290
	Equal variances not assumed			1.618	204.436	.107	.131	.081	-.029	.290

Table 4.32

The independent samples test is a parametric test that is used to compare the means of two independent groups in order to determine if there is evidence that the population means are significantly different. This test can only be used to compare means for two groups. The means for more than two groups can be compared using the analysis of variance (ANOVA). The independent samples test shows Lavene's test for equality of variances, t-test for equality of means and the confidence interval of the difference. Lavene's test shows the F, which is the test static and Sig, which is the p-value, corresponding to the test static. The p-values obtained in this test are greater than .05, which means that the variability in the measured conditions is almost the same. Equal variances are therefore assumed. For D1, D3, D4, D5 and D6 the p-value (2-tailed) is greater than .05 which means that there is no significant statistical difference between the given conditions.

4.8. CONCLUSION

The data captured and presented in this chapter indicates that the researcher received a good response from the questionnaires distributed. The results analyzed were presented in tables, pie-chart and bar graphs. The reliability of the study was carried out by obtaining the Cronbach's alpha of grouped questions in section two. The questions were grouped in the categories of support, ease of use, barriers, information, complex to use and various. A t-test was also carried out to determine if there exits statistical evidence that the means of the population under study is significantly different. It was observed from the t-test analysis that there were some similarities and differences in the responses from both groups regarding their awareness of the online registration support provided by the UoT. This is noted because this study was carried out on first time system users and old users of the system. Chapter five provides the conclusion and recommendations for this study.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1. INTRODUCTION

The preceding chapter analyzed, discussed and interpreted the findings. The primary objective of this study was to establish the student's perceptions of the online registration system.

Chapter five will draw conclusions and suggest recommendations to those responsible for managing the online registration system at the UoT. These will also be beneficial to management responsible for deciding on information systems used at the UoT.

5.2. SUMMARY OF PREVIOUS CHAPTERS

Chapter One

The chapter introduced the study and provided the background. The research problem and the questions relating to the research were outlined. The concepts used and the objectives of the study were defined. The significance of the study and the research design and methodology used are discussed.

Chapter Two

This chapter focuses on the literature reviewed. The literature reviewed highlighted research conducted on information systems, specifically enterprise resource planning systems (ERP) in Higher Education (HE)/ tertiary institutions. Literature was drawn from similar research carried out internationally in UK, USA and Australia. Similar studies carried out in Africa were highlighted, particularly from Nigeria.

Chapter Three

Chapter three discusses the research design and methodology used for the study. This chapter provides clarity on the methodology applied. Detailed explanations were given of the process and why a quantitative method was

chosen for collecting data. The ethical consideration undertaken by the researcher was discussed. The validity and reliability of data collected were also discussed.

Chapter Four

Quantitative data was collected through self-administered questionnaires. Analysis and interpretation of the data was done in accordance to the research question and research objectives. The findings of this study were presented using tables, pie-charts and graphs. The questionnaire had two sections and therefore the findings were presented per section. These findings were discussed and compared with literature.

Chapter Five

Chapter five concludes the study with recommendations for those managing the online registration system at the UoT. The objectives of the study are revisited. The recommendations provide insight on how the online registration can achieve user satisfaction. A conclusion of the study is then given.

5.3. REVISITING THE RESEARCH PROBLEM

The research problem that was posed in this research reads as follows:

“It was observed that during registration students’ stand in long queues waiting for assistance to register and the system tends to ‘freeze’ whilst students are registering. In most cases students are unfamiliar with the interface, as they constantly have to enquire what to do next when going through online registration. This problem will be used to highlight aspects of information quality, service quality and system quality. Using the updated D&M IS success model (2003), this research will highlight the students’ perceptions of the online registration system.”

The results from the data analysis showed that the problem of long queues during registration still exists. Respondents from both groups indicated the online registration system was easy to use (43% first year, 41% BTech). This was a significant response compared to those who disagreed. It was therefore taken into consideration that some of respondents were novice users and were most likely to perceive the system as not easy to use or

frustrating. Regarding support provided for online registration, the majority of respondents from both groups indicated that they were familiar with it (64% first year, 67% BTech). This means an almost similar number of respondents from both groups were not aware of the support. This most likely led to more BTech (47%) users indicating they disagreed that support staff are quick to respond to complaints. 29% first year respondents disagreed. Not many respondents agreed or strongly agreed, most were neutral in their responses meaning that the aspect of service quality needs to be considered.

Data analysis shows that, regarding the response rate of the system during registration a significant number of respondents from both groups agreed that they were satisfied. However, there were also an almost similar number of respondents from both groups who disagreed (16% first year, 22% BTech). This needs to be addressed in order to achieve maximum user satisfaction. In comparison, more of the BTech respondents agreed that lack of ample internet facilities around the university affects user satisfaction (46% BTech, 24% first year). Lack of ample internet facilities would therefore result in long queues during registration. The first year students had the opportunity to register before the returning students. This is likely the reason there is a significant difference in the responses. The recommendations to mitigate the research problems are provided below.

5.4. REVISITING THE RESEARCH QUESTIONS: MAIN QUESTION

Has online registration made any difference in the student registration process?

In this study it was observed that most students from both groups viewed online registration as easy to use. A similar number of students indicated that the online registration system was good and a similar number also indicated it was fair. The respondents' perceptions in this regard satisfied they will be using the current system. In terms of the difference in the registration process the students still stand in long queues, which is not different from the manual registration era.

5.5. REVISITING THE INVESTIGATIVE QUESTIONS

- *What are the student's perceptions on online registration?*

The respondents provided their perceptions, suggestions and comments regarding the online registration system at the UoT. More details of the students' perceptions of the system can be found in section two of the preceding chapter.

- *What challenges are associated with online registration?*

The students highlighted that they faced challenges like, being unaware of the online registration support, speed of staff to respond to complaints, lack of ample internet facilities, poor internet connection and slow system speed.

- *What are some success factors of using online registration?*

Ability to register from any location, this was experienced by a small number of students. Respondents indicated that the system was easy to use and does not take a lot of effort to know.

- *Does the UoT have adequate systems to register students?*

The respondents indicated that a lack of ample internet facilities during registration affected their satisfaction. The lack of ample facilities to register during registration results in long queues.

5.6. REVISITING THE RESEARCH OBJECTIVES

The primary objective of this study was to establish the student's perceptions of the online registration system. In view of the research findings, this objective was met. As alluded in the preceding text, these perceptions are highlighted in section two of the preceding chapter. The secondary objectives were stated as follows:

- To determine if the online registration makes registration easier for the users – the student.
- To identify the challenges and success factors of managing an online registration system.

The secondary objectives of this study were met. Respondents highlighted

their perceptions on whether the online registration system is easy to use. As indicated in the preceding text the challenges and success factors were also identified.

5.7. RECOMMENDATIONS AND FURTHER RESEARCH

The recommendations were made from the findings obtained in this study. These recommendations will be of importance to management on how best to curb challenges faced by students. The recommendations were divided into system quality, information quality, service quality and technological and infrastructural issues.

(a) System quality

The majority of the respondents from both groups agreed that the system was easy to use. However, it cannot be overlooked that there were some respondents who disagreed with this view. The university should therefore consider having dedicated facilities like classrooms during registration for assistance with online registration. The UoT can also have online registration orientation where students are shown how to navigate the system on their own. As much as best practices are followed when implementing and introducing an information system, the needs of the users should be considered. This allows the development of a system that has its users in mind. Where the respondents found the system frustrating, inflexible to interact with, this can also be limited through an orientation session of the system. This orientation can be offered from the beginning of the year until registration period ends.

(b) Information quality

Regarding information quality on the system, there were very few respondents from both groups who indicated that it was not accurate, timely or relevant. Accuracy and relevance of information means that the end-users are provided with correct information on the system. Things like tuition fees, modules registered, biographical details, proof of registration. The timeliness of information means that users are able to view real-time information during registration. Some respondents indicated that the information provided was not timely. Allowing the users to edit information on the online registration system can curb this, e.g. where biographic details have changed.

(c) Service quality

Intensive practical training for those selected to assist students during registration, this will assist them in responding to complaints and attending to issues that arise. Training can take place at the beginning of the academic year before registration commences. The university can also consider putting up notices, online, on display monitors and notice boards about the support available. Have more staff that will be at service points to assist with the online registration. This will mean that any arising issues will be attended to quickly.

(d) Technological and infrastructural issues

The respondents indicated that the lack of ample internet facilities affected user satisfaction. Acquiring more computers would prove to be an expensive effort for the university. The UoT can make provision to spread out the registration period from early January when the university opens. The computer labs and the library can also be utilized as registration points before classes resume. This will reduce the long queues observed during the registration period. Another way to reduce long queues would be for the UoT to arrange with a provider of laptops at a reasonable price for students. Those who are able to purchase will do registration from home or dedicated classes for laptop users. Students who already have laptops would be able to use them for registration. Availability of online registration via mobile devices should be something that the UoT considers. Users of technology are now vying for how quick and easy it is to access an online platform or system. Where unstable power supply has been experienced, the UoT should ensure that that backup generators are immediately available. Poor internet connection and slow system speed can be as a result of different factors. The UoT should ensure that the hardware and software used are compatible and up to date as well as ensuring that an up to date antivirus is used for all computers. They should make sure that the wi-fi gateway is not located in a place where obstructions can occur. Walls and metal pipes can be impediments and can interfere with the system. In view that this study was carried out within one department, in one of the faculties at the UoT. The researcher recommends that a more thorough study be carried out across the university.

5.8. CONCLUSION

As highlighted in the problem statement of this study, students are still standing in long queues, experience system freeze whilst some are unfamiliar with user interface during online registration. To collect data, the study made use of the quantitative data collection method. The use of the updated D&M IS success model (2003) highlighted how the views of the user on the quality of the system can have an impact on user satisfaction. There is therefore a need to involve the end user in order to address their needs. The quality of information displayed on the online registration system is of importance in that it should be accurate and relevant. The service quality that highlights support provided during registration is integral in achieving user satisfaction. It is clear that the use of information systems at universities in South Africa is on the rise, from e-learning to course registration. The challenges and success encountered during registration clearly indicate that South Africa as a developing country can glean on the studies conducted in developed countries for students' online registration. This topic is therefore expected to attract scholars and practitioners within this field, as more research will be useful.

REFERENCES

- Abugabah, A. & Sanzogni, L. 2010. Enterprise Resource Planning (ERP) system in higher education: A literature Review and Implications. *International Journal of Computer and Systems Engineering*, 4(11):2120-2124.
- Adapt IT. n.d. ITS INTEGRATOR OVERVIEW. A step ahead and top of its class. [Online] Available from: <http://www.adaptit.co.za/Solutions/Documents/ITS%20Integrator%20Overview.pdf> [22 March 2017]
- Ader, H.J., Mellenbergh, G.J. & Hand, D.J. 2008. *Advising on research methods: A consultant's companion*. Huizen, Netherlands: Johannes van Kessel.
- Babbie, E. 2005. *The basics of social research*. Belmont: Thomson Wadsworth.
- Babbie, E. 2010. *The Practice of Social Research*. <http://books.google.com/books?id=QySynvetGQIC&pgis=1>
- Babbie, E. & Mouton, J. 2001. *The practice of social research*. Cape Town: Oxford University Press.
- Berg, M. 2001. Implementing information systems in Health Care organizations: Myths and Challenges. *International Journal of Medical Informatics*, 64:143-156.
- Bryman, N. & Bell, E. 2007. *Business research methods*. 2nd ed. New York: Oxford University Press Inc.
- Cape Peninsula University of Technology. 2012. Research, Innovation & Partnership. [http://www.cput.ac.za/storage/research/RTI Blueprint 2013 WEB.pdf](http://www.cput.ac.za/storage/research/RTI%20Blueprint%202013%20WEB.pdf) [27 January 2017]
- Carcary, M., Long, G. & Remenyi, D. 2007. The Implementation of a New Student Management Information System (MIS) at an Irish Institute of Technology – An Ex Post Evaluation of its Success. *Electronic Journal of Information Systems Evaluation*, 10(1): 31–44.
- Chen, P.S.D., Lambert, A.D. & Guidry, K.R. 2010. Engaging online learners: The impact of Web-based learning technology on college student engagement. *Computers and Education*, 54(4): 1222–1232..
- Collis, J. & Hussey, R. 2009. *Business Research: A practical guide for undergraduate and post graduate students*. Hampshire: Palgrave Macmillan
- Communication Office. newsflash@cput.ac.za, 2013. Courses available for Online Registration. [E-mail] Message to SC Chipeperewa (211165042@mycput.ac.za). Sent Monday, November 25, 2013 4:27 PM. Available at: www.cput.ac.za [25 February 2017].

Creswell, J. (2003). RESEARCH DESIGN:Qualitative, Quantitative & mixed methods approaches. London: Sage

Creswell, J.W. 2014. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. 4th ed. London: SAGE Publications.

Cusumano, M. 2010. Technology Strategy and Management. Cloud Computing and SaaS as New Computing Platforms. *Communications of ACM*, 53 (4) :27-29.

Communikay. (2013) Durban University of Technology upgrades management systems, boosts performance.
http://www.itweb.co.za/index.php?option=com_content&view=article&id=68417&catid=144&Itemid=92 [22 March 2017]

DeLone, W.H. & McLean, E.R. 2003. Journal of Management Information Systems The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems*, 19(4): 9–30.

Department of Education (DoE). 2004. Draft white paper on e-Education. Transforming learning and teaching through Information and Communication Technologies (ICTs) Government Gazette. No. 26734 [25 March 2017]

De Vos, A., Strydom, H., Fouche, C.. & Delport, C.S.. 2001. *Research at Grass roots for the Social Sciences and Human Service Professions*. 3rd ed. Pretoria: Van Schaik.

Doom, C., Milis, K., Poelmans, S. & Bloemen, E. 2010. Critical success factors for ERP implementations in Belgian SMEs. *Journal of Enterprise Information Management*, 23(3): 378–406.

Estevez, R., Rankin, S., Silva, R. & Indratmo. 2014. A model for web-based course registration systems. *International Journal of Web Information Systems*, 10(1): 51–64.

Fisher, M.D. 2006. Staff Perceptions of an Enterprise Resource Planning System Implementation : A Case Study of three Australian Universities.

Flick, U. 2011. *Introducing Research Methodology: A beginners guide to doing a research project*. London: SAGE Publications.

Fox, W. & Bayat, M. 2007. *A Guide to Managing Research*. Cape Town: Juta.

Giachetti, R.. & Truex, D. 2010. ERP Implementation Approaches : Pitfalls,Critical Success Factors and organizational analysis An ERP Systems implementation is not just another application development project . It is a business transformation project.

Hassanzadeh, A., Kanaani, F. & Elahi, S. 2012. A model for measuring e-learning systems success in universities. *Expert Systems with Applications*, 39(12): 10959–10966.

- Hellens, L. Von, Nielsen, S. & Beekhuyzen, J. 2005. Qualitative case studies on implementation of enterprise wide systems.
- Hevner, A. R., March, S.T. & Park, J. 2004. Design Science in Information Systems Research. *MIS Quarterly*, 28(1): 75–105.
- Irakoze, J.M.V. 2015. THE EFFECTS OF INFORMATION SYSTEMS ON END-USERS AND THE ORGANISATIONAL PROCESSES AT A UNIVERSITY OF TECHNOLOGY.
- Isaac, S. & Michael, W.B. 1981. *Handbook in research and evaluation*. San Diego: Edits Publishers.
- ITS Holdings. n.d. Available from:
<http://www.itweb.co.za/office/its/profile.htm> [22 March 2017]
- Jackson, S.. 2009. *RESEARCH METHODS AND STATISTICS: A CRITICAL THINKING APPROACH*. Belmont,USA: Cengage Learning.
- Jaffer, S., Ng'ambi, D. & Czerniewicz, L. 2007. The role of ICTs in higher education in South Africa: One strategy for addressing teaching and learning challenges. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 3(4): 131–142.
- Jagoda, K. & Samaranayake, P. 2017. An Integrated Framework for ERP System Implementation. *International Journal of Accounting & Information Management*, 25(1).
- Jern, A. 2009. On introducing Information Systems in Organizations.Helsinki University of Technology. Masters Thesis. Published.
- Kaufam Yares, A.C. 2010. Managing Multiple Sources of Information in an Independent K-12 Private School: A Case Study in a student Information Systems Evaluation.
- Kulas, J.T. 2009. *SPSS Essentials Managing & Analyzing Social Sciences data*. San Franscisco: Jossey-Bass
- Kumar, R. 2011. *Research Methodology: A step-by-step guide for beginners*. 3rd ed. California: SAGE Publications.
- Leedy, P.D. & Ormrod, J.E. 2001. *Practical research Planning and Design*. New Jersey: Merrill Prentice Hall
- Leedy, P.D. & Ormrod, J.E. 2010. *Practical research Planning and Design*. Boston: Pearson Education International
- Lin, H. 2007. Measuring Online Learning Systems Success: Applying the Updated DeLone and McLean Model. *Behaviour & Information Technology*, 10(6): 817–820.
- Lubbe, S. & Bopapa, M. 2011. The Social Impact of Information Systems at a Tertiary Institution.

Mardiana, S., Tjakraatmadja, J.H. & Aprianingsih, A. 2015. DeLone–McLean Information System Success Model Revisited: The Separation of Intention to Use -Use and the Integration of Technology Acceptance Models. *International Journal of Economics and Financial Issues*, 5(5): 172–182.

Maree K (ed.), Creswell JW, Ebersöhn L, Eloff I, Ferreira R, Ivankova NV, Jansen JD, Nieuwenhuis J, Pietersen J, Plano Clark VL & Van der Westhuizen CJ. 2014. First steps in research. Pretoria: Van Schaik Publishers

Markgraf, B. Characteristics of a Good Management Information System. <http://smallbusiness.chron.com/characteristics-good-management-information-system-59060.html> [11 July 2017].

Mills, M. 2006. Comparative Research: Persistent Problems and Promising Solutions. *International Sociology*, 21(5): 619–631.

Mitchell, B. 2017. Tips for Troubleshooting Slow Internet Connections at Home. <https://www.lifewire.com/troubleshooting-slow-internet-connection-818125> [11 July 2017].

Moses, A.G. 2014. The strategic role of the Chief Information Officer during post-merger at institutions of higher learning : a case study. Cape Peninsula University of Technology. Master Thesis. Published.

Mushavhanamadi, K. & Mbohwa, C. 2013. The Impact of Enterprise Resource Planning System (ERP) in a South African Company. *International Journal of Social Management, Economics and Business Engineering*, 4(11): 1632–1636.

Nandi, M.L. & Kumar, A. 2016. Centralization and the success of ERP implementation. *Journal of Enterprise Information Management*, 29(5): 728–750.

Ngai, E.W.T., Law, C.C.H. and Wat, F.K.T. 2008. Examining the critical success factors in the adoption of enterprise resource planning. *Computers in Industry*, 59(6), 548-564.

Nielsen, J.L. 2002. Critical Success Factors for implementing an ERP system in a university environment: a case study from the Australian HES.

Nykiel, R.A. 2007. Handbook of marketing research methodologies for hospital and tourism. New York: The Harwoth Hospitality and Tourism Press Inc

Oladunjoye, P. & Omemu, F. 2013. Assessing Manual and Online Course Registration in Nigeria Tertiary Institutions.

Olson, D. 2004. *MANAGERIAL ISSUES OF ENTERPRISE RESOURCE PLANNING SYSTEMS*. Singapore: McGraw-Hill Education.

Oluwatobi, O. Yemisi, B. & Christopher, O. 2014. Undergraduated Students' Assessment of E-Portals in Selected Private Universities in South-West Nigeria. *Journal of Emerging Trends in Computing and*

Oppong, S.H. 2013. The problem of sampling in qualitative research. *Asian Journal of Management Sciences and Education*, 2(2): 202–210.

Ozkan, S. & Koseler, R. 2009. Multi-dimensional students' evaluation of e-learning systems in the higher education context: An empirical investigation. *Computers and Education*, 53(4): 1285–1296.

Petter, S., DeLone, W. & McLean, E. 2008. Measuring information systems success: models, dimensions, measures, and interrelationships. *European Journal of Information Systems*, 17(3): 236–263.

Piccoli, G. 2012. *Essentials of Information Systems for Managers*. USA: John Wiley & Sons.

Pinar, I., Mehtap, Ö. & Erzengin, E. 2012. the Effect of End User Perceptions of Information Technologies on the Information.

Rabaa'i, .A. 2009. Identifying Critical Success Factors of ERP Systems at the Higher Education Sector. *ISI/ICT 2009 : Third International Symposium on Innovation in Information & Communication Technology*: 133–147.

Sabry, K. & AlShawi, S. 2009. Information systems for higher education: interactive design perspective. *Transforming Government: People, Process and Policy*, 3(2): 163–180.

Stair, R., Reynolds, G. & Chesney, T. 2012. *Fundamentals of Business Information Systems*. 2nd ed. United Kingdom.

Shee, D.Y. & Wang, Y.S. 2010. Evaluating e-learning systems using E-Traceability Systems. *Journal of Computer Science*, 6(2): 210–216.

Terre Blanche, M., Durrheim, K. & Painter, D. eds. 2006. *Research in Practice: Applied methods for social sciences*. Cape Town: UCT Press.

UCLA. n.d. WHAT DOES CRONBACH'S ALPHA MEAN? | SPSS FAQ. <https://stats.idre.ucla.edu/spss/faq/what-does-cronbachs-alpha-mean/> [11 July 2017].

Udofia, N. 2015. An Evaluation of Students ' Response to Online Registration. 2(4): 90–95.

Umble, E.J., Haft, R.R., Umble, M.M., Silva, R. Da, Rahimi, I. & Bansal, V Argarwal, A. 2003. Issues in Implementing CRM: A Case Study. *Citeseer*, 146(6): 241–257.

Vaughan, P.J. 2001. System Implementation Success Factors ; It ' s not just the Technology System. *CUMREC Conferences*: 2–16.

Wang, W.T. & Wang, C.C. 2009. An empirical study of instructor adoption of web-based learning systems. *Computers and Education*, 53(3): 761–774.

Wang, Y.S., Wang, H.-Y. & Shee, D.Y. 2007. Measuring e-learning systems success in an organizational context: Scale development and

validation. *Computers in Human Behavior*, 23(4): 1792–1808.

Wang, Y.S. & Liao, Y.W. 2008. Assessing eGovernment systems success: A validation of the DeLone and McLean model of information systems success. *Government Information Quarterly*, 25(4): 717–733.

Weiner, J. 2007. Measurement : Reliability and Validity Measures. *Johns Hopkins University*:

Weinrich, K.I. & Ahmad, N. 2009. Lessons Learned During a Decade of ERP Experience: A Case Study. *International journal of Enterprise Information Systems*, 5(1): 55-75.

Welman, J.. & Kruger, S.. 2001. *Research Methodology for Business and Administrative Sciences*. 2nd ed. Cape Town: Oxford University Press.

Younis, A.R.M. 2005. Local online information systems in Jordanian university libraries. *Online Information Review*, 29(1): 54–74.

Yusuf, Y., Gunasekaran, A. & Wu, C. 2006. Implementation of enterprise resource planning in China. *Technovation*, 26(12): 1324–1336.

Zhuang, L., Qiu, Y. & Peng, L. 2011. Is it the more the merrier?: An exploratory study into the growing problem of information overload. *Journal of Technology Management in China*, 6(1): 69–83.

APPENDICES



**Cape Peninsula University of Technology
Faculty of Business and Management Sciences
Consent to partake in an academic study**

Research conducted by:
Sharon Chironziwa Chiipeperewa
Student number: 211165042

Invitation to participate in an academic research study

You are kindly invited to participate in a research study titled “Challenges and success factors in introducing information systems for students’ online registration: a case study of a university of technology”. This study is being conducted by Ms Sharon Chironziwa Chiipeperewa, a Masters student at the Cape Peninsula University of Technology (CPUT) under the supervision of Mr. S. Fore. The purpose of this study is to determine the perceptions of students towards the current online registration system used at a university of technology.

Your participation in this study is voluntary and you are free to withdraw from it at any time without an obligation. There are no risks associated with participating in this study. Your response in this questionnaire will be kept confidential and used for the intended purpose only. Even though you will not be rewarded for partaking, the information collected in this study will provide a clear and better understanding of how efficient/inefficient the system has been.

Your consent to participate in this study will be highly appreciated.

For further inquiries, you may contact me on:

Sharon Chiipeperewa

211165042@mycput.ac.za

**QUESTIONNAIRE: CHALLENGES AND SUCCESS FACTORS IN
INTRODUCING INFORMATION SYSTEMS FOR STUDENTS' ONLINE
REGISTRATION: A CASE STUDY OF A UNIVERSITY OF
TECHNOLOGY.**

This questionnaire is designed to study student's perceptions of an online registration system used at a university of technology. Your response in this questionnaire will be kept confidential and used for the intended purpose only.

INSTRUCTION: Kindly mark the appropriate response with an **X**

SECTION ONE

1. Which year of study are you currently?

1st year ☐ 2nd year ☐ 3rd year ☐ BTech ☐

2. What is your gender?

Female ☐ Male ☐

3. Which age group do you belong to?

18-20 ☐ 21-24 ☐ 25-34 ☐ 35 and above ☐

4. Are you aware of the online registration system at the university?

Yes ☐ No ☐

5. With regards to technology in general how would you describe yourself?

Novice user ☐ Intermediate user ☐ Advanced user ☐

6. How would rate your knowledge of the online registration system?

Very Good ☐ Good ☐ Fair ☐ Poor ☐ Very Poor ☐

7. How would you rate the current system used for registration?

Very Good ☐ Good ☐ Fair ☐ Poor ☐ Very Poor ☐

8. Are you familiar with the online registration support provided by the university?

Yes ☐ No ☐

SECTION TWO

INSTRUCTION: Kindly read each statement carefully and indicate your level of agreement by marking with an X in the appropriate box. Please give only one response for each statement.		1	2	3	4	5
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
9	The online registration system is easy to use	1	2	3	4	5
10	I am satisfied with the response rate of the online registration system	1	2	3	4	5
11	Interacting with the online registration system is often frustrating	1	2	3	4	5
12	The online registration system is rigid and inflexible to interact with	1	2	3	4	5
13	It is easy for me to remember how to use the online registration system	1	2	3	4	5
14	My interaction with the online registration system is clear and understandable	1	2	3	4	5
15	I find it takes a lot of effort to know how to use the online registration system	1	2	3	4	5
16	I find it easy to get the online registration system to do what I want it to do	1	2	3	4	5
17	I am satisfied with how quick the online registration page loads	1	2	3	4	5

INSTRUCTION: Kindly read each statement carefully and indicate your level of agreement by marking with an X in the appropriate box. Please give only one response for each statement.		1	2	3	4	5
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
18	Information displayed on the online registration system is easy to understand	1	2	3	4	5
19	The information on the online registration system is always accurate	1	2	3	4	5
20	The information on the online registration is always timely	1	2	3	4	5
21	The information on the online registration system is usually relevant	1	2	3	4	5
22	Support on how to use the online registration system is readily accessible	1	2	3	4	5
23	The support staff are quick to respond to complaints	1	2	3	4	5
24	The support staff that assist with online registration are very reliable	1	2	3	4	5
25	The support staff are technically competent to attend to issues that arise	1	2	3	4	5
26	The online registration system is very slow and needs to be upgraded	1	2	3	4	5
27	Unstable power supply is a major challenge during registration	1	2	3	4	5
28	Lack of ample internet facilities around the university affects user satisfaction	1	2	3	4	5
29	Poor internet connection during registration limits user satisfaction	1	2	3	4	5

INSTRUCTION: Kindly read each statement carefully and indicate your level of agreement by marking with an X in the appropriate box. Please give only one response for each statement.		1	2	3	4	5
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
30	Slow system speed is a challenge during registration	1	2	3	4	5
31	I am satisfied with how quick the online registration page loads	1	2	3	4	5

32. Please provide comments/suggestions on the online registration system at the university.

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE!

APPENDIX B: 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 27 February 2017, Ethics Approval
was granted to Sharon Chironziwa Chiheperekwa (211165042) for research activities
Related to the MTech/DTech: MTech Business Administration in Project Management at the Cape
Peninsula University of Technology

Title of dissertation/thesis/project:	CHALLENGES AND SUCCESS FACTORS IN INTRODUCING INFORMATION SYSTEMS FOR STUDENTS' ONLINE REGISTRATION: A CASE STUDY OF A UNIVERSITY OF TECHNOLOGY. Lead Researcher/Supervisor: Mr S Fore
---------------------------------------	--

Comments:

Decision: **APPROVED**

	27 FEBRUARY 2017
Signed: Chairperson: Research Ethics Committee	Date

Clearance Certificate No | 2017FBREC427

APPENDIX C: CONSENT LETTER



FACULTY OF BUSINESS & MANAGEMENT SCIENCES

Ms AF Buys

Department of Management & Project Management
Cape Town Campus
P O Box 652 Cape Town 8000 · Corner of Keizergracht and
Tennant Street, Cape Town 8000 ·
Tel: +27 21 460 3928 · Website: <http://www.cput.ac.za> ·
E-mail: buysa@cput.ac.za

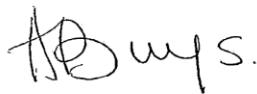
8 February 2017

TO WHOM IT MAY CONCERN

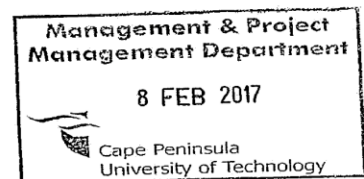
This letter serves to grant Sharon Chironziwa Chipeperekwa, student number 211165042 permission to carry out the research entitled: *Challenges and success factors in introducing information systems for students' online registration: a case study of a university of technology*, within the Department of Management and Project Management at the Cape Peninsula University of Technology. This research is toward partial fulfilment of the MTECH: Business Admin in Project Management offered by the same department.

The research will contribute positively towards the improvement of the department and institution at large.

Yours sincerely



MS.A.BUYS
ACTING HEAD OF DEPARTMENT: MANAGEMENT PROGRAMME
DEPARTMENT OF MANAGEMENT & PROJECT MANAGEMENT
TEL: +27 21 460 3928



APPENDIX D: RELIABILITY TABLES

Scale: Barriers

Case Processing Summary

		N	%
Cases	Valid	295	100.0
	Excluded ^a	0	.0
	Total	295	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability

Statistics

Cronbach's Alpha	N of Items
.819	3

Reliability

Scale: Information

Case Processing Summary

		N	%
Cases	Valid	295	100.0
	Excluded ^a	0	.0
	Total	295	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability

Statistics

Cronbach's Alpha	N of Items
.655	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
The information on the online registration system is always accurate	6.70	1.640	.506	.502
The information on the online registration system is always timely	6.72	1.780	.515	.490
The information on the online registration system is usually relevant	6.45	2.174	.385	.658

Reliability

Scale: Complex to use

Case Processing Summary

		N	%
Cases	Valid	295	100.0
	Excluded ^a	0	.0
	Total	295	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.540	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlati on	Cronbach' s Alpha if Item Deleted
Interacting with the online registration system is often frustrating	5.81	2.200	.352	.441
The online registration system is rigid and inflexible to interact with	6.03	2.346	.392	.375
I find it takes a lot of effort to know how to use the online registration	6.14	2.528	.314	.496

Reliability

Scale: Various

Case Processing Summary

		N	%
Cases	Valid	295	100.0
	Excluded ^a	0	.0
	Total	295	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.387	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correla- tion	Cronbach 's Alpha if Item Deleted
I am satisfied with how quick the online registration page loads	6.41	2.174	.234	.282
Information displayed on the online registration system is easy to understand	6.03	2.550	.258	.256
Unstable power supply is a major challenge during registration	6.58	2.136	.200	.358

GRAMMARIAN CERTIFICATE

MELODY KOZAH PROOF READING SERVICES

7 December 2017

Dear Sir/ Madam

This confirms that I have proof read and edited the research study entitled, '*Challenges and Success Factors in Introducing Information Systems For Students' Online Registration: A Case Study of a University of Technology*', and that I have advised the candidate to make the required changes.

Thank you.

Yours faithfully



MELODY RUMBIDZAI KOZAH

Editor

(University of Cape Town LL.M and LL.B)

melkozah@gmail.com

+27 78 398 7468
