

UNIVERSITY OF KWAZULU-NATAL

**An Evaluation of the Effectiveness of Students' Online Registration
System at the University of Zululand**

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**A dissertation submitted in partial fulfillment of the requirements
for the degree of
MASTER OF COMMERCE IN LEADERSHIP**

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DECLARATION

I, **Zakhele Phiwayinkosi Gumede**, declare that:

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ABSTRACT

The aim of this study was to evaluate whether the online registration system implemented at the University of Zululand (UNIZULU) in KwaZulu-Natal, South Africa, was effective and achieved its intended purpose. Like most institutions of higher learning in the world, UNIZULU had to keep abreast with the latest and progressively evolving information technology by ensuring that students are registered on an automated process, moving away from the traditional way of manual processes. The study employed a quantitative method in a form of questionnaires. A total of forty staff members from the sections or departments which are directly involved in the registration of students and four hundred and fifty students were sampled to answer to self-completed questionnaires. The data collected were statistically analysed by using Statistical Package for the Social Sciences (SPSS) version 25. The findings indicated that in as much as the online registration system has a positive impact in the entire enrolment process, there were challenges towards the full implementation and also factors that affected the effectiveness of online registration system were identified. Key benefits emerged from the analysis of the data and interpretation that online registration system was ease of use, saves time and costs and should be able to be accessed anytime and anywhere without being physically present at the university. The findings also showed that most students and staff were satisfied with the online registration system with the exception of few students and staff members. The academic structure was not properly set-up, some modules were not linked to the relevant qualifications and accessing the system off campus were some of the challenges that emerged from the findings. Furthermore, the findings pointed out that slow internet, downtime and load shedding were some of the factors affecting the online registration system. In conclusion, even though there were challenges, the majority of students and staff members had confidence in the online registration system and further indicated that it should not be changed for another system. The study recommended that the online registration system must be fully implemented as scheduled to prevent challenges and also to add some features to enhance system performance.

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GLOSSARY

Abbreviation	Description
FTENS	First Time Entering Students
HEI	Higher Education Institution
HEMIS	Higher Education Management Information System
ICT	Information and Communication Technology
IT	Information Technology
ITS	Integrated Tertiary Software
KZN	KwaZulu-Natal
LAN	Local Area Network
NOUN	National Open University of Nigeria
PQM	Programme Qualification Mix
SMS	Short Message Service
SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
UJ	University of Johannesburg
UNIZULU	University of Zululand

CHAPTER ONE

1.1 Introduction

Education is a basic human right enshrined in the Constitution of South Africa under the Bill of Rights. A progressive nation is the one that invests on educating its people. Odero and Oloko (2013) state that education is a basic human development measurement that is very central in defining the quality of life, thus, when acquired it improves the value of human life through sharing of knowledge and it creates self-reliance. Therefore, accessing higher education institutions should be made easy to those who have earned necessary requirements to study. The foundation for the successful transformation of institutions of higher learning lies on the access and the provision of quality education. In order to transform the higher education institutional landscape, the notion of access can be used to respond to national priorities. Through advanced technologies new models have long been developed to create opportunities for high school graduates and the working class to access institutions of higher learning. As a result, the majority of institutions have adopted the most dedicated educational network interface to address the increasing demands of simplifying the intake and enrolment targets. Hence, the automation of manual application and registration processes is taking central approach for tertiary institutions in the world. According to Malik, Danish and Usman (2010), in any institutions of higher learning, the automated application and registration system is considered as a crucial factor for alluring and retaining students who need to obtain tertiary education whether it is the public or private sector.

In the current competitive environment, not only has tertiary education become a requirement of the day but it is also a necessary asset provided by the parents for their children (Malik *et al.*, 2010). Shaltoni, Khraim, Abuhamad and Amer (2015) state that automated processes have transformed the way institutions of higher learning conduct their enrolment business and also, due to the fact that web application is advancing, tertiary students are exposed to latest features that enable personalisation and interactivity.

The focus of this chapter is to introduce the study by providing the study background developing the problem statement, research objectives and questions. In addition, the purpose of the study is to evaluate the effectiveness of the students' online registration system at the University of Zululand.

1.2 Background of the Study

The University of Zululand (UNIZULU) is one of the twenty-six (26) public universities in South Africa. It is located within the uMhlathuze Local Municipality in the North Coast of KwaZulu-Natal (KZN). It was established in 1960 as the University College of Zululand, which later became a University on its own and in the new dispensation it is referred to as a *comprehensive university*. Its rural location is strategic in a sense that it caters for the needs of the previously disadvantaged communities for whom to access higher education would otherwise be unachievable (The Madibaz, 2017).

The Council of the University of Zululand approved the introduction of a students' online registration system as a project in 2015, to be introduced the following year (2016) gradually and to be fully implemented by 2020, as shown below in *Table 1*. So many things had to be considered before the project was implemented. The University, through the Office of the Registrar, had to drive a programme of academic structure revision to ensure that the academic structure of the entire University corresponded with the Programme Qualification Mix (PQM). Detailed comparative audits had to be done to ensure harmony amongst the Faculty Handbooks, PQM and Integrated Tertiary Software (ITS) student data. For the inclusion of all stakeholders, training and mentoring of Faculty Managers, Co-ordinators and Officers was conducted to ensure the accuracy of academic data and correct course management procedures (Janse van Rensburg, 2016).

Traditionally, UNIZULU over the years has been using manual process to register students. This paper based manual registration process consumed time with lot of human and paper involvement and less technology. The manual registration process

was no longer compatible with the demands of the current technological generation. According to Oladunjoye and Omemu (2013); Bemile, Gborgla, Mensah, Boateng, Ansa and Twum (2014); Singh, Singh, Kaur and Gupta (2016) and Agwa-Ejon and Pradhan (2017), the manual registration process needed students to be physically present in the institution and to go through a lot of sequential steps. These chronological steps include an advising process which on its own was a course of frustration to students when relevant officials were not available on the day, and also the bad attitude students received from staff who are supposed to provide administrative services. Singh *et al.* (2016) state that the manual system faces various problems such as maintaining student data manually. Furthermore, this manual process of registration affected the main academic activities of the university when some lectures could not commence on scheduled period because the majority of students were still not done with registration (Oladunjoye & Omemu, 2013).

UNIZULU was compelled to introduce an online registration system with the purpose of mitigating challenges posed by the manual registration and also to improve registration processes as well as to save time. According to Olandunjoye and Omemu (2013), online registration allows students via internet to choose their programme and modules to study for in that academic calendar year. The online registration system is meant to conveniently and easily manage the registration process of students in an institution. When it was introduced at UNIZULU, it was embraced by many but understood by few. Even though online registration system is regarded by universities of the world as the latest trend in the field of information technology (Olandunjoye & Omemu, 2013), it brought along other challenges. These challenges are as a result of the lack of skills or a lack of knowledge on end users which all amounts to the frustration by the very system. When this evaluation was undertaken the institution was conducting an online registration simultaneously with manual registration process for support to some of the programmes.

Table 1.1: Online Registration Plan 2016-2020 (Janse van Rensburg: 2018)

Implementation Phase	Description	Implementation Date
Phase I	<ul style="list-style-type: none"> • Online registration set up. • Selected four programmes to registered using web based registration. 	2016
Phase II	<ul style="list-style-type: none"> • Academic Structure revision of the University. • Academic structure and PQM alignment. • Insert rules i.e. co and pre-requisites & substitutes • Register all FTENS & Postgraduate programmes 	2017
Phase III	<ul style="list-style-type: none"> • Insert progression rules for auto promotion. • Design online payment system to enable full online registration. • Redesign website to be more informative. • Co-registration process of manual & online registration 	2018
Phase IV	<ul style="list-style-type: none"> • Online registration of all programmes, with manual registration as back-up. • Implementation of mobile app for students. 	2019
Phase V	<ul style="list-style-type: none"> • Online registration of all university programmes. 	2020

1.3 Statement of the Problem

In the 21st century, most universities in South Africa are shifting from manual processes to using online system to recruit and register students (Agwa-Ejon & Pradhan, 2017). A typical online registration system permits students through internet from the curriculum to view and select linked qualification of their choice, majors and elective modules during stipulated registration period. Estevez, Rankin and Silva (2014), state that this system with its functionality always provides a multiple-step process whereby each step is saved before moving to the next.

A significant amount of literature including, Agwa-Ejon and Pradhan, (2017); Mashabela and Pillay, (2017), has explored the effectiveness and challenges of students' online registration system in the higher education institutions in South Africa with a specific reference to University of Johannesburg (UJ). Many other researchers world-wide including, Singh, *et al.* (2016); Thossansin and Pomsathit (2014); and Chen and You (2013) and also across the African continent including, Udofia (2015); Oladunjoye and Omemu (2013) and Okoye (2015) have conducted investigations and

assessments on different issues around online registration systems in the institutions of higher learning. The implementation of an online registration system at UNIZULU only in 2016 as a pilot project presented a lot of benefits, however, through the passing of time it was evident that there are challenges as well.

The uniqueness of the online registration system is such that many expectations are created without considering the availability of skills and knowledge within the institution. Those who are assigned to manage and setup the online system, are given limited timeframe, hence different challenges come during the peak time of registration cycles at the beginning of each academic year. The central issue is that UNIZULU has not achieved the implementation of online registration because of some challenges and other factors that contribute to the malfunctioning of the operational system including, the inability of students to remotely register, upload all required documents and access their academic records. There are also many factors affecting the effectiveness of the software that manages online registration, such as, poor internet connectivity, load shedding and downtime. The researcher believes that the online registration system, if successfully managed like any system in the organisation, can deliver positive results and enhance registration operations of the University of Zululand.

1.4 Motivation of the Study

The principal researcher has in total worked at UNIZULU for sixteen (16) years and specifically in the Office of the Registrar for six (6) years as the Manager: Student Administration and was promoted to the Deputy Registrar: Student Administration position. The enrolment of the entire student body of UNIZULU is the sole responsibility of the University Registrar but delegated to the Deputy Registrar.

Firstly, the challenges on students' registration process is due to the fact that the software that manages online registration system is not being fully utilised at the University. Secondly, some of the students, especially FTENS, do not have information technology (IT) skills and knowledge to operate the online registration

system, thus an assistance is required, which defeats the intended purpose. Thirdly, some of these challenges are as a result of inadequate ITS skills and knowledge by administrators. Fourthly, the lack of knowledge by faculties on how to set up a correct academic structure makes it impossible for students' online registration to be fully functional. Lastly, during registration there is a downtime issue wherein the online system is not working, which also frustrates students. All these challenges impact negatively on the well-intended students' online registration system at UNIZULU.

It was for these reasons that the researcher intended to evaluate whether the students' online registration system is bearing any positive results or if it has any effect towards improving registration processes at UNIZULU.

1.5 Aim of the Study

The main aim of this study was to evaluate the effectiveness of students' online registration system, as the annual major project of the University of Zululand. Additionally, the study assessed the perception from the personnel as well as the students towards students' online registration.

1.6 Objectives of the Study

To achieve the above mentioned aim, the primary objectives of the study were:

- To establish benefits of students' online registration system at the University of Zululand;
- To identify the challenges faced by the University of Zululand in the full implementation of online registration system;
- To identify the factors that affect the students' online registration system at the University of Zululand; and
- To make recommendations to the University of Zululand senior management on how to enhance students' online registration system.

1.7 Research Questions of the Study

The following were the fundamental research questions:

- What are the benefits of students' admission and online registration system for the University of Zululand?
- What are the challenges faced by the University of Zululand in the implementation of online registration?
- What are the factors that affect the students' admission and online registration system at the University of Zululand?
- What are the recommendations to the University of Zululand senior management on how to enhance students' admission and online registration system?

1.8 Intended Contribution of the Study

The main purpose of conducting research was to extend the borders of knowledge and to add to the existing body of knowledge. Leeds (2010) indicates that research has to discover the truth and pose an important question for which no definite answer has previously been provided.

The study will not only contribute to literature but will also add value to the University's decision makers in understanding the challenges posed by online registration system and how best those challenges can be mitigated.

1.9 Research Methodology

This study will be approached from a positivism paradigm using the quantitative method with questionnaires as a data collection method. The targeted population of the study were students (about 14 000) and the complement of about 405 personnel,

out of which a sample size of 450 students and 40 staff members were selected to be part of the study using the convenience sampling method. Furthermore, the Statistical Package for the Social Sciences (SPSS) version 25 was utilised to analyse data.

1.10 Organisation of the Study

This study comprised five chapters as stipulated below:

Chapter One: Introduction

This chapter consists of: Background of the study, Statement of the problem, Aims of the study, Research objectives and questions, Intended contribution of the study, Feasibility, Intellectual property, Ethical and safety issues and Organisation of the study.

Chapter Two: Literature Review

This chapter provides an overview and understanding of the relevant literature.

Chapter 3: Research Methodology

This chapter pays attention to research design, population of the study, method of sampling, sampling size and the type of research instrument used to conduct this study.

Chapter 4: Data Analysis and Results

Chapter four presents the results from data collected, data analysis and the interpretation of data. It further outlines the statistical functions used in this chapter.

Chapter 5: Conclusion and Recommendations

The chapter presents the conclusions, recommendations and it indicates avenues for future research.

1.11 Conclusion

This chapter provides an outline of the entire study and further indicates all the various contributing factors for this to be undertaken. The objectives, as stated in this chapter, showed what the study intended to achieve. Furthermore, through the presentation of the organisation of the study the entire dissertation was outlined. The next chapter presents the Literature Review of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is the continuation of the first chapter and it presents literature related to the study. An attempt was made to align the literature to the objectives of the study. The chapter, therefore, includes the benefits of online registration, challenges faced when implementing online registration, factors that affect online registration and theoretical framework. First and foremost, the chapter begins by defining key concepts underpinning the study.

2.2 Definition of Key Concepts

2.2.1 Online Systems

The online system is regarded as an organised system that allows activities, services, transactions or exchange of information to take place via internet [online]. According to Singh *et al.* (2016), online system is the integration of multiple subsystems to form a combined framework which further contains various functions and is designed to achieve intended objectives. In the financial sector, for example, Mujinga, Eloff and Kroeze (2018) point out that the financial landscape has been transformed by the use of online systems when conducting business through electronic banking (eBanking) and online banking which offers several banking activities over digital technology. Another example is a well-developed online record system with just a push of a button that permits the timely retrieval of the required documents or information (Oladunjoye & Omemu, 2013), and also allows the linking and filing of electronic documents in the specific file for the particular employee in the online system.

In the context of the tertiary institutions, Okewu and Daramola (2014) state that higher education institutions, as a complex enterprise, require automated systems to function effectively and efficiently. Online systems have increasingly become ordinary-tools in higher education institutions in such a way that most of these institutions utilise such systems to support teaching and learning, administration or communication (Kimmons, 2015). The incorporation of online systems by many institutions across the world has provided other online functionalities such as e-Learning, students' online registration, online student records, online payment (Arif, Ameen & Rafiq, 2017) and e-Administration (Okewu & Daramola, 2014), to enhance business operations. Furthermore, the objective of developing such reliable automated systems is to achieve some advantage regarding time and cost spent on any manual processes.

There has been a response to calls, according to Kimmons (2015), regarding the adoption to increase online system in supporting online learning in schools and the effectiveness of online system to improve student results is evident currently. Mgutshini (2013) sees online systems as an exposure in which all facets of institution's activities are carried out via the internet where students do not have an opportunity of face-to-face contact with their lecturers or administrators during the entire course of their studies. The same sentiment is shared by Okewu and Daramola (2014), that the design of online systems is to centrally harmonise the information needs of a tertiary institution by cementing the core strategic and support business processes which are the centre of teaching, learning, research, human capital development as well as community engagement.

2.2.2 Web Registration Portal (iEnabler)

A web portal is known as a specially designed website to search, present, classify and integrate related information from different and unique sources such as search engine, email, news and many other various applications (Jiang & Ji, 2014). In any organisation, it caters both internal and external constituents through a single point of contact to access online information and resources (Gant & Gant, 2002). According to

Pinho, Franco and Mendes (2018), for Higher Education Institutions, web portals have become important since they serve as communication channel and interface across all academic staff. A university web portal is vital since it assists students in accessing numerous online services including online registration system, academic management system and financial services and, furthermore, serves as a tool for communication amongst academics, administrators and importantly, students (Shaltoni *et al.*, 2015).

Developing a web portal for registration streamlines the process for the entire university community and assists to cut down attrition and frustration related to coping with bureaucracy, and similarly, obtaining buy-in from the student body has always proved essential to increase the success of the online registration since it becomes repetitive for students to utilise their registration portal for everything associated to online registration processes (Sutton, 2016). The distribution and obtaining information online have become a standard operation and most institutions have invested considerably in electronic resources and also avail them via information gateways for online content normally known as web portals (Chen & Chengalur-Smith, 2015). This gateway has provided access to millions of web users through the huge landscape of information, applications and services on websites (Gant & Gant, 2002).

Pinho *et al.* (2018) suggest that one of the means to attain the basic human need of open and shared access to academic material is via web portal. A web portal for registration process as an essential component of the system, requires transparency to the end users (Bamile *et al.*, 2014). The successful use of university registration portal should be determined by users' satisfaction, and in this case, these are mainly students (Shaltoni *et al.*, 2015). To be able to access ITS iEnabler at UNIZULU, as shown in Figure 1, a login ID and pin must be obtained from system administrators via email or short message services (sms) anytime and anywhere in order to proceed with the registration process. Once a user logged-in the actual registration commences till the end and until the user logout of the portal, as shown in Figure 2.

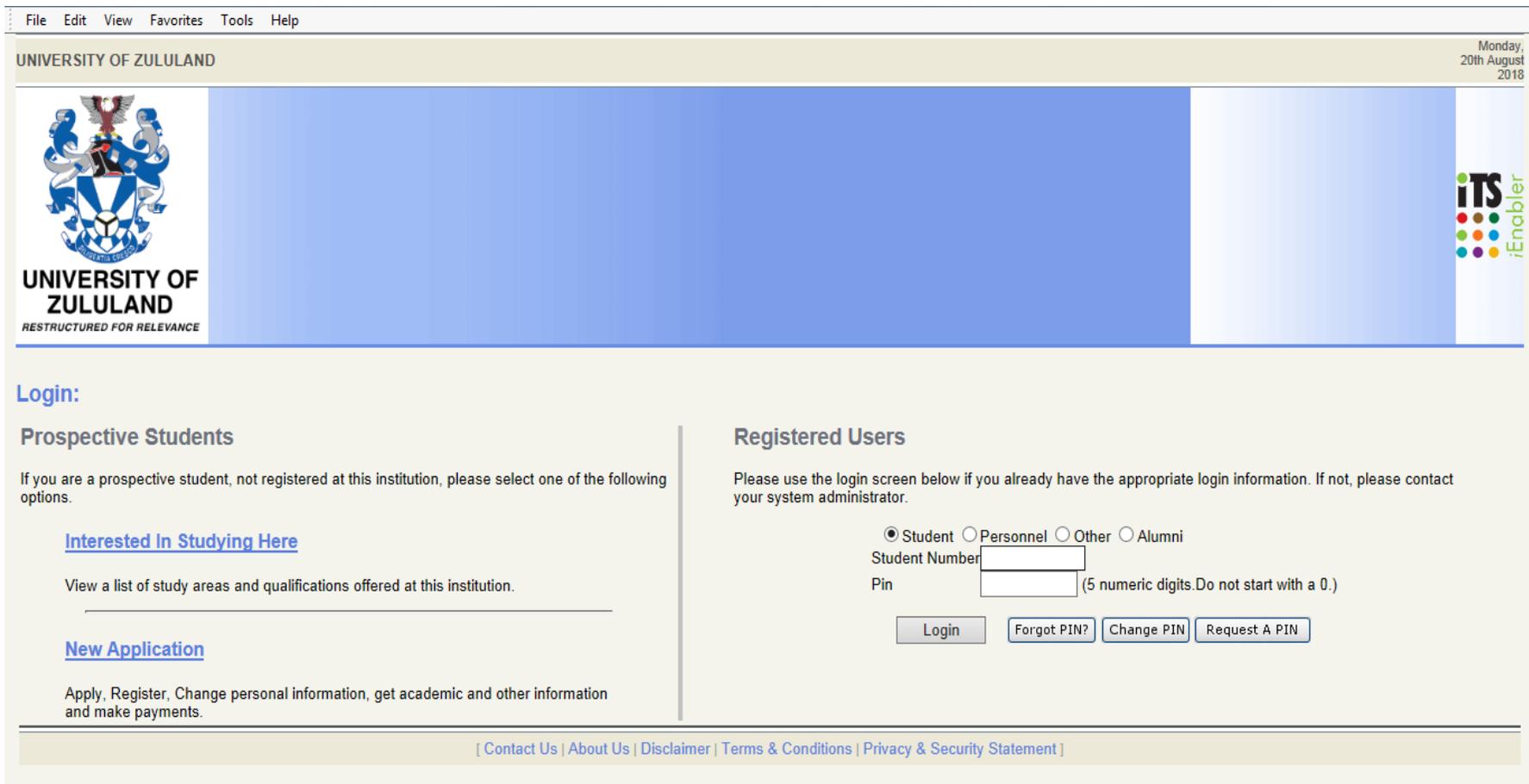


Figure 2.1: UNIZULU Web Portal – Login Interface

(https://drappsvr.unizulu.ac.za/pls/prodi03/w99pkg.mi_login?numtype=P)

File Edit View Favorites Tools Help

UNIVERSITY OF ZULULAND Monday, 20th August 2018

ITS iEnabler

Welcome **Bongakonke Sandile Gumede** to the ITS iEnabler system for Students.

Navigate through the menu pane on the left and click the required option in order to proceed.

The following table provides a brief description of the main processes available to you. Click on the link you require in the left hand menu panel to view the available sub-processes or process steps within each of the displayed processes.

Registration	You can register your qualification and subjects. And also print a proof of registration.
Student Enquiry	To view student related information.
Residence Application	This process allows you to <u>apply</u> for admission to a residence. You will be able to choose which building to apply for
Residence Registration	This process allows you to <u>register</u> for a residence.
Financial Aid	
MyGate Online Payment	E-payments: Read Here
Request For Information	
Access Control	
Medical Web	
OPAC (Library System)	

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100%

Figure 2.2: UNIZULU Web Registration Portal (iEnabler)
 (https://drappsvr.unizulu.ac.za/pls/prodi03/w99pkg.mi_main_menu)

2.2.3 Online Registration System

In the current technological era of education most of the institutions of higher learning in the world are using online registration system for student's enrolment. According to Agwa-Ejon and Pradhan (2017), recruitment and registration processes in most universities in the world have begun to shift from the normal paper based forms to an electronic process. Odero and Oloko (2013) further state that online registration system emerged as a result of problems associated with manual registration system which include manual filing of student records. At the beginning of every academic year there is the requirement of a registration process, an activity which is highly repetitive and has become more essential to simplify through automated process which can further assist the institution to efficiently manage the resources (Singh, *et al.*, 2016).

With the competition increasing amongst institutions of higher learning, the need for maintained relevance, the manual systems of operating, presenting and utilising information is demonstrating inadequacy. Hence, centralising information through online registration system is considered cost-effective when the overall objectives and interests of the institution are regarded. This is the primary reason that should advocate the operations of the institution to be driven by technology and, by doing so, inefficiencies and ineffectiveness associated with the manual registration and other challenges of disparate legacy system can be excluded. Therefore, by using online registration this indicates that the integration of ICTs in institutions enables the development of new practices and services as well as cost and time reduction of services rendered (Okewu & Daramola, 2014).

The online registration process begins foremost with the application which is done by applicants themselves and followed by registration of the student (Agwa-Ejon & Pradhan, 2017). Bemile *et al.* (2014) suggest that online registration system assists the educational institution through the availability of student data to align its business processes towards the needs of stakeholders and students. For successful registration

of students, online registration system is critical to maintain pace with latest advancing information technology. By shifting from manual to a completely new registration system, as noted by Peng, Liu, Li and Shao (2012), there is overstressing of the importance of student-oriented model to improve the quality and efficiency of registration and to fully integrate registration requirements which support the enhancement of education for students, teaching, administrative activities and further to ensure that the system is accommodative and adaptable to students and online programmes.

This idea of implementing the online registration system is in sync with the current trend of simplifying student enrolment business processes in tertiary institutions. Thus, the ideal expectation is for students to be able to register online self-reliantly, conveniently and even at home (Olandujoye & Omemu, 2013). Peng *et al.* (2012) regard the online registration system as a central muscle of the administration in the educational system which is made up of different types of registration processes and information exchange. This automated registration system, according to Okewu and Daramola (2014), is a cost and time effective process that enhances business workflow, improves efficiency, increases levels of control and minimises the use of paper. Therefore, the increasing need for using online registration system in most universities in the world to enrol students cannot be overstressed.

Chaka and Mungadzi (2013) state that the students' online registration system restructures and integrates the application, registration and monitoring of students in the institution. A good students' online registration system in the institution of higher learning, particularly the university environment, enhances other processes for the benefit of all sectors in the institution. According to Odero and Oloko (2013), students' online registration is a system that should easily administer its entire student body while offering added benefits, with the main purpose being to simplify the transfer of information. It also provides cost effective methods and secures a registration process that presents online access of files to students. Moreover, the online registration system is developed for easily managing the annual process of registration (Singh *et*

al., 2016) and also permits institutions to give more attention to the educational needs of students and minimises on paperwork (Thompson, 2017).

The online registration system is regarded as an evolving and innovation tool which is used for diversity purposes and in different ways and settings to help transform higher education. The usage of online system is entirely dependent on ease of use, friendliness, usefulness and also the satisfying achievement to the users and the owners of the system (Yuen, Fox, Sun & Deng, 2009). Lawal-Adebowale and Oyekunle (2014) emphasise that the online registration system, as a new phenomenon, is meant to improve the formation and recording of students' academic data through a modern technology. Arif *et al.* (2017) agree that the processing of data through web-based information system has significant effect on students' satisfaction, academic performance and achievements. Therefore, an online registration system has accumulated massive interest to the academia and other stakeholders.

Odero and Oloko (2013) present the fundamental principles which are the pillars of rolling online registration system, the first one being the simplicity, meaning that the users of the system require a simple and clear online registration environment. Next is dependability, which is viewed in the sense that the availability of the site and its contents should be predictable. Another is measureable value, which primarily means the system users should comprehend added value and feel self-supporting from accessing online registration system. The online registration system should be such that users are able to modify and personally connect with the functionality of it, and this is referred to as personalisation. Finally, the systematic management needs a long term success as a systematic method towards a long-term commitment.

2.3 Role of ICT in Higher Education Institutions

According to Arikawei, Amadi and Leo (2016), the challenges and growing complexities posed to universities in a globalised world make the application of

Information and Communication Technology (ICT) essential for quality assurance and goal achievement in service delivery. Bemile *et al.* (2014) stress that in a rapidly developing world of advanced technology and innovations, ICT has now defined the way of life and is a force to be reckoned with in a modern education. For more productive operatives and accurate results ICT has turned to be one of the most important infrastructures in any institution. Omambia, Ndiege, Wakoli, Nyamboga and Nyansiaboka (2014) state that it is undisputed that most institutions of higher learning increase their investment on ICT to automate most of their key business operations. Bemile *et al.* (2014) concur that the investment is to strengthen their web-technology and online system.

Like any other institution of higher learning, UNIZULU has an ICT department that creates and provides maintenance for the entire ICT infrastructure. This section is responsible for ensuring that the network where online registration system is held functions properly. The university has recently upgraded its ICT systems with the invention of the latest web-technology which is capable of hosting for example, online registration, electronic filing, and electronic payment, to mention just a few. Bemile *et al.* (2014) note that the fundamental roles of ICT in a university are to provide support for academic business, strategic support for decision makers and other operational processes. It is through ICT that the institution can achieve excellence and develop efficiency in its operation to obtain maximum profitability. It is for this reason that the universities must be ready to conform to the technological developments of the 21st century.

Ocholla (2015) argues that most public universities in Africa continue to display poor performance in global web ranking because of the appalling state of ICT and lack of investment on ICT projects. For the online systems to be effective and truly beneficial there has to be a reliable, smooth and fast internet connectivity of which such platform can only be provided by ICT infrastructure. Yuen *et al.* (2009) state that two decades ago there have been an unprecedented growth in the technological world especially internet and a subsequent development in the higher institutional landscape. The acceptance of a wide variety of web-based tools has seen a growth to the trend of online system activities in educational sector.

There is an acknowledgement on the significant role played by ICT in student development. Udofia (2015) reveals that online registration system contributes immensely in the enhancement of students' knowledge on ICT largely because of the utilisation of web-technology during online registration. Stein (2009) and Chaplain (2006) as cited by Udofia (2015), agree that apart from the fact that online registration system deducts face-to-face communication between students and staff, it also influences students' skills in ICT usage and application. Bemile, *et al.* (2014) highlight that web-technology has presented many opportunities to advance teaching and learning and also creates excitement and inspiring environment.

2.4 Current Literature for Online Registration System

The researcher considers some empirical studies to be relevant to this study, for instance, Mashabela and Pillay (2017) conducted an investigation on whether the new students' online registration and admission system that was implemented at the University of Johannesburg (UJ), Gauteng – South Africa, was successfully meeting the expectations of its users through the evaluation of its effectiveness against the ancient walk-in/manual registration system and further analysed the system's strengths and weaknesses. This research was prompted by the incident that happened in January 2012 after a mother queuing for the admission of her child at UJ died after a stampede. The significant findings emerging from this investigation were that although some staff members and students had some challenges with the new students' online registration and admission system, most of them indicated that it met their expectations. Furthermore, the research contributed knowledge that determined the performance of an information system in the institution of higher learning.

Another study from the same institution – UJ, was conducted by Agwa-Ejon and Pradhan (2017) to evaluate the utilisation and effect of the online application and registration process of prospective and registered students in the university. A group of students and administrative employees were involved from all faculties and central

administration of the university. The study concluded that the majority of the respondents which included administrative staff and students, were satisfied with the current online registration process. It was found that the online system was easy and simple although a few indicated that it was challenging and difficult. The findings of this study are almost similar to the one that was conducted by Mashabela and Pillay (2017) where the outcome shows that the majority of respondents found the online registration system to be effective.

Udofia (2015) conducted an investigation which assessed the influence of online registration on students of the University of Uyo, Uyo – Nigeria, which produced completely opposite findings from the ones stated above. In other words, all four hypotheses of the study were rejected. The findings implied that students' online registration system has a strong and positive relationship with manual registration because of the face-to-face interaction of students with faculty administrators and also that online registration requires ICT knowledge acquisition by students. This investigation revealed that the manual process of face-to-face registration was preferred by the majority of students because it presents an opportunity for students to ask questions, submit enquiries and receive feedback on the spot from academic advisors. However, some students were excited about online registration and they viewed it as a time and cost reduction system.

The emphasis on online registration is to have an easier and even more convenient registration process for the entire student body and staff. To this end, Oladunjoye and Omemu (2013) assessed the perception of both female and male students towards manual and online registration system at the institutions of higher learning in Nigeria. The study was guided by one research question. The outcome from the assessment was that the difference was not significant in the perceptions of both male and female students on both manual and online registration systems. Although the process of registration may vary from one institution to the other, the majority of respondents stated that online registration system is cost effective, saves time, is easy and convenient to use, retrieval of information is simple and it defines digital age. Those in

support of the manual registration process felt that it inspires mutual understanding amongst students and if errors occur they can be corrected easily.

A similar study was carried out by Stein (2009), as cited by Udofia (2015), regarding the effect of students' online registration system on Amsterdam University students in South Africa. It was discovered that the majority of students, when asked about their experience in the use of students' online registration system and whether it affected them or not, felt that it took away their opportunity to engage members of their faculties. In another survey conducted by Mirmohammadi, Hashemian, Firozabadi, Dehghani and Eghbal (2011) from Yazd University of Medical Science in Iran on the satisfaction rate of students towards online registration process, the findings were that the majority of students were satisfied with registration processes in the whole, but did not consent with online registration.

A project report was released by a syndicate group called The Madibaz (2017) on how the registration process can optimise the utilisation of financial and human resources at UNIZULU. The report revealed that UNIZULU students and academic as well as administrative personnel wish to see a fully functional students' online registration system to save huge expenditures on manual registration and also on employment of temporary workers who assist during registration. Okoye (2015) presented findings on a case study of Enugu study centre about challenges of online registration system faced by open and distance learners of the National Open University of Nigeria (NOUN). The study was administered to the entire student body of NOUN and explored the sources of the challenges confronted by students during online registration. The findings of the study were that the core challenges of online registration were computer illiteracy, lack of internet services, poor network, costly internet services and power supply interruption.

Lastly, Thossansin and Pomsathit (2014) presented a paper on comparing the use of desktop web application and a mobile application for students registering at the University of Rangsit, Thailand. There were two main objectives of the study, namely,

to assess the accomplishment of developing a hassle free mobile device system and to evaluate the interest of users in the future development of mobile system. The outcome from this comparison was that the majority of students were likely to use mobile system when it is implemented and they were also satisfied with the current self-service registration system. Yuen *et al.* (2009) agree by stating that an online registration system is progressively used as a solution to stimulate the quality, efficiency and flexibility of teaching and learning in higher education institutions.

2.5 Current Registration System at UNIZULU

The University of Zululand is currently using Integrated Tertiary Software which was developed and is being maintained by ITS Integrator, a subsidiary of Adapt IT. This software provides the platform for the University to be able to set up its subsystems for various departments and functions including online registration through iEnabler as a built-in, self-service module which allows students to have direct access to their information for online registration purposes. This information includes, but is not limited to, selected personal or biographical information, finances, proof of registration, timetable, results or transcripts as well as academic related activities. This self-service web portal is also available on ITS for support and academic staff members (<https://www.adaptit.co.za/>).

According to Yuen *et al.* (2009), a software package such as ITS widely provides web-based services, tools and resources to enhance teaching and learning as well as research and innovation processes in an institution. It continuously gets upgraded to keep up with the latest developments in the world of technology. Beside the enrichment in the academic business process, ITS is regarded as a most significant tool for accurate administrative outcomes and more productive operations (Bemile, 2014). Therefore, the current software that is being used at the university is not only for online registration process, but it is also used to manage the entire university business functions, for instance, other divisions such as Finance, Human Capital, Research Unit, Quality Assurance, and Residences utilise the software for their day-to-day business.

This software is regarded as the management of information system because, according to Ocholla (2015), it has a structured approach to assemble information about the organisation's operations and to take informed strategic decisions. An information system is described as a group of components that produce information through their interaction. The University, just like any typical organisation, invests in resources that manage the processing of valuable information to deliver lasting solutions and when it is properly planned, maintained and operated, it provides good benefits. This student portal, also referred to as iEnabler, through which students access more interconnected functionalities such as admissions, enrolment, module registration, statement of student account, modification of module and qualification, facilitates interaction between academics and students regarding study material and other usability.

Figure 3 illustrates the current registration process at UNIZULU through student web iEnabler for both undergraduate and postgraduate students. When student fees are paid, the student finance section, as a first step, commences with financial clearance for cash paying students and bursary holders. Biographical data verification follows as a second step in the process after which the academic advising process kicks-in for FTENS and returning students with outstanding modules. Students with no outstanding module/s and those who are not affected by system rules like, for instance, pre and co-requisites, substitute modules and others, will proceed to the login stage and begin with the actual registration, as demonstrated in Figure 2. Through auto-promotion (auto-progression) a student is redirected to the actual registration web portal.

During this stage of the process, the student will accept the rules and proceed with the selection of modules until the system requires activities to be saved and further provides the option for the printing proof of registration. Upon receiving the proof of registration the student proceeds to take a student card and, thereafter, goes to claim a room, in the case of a resident student.

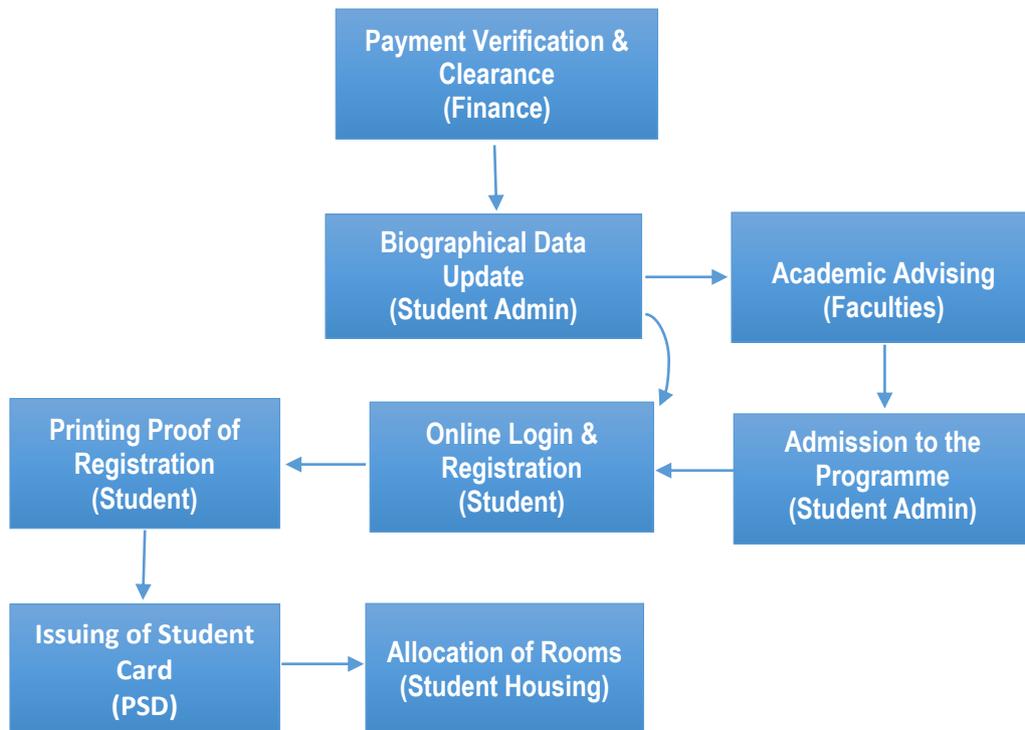


Figure 2.3: Online Registration process at UNIZULU

2.6 Benefits of Online Registration System

According to Agwa-Ejon and Pradhan (2017); Chaka and Mungadzi (2013), web-based online system is being utilised broadly in the academic institutions of higher learning as a major tool for numerous ways to achieve academic and administrative excellence such as online application and selection, registration and electronic filing. One of the main intended goals with the online system is to avoid the huge influx of students flocking to the University during registration period, and according to Agwa-Ejon and Pradhan (2017), masses flood in front of administrative offices and that creates a bottle-neck. This automated system is meant to assist the University to do away with long queues at registration venues for students who do not have gadgets or access to internet.

The students' online registration system is supposed to take few minutes for each student to complete registration, no matter where the student is located. Udofia (2015) concurs that the online system assists students to access the registration portal anywhere, anytime and conveniently. This online system is beneficiary to students who pay their fees timeously to avoid a last minute financial clearance rush. This automated system is designed to be user- friendly and easy to use and, thus, is regarded as saving time and money as compared to manual processes (Singh *et al.*, 2016). The Madibaz (2017) concurs that the online registration system is known to be a student-friendly and hassle free automated system. Therefore, Estevez *et al.* (2013) note that an online registration system should have an incredible usability and learnability.

The online registration system is also intended to eliminate errors tremendously in the university database (Chaka & Mungadzi, 2013), which has a significant impact on High Education Management Information System (HEMIS) data. HEMIS data is crucial for any higher education institution largely because it forms a major part of the report to the Department of Higher Education and Training (DHET) for funding purposes, and it indicates the supply of skills to various sectors as well as compliance on enrolment target issues. This online process will lead to saving time and eradicate regular errors (Singh *et al.*, 2016). Additionally, Oladunjoye and Omemu (2013) believe that on the bases of a well-developed online registration system, retrieving accurate data is an added benefit and there is ease of electronic calculation rather than manual calculation of credits.

It is common knowledge that online registration system carries huge amounts of data and documentation and, therefore, secured registration process and cost-efficiency should be ensured for the benefit of the institution, more importantly, students. Furthermore, Thompson (2017) proposes that online registration should be able to provide the following potential benefits:

- Enhancements to reliability, integration and information sharing. This will increase the quality and data accuracy and also develop internal workflow across all operational areas;
- Efficient flow of data integration, best business and practices;
- Through convenient, anywhere, anytime, timely access to online registration system via web and mobile interfaces improves customer services in the institution;
- Positively impacts on decision making and planning by management/ executive with timely access to information and data;
- Enhanced efficiency regarding the utilisation of hardware equipment as well as minimising the number of needed resources, and
- As a result of efficiency, improvement income will increase and expenses will decrease

When correctly setup, the online registration system should eliminate the element of face-to-face academic advising, which is required by the majority of students who have outstanding module/s from previous years. The students' online registration system should be user- friendly such that it creates a positive influence on students' knowledge and experience on ICT. Furthermore, the students' online registration system should boost the image of the university and also enhance its reputation to the public in general and prospective students in particular (The Madibaz, 2017). Bemile *et al.* (2014) concur that when a tertiary institution does not have online system it will not be able to maintain a previous track record, exhibit its present status and cannot predict the future.

2.7 Challenges of Online Registration System

The commitment of the university to migrate from manual registration to online system met with numerous teething problems (Odero & Oloko, 2013). The migration to online registration posed challenges for the entire registration processes which have been made to be electronic, starting from application, payment of fees and module

capturing. Most of these challenges emanate from the inaccurate set-up of academic structure on the ITS as approved in the Programme Qualification Mix (PQM) of the university. This software is used by the majority of universities in South Africa and has the latest user-friendly technology. These inaccuracies and inconsistencies expose the system to data integrity, which can compromise record management of the University.

The other challenge is the lack of skills and knowledge by faculties to correctly capture all elements required for the academic structure that will not need adjustment during registration. If the academic structure is not correctly setup online registration system will not be able to do what is intended. Some of the modules in academic structure are not allocated correct credit units, which impacts on the overall annual credit values of that qualification. On the other hand, the majority of students do not understand how their academic performance affects their academic progression. The good of the system is that students who are academically performing should not be prevented by any academic rules to progress to the next level of their studies. These academic rules are, namely, pre and co-requisites, auto-promotion and substitute rules and they are central integrity to the quality of the qualifications the University offers.

Developing a properly functional, simple and easy to use online registration system is a challenging process, especially for students who join the university for the first time and who have less or no knowledge and experience of ITS and online system in general. Equally, with the senior students who are familiar with the online system, may feel limited and slackened by the registration process. This challenge is as a result of student usually accessing the online system once a year, only during registration period (Estevez, *et al.*, 2013). Currently at UNIZULU, the online registration process can only be done when students have logged on to the University local area network (LAN), meaning students cannot register while sitting at home or somewhere outside the University. As a result, this causes frustration to students as they have to be in long queues, which at times takes the entire day, depending on the size of the programme allocated on that specific day of registration.

Furthermore, online registration system cannot calculate how many modules are outstanding for each student to proceed to the next level of study- it is a manual process which exposes the process to human errors. All these challenges make it difficult for UNIZULU to achieve the full implementation of students' online registration project sooner.

2.8 Factors that affect Online Registration System

There are factors that affect online registration system, some of which are internal and others external. Some of these factors might not be directly linked to the users of the system because of the very nature that they are unavoidable and some are preventable. A major factor that affects online system is the downtime wherein during registration the system freezes and stops functioning. This could be as a result of the system load during registration phase, which according to Peng *et al.* (2012), is a period when there are too many concurrent online users and huge online operations taking place and, therefore, downtime is likely because of system overload, thus it is essential to choose a suitable systems architecture. Similarly, if the online system is not serviced regularly or else the servers are not compatible with the software which is being used for online registration, this can also cause hiccups with the system.

The other contributing factor is the organisational culture embedded to individuals who have been in an institution for long who know and accept things in a particular way. Organisational culture, according to Manetje (2009), is a pattern of created basic assumptions that have developed over time and considered valid to be shared by new members, and therefore, resist anything that seeks to invalidate the known pattern. As a result, the organisational culture, especially with long serving personnel, affects professional activities at the university such that the implementation of online registration system is considered as a threat towards their employment and, therefore, gets affected.

During online registration period, different sections, departments and units are running reports as part of their operations which also create an overload to the system and it shuts down. The online registration system also gets affected when there is no power supply, that is, load shedding, which at times happens without a warning. Odero and Oloko (2013) insist that the system should have a guarantee of the network security and besides, the fact that the service would be accessible the entire day all the time should also have un-interruptible power supply. This is regarded as an external factor, although it can be avoided through a backup generator and other means of power supply.

The ITS system that UNIZULU is using requires to be supplemented by locally developed software to do other operational functions and to run some essential reports. A local software is designed when the standard system is unable to provide or perform a specific function in a particular way as required by the user. Some of the functions that UNIZULU needed to be customised are firstly, the development of pins (logic of it) which get assigned to each student to access online system, especially during registration period. Secondly, the standard system produces a complex class list that is not user- friendly to academics, thus a local software was developed to serve that purpose. These are just few examples that emphasise the necessity for standard online registration system to be supported by developing local software.

Even though the huge amount of financial resources were invested in the purchasing of the system, more budget is required to enhance its capability and suitability to the university. This system relies mostly on computer hardware and software for proper functioning (Singh *et al.*, 2016), and it is also essential that periodically the server storage as well as the entire system is upgraded with new versions and that (Thompson, 2017) user trainings are organised and conducted so that a firm understanding of the system is obtained and that the system is utilised to its maximum capacity. If budgeting is not properly done or there is lack thereof, it impacts badly on the improvement of the system.

2.9 Theoretical Framework

This study will be premised on the Technology Acceptance Model (TAM) as the framework which was originally propounded by Davis in 1986. Many various theories over the past few decades have been developed (Al-Adwan, Al-Adwan and Smedley, 2013) and the most prevalent developments based on the TAM, intentions and attitudes to utilise technology are mostly dominated by the performance improvement or effectiveness and easy to use (Lemay, Morin, Bazelais & Doleck, 2018). In the same vein, Tang and Chen (2011); Park (2009) agree that TAM is regarded as a persuasive extension and is by far the most extensively debated amongst all other models founded on the theory of reasoned action and further exposed a great influence in predicting and defining user behaviour of information technology.

Since the development of the TAM, it has optimised distinct status for its exceptional performance to clarify the differences in user behaviour (Tang and Chen, 2011). Park (2009); Mashabela and Pillay (2017) state that TAM is an information system model which provides information and is aligned to technology acceptance and use. As cited by Liu, Chen, Sun, Wible and Kuo (2010), Davis (1986) recommended that technology impacts users' purpose to use it with the ease of use and usefulness. This model advances the notion that the user may utilise technology even though they have no positive attitude towards it since it may improve the institutional product (Verma, Bhattacharyya & Kumar, 2018). Similarly, with online registration system it enhances the skills and cements knowledge of technology users at the university. Tang and Chen (2011) regard TAM as a tool to estimate the probability of a new technology being accepted within the institution.

The main ideas and structure of TAM are demonstrated in Figure 4 and Liu *et al.* (2010), supported by two principles, namely perceived usefulness and perceived ease of use. Gu and Liu (2011); Tang and Chen (2011); Al-Adwan *et al.* (2013); Verma *et al.* (2018) termed perceived usefulness as the potential user's subjective prediction that is utilising a particular application system to improve individual's job performance

within the institutional context and referred to perceived ease of use as the amount to which the targeted system is expected to be free of effort by potential user. In short, TAM is determined by technology usage through behavioural intention to use the system, where an individual attitude regarding using the system and its perceived usefulness is determined by the intention to use technology (Verma *et al.*, 2018). For instance, the discovery is that a significant variable is the computer self-efficacy and the assumption that positive connection occurs between perceived ease of use and perceived usefulness on the one hand and higher computer self-efficacy on the other (Liu *et al.*, (2010).

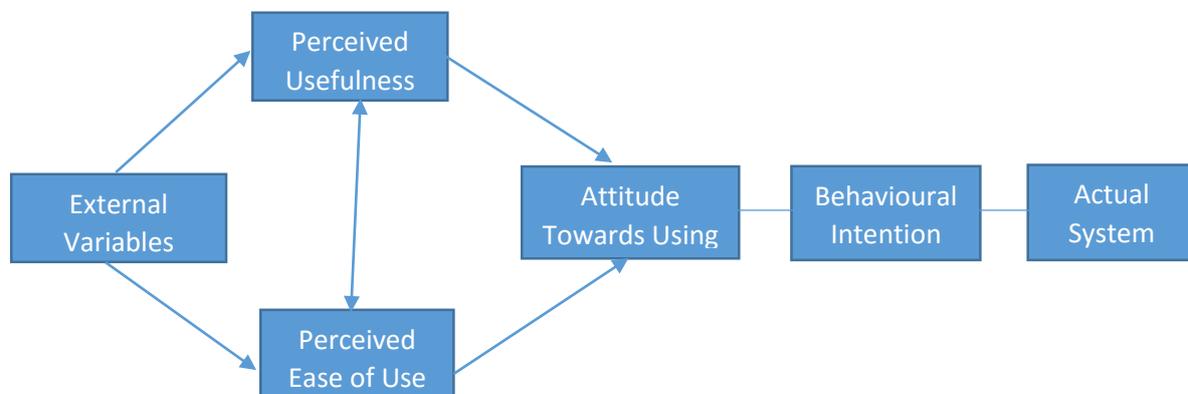


Figure 2.4: Technology Acceptance Model (TAM) (Davis *et al.*, 1989)

Many researchers and authors, as stated by Park (2009), suggested TAM to illustrate why a user rejects or accepts technology by theory of reasoned action. This study recommends TAM as the most appropriate model to evaluate the effectiveness of online registration as a slowly phased in system to address registration challenges at UNIZULU. The model seeks to observe whether system users accept or reject the implemented technology and, according to TAM, users of technology (students and staff members) are directly or indirectly influenced by their attitude, behavioural intentions, perceived usefulness and ease of use of the system (Park, 2009). The frequently accepted principle is to define the influence of technology acceptance by beliefs that are controlled by situations which determine the degree of voluntariness of technology use (Lemay *et al.*, 2018).

Mashabela and Pillay (2017) have applied TAM and other models to illustrate how both students and staff at the university adopted and used online enrolment system to attend to challenges of registration. Similarly, Lemay *et al.* (2018) examined the technology acceptance by college students through the testing of TAM concepts, behavioural intention, and attitude towards the use and other constructs. The outcome of the study showed that the attitude influences behavioural intention which in turn also influences the use of technology and eventually influences both perceived usefulness and perceived ease of use. Lastly, a paper produced by Tang and Chen (2011) reviewed and made a comparative analysis of user acceptance literature and deliberated on four essential models that relate to technology acceptance. The findings consistently illustrated that all four typical models clarified considerable proportion of adjustment in user intentions and user behaviour.

2.10 Conclusion

Chapter two of this report has provided an overview of literature on the effectiveness of students' online registration system at tertiary institutions. It has also defined key concepts which support the objectives of the study and further highlighted the theoretical framework and its relevance in the study. The next chapter outlines the research methodology that was employed in this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology used in the study. The pathway for the study is represented by the research methodology, which helps in achieving the objectives of the study while making attempts to provide responses for the research questions. It outlines the means used to conduct the study: the research design, qualitative and quantitative research methods, research philosophy, population, sampling and sample size, research instruments, techniques used in data collection and analysis.

3.2 Research Design

The research design is basically about the plan or strategy of designing and executing the research project to convince a wider audience that the research conclusions underlying essential decisions are well kept (Punch, 2009; Gorard, 2013). According to Yunus and Tambi (2013), under research design topic, the researcher deliberates on a range of research designs that provide the audience with an insight on how the survey will be conducted. This includes the whole research process from identifying the problem to formulating research questions, as well as on the collection of data, analysis, reporting and publishing of results (Creswell, 2007; Punch, 2009). Additionally, research design is identified by Welman, Kruger and Mitchell (2005) as the planning to which information is collected by research contributors, while Mouton (2006) categorises research design as a clarification of the researcher's plan to execute research methods.

In general, a research study has four common types of designs, namely descriptive, explanatory, exploratory and correlational (Kumar, 2011). Babbie (2008) concurs that

the research design determines the purpose of the study through the influence on the choices of data sources and types of data collected. The following are the four different types of designs:

- **Descriptive Studies** – this design allows the researcher to observe and afterwards describe statistically the observation through a particular technique (Yunus & Tambi, 2013). For instance, the objective of Census South Africa is to precisely and accurately describe a range of the population characteristics. The descriptive research design responds to questions of what, when, where and how of the study being conducted (Babbie, 2008).
- **Exploratory Studies** – the design applies when the research is conducted with the purpose either to explore an unknown area or investigate the likelihood of undertaking the study in the area where the researcher has little or no knowledge (Kumar, 2011). According to Babbie (2008) the purpose of this design is to fulfil the curiosity of the researcher and desire for greater understanding, as well as to construct the techniques to be used in any subsequent study.
- **Explanatory Study** – unlike descriptive study, explanatory study seeks to provide answers focusing on why question (Babbie, 2008) and clarify the reason there is a connection amongst two aspects of the phenomenon (Kumar, 2011). An explanatory study is also known as causal research which is carried out in order to prove that the existence of dependent variable is as a result of the presence of independent variables (Yunus & Tambi, 2013). According to Leedy and Ormrod (2010), the explanatory design requires respondents to describe their thoughts and feelings or to explain on their answers to survey questions which can assist the researcher to provide substance and understanding to the numbers.
- **Correlational Study** – it inspects and establishes the existence of a relationship or association amongst two or more characteristics or variables

(Leedy & Ormrod, 2010; Kumar, 2011). The primary objective of this design is to interdependently associate two variables in a way that changes if one variable is linked to the other variable or certain features of one are linked to certain features of the other (Babbie, 2008).

Therefore, the study as a quantitative research, used a descriptive design because of the responses provided by research participants to critical questions, comparing attitudes towards matters of major significance to the chosen population. The descriptive design fits this study because it involves collection of quantitative data that can be tabulated along a scale in numerical form and also describe categories of data such as gender or patterns in a group situation. In employing descriptive research design, the researcher quantified certain observations regarding the effectiveness of students' automated registration system and identified connection between variables.

3.3 Research Philosophy

A research philosophy deals with the approach a researcher should be adopting with the basic assumptions of the worldview which mostly derived from the fundamental research questions (Flick, 2015). Du Plooy-Celliers, Davis and Bezuidenhout (2014) suggest that phenomena and paradigms are part of research philosophies and are mostly referred to as research traditions because they ascertain what questions are regarded as worthy of researching. There are two research philosophies that are commonly employed by different researchers and those are phenomenological and positivist (Tuli, 2010), and they are discussed below.

3.3.1 Phenomenological Philosophy

Leedy and Ormrod (2015) postulate that phenomenological research is a study that seeks to understand the perspectives and perceptions of people associated to a particular situation. Babbie (2016) regards phenomenological study as a unique

approach to qualitative research because of its traditional roots in the philosophy which explains why respondents report their experiences of reality in a particular way. For a qualitative research this is another approach for researchers to prevent imposing their assumptions on to the data, and instead pay attention to the main concern which is defining people's experiences of a specific aspect of their lives (Bless, Higson-Smith & Sithole, 2013). Finally, many researchers attempt to label this philosophy through the view of or as experienced by their respondents.

3.3.2 Positivist Philosophy

According to Tuli (2010) the positivist philosophy represents quantitative research and it employs experimental designs to ascertain the effect and numerical measurement to assess a social phenomenon in stressing objectivity and reliability of the outcome. Flick (2015) indicates that positivism is often linked with realism and uses quantitative approach to develop hypotheses for subsequent testing. According to Guthrie (2010), positivist experiments have a potential to provide more thorough assessment of cause-and-effect. Furthermore, this paradigm employs reliability, validity and precision to determine the accuracy of quantitative studies as they meant to predict, describe and verify empirical associations in comparatively controlled settings (Tuli, 2010).

Based on the above, the philosophy of this study is placed on positivist paradigm because of it being a quantitative research and the fact that the study of this nature allows the collection of data from larger samples. This study evaluated the student's online registration system at UNIZULU and, therefore, collected research data from a bigger population of student body and selected personnel. Tuli (2010) stresses that positivism is centred on the assumption that universal rules exist that regulate social events and through these laws researchers are able to predict, define and govern social phenomena. According to Bless *et al.* (2013), a quantitative approach which is positivism depends broadly on numbers and statistics in analysing and interpreting data and outcomes that are reflective of the entire population.

3.4 Research Method

Research methods are divided into qualitative, quantitative and mixed-methods. A researcher chooses a type of study amongst these three methods/ approaches that determine a particular direction for procedures in a research (Creswell, 2014). Most researchers prefer to employ either qualitative or quantitative methods, but Guthrie (2010) argues that a progressively significant section of social science research is the use of the mixed methods. The mixed-methods research integrates techniques associated with both quantitative and qualitative research (Du Plooy-Cilliers *et al.*, 2014). Such study includes not only gathering, analysing, and interpreting data for both quantitative and qualitative, but also combines outcomes from those data into one (Leedy & Ormrod, 2015). Du Plooy-Cilliers *et al.* (2014) postulate that critical realists employ various sources of data gathering because they increase the reliability and validity of the study.

Commonly, with many studies the distinction drawn between quantitative and qualitative is basically the distinction between nonnumeric and numeric (Babbie, 2008). According to Creswell (2003), in a quantitative research, the problem is mostly explained by understanding what constructs or factors determine the outcome, whereas with qualitative research the researcher will define a research problem that can mostly be understood by enquiring a notion or circumstances. Punch (2009) agrees that the basic difference between the two methods depends on the process of measurement, which mostly engenders inflexible positions regarding research and for a long time has been deliberated between two approaches. As it is shown in *Table 3.1*, Langkos (2014) posits that the main attribute of qualitative research is that it is best suitable for small samples, while its conclusions are not quantifiable and measurable, and on the contrary the quantitative research is mostly appropriate for a bigger sample and its outcome is measurable and quantifiable.

Table 3.1: Attributes of Quantitative and Qualitative Research (Lungkos, 2014)

Quantitative Research	Qualitative Research
The purpose is to classify features, count them, and construct statistical models in an attempt to explain what is observed.	The purpose is a complete, detailed description.
Researcher knows vividly in advance what she/he is looking for.	Researcher may only know roughly in advance what she/he is looking for.
Recommended during latter phases of research projects.	Recommended during earlier phases of research projects.
All aspects of the study are carefully designed before data is collected.	The design emerges as the study unfolds.
Researcher uses tools, such as questionnaires or equipment to gather numerical data.	Researcher is the data gathering instrument.
Data is in the form of statistics and numbers.	Data is in the form of words, pictures or objects.
Objective: needs exact measurement and analysis of target concepts, e.g., uses surveys, questionnaires etc.	Subjective – individual's understanding of events is important ,e.g. uses participant observation, in-depth interviews, etc.
Quantitative data is more efficient, able to test hypotheses, but may miss contextual detail.	Qualitative data is more 'rich', time consuming, and less able to be generalised.
Researcher tends to remain objectively separated from the subject matter.	Researcher tends to become subjectively absorbed in the subject matter.

In this study the quantitative method was followed. According to Du Plooy-Cilliers *et al.* (2014), quantitative research is employed to control and predict future outcomes, define the importance of quantities, levels and relationships of quantities and also to

generalise from a sample of persons to a bigger population. Mashabela and Pillay (2017) affirm that in a quantitative study data is collected from a bigger geographical area and time saving while enhancing reliability and validity of the outcomes. Thompson (2017) concurs that quantitative research approach mostly addresses the quantity of understanding and this is opposed to qualitative research approach that addresses and focuses on the in-depth qualities and understanding variables.

3.5 Research Strategy

A research strategy is the way in which the researcher intends to respond to research questions in trying to meet the objectives (Saunders, Lewis & Thornhill, 2009). The researcher uses research strategy as means for solving the research questions. The two research strategies, which are phenomenological and positivism, are discussed below.

3.5.1 Phenomenological Research Strategy

3.5.1.1 Grounded Theory

Creswell (2014) postulates that grounded theory is a technique of inquiry in which a researcher develops a philosophical theory of process or interaction based on the opinions of respondents. As a qualitative research, this is a methodology for constructing theory from data and the codes utilised in this theory are never drawn from the theory, but instead, directly from the data (Bless *et al.*, 2013).

3.5.1.2 Case Study

According to Du Plooy-Cilliers *et al.* (2014), a case study is a comprehensive description of the existence of a social phenomenon within the actual world context. A case study research could be looking at a small group, an individual, a community, an

event or a city (Kumar, 2011). The goal facilitation of a qualitative study with characteristics of the case study method focuses on the subjective and specific reality of respondents (Du Plooy-Cilliers *et al.*, 2014).

3.5.1.3 Action Research

Action research is made up of two terms brought together as *action* and *research* to mean, involved in a careful, diligent investigation to obtain information having practical application to the answer of particular problems associated to the work (Punch, 2009). According to Saunders *et al.* (2009), the main centre of attention of action research is to advance change within the institution. Both action and research occur alternatively in a continuous development process for every participant (Bless *et al.*, 2013). Finally, the action research combines the doing (acting) and enquiring (researching) (Punch, 2009).

3.5.1.4 Ethnography

According to Babbie (2016), an ethnography is a study that puts emphasis on precise and detailed description instead of explanation. Babbie and Mouton (2009) describe ethnography as the cultural data that emanates from the behaviour which is directly observed in a specific society with the intention to understand a different way of life from that specific society's point of view.

3.5.1.5 Interview

An interview is a qualitative data gathering technique which permits the researcher to put forward questions to participants with the intention of knowing more about their opinions, beliefs and views on a particular subject (Du Plooy-Cilliers *et al.*, 2014). According to Bless *et al.* (2013), an interview includes direct personal interaction with

the respondent who is asked to respond to questions concerning the research problem. An interview is regarded by many researchers as a very time consuming and resource intensive qualitative research tool (Du Plooy-Cilliers *et al.*, 2014).

3.5.1.6 Focus Group

The focus group technique, which is also known as group interviewing, is suitable for the qualitative data collection that is often employed by market researchers who, for example, ask consumers in groups to assess a product (Babbie, 2008). This qualitative data gathering method's main aim is to facilitate group discussion in which a researcher poses questions that ignite discussion between group members and it is considered a low cost and popular method for gathering data in most professional and academic fields (Kumar, 2011).

3.5.2 Positivist Research Strategy

3.5.2.1 Survey Strategy

According to Leedy and Ormrod (2015), some researchers employ the word survey research when referring to descriptive or quantitative study. A research may involve finding out about one or more groups of people towards a specific matter, for instance about their attitudes, characteristics, orientations and opinions through questioning them and tabulating their responses (Bless *et al.*, 2013). Babbie and Mouton (2009) consider survey as the best technique available for researchers to collect original data for defining a population too big to directly observe.

3.5.2.2 Experimental Design Strategy

In an experimental design, a researcher persuasively detects cause-and-effect connections by identifying many related factors that can possibly influence or cause a specific phenomenon (Leedy & Ormrod, 2015). Du Plooy-Cilliers *et al.* (2014) posit that experimental design is another method of quantitative research to collect data using different experiments and in the process the researcher attempts to regulate all other factors that can influence the outcome. This method is hardly utilised and it is normally used under certain terms (Saunders *et al.*, 2009).

3.5.2.3 Quasi-experimental Design Strategy

Bless *et al.* (2013) postulate that quasi-experimental design has fewer requirements than other experimental designs in research. In this design according, to Creswell (2014), the common approach is that participants when selected are not randomly assigned. Babbie (2016) concurs that this experimental design differentiates itself from real experiments mainly by the lack of assignment of individuals to groups for experiments.

This study is presented from the perspective of a positivist research methodology, therefore, survey strategy was suitable. The appropriateness of survey strategy emanates from the fact that it employs questionnaires as the data collection method. The survey strategy is regarded as a time saving technique. Mostly, the gathering of data is from the large sample where a particular population is presumed to be represented so that generalisation of the findings can be done about the population.

3.6 Target Population and Area of the Study

When constructing a research project there is a need of ensuring that the entities where data are selected from maximise the opportunities of representing the true population (Msweli, 2011). According to Babbie (2001); Mouton (2006); Babbie (2008), a study population is defined as the collection of elements (individuals, objects and events) from which the study sample is actually drawn, and Msweli (2011) concurs that it is a group of entities about whom the results of the study are generalised. The area of the study is UNIZULU, both KwaDlangezwa and Richards Bay campuses and it comprises four (4) faculties, namely Faculties of Arts; Commerce, Administration and Law; Education and Science and Agriculture. The study population consisted of the registered students and administrative employees of UNIZULU. When this study was conducted the university had an entire student population of 14 000 which comprised both undergraduates and postgraduates, as well as staff compliment of about 450 for both campuses.

3.7 Sampling Strategy

The sampling strategy can be referred to as a plan set forth to ensure that the sampling used in a study represents the population. According to Kumar (2011), sampling is the process whereby a researcher chooses a few from a larger group to become the foundation for projecting or estimating the prevalence of the outcome concerning the larger group. Therefore, it is a method of choosing observations (Babbie & Mouton, 2009).

3.7.1 Probability Sampling

Leedy and Ormrod (2015) state that probability sampling is when a researcher's purpose is to predict what a fairly huge population thinks, feels or does. The probability sampling employs some sophisticated statistics when selecting study participants and

the probability technique which utilises the positivist paradigm and survey strategy (Babbie, 2016). It is imperative when using a probability sampling method that every element in the population gets an independent and equal opportunity of being selected in the sample and the meaning by equal is to treat each member of the population as the same also that each member in the sample is by any chance not influenced by personal preference (Kumar, 2011). The probability sampling is comprised of simple random, systematic, cluster as well as stratified sampling (Bless *et al.*, 2013).

The simple random sampling is a procedure that offers equal chances of choosing for each element in a population (Bless *et al.*, 2013), and to employ simple random sampling a single number must be assigned to each subject in the list without missing any number in the process (Babbie & Mouton, 2009). In the systematic sampling, similar to simple random sampling, each element also has an opportunity to be picked and additionally the researcher separates the population into numerous subpopulations and then draws a random sample (Flick, 2015).

According to Yunus and Tambi (2013), the population in cluster sampling is divided into discrete groups before sampling and each element is chosen from each cluster. In the stratified sampling, the major consideration is on the individual characteristics (i.e. gender – males and females) being represented in the sample and that the sample mirrors the real proportion in the population (Creswell, 2014).

3.7.2 Non-probability Sampling

According to Du Plooy-Cilliers *et al.* (2014) and Kumar, (2011), the researcher employs non-probability sampling when it is almost impossible to identify who the whole population is and also the number of elements is unknown or when obtaining access to the total population is difficult. Babbie (2016) states that any method in which samples are chosen in a certain way which is not in line with probability theory is called a non-probability sampling. There are four types of non-probability sampling which are

commonly used in both quantitative and qualitative research, namely snowball, convenience, purposive and quota sampling (Babbie & Mouton, 2009).

The main objective of the purposive sampling is to choose elements that can supply quality data to achieve the aims of the study and it is mostly useful when the research seeks to develop or describe a phenomenon which only a little is known about (Kumar, 2011). A convenience sampling randomly selects those elements that are easiest to assess and willing to participate as part of the sample (Saunders *et al.*, 2009). Du Plooy-Cilliers *et al.* (2014) posit that in a snowball sampling the researcher makes use of referrals from other participants to develop the sample size, whereas in quota sampling, the researcher considers some visible characteristics in the entire population of interest, i.e. race or gender (Kumar, 2011).

This study employed the convenience sampling which is part of the non-probability sampling techniques and also regarded it as convenient and economical to gather the research information. This sampling is appropriate for this study because the researcher used a university and participants (students and staff) who were available and keen to partake. For the data collection purposes, the sample of the study was drawn from the students at all levels of study and staff members in the Office of the Registrar, Faculty Administrators, ICT and Student Finance.

3.8 Sampling Size

According to Bless *et al.* (2013), the size of the sample is an essential determining factor of the research statistical power. A huge sample is costly, but more representative and the opposite is more convenient, but much less accurate (Bless *et al.*, 2013). This study was conducted at UNIZULU and the researcher had to determine the accurate sample size of student population from the Population Size = N of 14 000, the 95% Confidence Level was employed as a research industry standard with the Margin of Error = e of 3% which gives the total Sample Size of 450. As for personnel

in targeted departments with Population Size = N of 45, the 95 % Confidence Level was used with the Margin of Error = e of 5% to achieve the Sample Size of 40.

3.9 Data Collection Instruments

There are numerous data collection instruments in both quantitative and qualitative research which include questionnaire, interview, document reviews and observation (Msweli, 2011). Babbie and Mouton (2009) state that the collection of data can be primary or secondary and the majority of researchers use questionnaires and interviews. The primary data is gathered for the objective of the specific research and the secondary data being the information that is taken from another researched work (Yunus & Tambi, 2013).

The questionnaire is comprised of a list of pre-set questions with open answers where participants write their responses in their own words and it is mostly suitable for a research study that seeks to test a hypothesis (Flick, 2015). Babbie (2016) considers interview as a data gathering tool in which a researcher asks pre-set questions with the intention to solve a research problem. When reviewing existing documents (e.g. reports, meeting minutes, etc.) as a way of data collection method it is known as document review and it is a rarely used technique, whereas with observation, the researcher uses different senses to examine the patterns in people's social interaction (Punch, 2009).

This study used a survey questionnaire as a data collection instrument. Babbie (2008) posits that questionnaires are utilised in relation to different modes of observation in survey research. The use of questionnaire permits the researcher to gather a high proportion of reliable responses from a large sample. The structured questionnaire was employed in this study to ascertain the attitudes, perceptions, preferences and opinions of the selected population (Mashabela & Pillay, 2017) at UNIZULU - being students and members of staff from selected divisions. The questionnaire was

structured in such a way that all three research objectives had each been covered by a set of questions. In other words, the questionnaire was divided into four sections and these were:

- **First Section** required the personal information (demographics) such as gender, age group, race, level of study and educational level.
- **Second Section** asked questions that sought to identify benefits of students' online registration system.
- **Third Section** asked questions that identify challenges faced by the automated registration system at UNIZULU.
- **Fourth Section** probed the factors that are affecting online registration system as the third objective of the study.

This study employed closed ended questions on the questionnaires as they are quick and easy to respond to and also save time. When compared with other respondents, they make it easier and even with analysing the data on a computer. The five-point Likert scale was used as it is known to assess people's attitudes, behaviour and other phenomenon of interest (Leedy & Ormrod, 2010), although it may restrict the number of answers by virtue of a scale arrangement (Flick, 2011). Guthrie (2010) appraises Likert scale as a common method of scaled answer which requires participants to answer to a statement by selecting the response that most corresponds to their perspective. By constructing this type of questionnaire it encourages respondents to be cooperative and produce answers a researcher can use and interpret. To prevent the likelihood of confusion which might lead into different possibilities of interpretations, a simple language was used.

3.10 Pilot Study

According to Leedy and Ormrod (2015), a pilot study is to test a particular instrument, cautiously examining it of any possible errors or weaknesses in preparation for the actual survey. The objective of the pilot study is to test particular procedures and that respondents understand the instructions, terminology used, and questions asked to prevent the failure to collect the much required data.

The researcher piloted the questionnaires on ten (10) students and at least four (4) staff members who were not part of the actual survey. The entire process took place without any due influence or explanation from the researcher, which means the questions were clear, understandable and no modifications were done on the questionnaires.

3.11 Administration of Questionnaire

The data collection process started with the administering of questionnaire. After the permission was sought from the university, the researcher then enlisted the aid of four (4) research assistants to administer the questionnaire to students during lecture periods and also visited students' recreational venues on campus residences. Adequate directives were issued to research assistants to help the respondents to fill-in the questionnaires with ease. It is always preferable for mobile respondents (like students) when questionnaires are administered physically that they are completed and returned immediately. As for staff members, the questionnaire was emailed to the relevant student administrators from selected divisions and were requested to fill it in and return it to the principal researcher.

3.12 Data Analysis

The data analysis represents a major step in any research project (Flick, 2015), and data are analysed by recognising patterns in the data and making conclusion from them. The collected information had to be sorted, grouped, organised and assembled in line with the numbers linked to the questions that were placed as the coding system in order to gather the emerging points/issues and to create particular orders in all the answers. The statistical analysis of the data was done using descriptive and inferential statistics, meaning that the data were analysed through basic measures relevant to Likert scale rating (Mashabela & Pillay, 2017). The descriptive and inferential statistics created the possibility to have an explicit presentation and deliberation of answers of the respondents (Lawal-Adebowale & Oyekunle (2014). The quantitative data gathered from the questionnaires were correctly captured and analysed using Statistical Package for the Social Sciences (SPSS) version 25 to draw implications on the usage and impact of students' online registration system at UNIZULU. Based on the questionnaire as a tool for collecting data, useful and meaningful inferences from final scores were drawn for determining the findings of the study. Basically, a quantitative study uses statistical techniques to analyse data and, therefore, through the display of graphs, charts, tables and other statistical means, the data are analysed, interpreted and reported.

3.13 Validity and Reliability

According to Guthrie (2010), validity is known as the correctness of the collected data and Punch (2009) refers to the overall validity of the research as the level to which the distinct parts of the study fit together. Reliability is referred to as the degree of consistency with which an instrument to measure produces a particular outcome when there has not been any change on the entity that is being measured (Leedy & Ormrod, 2010). In this quantitative study, reliability of instruments used in gathering data from the elements was affirmed by the outcome of the pilot study conducted prior to the subsequent survey. Furthermore, the content validity of the instrument was used for

determining the effectiveness of the students' online registration system at UNIZULU. To ensure that all constructs developed as the instruments in the questionnaires are correct, it was tested for its reliability through pilot study. The supervisor of the principal researcher provided an expert opinion validating if the questions in the questionnaires were appropriate and reliable before being administered.

3.14 Ethical Considerations

Generally, ethical issues are pertinent to social research (Flick, 2015), this is largely because the research is about people and involves gathering data from people (Punch, 2009). Creswell (2003) and Guthrie (2010) agree on the significance that ethics considerations should be an important pathway of research process, starting from the study formulation stage to analysis and declaration of the research outcomes. Furthermore, Kumar (2011) and Leedy and Ormord (2015) posit the significant of ethical conduct in research, also stating that there are many principles underlying ethics in research such as right to privacy, protection from harm, honesty and voluntariness.

Guthrie (2010) states that an approval to conduct research project is normally required initially by your institution of higher learning. For this study, the research office issued the ethical clearance after the principal researcher obtained the gatekeeper's letter from the institution where the data were collected. All the respondents signed the consent form as an agreement to participate in the research study voluntarily. There was consistent maintenance of confidentiality and anonymity when data were collected from the respondents. The copy of the ethical clearance is herewith attached at the end of this study and the ethical clearance number is HSS/1180/018M.

3.14.1 Recruitment

The recruitment of participants for the study (especially students) was done after the permission was sought from the university, the researcher then enlisted the aid of four (4) research assistants to administer the questionnaires to students during lecture periods and also visited students' recreational venues on campus residences. For the recruitment of personnel as participants, the questionnaire was emailed to the relevant student administrators from selected divisions and they were requested to fill it in and return it to the principal researcher within five (5) working day.

3.14.2 Ensuring Anonymity

According to Bless *et al.* (2013), participants' information must never be disclosed and anonymity should be implemented in all parts of the research processes. In this study anonymity was ensured and participants were also informed through the participant letter that their information on the consent letter will not be divulged. The identity of all participants will not in any way be associated with their research answers.

3.14.3 Ensuring Confidentiality

Bless *et al.* (2013) refer to confidentiality as an ethical requirement whereby sensitive and personal information given by participants should be protected and only be known to researchers not anyone else. In the participant letter, attached to the questionnaire, the confidentiality is guaranteed. It is the responsibility of the researcher to ensure that the data gathered from participants are kept under secure conditions.

3.15 Conclusion

This chapter described the research methodology and research design. At the beginning of the chapter, the research problem is restated and followed by the comparison between quantitative and qualitative research methods. Furthermore, the study outlined the population and identification of sample size, data collection method, data analysis, liability and pilot study, validity, ethical consideration and conclusion. The next chapter will present the actual data analysis, and discussion of the findings.

CHAPTER FOUR

RESULTS, DISCUSSION AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter presents the data analysis, research findings and discusses the results of the study. In this chapter the data are analysed and interpreted using descriptive statistics and are presented in a form of graphs, charts, tables as well as other figures from the data collected in a quantitative study. Therefore, this chapter presents the result of students' online registration system at UNIZULU from the perspective of both staff members from selected units and students in terms of the benefits of using the system, challenges encountered and factors affecting the online system. The primary data gathering instrument employed for this research study was a questionnaire.

4.2 Response Rate

According to Babbie (2016), a response rate in a form of a percentage that refers to a total number of participants who answered the questionnaire as a data collection instrument, divided by the number of selected participants in the entire sample. A total of 405 questionnaires were returned by respondents after 450 were dispatched for students, and out of 40 questionnaires dispatched 33 were returned by staff members, which is considered good by Saunders *et al.* (2009) who recommend that a response rate which is above 40% is satisfactory.

Table 4.1 Response Rate

Respondents	Distributed	Returned	Percentage
Staff members	40	33	82.5
Students	450	405	90.0
Total	490	438	86.2

Table 4.1 indicates that 82.5% (33) and 90.0% (405) of the questionnaires distributed noted a satisfactory of 86.2% return rate. The primary focus of the study was both students and staff members from the sections that are directly involved with registration.

4.3 Presentation and Interpretation of Research Questions in Section A for Staff and Student Respondents

4.3.1 Presentation of Demographic Data

Demographic data involve respondents' particulars on gender, age, race, level of study, highest qualification, faculty and campus. Each variable is presented below.

4.3.1.1 Gender of Respondents

The study intended to establish the gender of each respondent. To that effect, all respondents were asked to indicate what their gender is. Below, tables 4.2 and 4.3 show the results.

Table 4.2 Gender of Staff Respondents

Indicator	Frequency	Percentage
Male	12	36.4
Female	21	63.6
Total	33	100.0

Table 4.2 indicates that 21 staff members (63.6%) were females while 12 (36.4%) were males. The above table shows that female staff members were in majority in all the sections that were role players in the registration processes.

Table 4.3 Gender of Student Respondents

Indicator	Frequency	Percentage
Male	201	49.6
Female	204	50.4
Total	405	100.0

Table 4.3 above reveals that out of 405 student participants 204 (50.4%) were females and 201 (49.6%) were males. This indicates a good balance in students' participation in as far as the gender is concerned, although female respondents were a slightly more than male respondents.

4.3.1.2 Age Respondents

The study intended to find out the age of the respondents who took part in the study. The staff and student respondents were requested to indicate their age.

Table 4.4 Age of Staff Respondents

Age	Frequency	Percentage
25-34 years	11	33.3
35-44 years	8	24.2
45-54 years	8	24.2
55-65 years	6	18.3
Total	33	100.0

Table 4.4 shows that the age of the total respondents was between 21 to 65 years with 35 years as a mean value. The respondents with 33.3% fall in the age between 25 to 34 years, 24.2% were aged between 35 to 44 years and, similarly, with respondents aged between 45 to 54 years, 24.2% and 18.3% were aged between 55 to 65 years. The majority of the staff respondents were in the range of 25 to 34 years of age with 33.3 percent.

Table 4.5 Age of Student Respondents

Age	Frequency	Percentage
18-24 years	309	76.3
25-34 years	80	19.7
35-44 years	12	3.0
45-54 years	3	0.7
55-65 years	1	0.3
Total	405	100.0

Table 4.5 shows that 309 (76.3%) student participants were aged between 18 to 24 years, 80 (19.7%) were aged between 25 to 34 years, 12 (3.0%) were aged between 35 to 44 years, 3 (0.7%) were aged between 45 to 54 years and 1 (0.3%) was between 55 to 65 years old. The majority of the student participants were aged between 18 to 24 years and the above reflects the fact that UNIZULU is a full time based institution and uses a contact method of teaching and learning.

4.3.1.3 Race of Respondents

The study sought to find out the race of both staff and student respondents. They were asked to indicate which race they belonged, to with four categories of specific races and 'other'.

Table 4.6 Race of Staff Respondents

Race	Frequency	Percentage
African	29	87.8
Indian	2	6.1
White	2	6.1
Total	33	100.0

Table 4.6 above indicates that 29 (87.8%) staff respondents were Africans, 2 (6.1%) were Indians and another 2 (6.1%) were Whites. Respondents were made up of Africans, Indians and Whites, although Coloured and Other were also an option, but no staff respondents belonging in the latter two race categories were identified. The findings show that Africans were the majority, and this was a true reflection, considering that UNIZULU is located in the deep rural area of Northern KwaZulu-Natal.

Table 4.7 Race of Student Respondents

Race	Frequency	Percentage
African	341	84.3
Indian	27	6.6
Coloured	28	7.0
White	6	1.4
Other	3	0.7
Total	405	100.0

According to Table 4.7, 341 (84.3%) student participants were Africans, 27 (6.6%) were Indians, 28 (7.0%) were Coloureds, 6 (1.4%) were Whites and 3 (0.7%) were indicated as Other. The findings indicate that African student participants were in majority by 84.3% above all other races and the contributing factor might be that the majority of students come from rural areas in the Province of KwaZulu-Natal.

4.3.1.4 Highest Level of Qualification

This study asked staff members to indicate their highest level of qualification. According to the questionnaire the options were Undergraduate Diploma and Degree, Postgraduate Diploma and Degree, Masters and Doctoral Degrees, as well as 'other'. In this study undergraduate qualification referred to the qualifications that require matriculation or grade 12 certificate as a pre-requisite and postgraduate requires undergraduate qualification as a pre-requisite to pursue it. The 'other' referred to any qualification below undergraduate diploma or degree.

Table 4.8 Highest Level of Qualification for Staff Respondents

Qualification	Frequency	Percentage
Diploma/Degree	11	33.3
Postgraduate Diploma/Degree	15	45.5
Master's Degree	4	12.1
Other	3	9.1
Total	33	100.0

Table 4.8 shows that 11 staff respondents (33.3%) possess either an undergraduate diploma or degree, 15 staff respondents (45.5%) hold either a postgraduate diploma or degree, while 4 staff respondents (12.1%) possess Master's degree and 3 staff respondents (9.1%) hold a certificate or matriculation. According to the table above, the majority of staff members (45.5%) hold postgraduate qualifications.

4.3.1.5 Level of Study

The study sought to find out the level of study from the student respondents. They were asked to indicate whether they were studying undergraduate or postgraduate studies.

Table 4.9 Level of Study for Student Respondents

Indicator	Frequency	Percentage
Undergraduate	357	88.1
Post-Graduate	48	11.9
Total	405	100.0

Table 4.9 indicates that 357 (88.1%) student participants were enrolled for undergraduate studies, while 48 (11.9%) were postgraduate students. The findings indicate that the majority (88.1%) were undergraduate students, and this might reflect the fact that UNIZULU is a full time based institution and uses contact as a mode of teaching.

4.3.1.6 Faculty for Students

The study sought to find out from the student respondents the faculties in which they were registered for their studies. In the questionnaire, they had to choose their Faculties between Arts, Commerce (Commerce, Administration and Law), Education and Science (Science and Agriculture).

Table 4.10 Faculty for Students

Faculty	Frequency	Percentage
Arts	129	31.8
Commerce	131	32.4
Education	63	15.5
Science	82	20.3
Total	405	100.0

From Table 4.10 it shows that 129 (31.8%) student respondents were in Arts, 131 (32.4%) were in Commerce, 63 (15.5%) were in Education, while 82 (20.3%) were in Science. The above findings show that the majority of students (32.4%) were in the Faculty of Commerce, Administration and Law.

4.3.1.7 Campus for Respondents

The University of Zululand (UNIZULU) has two campuses, namely Kwa-Dlangezwa and Richards Bay, and this study sought to establish the campus at which each staff respondent is working and also for student respondents to indicate at which campus they are registered.

Table 4.11 Campus for Staff Respondents

Campus	Frequency	Percentage
Kwa-Dlangezwa	21	63.6
Richards Bay	12	36.4
Total	33	100.0

Table 4.11 indicates that 21 staff respondents (63.6%) work at Kwa-Dlangezwa campus, while 12 staff respondents (36.4%) work at Richards Bay campus. These

findings show that the majority of staff respondents (63.6%) work at Kwa-Dlangezwa campus and the contributing factor to this outcome was the fact that Kwa-Dlangezwa campus is the main campus and also that most of the work-force is based there.

Table 4.12 Campus for Student Respondents

Campus	Frequency	Percentage
Kwa-Dlangezwa	276	68.1
Richards Bay	129	31.9
Total	405	100.0

Table 4.12 shows that 246 (68.1%) student participants were at Kwa-Dlangezwa campus, while 129 (31.9%) were at Richards Bay campus. From the findings above, the majority of students (68.1%) were studying at Kwa-Dlangezwa campus. This reflects the fact that most of the study programmes are offered at Kwa-Dlangezwa campus and also it is regarded as the main campus of UNIZULU.

4.4 Presentation and Interpretation of Research Questions in Section B for Staff Respondents

4.4.1 Findings based on Objective 1: To establish the benefits of students' online registration system at the University of Zululand.

The first objective of the study sought to establish the benefits of using online system to register students for the programmes and modules of their choice. To address this objective based on staff members' perspective, ten questions were developed and the findings are captured in Figures 4.1 to 4.10 hereunder.

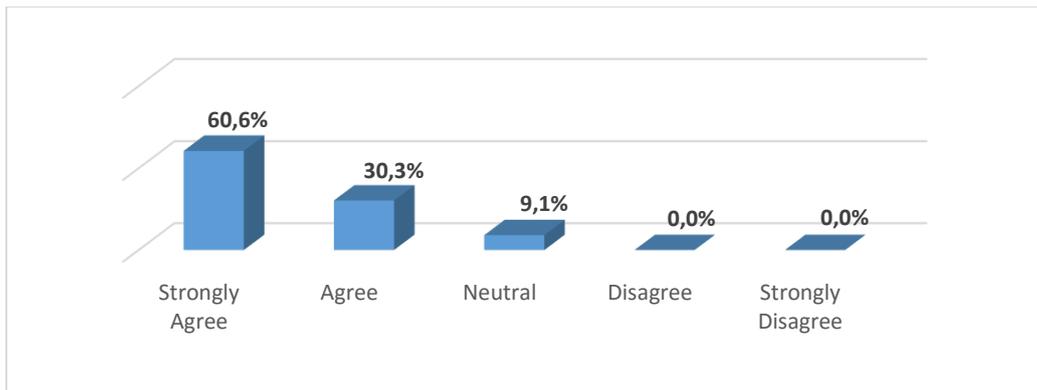


Figure 4.1: The online registration system is better than the manual registration

Figure 4.1 indicates that 60.6% of the respondents strongly agreed and 30.3% agreed with the statement that the online registration is better than the manual registration, while only 9.1% chose 'neutral' as the response. The students' online registration system is employed for facilitating complex challenges brought by manual registration processes and it is developed to easily manage the entire process of registration in the institution (Singh *et al.*, 2016). The above outcome clearly indicates that staff members embraced the introduction of new technology and they are willing to adapt to change. Furthermore, they also find it much better to work with online registration because it takes away face-to-face contact and lot of chronological steps as well as paper work. According to Udofia (2015), most researchers view online registration as having a positive impact in the sector of higher education and also as a right thing at the right time for the academic world and students in particular.

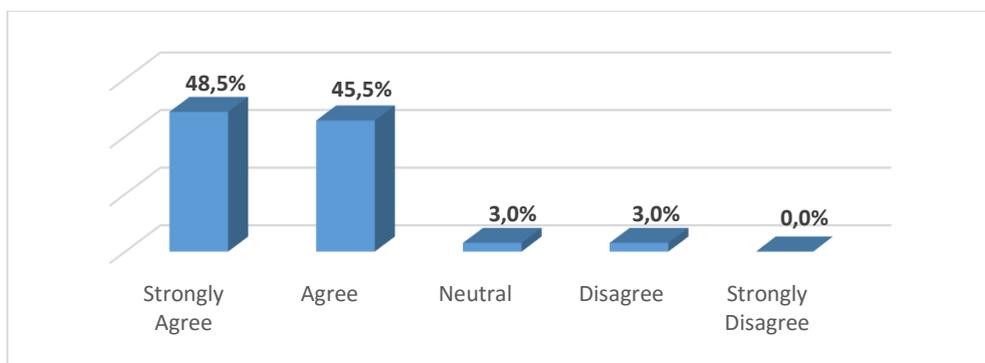


Figure 4.2: The online registration system is user friendly

Statistics presented in Figure 2 show that a total of 48.5% of staff respondents strongly agreed, while 45.5% agree with the statement that the online registration system is user friendly. A few of them (3%) disagreed with the above statement, while another 3% were neutral. This outcome confirms that the online system is the big boost to the registration of students and, according to Agwa-Ejon and Pradhan (2017), it presents a simple and electronic way to monitor and control registration figures as part of compliance without being in contact with students physically. The use automated registration system enables the institution especially administrators to centrally collate students' data for easy access by all stakeholders at any time without delay and in particular for reporting and decision making purposes (Agwa-Ejon and Pradhan, 2017; Okoye, 2015).

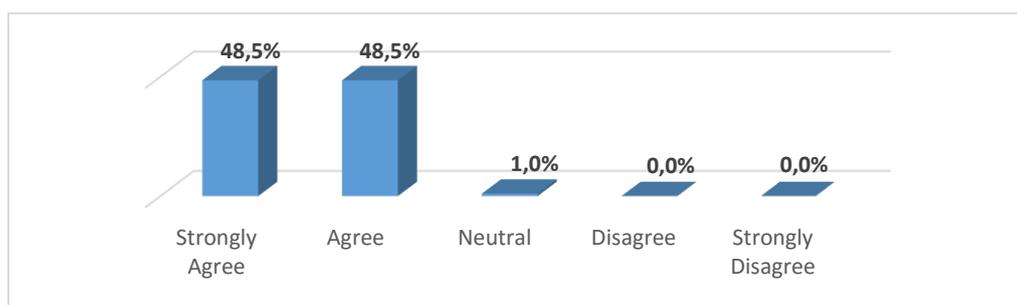


Figure 4.3: The online registration system saves time

Data presented in Figure 4.3 illustrates that the majority of staff respondents overwhelmingly gave 48.5% on both 'strongly agree' and 'agree' variables on the statement that online registration saves time, while only 1% was neutral. This finding confirms the fact that the online registration system does not require a person to be physically present at the institution and to go through sequential steps, but it can be accessed in any place where there is network and internet and, therefore, saves time to travel and also to go through long queues. In different studies conducted by Oladunjoye and Omemu (2013); Agwa-Ejon and Pradhan, 2017; Mashabela and Pillay, 2017, the majority of the participants perceived that the online registration system is most favourable in terms of time saving and is also cost effective.

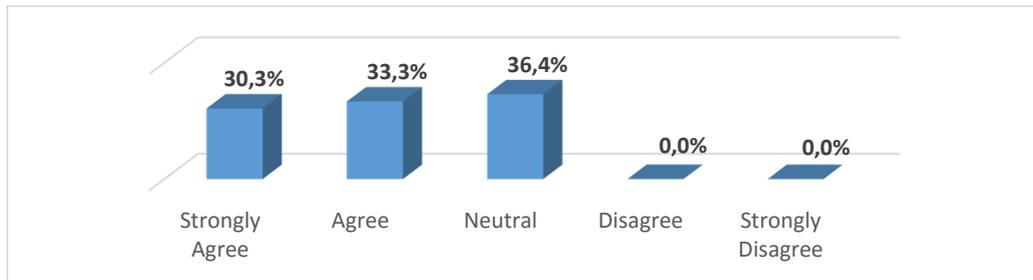


Figure 4.4: The online registration system saves cost

Figure 4.4 reveals that the majority of staff respondents agreed with the statement that the online registration system saves cost. The above figures show that 33.3% agreed, while 30.3% strongly agreed and 36.4% were neutral with the cost effective notion regarding the automated system. According to The Madibaz (2017), the institution with a fully automated system will minimise cost on employment of temporary staff as registration assistants. It will also minimise the involvement of human element that creates lots of data integrity issues which at the end cost more money to clean up and verify before submitting to the authorities for compliance and funding purposes. This outcome concurs with Agwa-Ejon and Pradhan (2017) that to save cost some administrative sections and departments reduced the services of contract staff and student assistants as they discovered that fewer staff members were sufficient to deal with online registration processes.

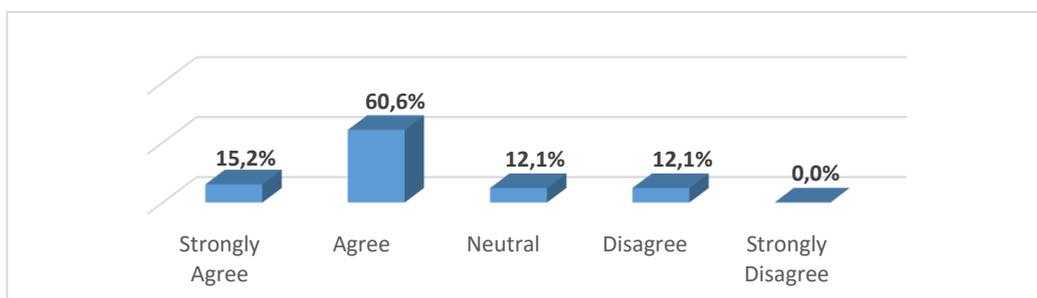


Figure 4.5: The online registration system performs exactly as expected

According to Figure 4.5 above, most of the staff respondents agreed that the online registration system performs exactly as expected. The statistics show that 15.2% strongly agreed and 60.6% agreed, while 12.1% disagreed and 12.1% were neutral.

The above figures indicate that the expectations of online registration system users were met and, according to Oladunjoye and Omemu (2013), this is precisely in agreement with the current digitalisation wave. As stated by Mashabela and Pillay (2017), an excellent automated system has to execute its functions as expected by its users. Additionally, this outcome confirms that the online system and its functionalities are beneficiary to the registration of students at the university, which is what the first objective of this study sought to establish.

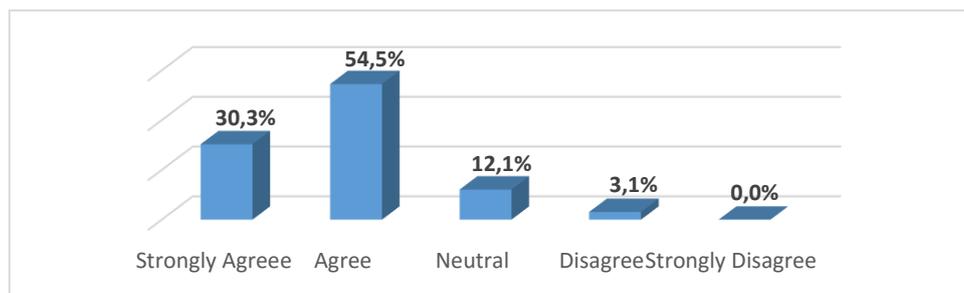


Figure 4.6: I have confidence in the online registration system

Figure 4.6 displays that the majority of staff respondents agreed with the above statement that they have confidence in the online registration system. The above figures show that 54.5% agreed and 30.3% strongly agreed, while 3.1% disagreed and 12.1% were neutral. This is a clear indication from the respondents that this automated registration system stimulates confidence to the users. According to Mashabela and Pillay (2017), the reliability and performance of the system determine the user's confidence. If system users lack understanding and confidence to explain the underlying process behind the results, they always become reluctant to use such system. When the system is well understood, it improves user experience, performance and confidence.

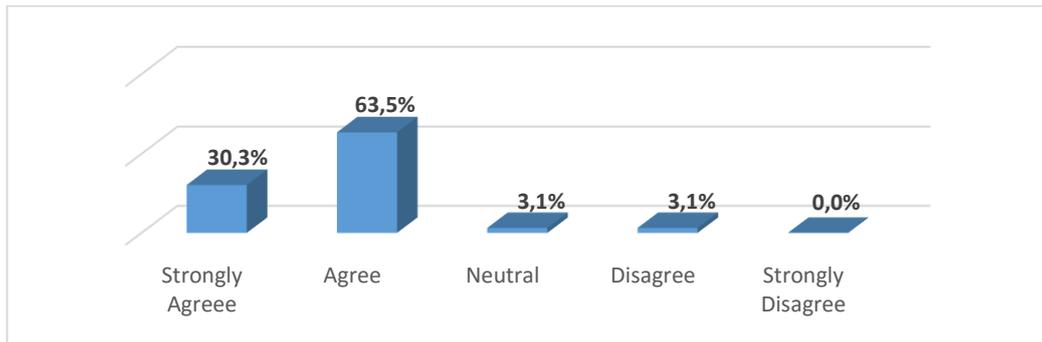


Figure 4.7: The online registration system is effective

The above statement suggests that the online registration system is effective and most of the staff respondents 63.5% agreed and 30.3% strongly agreed, while 3.1% disagreed and another 3.1% were undecided about the effectiveness of the system. The findings, as displayed above, suggest that the functionality, availability, dependability and capability are the measurement for the effectiveness of the online system. For the online registration system to be truly beneficial and effective, it has to be smooth, fast and reliable to the users (Ocholla, 2015). Additionally, the institution through effective implementation of online registration system could attract and engage larger numbers of students (Al-Adwan *et al.*, 2013).

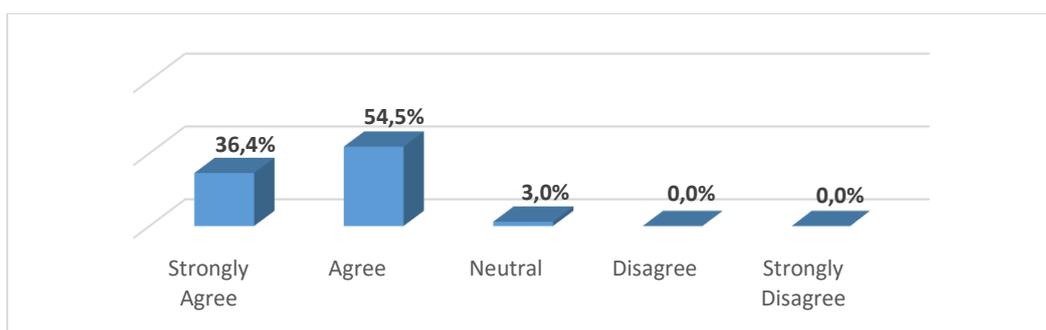


Figure 4.8: With the online system there is improvement in the registration process

From Figure 4.8 it shows that a total of 54.5% of the staff participants agreed and 36.4% strongly agreed, while only 3.0% were not sure about the statement that there is improvement in the registration process with the online system. The majority of the respondents (90.9%) agreed that registration has improved since the introduction of online registration system at UNIZULU. According to Lemay *et al.* (2018), the implementation of the new system with the right intention and attitude is mostly dominated by the performance improvement or effectiveness and easy to use. Furthermore, when a new system is introduced and effectively adopted, positive outcomes are most likely to be achieved (Mashabela & Pillay, 2017).

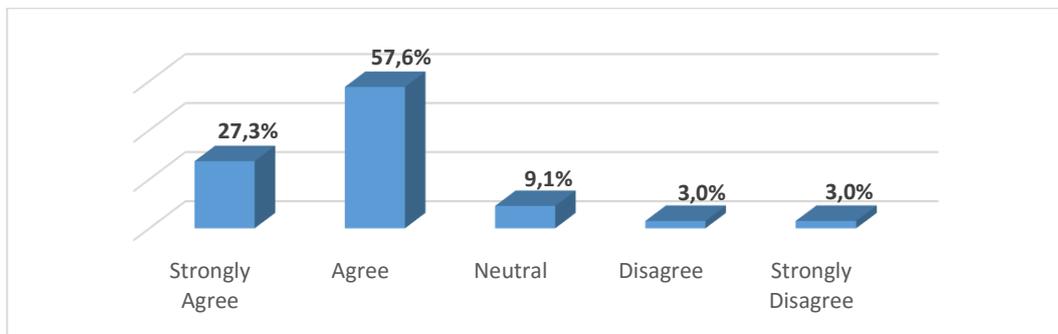


Figure 4.9: Sufficient and clear information required is provided on time

According to Figure 4.9, most staff respondents agreed with the above statement that sufficient and clear information required is provided on time. A total of 57.6% agreed and 27.3% strongly agreed, while 6% disagreed and 9.1% were undecided. According to Park (2009), many researchers and authors illustrate that clear supply of information to the users on the capability of the system contributes towards achieving positive results. One of the important element as part of educating system users is to supply information using all media platforms on step-by-step process of registration and easy to follow instructions (Estevez *et al.*, 2013)

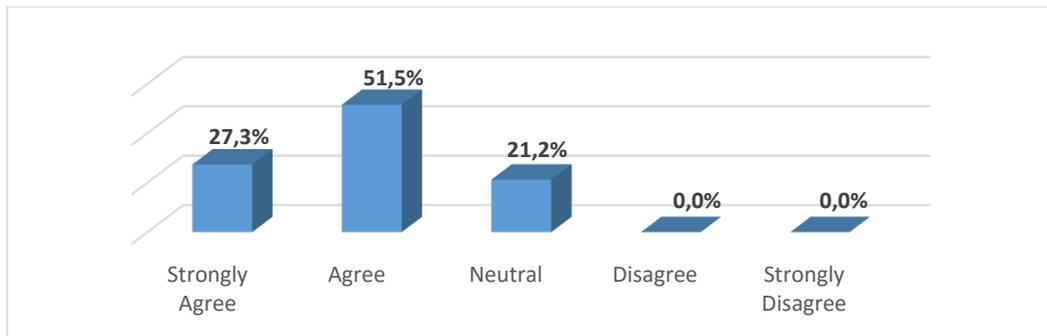


Figure 4.10: Online registration makes it easy to monitor enrolment

Figure 4.10 shows that the majority of staff respondents agreed with the above statement that the online system makes it easy to monitor enrolment of students. A total of 51.5% agreed and 27.3% strongly agreed, while 21.2% were not sure. According to Agwa-Ejon and Pradhan (2017), the online registration system provides simple ways to monitor and control the enrolment targets through parameter settings which automatically police the registration quotas of each programme.

4.5 Presentation and Interpretation of Research Questions in Section C for Staff Respondents

4.5.1 Findings based on Objective 2: To identify the challenges faced by University of Zululand in the full implementation of online registration system.

The second objective of the study sought to identify the challenges presented by the full implementation of online registration system at UNIZULU. To address this objective based on staff members' perspective, eight questions were developed and the findings are captured in Figures 4.11 to 4.18 hereunder.

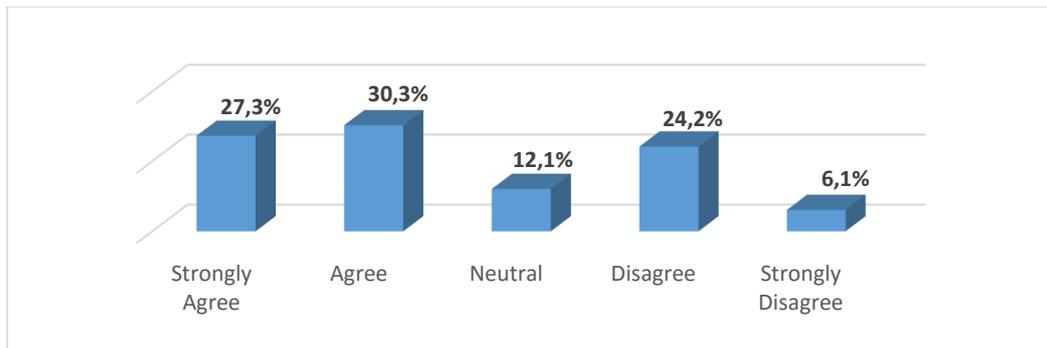


Figure 4.11: There are challenges encountered when using online registration system

The majority of staff respondents agreed with the above statement that there are challenges encountered when using the online system and data displayed in Figure 4.11 show that a total of 30.3% of staff respondents agreed and 27.3% strongly agreed, while 30.3% disagreed and 12.1% were neutral. According to Mashabela and Pillay (2017), the restoration of the system is essential as the system failure can happen unexpectedly. Garg, Shukla and Kendall (2015) reported some challenges faced by tertiary institutions towards technology adoption as: poor communication by/to the users, lack of trained personnel to manage the system, poor network connectivity and unreliable power.

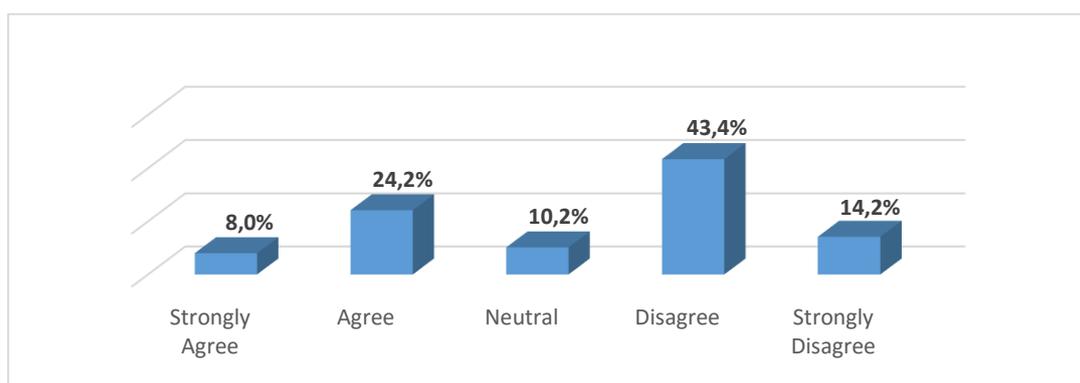


Figure 4.12: The academic structure is properly set up for online registration processes

The data in Figure 4.12 reveal that the majority of the staff respondents disagreed with the statement that the academic structure is properly set up for online registration processes. A total of 43.4% disagreed and 14.2% strongly disagreed, while 24.2% agreed and 8.0% strongly agreed, with 10.2% neutral. The academic structure is the foundation on which the web-based registration is built and for the online registration system to work the academic structure must be properly set-up (Janse van Rensburg, 2016).

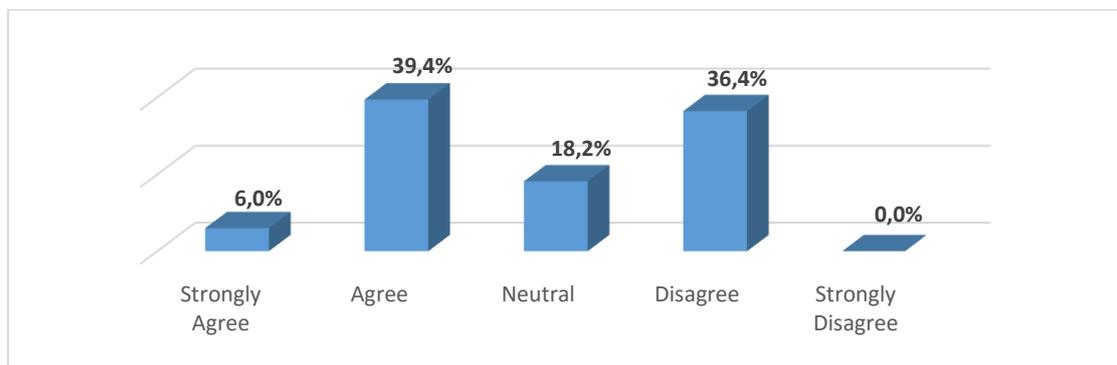


Figure 4.13: Network connectivity for online registration system is always available

Figure 4.13 exhibits that most participants agreed with the above statement that the network connectivity is always available for online registration system. A total of 45.4% of staff respondents agreed, while 36.4% disagreed and 18.2% were neutral. It is quite interesting that a significant number of staff respondents felt that the network connectivity is always not available during the registration period. This indicates that some personnel do experience challenges or maybe they receive reports from students complaining about the unavailability of network during registration. According to Mashabela and Pillay (2017), to strengthen the performance of the system, the network connectivity must be available at all times for online registration system. Dahlstrom and Bichsel (2014) opined that the connectivity on campus networks requires to be fast and reliable to accommodate different type of gadgets and operating systems.

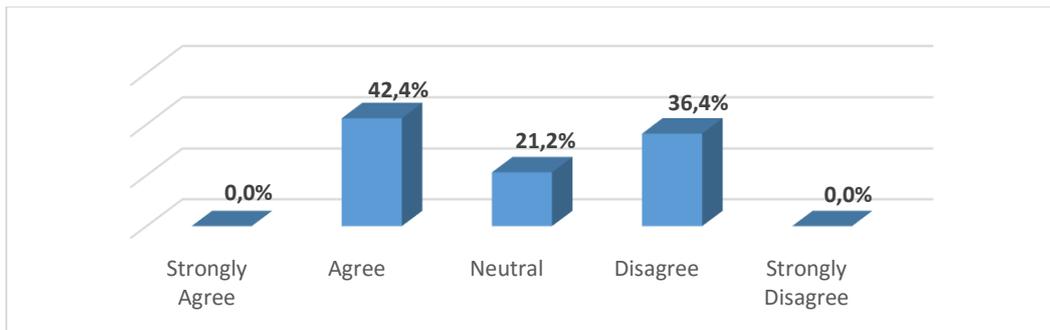


Figure 4.14: The online registration system sometimes has a slow response time

Figure 4.14 above displays that most participants agreed with the above statement that the online system sometimes has a slow response time. The majority of staff respondents (42.2%) agreed and 36.4% disagreed, while a huge percentage of 21.2% were neutral. Even though the network is always available, as stated in Figure 4.13, the online system sometimes has a slow response, according to Figure 4.14 above. Most African institutions of higher learning have a challenge of poor ICT infrastructure with a very low internet bandwidth and, as a result, an online registration system gets affected by low internet connectivity (Ocholla, 2015).

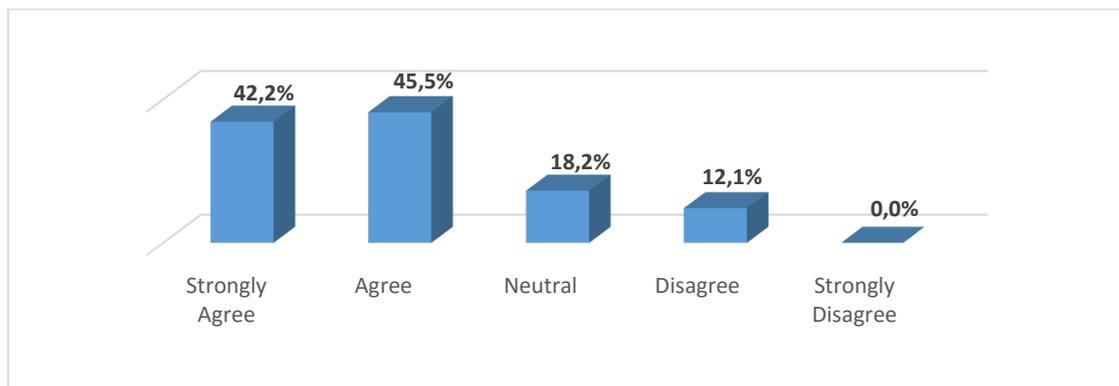


Figure 4.15: The online registration system requires enhancement

According to Figure 4.15 above, 45.5% of the participants agreed and 42.5% strongly agreed with the statement that online system requires enhancement, while 12.1% disagreed and 18.2% were neutral. Lemay *et al.* (2018) state that for the better performance of the IT system, from time-to-time there must be a system audit which

assesses if the input delivers the expected output and how to enhance it. Mashabela and Pillay (2017) concur that for an IT based system to perform it requires continuous evaluation. This is supported by Garg *et al.* (2015) who stress that the enhancement of the quality of service in educational institutions lies in each institution's ability to present change via its systems.

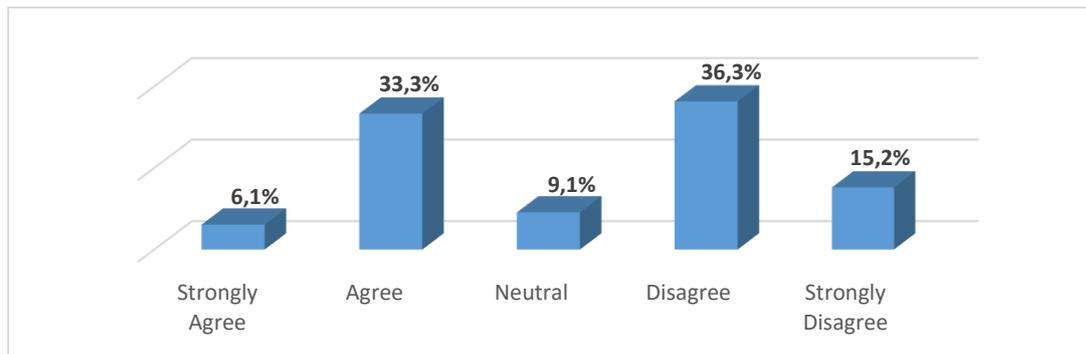


Figure 4.16: The online registration system can be accessed anywhere

According to Figure 4.16 above, 51.5% of the respondents disagreed with the statement that the online system can be accessed anywhere, while 39.4% agreed and 9.1% were neutral. Currently, at UNIZULU students cannot access registration system outside the institution, meaning that they have to be on campus to be able to register. This defeats the well-intended purpose of implementing student automated registration process. One of the major reasons the registration is not accessible anywhere is because of the failure to properly set up the academic structure of each programme in each faculty. Oladunjye and Omemu (2013); Udofia (2015); Agwa-Ejon and Pradhan (2017) state that the online registration system should permit students to conduct their registration anywhere, anytime and conveniently. The main reason for the institution to provide online registration is to support students to have the system accessed anywhere, anytime and anyplace (Thossansin & Pomsathit, 2014).

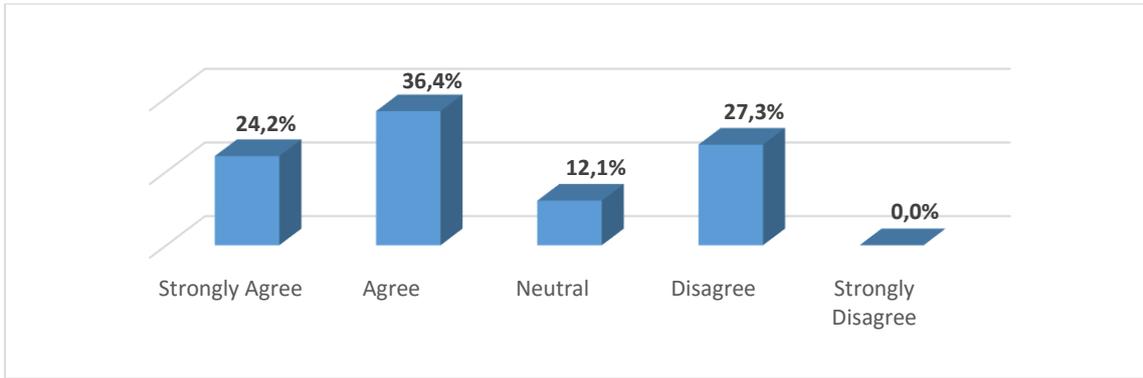


Figure 4.17: I am satisfied with the online registration system

From Figure 4.17 above, most staff respondents indicated that they were satisfied with the online registration system. A total of 36.4% agreed and 24.2% strongly agreed, while a sizeable percentage of 27.3% disagreed and 12.1% decided to be neutral. According to Shaltoni *et al.* (2015), the success of online registration at the university depends on users' satisfaction and more satisfied users' lead to positive attitude and widespread usage of the online registration system in the university.

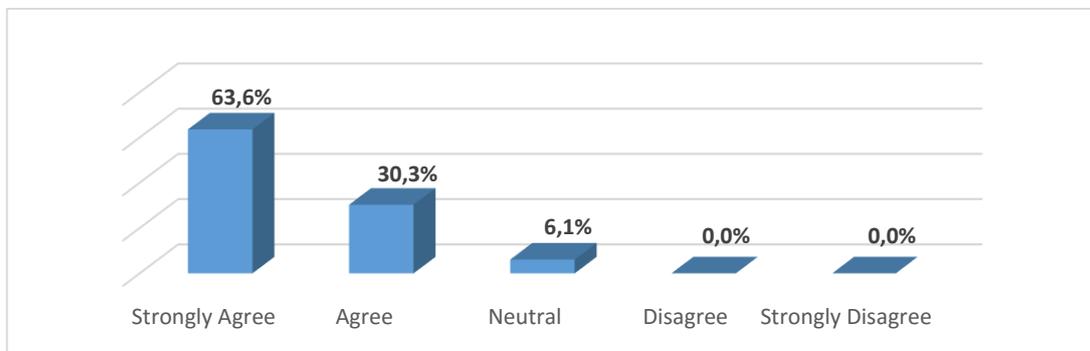


Figure 4.18: During registration students with less IT knowledge and skills are assisted

Figure 4.18 shows that most staff respondents strongly agreed with the statement that students with less IT knowledge and skills are assisted during registration. Overwhelmingly, a total of 63.6% strongly agreed and 30.3% agreed, while only 6.1% chose 'neutral'. This indicates that the institution provides student assistants to ensure that registration is smooth for every student.

4.6 Presentation and Interpretation of Research Questions in Section D for Staff Respondents

4.6.1 Findings based on Objective 3: To identify the factors that affect the students' online registration system at the University of Zululand.

The third objective of the study sought to identify the factors that affect the online registration system at UNIZULU. To address this objective based on staff members' perspective, eight questions were developed and the findings are captured in Figures 4.19 to 4.25 hereunder.

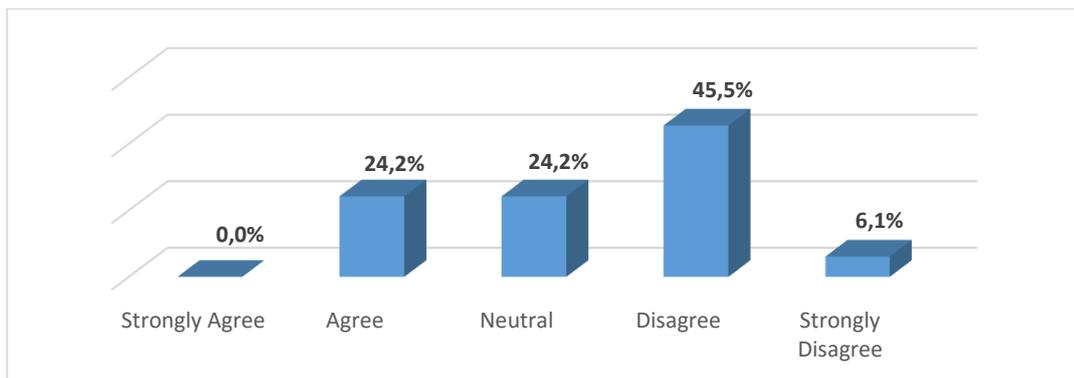


Figure 4.19: The internet is too slow during online registration period

Figure 4.19 shows that most respondents disagreed with the above statement that during online registration the internet is too slow. A total of 45.5% disagreed and 6.1% strongly disagreed, while 24.2% agreed and another 24.2% were neutral. The above statistics imply that the internet speed is not one of the challenges and, according to Shaltoni *et al.* (2015), the internet has changed how customer service is done in educational institutions.

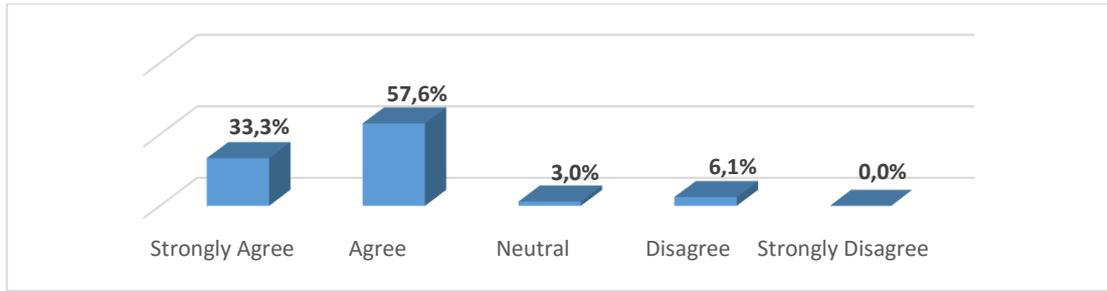


Figure 4.20: Academic and Support staff are capable to resolve students' queries

According to Figure 4.20, most staff respondents agreed with the statement that both academic and support staff are capable to resolve all students' issues. The majority of participants (57.6%) agreed and 33.3% strongly agreed, while 6.1% disagreed and only 3.0% were neutral. During registration period academic and administrative personnel are always available in the venues (computer labs) where registration takes place to attend to students' queries including academic advising. Inspired and well trained staff members can provide the best assistance to clients and also create and influence the quality relationship between the university personnel and students (Mashabela & Pillay, 2017).

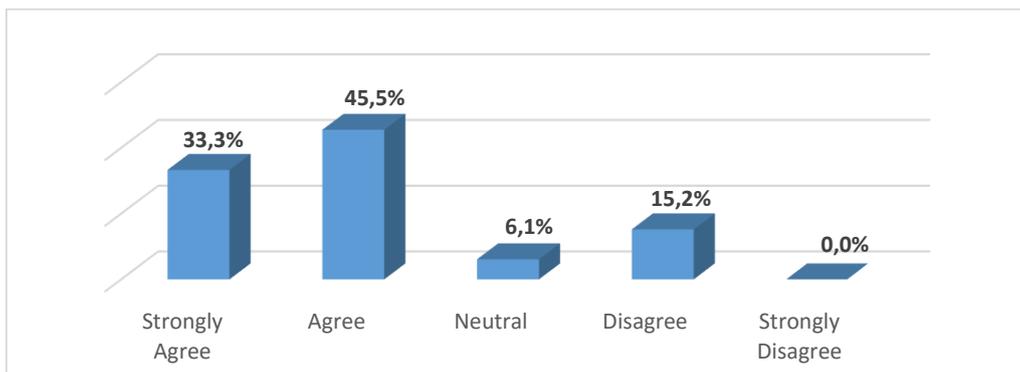


Figure 4.21: Support and Academic staff are trained for online registration system

According to Figure 4.21, the majority of staff respondents agreed with the statement that both support and academic personnel are trained for online registration system.

A total of 45.5% agreed and 33.3% strongly agreed, while 15.2% disagreed and 6.1% chose to be neutral. The benefit of training personnel for online registration system is that they become student centred and furthermore they transfer knowledge and skills to students for self-reliance. According to The Madibaz (2017), the institution has a responsibility to ensure that both academic and support staff members are adequately trained to improve customer service delivery during online registration period.

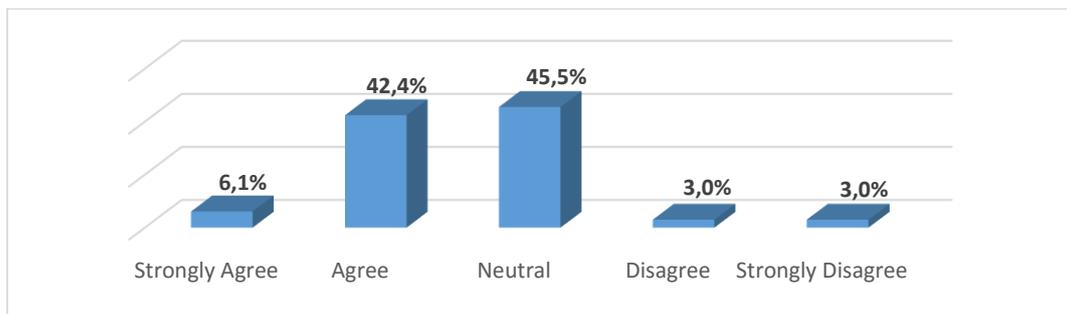


Figure 4.22: The maintenance of the system happens regularly

Figure 4.22 reveals that most respondents agreed with the statement that the online registration system maintenance occurs regularly. The majority of staff respondents (48.5%) agreed and 45.5% were neutral, while 6% disagreed. The above findings show that a substantial number of staff respondents are not sure if there is regular system maintenance at UNIZULU. The ICT Department needs to ensure that the operational maintenance including repairs of the software and hardware is frequently conducted in all the university computer laboratories and also computer equipment in offices of staff members (The Madibaz, 2017).

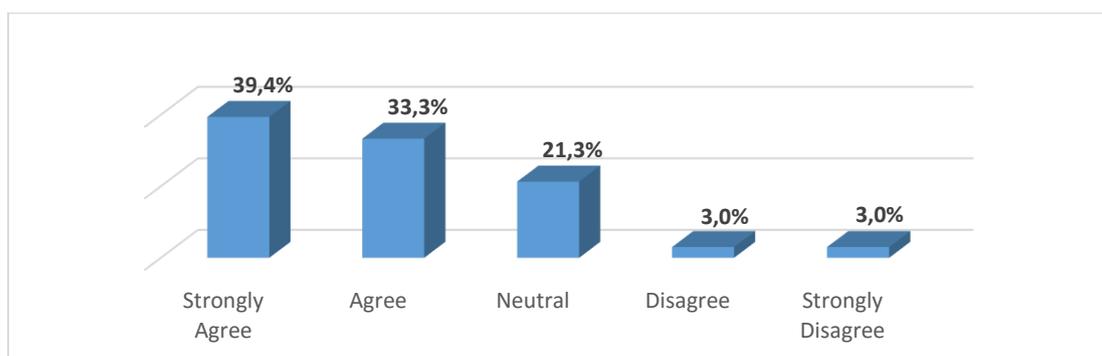


Figure 4.23: The online registration system should not be changed for another system

The data in Figure 4.23 reveal that most participants agreed with the above statement that the online registration system should not be changed for another system. A total of 39.4% strongly agreed and 33.3% agreed, while 6% disagreed and 21.3% were neutral. These findings agreed with the Figure 4.17 outcome of users being content with the online system. The users may want to replace the existing system due to system frustration (Mashabela & Pillay, 2017).

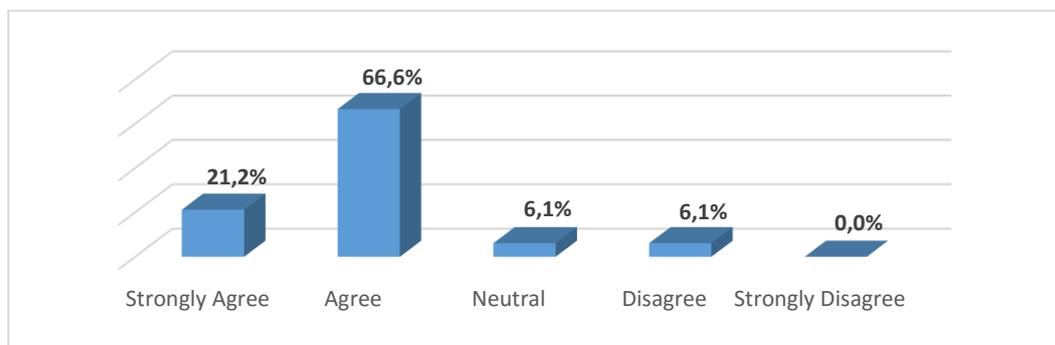


Figure 4.24: Finance/ FAB sections are always available for support and help

Figure 4.24 displays that 66.6% of the participants agreed with the statement that during registration Finance and Financial Aid Bureau (FAB) sections are always available to support and help students, while 21.2% strongly agreed, with 6.1% who disagreed and 6.1% who chose to be neutral. The majority of students at UNIZULU are funded by government to pursue their studies and, therefore, the role of Finance and FAB is crucial during registration to ensure that funded students are correctly flagged.

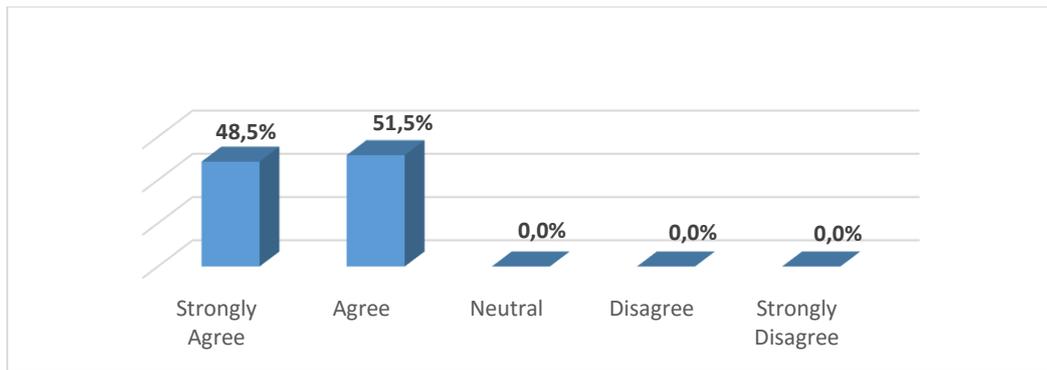


Figure 4.25: The ICT section is always available for support and help

According to Figure 4.25 above, 51.5% of staff respondents agreed and 48.5% strongly agreed with the statement that during registration Information Communication and Technology (ICT) section is always available to support and help students. Therefore, all respondents agreed that ICT do give system support and assistance during registration. Mashabela and Pillay (2017) state that users may rate a good system bad due to the absence of system administration personnel.

4.7 Presentation and Interpretation of Research Questions in Section B for Student Respondents

4.7.1 Findings based on Objective 1: To establish the benefits of students' online registration system at University of Zululand.

The first objective of the study sought to establish the benefits of using online system to register students for the programmes and modules of their choice. In addressing this objective, student participants responded to ten questions and the finding are captured in Figures 4.26 to 4.35 hereunder.

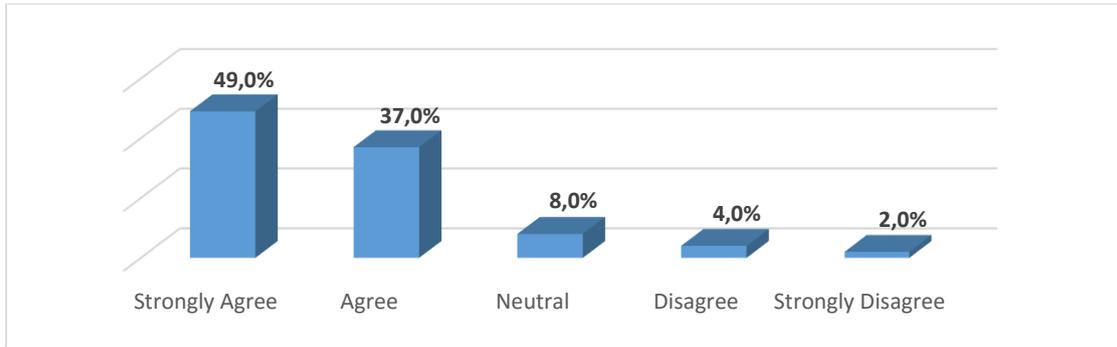


Figure 4.26: Using online registration is far much better than the manual registration

Figure 4.26 indicates that 49.0% of student respondents strongly agreed and 37.0% agreed with the statement that using online registration system is far better than the manual registration. Only 6.0% disagreed, while 8.0% were neutral with the statement. Tang and Chen (2011) state that new technology enables users to access different services. This is supported by Odero and Oloko (2013); Okoye (2015) that online registration is faster to use as oppose to manual registration and it also permits the university to pay less attention on processing paper work, but focus more on the core business of the institution which is teaching, learning and research.

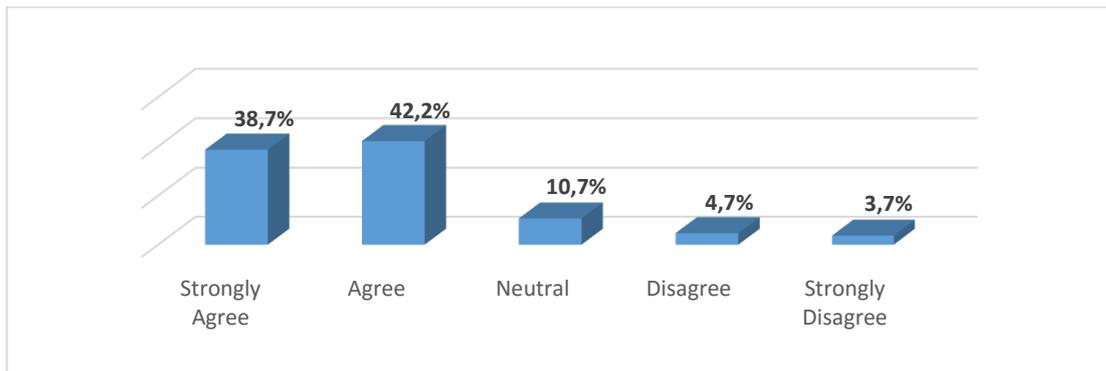


Figure 4.27: Using online registration system saves costs

From Figure 4.27 above, most student respondents agreed with the statement that using online registration saves costs. A total of 42.2% agreed, 38.7% strongly agreed and 8.4% disagreed, while 10.7% were neutral. These findings are similar to Figure

4.4 above where staff respondents also indicated that online system is cost effective in terms of travelling to campus, accommodation and meals as well as printing of forms. Bemile *et al.* (2014) agree that online registration improves student services and cutting off costs for the institution. It is also supported by Odero and Oloko (2013); Okoye (2015); Agwa-Ejon and Pradhan (2017) that as benefits online registration is cost effective and a secure registration process that permits for simple access to student records. Furthermore, online registration does not assist the students only in minimising the expenses, but also assists the institution's officials in improving their systems operations (Chaka & Mungadzi, 2013).

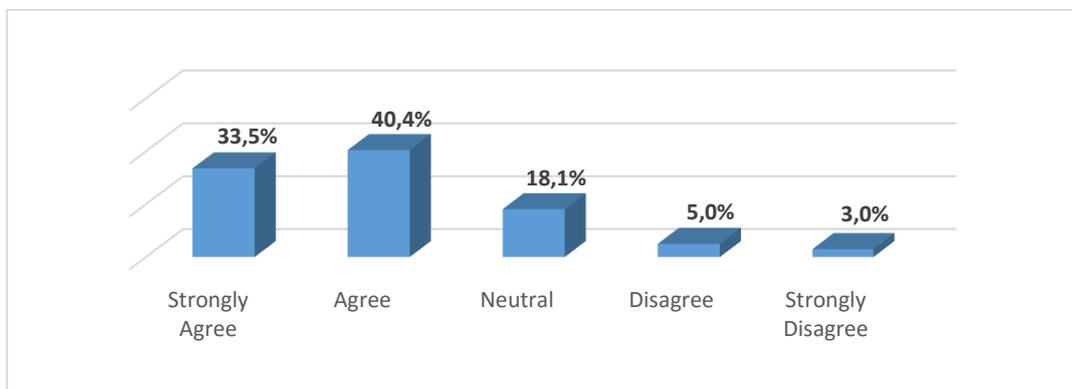


Figure 4.28: It is easy to use the online registration system

According to Figure 4.28, 40.4% of student respondents agreed and 33.5% strongly agreed with the statement that it is easy to use the online registration system, while a relatively smaller percentage of 8% disagreed, with 18.1% who chose 'neutral' as a response. According to Agwa-Ejon and Pradhan (2017), the simplicity and ease of using new technology are the attributes and benefits of online system. The new online registration system should be designed to be user-friendly, understandable and easy to use even by less IT skilled students (Singh *et al.*, 2016; Mashabela & Pillay, 2017).

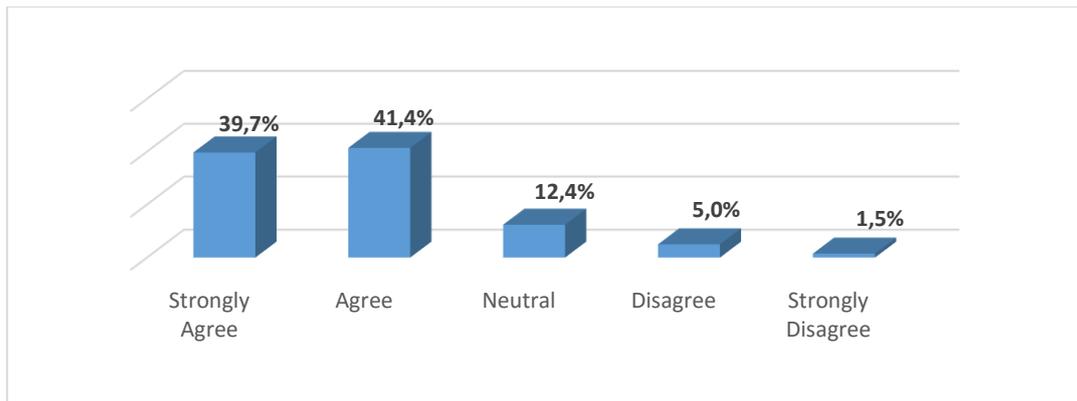


Figure 4.29: I spend less time with the online registration system

Data presented in Figure 4.29 indicate that 41.4% of the student participants agreed and 39.7% strongly agreed with the statement that they spend less time with the online registration system, while 6.5% disagreed, with 12.4% who indicated 'neutral' as their response. These findings are similar to Figure 4.3 above where staff respondents perceived that the online system is most favourable in time-saving. This indicates that it is faster to register students online as oppose to manual registration (Odero & Oloko, 2013). Udofia (2015) argues that online registration system has been identified by various researchers as a space and time management reducer. According to Okewu and Daramola (2014), online registration system is a cost and time effective process that enhances business workflow, improves efficiency, increases levels of control and minimises the use of paper.

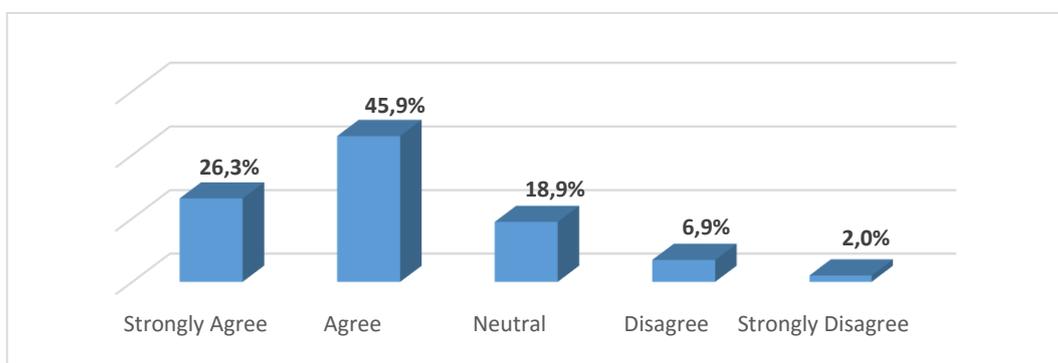


Figure 4.30: The online registration instructions are simple and clear to follow

Figure 4.30 shows that 45.9 % of student respondents agreed and 26.3% strongly agreed with the statement that the online registration instructions are simple and clear to follow. A relatively smaller percentage of 8.9% disagreed, while 18.9% of the respondents were neutral. According to Murray, Perez, Geist and Hedrick (2012), many researchers reported that for computer-aided instructions to be effective they must be well-designed and be clearer for the technology users to understand. Mashabela and Pillay (2017) concur that when the instructions are clear it is easier to operate the system and that if all role-players are not informed of the developments the new technology might fail.

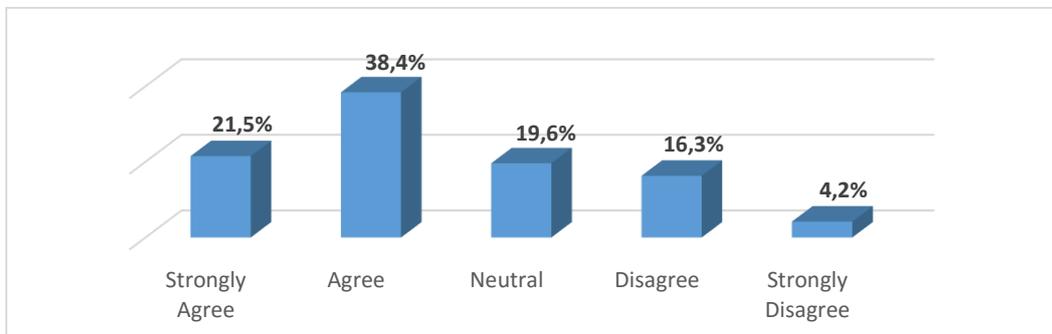


Figure 4.31: I do not need help for online registration system

Data presented in Figure 4.31 shows that most student respondents agreed with the statement that they do not need help to register online. A total of 38.4% agreed, 21.5% strongly agreed while 20.5% disagreed, with 19.6% who chose 'neutral'. Stein (2009), cited by Udofia (2015), revealed that online registration has a positive effect to students who were not conversant with using online systems. When the system is properly set-up and students do not require assistance during online registration, human resources can be diverted to meet other needs elsewhere and contracted human labour can be avoided to save money significantly (The Madibaz, 2017).

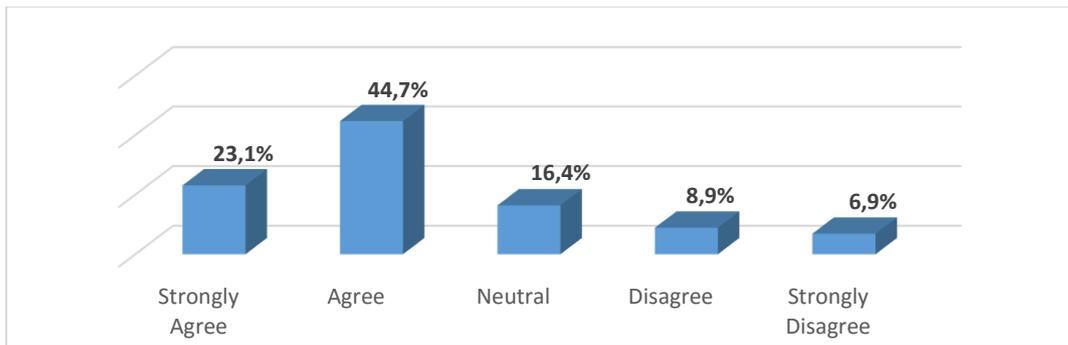


Figure 4.32: Support staff at computer lab for online registration system are helpful

According to Figure 4.32, 44.7% of the student participants agreed and 23.1% strongly agreed with the statement that support staff at computer lab for online registration system are helpful, while only 15.8% disagreed, with 16.4% who were neutral. This means administrative personnel is always available for student inquiries at computer laboratories. According to The Madibaz (2017), the registration process demands that support staff be trained and should understand how to use technology to enhance service delivery to the students.

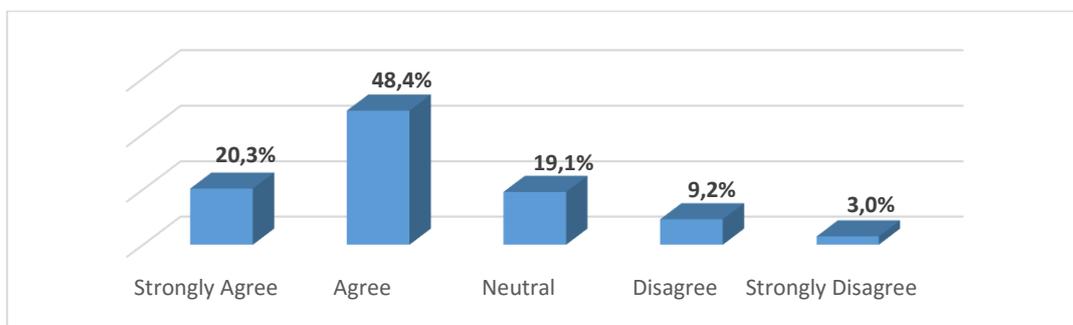


Figure 4.33: During online registration academic staff are available to help when required

From Figure 4.33 above, most student respondents agreed with the statement that during registration academic staff are available to help when required. A total of 48.4% agreed and 20.3% strongly agreed, while 12.2% disagreed, with 19.1% who chose 'neutral' as their response. This means academic staff members are always available

to provide academic advising where necessary. During registration the academic staff members should be able to access all aspects of academic progress of each student who has outstanding module/s for a proper advice on what to register for the next level or semester in that academic year (Bharamagouda, Geeta & Totad, 2013).

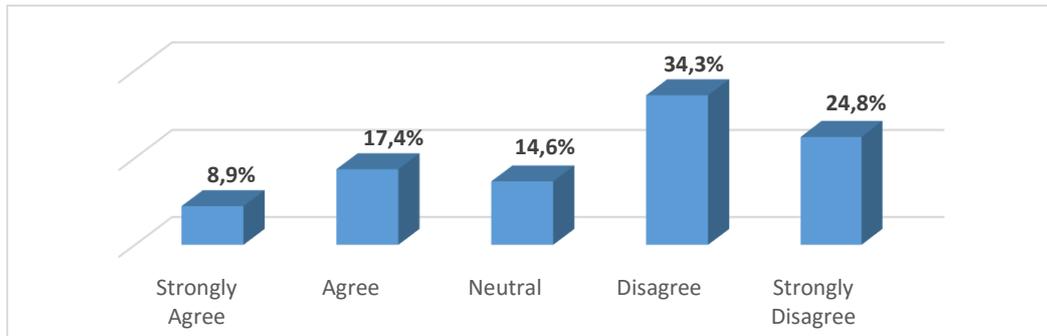


Figure 4.34: Computers at the lab are enough for everyone to register online

Figure 4.34 shows that most student respondents disagreed with the statement that at the computer laboratory there are enough computers for everyone to register online. A total of 34.3% disagreed and 24.8% strongly disagreed, while 17.4% agreed, with 14.6% who were neutral. This simple implies that more computer facilities should be made available to accommodate more student during registration. The institution must provide sufficient computers for students who do not have gadgets to access the system and there should also be a strong Wi-Fi connection on campus for those who can connect to the internet with their own devices (Oladunjoye & Omemu, 2013).

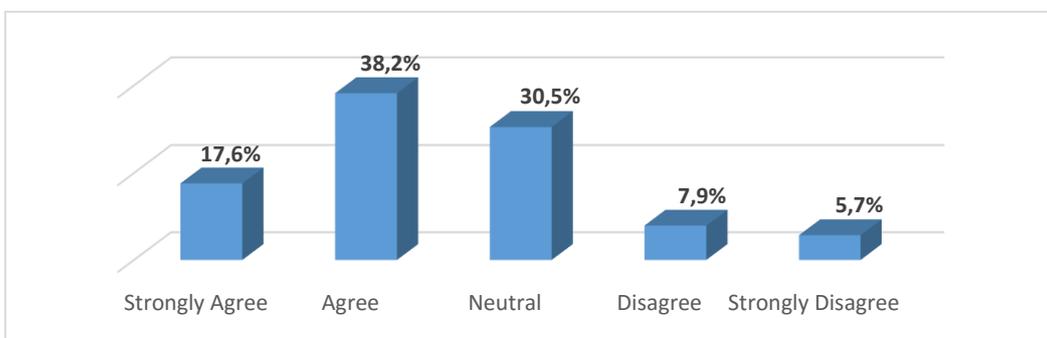


Figure 4.35: The online registration is effective and efficient

Figure 4.35 reveals that most student respondents agreed with the statement that the online registration is effective and efficient. About 38.2% agreed and 17.6% strongly agreed, while 13.6% disagreed, with a huge percentage of 30.5% providing a neutral response. Mashabela and Pillay (2017) state that an effective and efficient online registration system stimulates confidence to the users and also attracts more clients. In support of this, Omambia *et al.* (2014) advance that the effectiveness of online registration would lead to enhanced user-satisfaction, and as a result, transform into positive effect on individual user and ultimately result in improved institutional productivity.

4.8 Presentation and Interpretation of Research Questions in Section C for Student Respondents

4.8.1 Findings based on Objective 2: To identify the challenges faced by University of Zululand in the full implementation of online registration system.

The second objective of the study sought to identify the challenges presented by the full implementation of online registration system at UNIZULU. In addressing this objective, student participants responded to seven questions, and the finding are captured in Figures 4.36 to 4.42 hereunder.

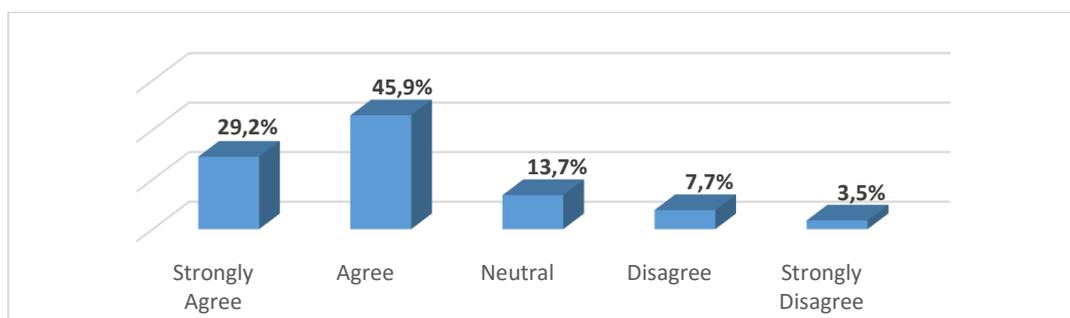


Figure 4.36: Students are not well informed and aware of the online registration system

According to Figure 4.36, 45.9% agreed and 29.2% strongly agreed with the statement that students are not well informed and aware of the online registration system, while 11.2% disagreed, with 13.7% who gave 'neutral' as their response. This means that the majority of student respondents (75.1%) are not well informed and not aware of the automated registration system. According to Park (2009), the majority of universities that provide online system (registration or e-learning) face huge challenges in obtaining successful implementation, effectiveness and acceptance of the system when the users are not properly informed or aware of its capabilities.

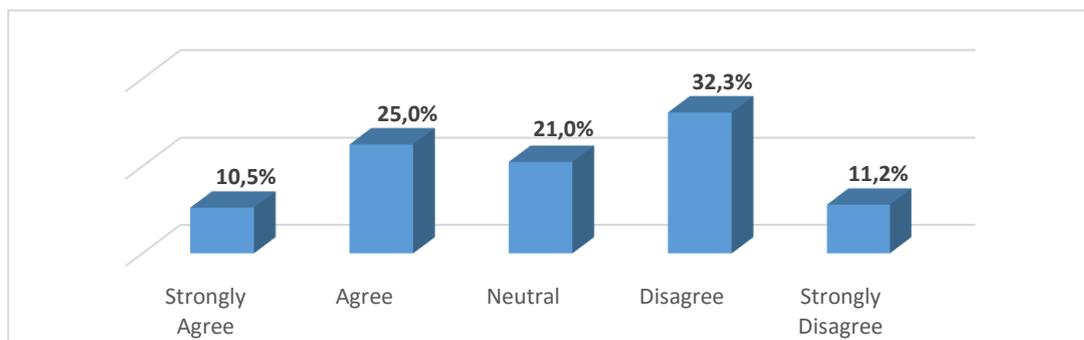


Figure 4.37: I do not know how to use online registration system properly

Figure 4.37 shows that most student respondents disagreed with the statement that they do not know how to use online registration system properly. A total of 32.3% disagreed, 11.2% strongly disagreed, 25.0% agreed, 10.5% strongly agreed and a large percentage of 21.0% were neutral. This finding shows that the majority of students (43.5%) know how to operate the online system. According to Dahlstrom and Bichsel (2014), the challenge facing institutions is to identify ways to use technology that are consonant with students' IT knowledge and skills while assisting them in achieving their academic objectives. Waycott, Bennett, Kennedy, Dalgarno, and Gray (2009) postulate that most students in their everyday interactions use technologies

with friends and family and, therefore, do not consider online system a major challenge.

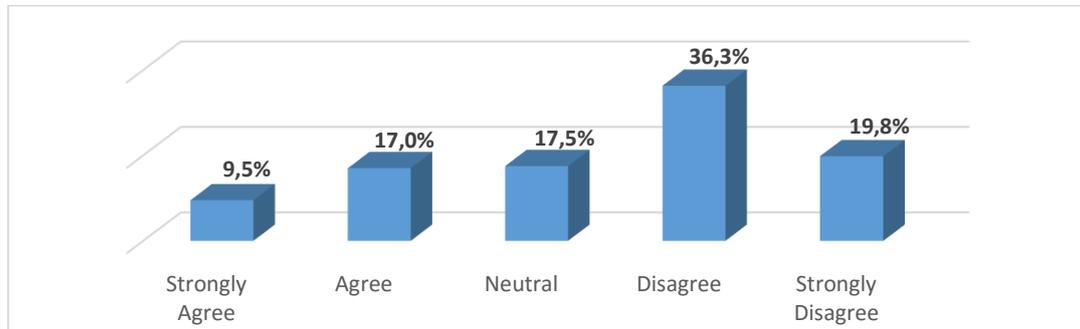


Figure 4.38: I do not have computer skills to use online registration system

From Figure 4.38, 36.3% disagreed and 19.8% strongly disagreed with the statement that as students they do not have computer skills to use online registration system, while 26.5% agreed, with 17.5% who chose 'neutral' as the response. From the findings above, the overwhelming majority of student respondents (56.1%) said they have necessary computer skills to operate the registration system themselves. Oladunjoye and Omemu (2013) state that most first year students from rural settings are not exposed to new technology and, therefore, cannot operate a computer system. On the other side, Dahlstrom and Bichsel (2014) argue that the skills to use technology are entrenched into the lives of students and they are usually inclined to utilise and to have positive approaches towards new technology.

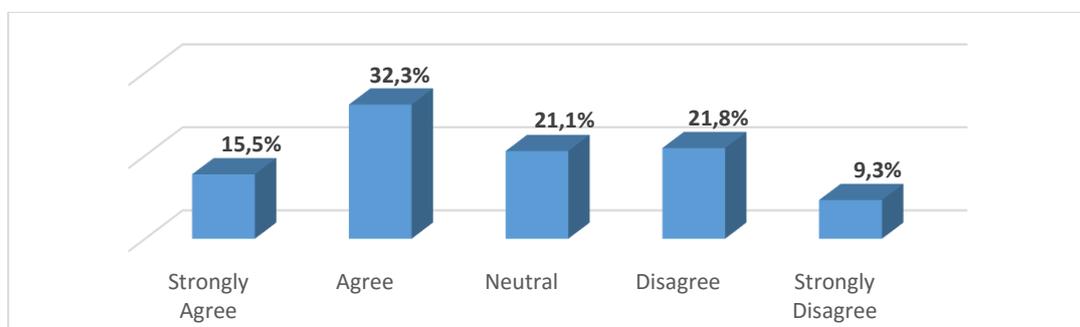


Figure 4.39: I need assistance to be able to register online

The results from Figure 4.39 show that most respondents agreed with the statement that students need assistance to be able to register online. A total of 32.3% agreed, 15.5% strongly agreed, while 31.1% disagreed, with 21.1% taking a neutral position. During registration, most institutions of higher learning employ contract staff and student assistants to help with online registration to students who are less skilled and knowledgeable on how to use the online system, as well as those who do not personally own any device that can access the internet (The Madibaz, 2017; Agwa-Ejon & Pradhan, 2017).

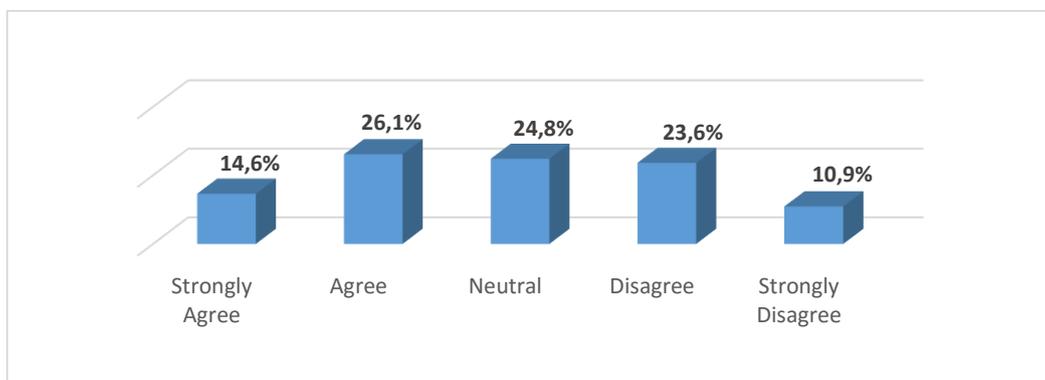


Figure 4.40: The network connectivity for online registration is much quicker

Figure 4.40 presents that 40.7% of student respondents agreed that the network connectivity for online registration is much quicker, while 34.5% disagreed, with a surprising percentage of 24.8% who chose 'neutral'. The above findings show that a slight majority of respondents (40.7%) agreed with the statement. When the demand of usage is high the network connectivity tends to be slower (Mashabela & Pillay, 2017). Arikawei *et al.* (2016) opined that poor network connectivity in the use of online registration generates problems for students to access the system at all times. Therefore, it is necessary to conduct a server routine maintenance to prevent failure or weak network connectivity during peak periods (Chen & You, 2013).

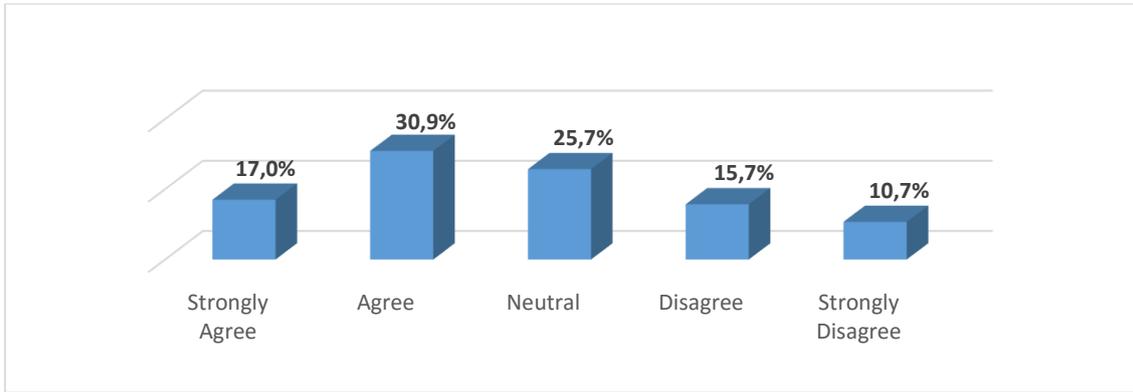


Figure 4.41: Some modules do not appear in my programme in the online system

According to Figure 4.41, most of the student respondents agreed with the statement that during online registration the system does not display some of the modules in the programmes they are linked to. A total of 30.9% disagreed and 17.0% strongly disagreed, 15.7% agreed, 10.7% strongly agreed, and a huge percentage of 25.7% took a neutral position. Park (2009) states that even though there is quantitative growth of online systems, there is also an increasing worry in how the information, content and rules are structured in the system to produce quality results. The rectification of anomalies for accuracy in the academic structure was vital to ensure that all modules are linked to relevant programmes for the success of online registration (Janse van Rensburg, 2016).

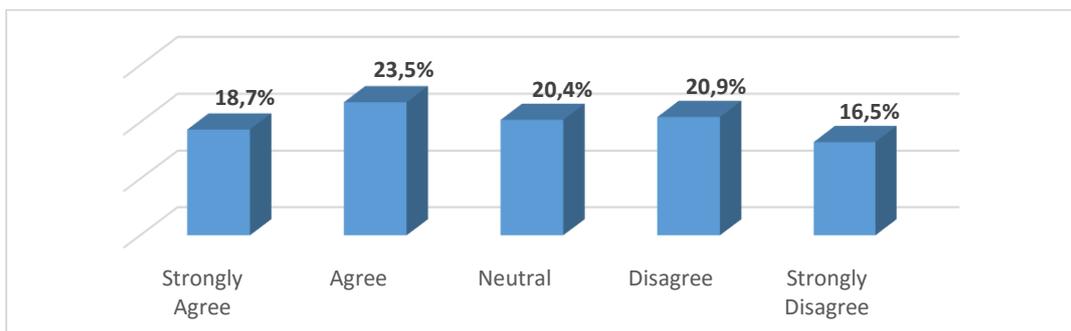


Figure 4.42: I am unable to register anywhere in the university

Data shown on Figure 4.42 show that 23.5% of student respondents agreed and 18.7% strongly agreed with the statement that students are unable to register

anywhere in the university, while 20.9% disagreed and 16.5% strongly disagreed, with 20.4% who chose 'neutral' as their response. The findings reflect the fact that UNIZULU at the moment is still piloting online registration system as approved by the University Council in 2015, and students have to be in the computer laboratory to be able to register, but they have to do the actual registration themselves. Singh *et al.* (2016) postulate that the objective of the online registration system is to computerise student database, maintain data integrity and consistency, automate the process of registration without any physical human interaction and making the registration process be accessible anywhere to the student.

4.9 Presentation and Interpretation of Research Questions in Section D for Student Respondents

4.9.1 Findings based on Objective 3: To identify the factors that affect the students' online registration system at the University of Zululand.

The third objective of the study sought to identify the factors that affect the effectiveness of online registration system at UNIZULU. In addressing this objective, student participants responded to six questions and the findings are captured from Figures 4.43 to 4.48 hereunder.

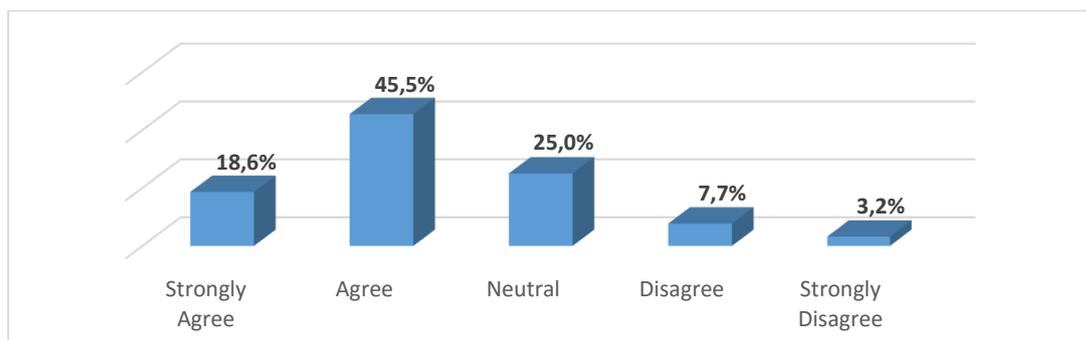


Figure 4.43: The online registration system eliminates risk factors

Figure 4.43 reveals that 45.5% of student participants agreed and 18.6% strongly agreed with the statement that the online registration system eliminates risk factors, while 10.9% disagreed and 25.0% chose 'neutral' as their response. The risks associated with manual registration can be eradicated through the implementation of online registration, risks such as, loss of student hard copy file, illegal data, criminal element when all students are onsite, healthy risks, time factor and more (Olandunjoye & Omemu, 2013; Singh *et al.*, 2016).

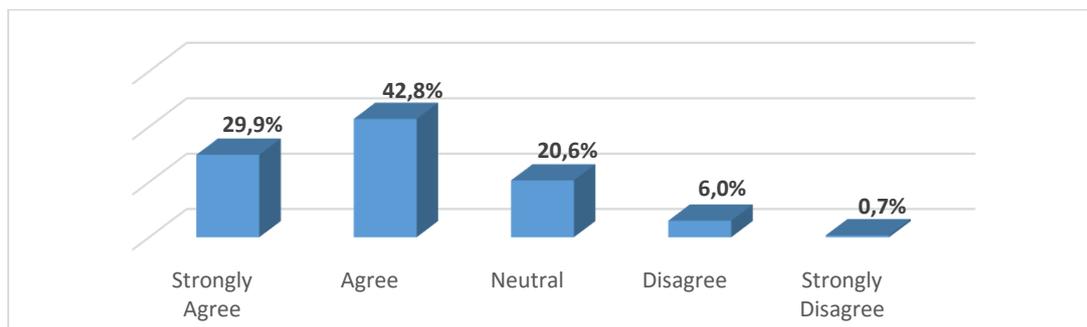


Figure 4.44: The online registration system requires enhancement

The results from Figure 4.44 show that 42.8% of student participants agreed and 29.9% strongly agreed with the statement that the online registration system requires enhancement, while 6.7% disagreed, with 20.6% who took a neutral stand. The findings above are similar to Figure 4.15, where staff members indicated that the current online registration system needs enhancement. According to Thossansin and Pomsathit (2014), the enhancement of the system is the direct investment to improve operations in the institution and also adds value towards staff motivation. Khameneh, Nemati and Mohammadian (2016) recommend that the registration system must be continuously inspected to review performance and to fix the flaws as well as shortcomings to achieve great results.

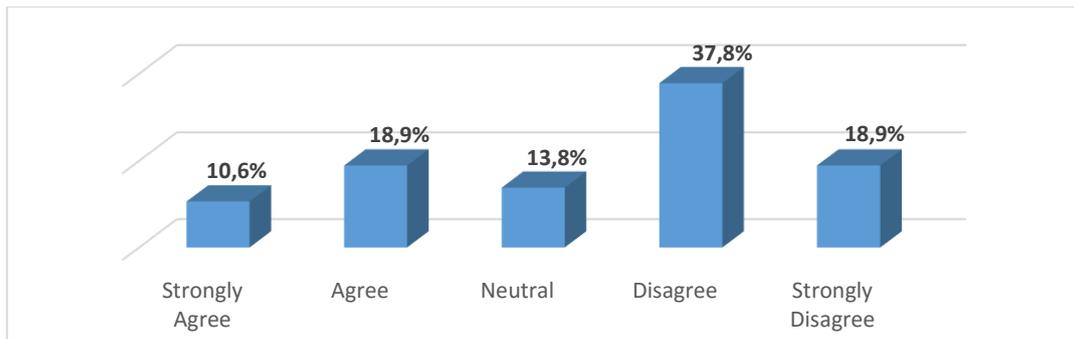


Figure 4.45: I use my personal gadget to assess online registration system

According to Figure 4.45, most student respondents disagreed with the statement that students use their personal devices to access online registration system. A total of 37.8% disagreed and 18.9% strongly agreed, while 29.5% agreed, with 13.8% who took a neutral position. Most students might own gadgets, but the system at the moment requires them to be at the university in the computer laboratory and obtain login details to register. When the system is properly set up and all other security majors are in place, according to Thossansin and Pomsathit (2014), students with smartphones and other devices can login and choose 'registration menu' to enrol for the programmes of their choice without being physically present at the institution. Okoye (2015) notes that students who lack computer technological skills and knowledge or who do not have access to gadgets or internet will most probably fall far behind those who have these gadgets or such access.

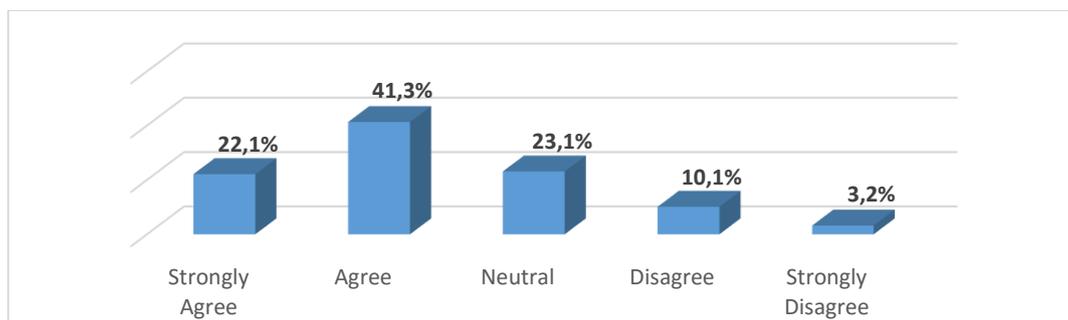


Figure 4.46: The online registration system is reliable

Figure 4.46 shows that 41.3% of student participants agreed and 22.1% strongly agreed with the statement that the online registration system is reliable, while 13.3% disagreed, with 23.1% who chose 'neutral' as their response. Mashabela and Pillay (2017) postulate that when the system is reliable it improves the brand image of the institution and further poses as an inspiration to both academic and support staff. When the system is reliable, the organisational information is secured and that can definitely expand the business confidence in the system (Gu & Liu, 2011).

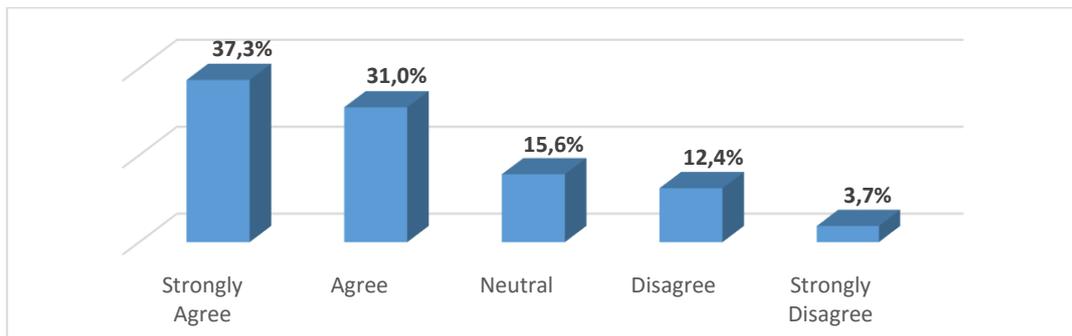


Figure 4.47: The internet speed is too slow during online registration period

The results on Figure 4.47 display that 37.3% of student respondents strongly agreed and 31.0% agreed with the statement that the internet speed is too slow during online registration period, while 16.1% disagreed, with 15.6% who took a neutral stand. There are so many reasons which are contributing factors for the internet to be slow during peak periods like the registration period. According to Adepoju and Alhassan (2008), these are some of the reasons: the lack of the frequent service and update to servers, failure of the system to handle huge internet users at the same time, downloading of huge files or data while registration is in progress, slow and power failure are few of the challenges that may cause slow internet speed.

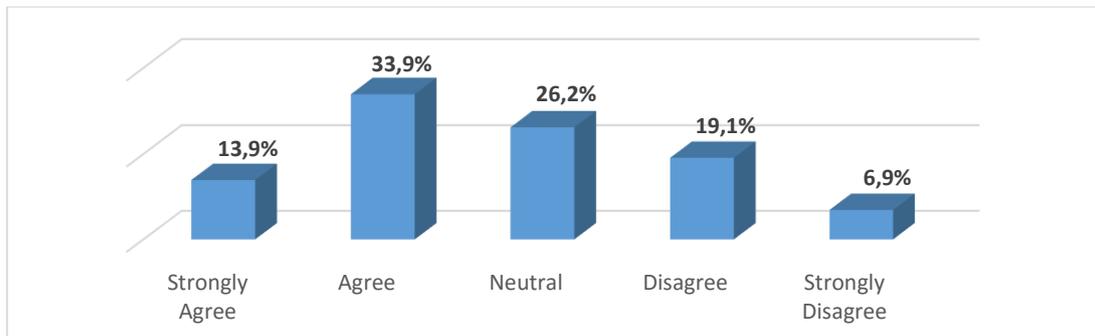


Figure 4.48: I am satisfied with the current online registration system

Figure 4.48 shows that most of the respondents agreed with the statement that students are satisfied with current registration system at UNIZULU. A total of 33.9% agreed and 13.9% strongly agreed, while 26.0% disagreed, with 26.2% who chose 'neutral' as their response. Ogunjuyigbe, Ayodele and Akinola (2016) state that user satisfaction is the measure of the level to which system users are content with the outcome. Through continuous usability, usage and adoption, the information system satisfaction is obtained when all expectations of the system users are met (Hadji & Degoulet, 2016).

4.10 Conclusion

The main focus of this chapter was to outline the results attained from the study, as discussed in chapter three. The chapter presented research questions which the study was based on, followed by data analysis as well as responses from research respondents. Furthermore, findings, as obtained from participants, were statistically presented in this chapter. The next chapter will discuss conclusions and recommendations of the study.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the conclusion and recommendation from the study. Based on the key findings on the study from literature review and data the conclusion was drawn. Similarly, based on the study findings on evaluation of students' online registration system and whether the implementation of the automated registration system at UNIZULU met the expectations of staff and students, the recommendations were made.

This study was conducted to evaluate the effectiveness of students' online registration system at the UNIZULU and the role of this automated system for enhancement of administrative operations and academic activities of the institution. Furthermore, the study looked into the user perception and acceptance of the new system/ technology and, as a result, the following objectives were developed to direct the study:

- To establish benefits of students' online registration system at the University of Zululand;
- To identify the challenges faced by the University of Zululand in the full implementation of online registration system;
- To identify the factors that affect the students' online registration system at the University of Zululand; and
- To make recommendations to the University of Zululand senior management on how to enhance students' online registration system.

The research instruments were developed based on the objectives of the study, which in essence netted the responses of the university communities as system users.

5.2 Key Findings from the Study

This section presents the findings of the study based on the relevant literature reviewed. The findings are presented hereunder from each research question.

5.2.1 Findings related to objective 1: The benefits of students' online registration system at the University of Zululand

The majority of scholars and researchers, for instance, Mashabela and Pillay (2017); Agwa-Ejon and Pradhan (2017); Chaka and Mungadzi (2013); Singh *et al.* (2016); Estevez, *et al.* (2013) and Oladunjoye and Omemu (2013) are of the opinion that one of the major benefits of using online registration is to obtain academic and administrative excellence in the institutions of higher learning in which the success of it is credited to the installation and maintenance of high performing information technology system. Okoye (2015) opines that in an ideal situation where the system is properly set-up, students by themselves are to register their modules even at the comfort of their home without being assisted.

The development and implementation of new online registration system has immensely simplified previously complex issues by reducing the manual processes such as workload to a large extent (Singh *et al.*, 2016). Arikawei *et al.* (2016) support the above statement by stating that the introduction of online registration has contributed in transforming the institution from the crude process of manual system to the practices of the modern technology. For online registration to be a success, Bemile *et al.* (2014) point out the significance of unity, support and corporation in the tripartite alliance, namely, institution, people and technology for enhancing the performance of the automated system.

Lawal-Adebowale and Oyekunle (2014) concluded by stating that online registration is a valuable development and is rated to be of high worth by the students largely because it ensures that their academic registration is easier and it provides quality assurance on the database of the institution. Okoye (2015) states that the role of ICT in institutions of higher learning is growing and changing the way business is conducted. It is through ICT platforms as the nerve centre of the institution that the coordination of administration and operations of online processes, such as admissions and registration, payment of tuition fees, issuing of results and residence allocations are self-processed by students themselves (Arikaweli *et al.*, 2016).

5.2.2 Findings related to objective 2: The challenges faced by the full implementation of online registration system

Literature identified few challenges faced by higher education institutions in general, but also UNIZULU specifically, regarding the full implementation of online registration system. Okoye (2015) referred the online registration as the electronic version of traditional/paper-based registration and the fact that it emerged as a result of challenges linked to the handling of manual registration and the manual filing of student records. Bamile *et al.* (2014) associated the following challenges with the implementation of online registration, namely the insufficient online services in managing student registration, failure of students to register remotely and the time consumed by each student in processing the registration and, that, unfortunately, this process can only be conducted with physical presence of the student on campus.

The other challenge raised in the literature was the inaccuracy in the academic/curriculum structure in terms of system rules, module combination and credit values, of which all these issues impact on data integrity of the institution. The core academic business of the university is embedded in accurately constructed curriculum structure which focuses on teaching, learning and research outcomes (Okewu & Daramola, 2014) and determines the enrolment targets as well as the

subsidy from government. Therefore, the lack of IT skills and knowledge by personnel posed major challenges in as far as managing and maintaining the academic structure, online registration system and other required administrative services to eliminate unnecessary queues, congestion and pressure, time and cost reduction for both students and staff (Adepoju & Alhassan, 2008).

The critical problem facing most students in institutions of higher learning is the lack of technological skills and experience, especially the high school graduates the majority of whom have little or no exposure to operate a computer system and internet, let alone online registration processes. Surprisingly, even some returning students struggled to master online registration and required assistance and guidance. Oladunjoye and Omemu, (2013) state that students with destitute backgrounds find it challenging to embrace modern technology, particularly online registration system. On the other hand, from the institutions' point of view, once the student masters how the online registration works, it helps in reducing risks associated with security, systems, administrative or operations and data quality (Singh *et al.*, 2016).

5.2.3 Findings related to objective 3: The factors that affect online registration system

There are various factors affecting online registration system in many institutions of higher learning even though the intention of implementation of online registration is to eliminate challenges brought by manual registration process. According to Okoye (2015), the effect of the causes affecting online registration system includes inability of the students to complete their registration timeously. Some of these factors are unavoidable and some are as a result of poor IT infrastructure and inadequate IT managerial skills. The major factors highlighted in the literature as most common causes of unexpected downtime of ITS during registration period were the system overload, software failure and non-implementation of regular upgrade of the system and they create operational disorder to staff and frustration to students.

Other factors that affect the automated registration system are poor network or internet connectivity, outdated computer hardware system and lack of service to IT infrastructure including, cables, servers and network plug sockets. When the above factors are not taken care of, they negatively impact on how the online registration system functions. Okoye (2015) regards the epileptic power supply as another contributing factor affecting automated system during registration period. The challenges brought by load shedding affect the entire registration schedule of the institution, decelerate the efficiency of the system and disorganise students' plans on that particular day.

5.3 Key Findings from the Primary Study

This section outlines the outcomes based on the collected data, as discussed in chapter four of the study.

5.3.1 Research Question 1: What are the benefits of students' online registration system at the University of Zululand?

A summary of responses collected from respondents, both staff and students, showed that students' online registration system is effective and beneficiary to UNIZULU communities. To be specific, the below findings emerged:

- Both staff and student participants (more than 80%) agreed that online registration was much better than manual registration process;
- The majority of staff (90%) and students (70%) who responded acceded that online registration was easy to use;
- Overwhelmingly, both staff and students confirmed that online registration saves time (90% of staff and 80% of students) and also saves costs (60% of staff and 80% of student participants);

- Above 50% of students and 90% of staff confirmed that online registration was effective;
- More than 80% of staff and 70% of student respondents agreed that sufficient information was provided timeously and instructions were simple to follow with the online registration system;
- The majority of staff respondents (75%) said online registration performed as expected and, therefore, 60% of students indicated that they did not require help during registration;
- During online registration, more than 60% of student participants agreed that they did get help when needed from both academic and support staff; and
- The respondents had confidence with the online registration system, as reflected by 80% of the respondents.

5.3.2 Research Question 2: What are the challenges faced by the University of Zululand in the full implementation of students' online registration system?

A summary of participants' responses from both staff and students showed that there are challenges with the full implementation of online system at UNIZULU. To be specific, the following findings emerged:

- The implementation of online registration system encountered challenges, as reflected by more than 50% of staff respondents and, as a result, 75% of students reflected that they were not well informed of the automated system;
- The majority of staff respondents (55%) felt that the academic structure was not properly set-up and, as a result, less than 50% of students stated that some modules did not appear on their programmes during registration. The students' outcome was influenced by neutral respondents;
- On the network, a slight majority (45%) of staff respondents indicated that during online registration network connectivity was always available and 40% of students indicated that the network was quicker. This was influenced by a

huge percentage of both staff and student respondents who chose 'neutral' as their response;

- Above 80% of staff and 70% of student participants felt that the online system requires enhancement for better performance and outcome;
- Over 90% of staff participants said students with less IT skills were assisted during online registration, and just above 50% of students indicated that they have necessary skills to operate the computer, hence above 40% agreed that they needed assistance to be able to register online; and
- Accessing online registration system anywhere was still a challenge, as reflected by more than 50% of staff participants and 40% of student participants who agreed with the statement. The students' outcome was influenced by a big percentage of neutral respondents.

5.3.3 Research Question 3: What are the factors that affect students' online registration system at the University of Zululand?

A summary of participants' responses from both staff and students showed that online registration is affected by various factors to be fully functional. To be specific, the following findings emerged:

- The online registration eliminates risks associated with paper based registration, as reflected by more than 60% of student respondents;
- More than 60% of student respondents stated that during registration online system response was sometimes slow and above 40% of staff respondents acceded to the fact that at times the system was slow. The latter outcome was influenced by neutral respondents;
- Regarding internet, above 50% of staff said internet was not too slow during online registration period, while more than 60% of student respondents felt that the internet is too slow during registration;

- A slight majority of respondents (48%) indicated that the system maintenance happened regularly and, on the other hand, 45% said they were not sure whether maintenance happened regularly;
- The online registration should not be changed for another system, as reflected by more than 70%;
- More than 80% of staff participants said the university personnel were trained and were capable to resolve online registration related queries; and
- Student participants were not overwhelmingly satisfied with online registration system, as reflected by 46%, whereas staff participants felt differently- more than 50% said they were satisfied with online registration system.

5.4 Conclusions

This section presents the conclusions taken from both literature outcomes and the primary study research in outlining the aim and objectives of the study. The conclusions were guided by the objectives of the study.

5.4.1 Conclusion aligned to Objective 1: To establish benefits of students' online registration system at the University of Zululand.

The students' online registration system is a major boost and relief against paper based registration to institutions of higher learning. The implementation of online registration system to benefit both staff and students cannot be over emphasised. The study findings confirmed that the students' online system is found to be simple and easy to use. This self-service system helps staff to improve the administrative processes, including student records management and data management system of the institution. Furthermore, it is considered as a cost and time reduction method, while contributing to the improvement of IT skills and knowledge for system users.

5.4.2 Conclusion aligned to Objective 2: To identify the challenges faced by the University of Zululand in the full implementation of students' online registration system.

In the full implementation of students' online registration system, UNIZULU experienced some challenges, as reflected by literature of the study and findings in the data analysis. An effective online registration system should enable students to enrol without being physically present on campus, which is currently one of the challenges at UNIZULU, although the institution is aiming to achieve that, since the project is still on a pilot mode. The findings indicate that the institution has to properly set-up the academic structure to eliminate bottlenecks caused by manual intervention during registration periods, for example, to add modules that were erroneously not linked to the curriculum, including pre and co-requisites and substitute rules.

5.4.3 Conclusion aligned to Objective 3: To identify the factors that affect the students' online registration system at the University of Zululand.

The effectiveness of online registration depends on the quality of the system and how much stress it can absorb and still be reliable, as well as how easy it is to use with simple navigation. Some of the factors affecting online registration system include poor internet connectivity, load shedding, inadequate systems management and the lack of systems upgrade and regular maintenance. All these factors affect the academic and administrative enterprise and negatively contribute to service quality of the university.

5.5 Recommendations

Based on the reviewed literature and the primary study findings, the following recommendations were made:

- The University of Zululand must ensure that online registration system is fully implemented, as per the project plan to eliminate registration challenges.
- There should be more workshops and trainings of personnel to improve technological skills and knowledge to be able to manage academic structure issues.
- The university should ensure that computer education is made compulsory to all first year students and the emphasis be placed specifically on the practical aspects of it.
- The university needs to ensure that students are well informed timeously to equip them with online registration processes and they must also be orientated about online registration system.
- There is a need for the university to provide maintenance regularly on IT system and infrastructure to prevent unplanned downtime and slow internet speed.
- There is a requirement for the university to increase server storage capacity to accommodate the upload and download of huge students' document during registration.
- The university must consider expanding Wi-Fi connectivity and bandwidth in all campuses in order for students to be able to access internet not only in hotspots but anywhere around each campus.
- Additional features must be added on the students' online system for enhancement of registration processes and also for improvement on system's performance.

5.5.1 Recommendation for Future Study

This study was confined to UNIZULU's registration processes and there is a need to conduct a similar study to more other institutions in South Africa to prevent the flooding in of walk-ins during registration periods. It is strongly recommended that when a similar study is conducted, it should be done at an institution that uses ITS as an online

registration system. The findings of further research will then authenticate the outcome of this study and also be able to cover some of the limitations of this study.

5.6 Conclusion

The purpose of the study was to evaluate the effectiveness of students' online registration system at the University of Zululand as the approved project by the Council of the institution. In the first chapter the study was introduced, while the second chapter focused on literature review. The third chapter outlined the study design and methodology where quantitative methods were employed and data were collected using questionnaires. The study findings were presented in the fourth chapter based on each objective, while the fifth chapter drew the study to recommendations and conclusions.

The primary objectives of the study were to determine the benefits, identify challenges and isolate factors affecting online registration system. The findings show that the majority of respondents had confidence in the online registration system, although there were some who had minor reservations. Most of the participants found the system effective and indicated that it should not be replaced with another system, but extra features should be added to enhance performance. The results have shown that the implementation of the automated registration system has a potential to enhance administrative and academic enterprise in the institution.

REFERENCES

- AdaptIT (2018). ITS Integrator Functionality: Student Management System. <https://www.adaptit.co.za/integrator/Products/Pages/ITS-Integrator-Functionality.aspx>. [Accessed on: 01 March]
- Adepoju, S.A. and Alhassan, J.K. (2008). Students' perception about online registration -case study of Federal University of Technology Minna. *Journal of Science, Education and Technology*. Vol. 2 No.1 Pp 230-234
- Agwa-Ejon, J.F. and Pradhan, A. (2017). Technology Connectivity: A Tool for the Selection, Recruitment and Enrolment of Potential Students in South African Universities. *Technology Management for Interconnected World*. Retrieved on 09 July 2018 from <https://ieeexplore.ieee.org/document/8125282/metrics>
- Al-Adwan, A., Al-Adwan, A. and Smedley, J. (2013). Exploring students' acceptance of e-learning using Technology Acceptance Model in Jordanian universities. *International Journal of Education and Development using Information and Communication Technology*. Vol. 9 No 2. Pp 4-18
- Arif, M., Ameen, K. and Rafiq, M. (2017). Assessing distance education students satisfaction with web-based services: A Pakistani's perspective. *Online Information Review*. Vol. 41 No 2. Pp 202-218
- Arikawei, A.R., Amadi, E.C. and Leo, K.A. (2016). Challenges of Students in the Rivers State University of Science and Technology towards that ICT/E-Campus Innovation on Academic Records Management. *Gender and Behaviour*. Vol. 14 No.3 Pp 8030-8042
- Babbie, E. (2001). *The Practice of Social Research*. Thomson Wadsworth. 9th Edition
- Babbie, E. (2008). *The basics of social research*. Thomson Wadsworth. 4th Edition
- Babbie, E. (2016). *The Practice of Social Research*. Cengage Learning. 14th Edition
- Babbie, E. and Mouton, J. (2009). *The Practice of Social Research*. Cape Town: South Africa. Oxford University Press

- Barnham, C. (2015). Quantitative and qualitative research: Perceptual foundations. *International Journal of Market Research*. Vol. 57 No 6. Pp 837-854
- Bemile, R.K., Gborgla, J., Mensah, P.O., Boateng, V., Ansa, H. and Twum, E.G. (2014). Online Registration System (A Case of Methodist University College Ghana). *International Journal of Research in Information Technology*. Vol. 2 No 9. Pp 321-333
- Bharamagoudar, S.R., Geeta, R.B. and Totad, S.G. (2013). Web Based Student Information Management System. *International Journal of Advanced Research in Computer and Communication Engineering*. Vol. 2 No.6 Pp 2342-2348
- Bless, C., Higson-Smith, C. and Sithole, S.L. (2013). *Fundamentals of Social Research Methods: An African Perspective*. Cape Town: South Africa. Juta & Company Ltd
- Chaka, P. and Mungadzi, F.S. (2013). An Implementation of an Online Registration System in Tertiary Institutions in Zimbabwe. *International Journal of Engineering Research & Technology (IJERT)*. Vol 1 No 10. Pp 4011-4040
- Chen, Y. and You, H. (2013). Selection and Research for Online Registration System's Database System. *Journal of Software Engineering and Applications*. Vol. 6 No.1 Pp 33-36
- Creswell, J.W. (2007). *Qualitative inquiry and research design: choosing amongst five approaches*. SAGE Publications Ltd. 2nd Edition
- Creswell, J.W. (2014). *Research Design: Qualitative, Quantitative & Mixed-Methods Approaches*. SAGE Publication Inc. 4th Edition
- Dahlstrom, E. and Bichsel, J. (2014). *Study of Undergraduate Students and Information Technology*. Research report. Louisville, CO: ECAR
- Davis, F.D., Venkatesh, V., and Morris, M.G. (1989). Perceived Usefulness, perceived ease to use and user acceptance of information technology. *MIS Quarterly*. Vol 13. Pp 319-340
- Du Plooy-Celliers, F., Davis, C. and Bezuidenhout, R. (2014). *Research Matters*. Cape Town: South Africa. Juta & Company Ltd

- Estevez, R., Rankin, S. and Silva, R. (2014). A model for web-based course registration system. *International Journal of Web Information Systems*. Vol. 10 No 1. Pp 51-64
- Flick, U. (2011). *Introducing Research Methodology: A Beginner's Guide to Doing a Research Project*. SAGE Publications Ltd.
- Flick, U. (2015). *Introducing Research Methodology*. SAGE Publications Ltd. 2nd Edition
- Gant, J.P. and Gant, D.B. (2002). Web portal functionality and State Government E-service. *35 Hawaii International Conference on System Sciences*. Pp 1-10
- Garg, A., Shukla, B. and Kendall, G. (2015). Barriers to implementation of IT in educational institutions. *The International Journal of Information and Learning Technology*. Vol. 32 No.2 Pp 94-108
- Gorard, S. (2013). *Research Design: Creating Robust Approaches for the Social Science*. SAGE Publications Ltd
- Gu, W. and Liu, Y. (2011). SaaS-Based Services Information Technology Acceptance Model. *Computer Engineering and Management Sciences*. Pp 87-90
- Guthrie, G. (2010). *Basic Research Methods: An Entry to Social Science Research*. SAGE Publications Ltd
- Hadji, B. and Degoulet, P. (2016). Information system end-user satisfaction and continuance intention: A unified modelling approach. *Journal of Biomedical Informatics*. Pp185-193
- Janse van Rensburg, D.E. (2016). University of Zululand Annual Report 2016. KwaZulu-Natal, South Africa
- Janse van Rensburg, D.E. (2018). University of Zululand Registration Report to DHET. KwaZulu-Natal, South Africa
- Khameneh, Z.R., Nemati, M. and Mohammadian, M. (2016). Evaluation of Student's Satisfaction towards Online Registration in Urmia University of Medical Sciences. *International Journal of Advanced Biotechnology and Research*. Vol. 7 No.3 Pp 506-509

- Kimmons, R. (2015). Online system adoption and K-12 academic outcomes. *Journal of Computer Assisted Learning*. Vol 31 No 1. Pp 378-391
- Kumar, R. (2011). *Research Methodology: A step-by-step guide for beginners*. SAGE Publications Ltd. 3rd Edition
- Langkos, S. (2014). Athens as an international tourism destination: An empirical investigation to the city's imagery and the role of local DMO's. MSc (Marketing Management). [Unpublished]. University of Derby. (Accessed: 03 September 2018)
- Lawal-Adeboale, O.A. and Oyekunle, O. (2014). Agro-students' appraisal of online registration of academic courses in the Federal University of Agriculture Abeokuta, Ogun State Nigeria. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*. Vol. 10 No 4. Pp 139-154
- Leedy, P.D. and Ormrod, J.E. (2010). *Practical Research Planning and Design*. Pearson Education International. 9th Edition
- Leedy, P.D. and Ormrod, J.E. (2015). *Practical Research: Planning and Design*. Pearson Education International. 11th Edition
- Lemay, D.J., Morin, M.M., Bazelais, P. and Doleck, T. (2018). Modelling Students' Perceptions of Simulation-Based Learning using the Technology Acceptance Model. *Clinical Simulation in Nursing*. Vol 20. Pp 28-37
- Liu, I., Chen, M.C., Sun, Y.S., Wible, D. and Kuo, C. (2010). Extending TAM model to explore the factors that affect Intention to use an Online Learning Community. *Computers and Education*. Vol 54. Pp 600-610
- Malik, M.E., Danish, R.Q. and Usman, A. 2010. The Impact of Service Quality on Students' Satisfaction in Higher Education Institutes of Punjab. *Journal of Management Research*. Vol. 2 No 2. Pp 1-11
- Manetje, O.M. (2009). The impact of organisational culture on organisational commitment. MA (Industrial Psychology). [Unpublished]. University of South Africa. (Accessed: 30 July 2018)

- Mashabela, F. and Pillay, A.S. (2017). Effectiveness of an Integrated Tertiary Software Mobile Information System for Student Registration and Admission at a University in Gauteng. *Expert Journal of Business and Management*. Vol. 5 No 1. Pp 32-49
- Mgutshini, T. (2013). Online or not? A comparison of students' experiences of an online and an on-campus class. *Curationis*. Vol. 36 NO 1. Pp 1-7
<http://dx.doi.org/10.4102/curationis.v36i1.73>
- Mirmohammadi, S.J.; Hashemian, Z.; Firozabadi, M.R.H.; Dehghani, M.R. and Eghbal, A. (2011). The Satisfaction Rate of Students in Yazd University of Medical Science toward Registration Process in 2007. *Strides in Development of Medical Education*. Vol. 8 No 1. Pp 101-105
- Mouton, J. (2006). *Understanding Social Research*. Van Schaik Publishers. Pretoria
- Mouton, J. (2009). *Understanding Social Research*. Van Schaik Publishers. Pretoria
- Mseli, P. (2011). *Writing a Research Proposal: Practical guidelines for business students*. Juta and Company Ltd
- Mujinga, M., Eloff, M.M. and Kroeze, J.H. (2018). System usability scale evaluation of online banking service: A South African study. *South African Journal of Science*. Vol. 114 No ¾. Pp 1-8
- Murray, M., Perez, J., Geist, D. and Hedrick, A. (2012). Student Interaction with Online Course Content: Build It and They Might Come. *Journal of Information Technology Education: Research*. Vol. 11 No.1 Pp 125-140
- Ocholla, J.S.O. (2015). Influence of Public University Expansion on Adoption of Web-based Student Management Information Systems. A case of Moi University, Kenya. MA (Project Planning and Management). [Unpublished]. University of Nairobi. (Accessed: 05 July 2018)
- Odero, T.A. and Oloko, M.A. (2013). Effect of Online Registration on Exam Performance in Kenya Certificate of Secondary Education Enrolment. A case of Sotik District, Kenya. *American International Journal of Contemporary Research*. Vol. 3 No 7. Pp 117-127

- Ogunjuyigbe, A.S.O., Ayodele, T.R. and Akinola, O.A. (2017). User satisfaction-induced demand side load management in residential buildings with user budget constraints. *Applied Energy* 186. Pp 352-366
- Okewu, E. and Daramola, O. (2014). Component-based software engineering approach to development of a university e-administration system. In: Proceedings of 6th International Conference on Adaptive Science & Technology (ICAST). Ota, Nigeria, 29-31 October, IEEE, Pp 1-8
- Okoye, C.O. (2015). Online registration challenges faced by open and distance learners of National Open University of Nigeria: A case study of Enugu Study Centre. *Journal of Qualitative Education*. Vol. 11 No.1 Pp 1-7
- Oladunjoye, P. and Omemu, F. (2013). Assessing Manual and Online Course Registration in Nigeria Tertiary Institutions. *World Journal of Education*. Vol. 3 No 6. Pp 8-14
- Omambia, A.A., Ndiege, J.R., Wakoli, A.B., Nyamboga, C. and Nyansiaboka, A. (2014). Effects of use and application of online registration system on user satisfaction at the Institutions of Higher Learning in Developing Economies. A case of University of Eastern Africa, Baraton. *Baraton Interdisciplinary Res. J*. Vol 4. Pp 1-8
- Park, S.Y. (2009). An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioural Intention to Use e-Learning. *Educational Technology & Society*. Vol 12 No 3. Pp 150-162
- Peng, Y., Liu, N.J., Li, Y.X. and Shao, Z.L. (2012). Design and implementation of the online course registration system at Tsinghua University. *International Conference on Systems and Informatics (ICSAI 2012)*. Pp 1179-1182
- Pinho, C., Franco, M. and Mendes, L. (2018). Web portals as tools to support information management in higher education institutions: A systematic literature review. *International Journal of Information Management*. Vol 41. Pp 80-92
- Punch, K.F. (2009). *Introduction to Social Research: Quantitative and Qualitative Approaches*. SAGE Publications Ltd. 2nd Edition

- Saunders, M., Lewis, P. and Thornhill, A. (2009). *Research Methods for Business Students*. Pearson Education Ltd. 5th Edition
- Shaltoni, A.M., Khraim, H., Abuhamad, A. and Amer, M. (2015). Exploring students' satisfaction with universities' portals in developing countries. A cultural perspective. *The international Journal of Information and Learning Technology*. Vol. 32 No 2. Pp 82-93
- Singh, R., Singh, R., Kaur, H. and Gupta, O.P. (2016). Development of Online Student Course Registration System. *Oriental Journal of Computer Science & Technology*. Vol. 9 No 2. Pp 66-72
- Stein, B. (2009). *Controlling the Effect of Online Education in South African Universities*. Amsterdam University Press.
- Strauss, B. (2000). Students' Perception of E-Registration Portal of Ladoke – Akintola University of Technology, Ogbomoso, Nigeria. *Journal of Educational Technology*. Vol. 4 No 6. Pp 62-71
- Sutton, H. (2016). Build an online hub around student enrolment needs for increased retention, completion. *Wiley Periodicals, Inc*. Vol. 20 No 3. Pp 6-7
- Tang, D.P. and Chen, L.J. (2011). A Review of the Evolution of Research on Information Technology Acceptance Model. *Guandong Province Soft Science Research Project*. Pp 588-591
- The Madibaz (2017). An Investigation into the UNIZULU registration process to optimise the utilisation of financial and human resources. Certificate (Leadership Development Program). [Unpublished]. University of Zululand.
- Thompson, R.C. (2017). Determining critical success factors for implementation of online registration system. MA (Information and Communication Technology). [Unpublished]. Durban University of Technology. (Accessed: 05 July 2018)
- Thossansin, T. and Pomsathit, A. (2014). Differences in Enhancing Enrolment System between Web Application and Mobile Application for Rangsit University, Thailand. *International Journal of Electronics and Communication Engineering*. Vol. 8 No.9 Pp 3103-3106

- Tuli, F. (2010). The Basis of Distinction between Qualitative and Quantitative Research in Social Science: Reflection on Ontological, Epistemological and Methodological Perspectives. *Ethiopian Journal Education and Society*. Vol. 6, No 1. Pp 97-108
- Udofia, N. (2015). An Evaluation of Students' Response to Online Registration. *American Journal of Engineering, Technology and Society*. Vol. 2 No 4. Pp 90-95
- Verma, S., Bhattacharyya, S.S. and Kumar, S. (2018). An extension of the technology acceptance model in the big data analytics system implementation environment. *Information Processing and Management*. Vol 54. Pp 791-806
- Waycott, J., Bennett, S., Kennedy, G., Dalgarno, B. and Gray, K. (2010). Digital divides? Students and staff perceptions of information and communication technologies. *Computer and Education*. Vol. 54 No.1 Pp 1202 – 1211
- Welman, C., Kruger, F. and Mitchell, B. (2005). *Research Methodology*. 3rd Edition. Cape Town, South Africa: Oxford University Press
- Yuen, A.; Fox, R.; Sun, A. and Deng, L. (2009). Course management system in higher education: understanding student experiences. *Interactive Technology and Smart Education*. Vol. 6 No 3. Pp 189-205
- Yunus, O.M. and Tambi, A.M. (2013). *Essentials of Research Method*. UiTM Press