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The use of Non-Academic -e-Services: Experiences among first-time entering university students

by

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Declaration

I, **CEBISA NOLUDWE**, declare that the contents of this thesis are pure work done personally, and no part of this thesis dissertation has ever been submitted for academic examination towards any qualification. Furthermore, it reflects my own opinions and may not necessarily represent those of the Cape Peninsula University of Technology.

Signed  **Date:** 16 January 2024

Abstract

In South Africa, Universities are engaged in intense competition to attract a larger student population, prompting many of these institutions to prioritise the satisfaction of their students. This focus mirrors practices in business organisations, where meeting and exceeding customer expectations is paramount. However, the extent to which HEIs succeed in achieving this objective remains unexamined. This study explored the perceptions and experiences of first-time entering students regarding non-academic electronic services at a South African university of technology.

This study employed qualitative research, by distributing 200 questionnaires to first-time registered students within the Faculty of Business at the Cape Peninsula University of Technology (CPUT). A total of 43 completed questionnaires were returned, providing a robust basis for reliability and validity in the findings. The results revealed that, while certain aspects of the online system aligned with student expectations, particularly in terms of ease of access to information and timely peer assistance, significant challenges persisted. The research investigated how first-time entering, Generation Z students, engage with non-academic e-services. According to generational theory, Generation Z, like Millennials, expect technology to be intuitive, efficient, and responsive due to their background as digital natives. Frustration with old or complicated systems emerged, which encourages user-centric solutions. By considering such generational expectations, it emerged that institutions should be aware of the technological and cognitive needs of younger generation students.

The findings of this study reinforce the necessity for a more user-centric approach to the design and implementation of online services within the university framework. To foster a responsive and effective digital environment that caters to the diverse needs of the university community, the institution must commit to continuous improvement and active student engagement. The study offers recommendations for enhancing the quality of non-academic electronic services, contributing to a more satisfactory educational experience for student.

Dedication

I dedicate this thesis to my family, mentors, and all those whose support and inspiration have accompanied me through my academic journey.

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Table of Contents

List of Tables and Figures

Table of Acronyms

AI	Artificial Intelligence
ChatGPT™	Chat Generative Pretrained Transformer
CPUT	The Cape Peninsula University of Technology
E-SQ	Electronic Service Quality
E-SQ	Electronic Service Quality
HEI	Higher Education Institution
ICT	Information and Communication Technology
IS	Information Systems
LMS	Learning Management Systems
PAIA	Promotion of Access to Information Act
PEPUDA	Prevention of Unfair Discrimination and Promotion of Equality Act
POPIA	Protection of Personal Information Act
SOS	Student Online System
TAM	Technology Acceptance Models
USA	United States of America
UX	User Experience

Chapter 1 : Introduction and Outline of the Study

1.1. Introduction

There is a persistent misconception that low levels of student participation and high attrition rates are primarily caused by academic shortcomings (Heyman, 2010). However, this study argues that the non-academic factors, particularly the effectiveness and accessibility of non-academic services, play a significant part in shaping first-time entering students' experiences at a South African University of Technology. The study examines how the delivery and usability of e-services can enhance or hinder a student's ability to successfully navigate their academic journey and remain enrolled in the institution. In doing so, this study proposes to give further insight into how institutional support systems affect student retention and success.

In this context, student e-support services refer to an integrated set of digital facilities, activities, and interfaces designed to help students in their academic and social adjustment. It is essential that these e-services ensure that students can identify the information they require, the administrative processes they must complete, and engage with institutional processes without depending on anyone and feeling apprehensive. As the services of the university are further digitised in response to the fast technological innovations, plus a limitation of resources, it makes it imperative to assess if these systems are adequately designed to meet the diversified needs of incoming students (Van der Merwe & Pienaar, 2017).

Earlier studies have elucidated that e-services aid education, for example, by enhancing access, minimising administrative inefficiencies, and keeping costs low (Arkoful & Aibadoo, 2014; Alkharang & Ghinea, 2013). In higher education, they are considered to promote flexible learning opportunities as well as the efficiency of the institution. Conversely, the transition to digital systems comes with its own set of challenges. Many students either face problems in using web-based platforms or are not well supported because of low digital literacy (Kattoua et al., 2016). Such barriers may affect student

participation, delay important administrative procedures, and thus all in all have an impact on retention.

This study, therefore, considers first-time entering students as the main informants in addressing issues of usability, accessibility, and perceived effectiveness of various non-academic e-services. It attempts to determine how well the integration mechanisms go toward supporting the student, identify the ways in which the service delivery is lagging, and recommend improvements that would eventually bring digitisation closer to the real needs and contexts of the student.

1.2. Problem Statement

South African universities are increasingly applying digital technology to student application and registration processes. Whereas online self-service systems, especially since the beginning of 2021, were intended to facilitate operations, they posed a serious pragmatic problem: most of the first-time entering students cannot operate these platforms on their own because of low digital literacy and a lack of institutional support tailored to their needs. Despite all the claimed implementation efficiencies, when these students are left to use software that is not suitable for them, they usually become confused and frustrated, eventually disengaging in some cases.

Philosophically, the questions that can be raised are those of equity and inclusion and of moral duties imposed on educational institutions in an age shaped by digital design. If digital systems cannot be designed with the most vulnerable users in mind, are they genuinely inclusive? And to what extent should universities be held responsible for furthering the digital divide, thereby deepening the roadblocks to access, primarily on the periphery? Agwa-Ejon and Pradhan (2017) argue for the adaptation of e-services in keeping with changes in the needs of students. By contrast, universities have failed to design systems that respond to the needs of a diverse student population. In effect, this has created a yawning gulf between institutional efficiency and student experience-a kind of mismatch that erodes the very notions of trust and retention and opens moral questions about the human price of digital transformation in the education sector.

Even if research has hitherto treated student support in ODL contexts (Shikulo & Lekhetho, 2020), there appears to be a critical gap in understanding the lived experience of non-academic e-services by first-entry non-ODL students in traditional universities of technology. This study attempts to close that gap by looking at usability, accessibility, and general satisfaction with the systems, thus contributing on one hand toward practical service improvement and on the other to the broader philosophical discourse of educational justice in the footprint of time.

1.3. Study Significance

The study seeks to uncover data that will provide an in-depth understanding of how students receive current electronic services and how these impact students in terms of meeting their needs and expectations.

Such findings would provide recommendations to increase access to education and provide support to students, so that they cope with the demands of the academic environment. It has become increasingly important to identify challenges that students encounter in accessing/using electronic services (Smith & Brown, 2020). In addition, the study will provide recommendations on how non-academic electronic services to students can be improved.

Furthermore, the study seeks to contribute to the current literature on student experiences with a specific focus on application and registration on electronic services support systems. The study will act as an aid to overcoming challenges, such as barriers and other shortcomings, to accessing electronic services and improving online competencies for students and faculty.

1.4. Aim and Objectives

The study aims to explore the patterns of the user (first-time entering students) experiences with non-academic electronic services at a South African university of technology:

The research objectives are as follows:

- To explore the expectations of first-time entering students regarding academic and non-academic e-Services provided to support their application and registration.
- To investigate the first-time entering students, experience the academic and non-academic e-services provided.

1.5. Research questions

This study was guided by the following research questions:

- What are the expectations of first-time entering students regarding academic and non-academic e-Services provided to support their application and registration?
- How do first-time entering students experience the academic and non-academic e-services provided?

1.6. Assumption

It is the key assumption of this study that students at contact universities need more guidance to manage e-services.

Scope of the Study

The focus of this research is on the first-year students' interaction with non-academic electronic services, notably the online application and registration systems, at a South African University of Technology. The DeLone and McLean Information Systems Success Model acts as a framework from which to examine system performance, service quality, information provided, and net benefits achieved. The research deals only with non-academic electronic services, thus ignoring academic services such as the Learning Management System. The data are gathered from qualitative interviews with purposefully sampled first-year students. This is to guarantee that the study is grounded in the actual experiences of the students in dealing with the application and registration services offered by the institution. In parallel with existing research on e-services in tertiary education, the study examines how such services aid in the effectiveness, ease of access, and satisfaction of the students, and pinpoints areas that can be improved.

Limitations of the Study

The research has limitations that have been highlighted. Focusing on a singular University of Technology, the results cannot be applied in other universities for higher learning institutions with different digital infrastructures and resource capacities. The reliance on a small sample of first-year students, while allowing for depth of analysis, does not capture the full range of student experiences. Changes to the system or reforms to the institution after a particular academic period is also out of scope as the study is conducted during a particular academic cycle. The absence of the views of administrative staff, ICT personnel, and policymakers further decreases the scope of institutional information.

1.7. Outline of the study

1.7.1. Chapter One

Provides an overview of the study's problem statement, goal, objectives, and questions.

1.7.2. Chapter Two

Chapter two provides a comprehensive related literature. It combines a theoretical framework, major concepts, and empirical studies relevant to the study. Chapter two reviews past research findings along the lines of trends, patterns, and gaps in the literature that the study wants to close. Relevant theories and models championing the understanding of the research problem are pinpointed. It also ferrets into studies, methodology, and findings that dealt with similar questions, showing successful or limited methods to handle the topic. As it relates to the existing body of knowledge, Chapter Two strongly builds up dense research gaps with justification of the need for the present study in terms of a strong rationale for research objectives and questions.

1.7.3. Chapter Three

Chapter three will describe the paradigm for the study. It includes a research design and indicates whether the study is of the qualitative or quantitative type or is a combination of the two. The chapter also describes the population and sampling methods and clearly outlines how the respondents will be selected to obtain credible and valid results. The discussed collection techniques state the tools and instruments used for information

gathering, such as a survey, interview, or observation, among others. Finally, the chapter defines the analysis techniques used to interpret and create meaning out of the data collected. Ethical issues of an area like consent and confidentiality of participants are raised, ensuring the research process is done in an acceptable ethical manner.

1.7.4. **Chapter Four**

Chapter four will outline the process of analysing the data, detailing how data collection was organised and coded and the analysis that followed was intended to give specific answers to the research questions. Key findings of the study are presented, which include figures and descriptive narratives of the patterns, trends, or relationships that were found within the data. The chapter aims to interpret the findings within the context of the study's objectives and questions, reporting key insights and flagging findings that were unexpected. In addition, the chapter includes discussions about the reliability and validity of the findings, considering the possible biases or limitations.

1.7.5. **Chapter Five**

Chapter 5 discusses the interpretation of the findings in terms of the research objective and correlation with existing literature. In addition, it deals with the implications of the findings to enhance the understanding of the readers about their research. The chapter details the limitations faced during the study and their effect on the interpretation of findings as well. Recommendations for future research, policy changes, and practical application in the chosen field are captured in the chapter. Finally, the chapter summarises the overall conclusion derived from the study, emphasising its significance and potential impact.

1.8. Conclusion

Chapter one provides the research problem, aims and objectives, as well as the structure of this study. It discussed the major issues which the research seeks to address and creates an understanding of the scope of the investigation. This chapter has presented the theoretical framework and how this study is significant within the existing body of knowledge.

Finally, to present the methodology and research questions, Chapter one set the foundation that shall predicate detailed explorations in the subsequent chapters. Thus, it paves the way toward an understanding and awareness of the purposes, approaches and expected outcomes of the study concerning the objectives of inquiry.

Chapter 2 : Literature Review

2.1. Introduction

This chapter provides a brief historical background to understand and contextualise the significance, experiences, and adaptation of non-academic e-services. It also addresses the technical barriers to non-academic services, the factors that impact the use of e-services; and lastly, the chapter proposes improvements that could be implemented to enhance e-services within the university. Since the COVID-19 pandemic, most universities have moved to the use of electronic services methods. Prior to the pandemic, there had been a lack of attention to university technology infrastructure. The unpreparedness of most universities to abruptly transition from face-to-face student services to electronic services may negatively impact student satisfaction. In addition, most university activities were conducted the traditional way rather than through electronic means, including course registration, tuition fee payment, courses offered to prospective students and daily information. Hence, the study focuses on e-services provided by the Cape Peninsula University of Technology (CPUT) and student satisfaction with such services.

Moreover, the policy framework that governs the way in which e-services take place within CPUT has been considered and a theoretical framework is provided to guide this study. The policy framework under which non-academic e-services are rendered at CPUT has a far-reaching influence on how such services are conceived, designed, implemented, and managed.

Lastly, the chapter focuses on models and theoretical frameworks employed to assess the effectiveness of non-academic e-services, which was adopted to ensure measurements of evaluation. The framework guarantees alignment of these e-services to national and institutional standards protecting the rights of students, faculty, and staff, with such services meeting all legal and ethical demands.

2.1.1. National Legislation

In South Africa, the legal framework that governs higher education institutions, including CPUT, is primarily defined by the Higher Education Act (South Africa, 1997) and national policies on ICT. The South African Information Act (South Africa, 2002) and Protection of Personal Information Act (POPIA) (South Africa, 2013) provide significant direction on areas such as the protection of personal data and privacy, in this case particularly relevant with e-services dealing with the collection and storage of student data.

The Electronic Communications and Transactions Act (ECTA) (South Africa, 2002) prescribe rules governing electronic transactions, including contracts and agreements that may be made through digital platforms. Many e-services at CPUT are provided through online platforms; therefore, it is important to ensure that the legislative requirement is adhered to so that the legality and security of e-services can be maintained.

The National Development Plan 2030 (NDP) (South Africa, 2013) brings an overall vision for the education system in South Africa and contributes to the development of ICT and e-learning tools and thus fits well with CPUT's strategic intentions of including digital technologies into academic and non-academic services.

2.2. Search Strategy for Relevant Literature

To collect relevant literature focused on the utilisation and perceptions of digital services by first-year students in institutions of higher learning, a broad search strategy was applied within various academic databases such as ScienceDirect, Ebscohost, Emerald accessed through the CPUT library.

The perspective focused on searching student e-services and their use by students, especially in their first year at the university. The search string applied was structured as follows:

("use" OR "usage" OR "utilisation") AND ("Student*" AND ("e-Service" OR "eservices" OR "electronic services" OR "digital services")) AND ("experience" OR "perception" OR "view") AND ("first timers" OR "first year" OR "first year") AND (“universities” OR “colleges” OR” higher education”).

This search string was originally developed to look up articles that are relevant to student interaction and experiences with online services. However, when this search string was issued across the CPUT Library database, containing Ebscohost and Emerald, etc. no articles were found using this exact search string. Accordingly, it was attempted to alleviate the search by changing the combination of the words and even making the scope wider to digital services in general and such more detailed with other aspects as it is described in the next sections.

2.3. Search Results

2.3.1. ScienceDirect Search

The research undertaken in ScienceDirect was constrained within the years 2020 to 2024 and was directed towards peer-reviewed articles and advanced kinetic studies. There were two sets of search terms that were applied in this context:

First Search Term Set: (“use” OR “usage”) AND (“digital services” OR “e-Services”) AND (“perceptions” OR “experiences”) AND (“first-year students” OR “freshmen”). This search produced 865 results, out of which 19 articles were picked, which were on a research topic. The selection was provided by looking at the abstracts and covering only those studies that focused on digital services in higher education and first-year students only.

2.3.2. Second Search Term Set

This search added extra terms and criteria to limit the results:

(“use” OR “usage”) AND (“digital services” OR “e-Services”) AND (“perceptions” OR “experiences”) AND (“first-year students” OR freshmen). The second search only gave results for 26 articles, where, again, more relevant studies exploring students’ interaction with digital or electronic services in the first year of university were extracted. From the 26 articles, 11 articles were selected for thorough scrutiny. These articles gave the requisite perspective to comprehend the perception and experience of first-year students with digital services.

2.3.3. **Ebscohost and Emerald Search**

Similar searches were repeated in the Ebscohost and Emerald databases available in the CPUT Library. The principal search string employed consisted of the following terms:

(“use” OR “usage” OR “utilization”) AND (“Students*” AND (“e-Services” OR “eServices” OR “electronic services” OR “digital services”)) AND (“experiences” OR “perceptions” OR “views”) AND (“newentry” OR “first year” OR “first-year students”) AND (“academic” OR “college” OR “higher learning”).

The use of this sequential search string in these databases returned nil articles. This result indicates the fact that keyword combinations, specifically in relation to freshmen students along with digital services, may not have been extensively covered by scientific review journals during the specified period and databases.

This implies that subsequent literature searches for studies about first-year students’ interaction with digital services yielded a few pertinent findings. A considerable number of articles were available for review on ScienceDirect, but other sources such as Ebscohost and Emerald proved unhelpful with the same search terms. This study will focus on the 11 articles selected from the ScienceDirect course, which will analyse the digital services in universities and how these can be improved for first-year students.

2.4. Definition of Key Concepts

2.4.1. **e-Services**

According to Zeithaml and Bitner (2003), internet services are called e-services. E-service as well is referred to by Wilson (1998) as activities or a constellation of activities that take place during the interactions through electronic media between a service provider and a consumer. As stated by Taherdoost et al. (2014), key characteristics of e-services include intangibility, process orientation, uniformity, inseparability, lack of ownership, interactive aspects, self-service potential, usage for non-competitive purposes.

2.4.2. **e-Satisfaction**

e-Satisfaction is a user's contentment with the experience of interacting with an online service during or after the interaction. According to expectations, usability being a factor, function, and service delivery are at the center of attention. San Martin (2011) explains satisfaction as a positive emotional state that arises after meeting expectations stemming from earlier experiences with a service. E-satisfaction, contrastingly, is more concentrated on the interaction online. It assesses how users perceive a digital platform's effectiveness, efficiency, and responsiveness (Rodgers et al., 2005). General satisfaction can be modified by any number of subjective determinants, while e-satisfaction revolves around direct experience with an online system, for instance, the ease of use of a university's registration portal, the quickness of retrieving information, or the accomplishment of tasks without errors or delays.

2.4.3. **e-Service Quality**

Universities are now switching from physical student services toward electronic services, changing the way most institutions engage student facility and evaluation of the service quality within them (Mpungose, 2020) and service quality is shaped through users' perceptions and expectations (Parasuraman et al., 1985, 1988; Lewis & Mitchell, 1990). Service quality usually refers to "the extent to which a website facilitates efficient, and effective; shopping, purchasing and delivery of products & services" (Zeithaml et al., 2002), but considerable interest focuses on the e-service quality scale. According to Kumar and Dash (2015) and Krishnadas and Renganathan (2019), reliability and responsiveness are some of the dimensions encapsulated in the scale.

2.4.4. **e-Service Quality Dimensions**

Among various studies that have been conducted, Rowley (2006) posits that e-service quality incorporates various dimensions, such as website features, accessibility, security, responsiveness, reliability, information, communication and delivery. The design dimension of a website pertains to how much the aesthetic design of the user interface appeals to customers. Reliability is the website capacity to accurately execute orders,

deliver them on time, and keep personal data safe. Trust is the willingness of a customer to take risks in an online transactional activity as influenced by positive expectations from the online store about future behaviours. Personalisation is offering personal attention to customers through sending individualised thank-you notes, as well providing an area for the clients to send questions which could be answered by the business (Lee & Lin, 2005).

A study undertaken by Yinka (2017) analysed the adequacy of university support services in satisfying students' needs and academic requirements by evaluating universities according to the national quality benchmark standards. The research found that accorded to students the level of service support and quality was fair average and concluded that a close relationship exists between service support and quality. Yinka recommends that improvements be made to the area of service support to better address students' needs and expectations. Research conducted by Essel et al. (2018) entitled explored student support interventions in distance education and their Implications for students' success: The study employed a questionnaire and findings confirmed that where there is adequate support, the chances of success among students are enhanced and boosts student retention. This supports the argument for ensuring that student services are accessible as well as functional (Mendoza-González et al., 2022).

2.4.5. **Web Design**

According to Li and Suomi (2009) and Kim-Soon et al. (2014), the existence of e-services in virtual surroundings infers that the material elements include a web design and visible elements of it. The authors contend in their studies that a website must be "appealing and well-organized," with "consistent and standardised navigation," a "well-organised user interface", "quick loading times," and "ease of use in online transactions" to be attractive to customers. Likewise, in their study of service quality in e-retailing, Collier and Bienstock (2006) found that website design plays a critical role in the evaluation process customers go through when placing an order. While some researchers may refer to this concept as "graphic quality", "visual appeal" has been referenced by others, such as Loiacono et al. (2002) and Fassnacht and Koese (2006), who recognized these factors as critical indicators for customers in appraising e-services. Although website design was not the main theme of a study undertaken by Parasuraman et al. (2005) for goal-oriented online

shoppers, it was found that this dimension may be vital to pure service-oriented institutions, such as e-government and learning platforms (Wolfinbarger & Gilly, 2003; Kausar & Bokhari, 2010; Cox & Dale, 2001).

2.4.6. **Efficiency**

As Parasuraman et al. (2005) note, one of the three dimensions of e-service quality is efficiency, which can be defined as the quickest possible method of browsing the internet. This definition consists of three components: the user-friendliness and favourableness of the method, the speed of its usage and access, and its accessibility. As shown by Kim-Soon et al. (2014) and Sohn and Tadisina (2008), overall website convenience and ease of use are significant determinants of website quality and likelihood of repurposing. Several other factors, including attractiveness, information and technical quality, have also contributed to quality according to Fassnacht and Koese (2006). Reinders et al. (2007) found that dependability and ease of use were the most valued attributes in their research about customer evaluations of self-service technologies for public transportation. A study conducted by Li et al. (2009) found that online travel services are evaluated based on both trust and ease of use, and that trust is the most important factor affecting customer satisfaction.

2.4.7. **System Availability**

According to Pena et al. (2013), timeous and well-placed accessibility provides value to a service. Parasuraman et al. (2005) defined the dimension of availability according to the technical functionality of a website and note the value aspect as most important when evaluating an actual customer experience, which is directly related to website functionality regarding user interactions at login and is denoted by the availability and response of various servers and links. This dimension was further described by Ataburo et al. (2017) in terms of business availability, that the website should launch without delay and remain working effectively while in use. They further found that perceptions of security risks emanate from attitudes related to the use of online financial services.

2.4.8. **Responsiveness**

Ojasalo (2010) posits that the art of managing responsiveness is an important dimension for e-service providers when customers have queries or complaints and this dimension is the most effective and efficient resolution for managing problems (Parasuraman et al., 2005). Li and Suomi (2009), interpret responsiveness in e-services as making digital media available during times when a customer requires assistance with an issue or question, facilitating the ease of purchasing and allowing the customer to continue shopping without interruption. A benefit of the responsiveness dimension is that it allows for overwhelming information and answering customer's questions at the appropriate time to solve the problems without much delay (Li & Suomi, 2009).

Authors include this dimension of responsiveness in e-service recovery, which applies to websites in cases where customers experience problems and, as a result, seek to contact the e-service provider. Applicable, accurate and available contact information should always be easily found on a website (Mashaqi et al., 2020). In addition, good customer service is key to enhancing resolution of customer problems (Swaid, 2008).

2.4.9. **Contact**

Parasuraman et al. (2005) recommend having a telephone or an intermediate person available to assist with queries related to e-service to allow individuals access to a complaint or contact section in cases where they face problems on the website. The provision of such a service builds customer confidence when initiating a transaction, as they know they can rely on assistance whenever a problem occurs. In the context of education, a study by Ozkan and Koseler (2009), highlighted the fact that humans contact is preferred over that of an answering machine or automated systems.

2.5. Historical Background of Non-Academic e-Services

A student’s experience at a university is influenced by how student support is provided (Ruben 1995; Kuh et al. 2010) and the matter has been of concern throughout academic literature on student affairs and student development (Komives & Woodard, 2003; Reynolds et al., 2008).

According to Ravjee (2007), several universities in South Africa began to use networked technologies for e-services in the late 1990s and educational technologies and e-services commenced in South Africa in the form of Learning Management Systems (LMS) from the mid to late 2000s. As an emerging economy, South Africa witnessed a complete change in educational technology practices because of e-service, which in turn has led to a new vocabulary, policies, and budgets. Learning experiences and output of students have been addressed in the White Paper using Information and Communication Technology (ICT) (South Africa, 2003).

Kim-Soon et al. (2016) posit that the essence of e-service in higher education is a desire to streamline learning and administrative processes, However, Edumadze et al. (2017) state that most nations have invested in human and financial resources due to the potential opportunities offered by e-service by integrating e-services into traditional lecture rooms and ensuring that students are able to use technology to its full potential As a result the educational technology market has opened and facilities and services have improved the quality of learning (Kenan, 2015). According to Kenan (2015) higher education has increasingly embraced e-services due to the rapid development of technology, interactive media, digital technologies, and the internet, resulting in more connections, collaborations and interactions among students and instructors.

2.6. Non-Academic e-Service Support at a University

Academic enquiry into student support services in South Africa is centred on open distance learning (Arko-Achemfuor, 2017). Makoe and Nsamba (2019) investigated the quality of student support services in open distance learning universities and the needs and experiences of users. The study established that expectations of service support are higher than perceptions, indicating a gap in service quality. Makoe and Nsamba further found that student support services may be assessed according to the four dimensions of service quality by (Parasuraman et al., 1988), namely:

1. Tangibles: The physical appearance of facilities, equipment, personnel, and communication materials. This includes aspects such as cleanliness, the professionalism of staff, and the visual appeal of service environments.

2. Reliability: Doing the promised service dependably and rightfully. This dimension in the service industry refers to the consistency of the service; in addition, do the service providers meet customer expectations every single time?

3. Responsiveness: The readiness to be of service to customers and to provide prompt service can be talked about as operationalized by promptness with which the organization gives attention to the needs and complaints of its customers.

4. Assurance: The knowledge and courtesy of employees and their ability to inspire trust and confidence. This dimension emphasizes the efficiency, courtesy, plus credibility of service personnel in reassuring customers. Nsamba (2018) argues that, in addition to student satisfaction, service quality should be evaluated by universities when assessing such support services, which implies that the satisfaction of students cannot be said to reflect the reality of service quality.

A study by Netanda and Mamabolo (2018) investigated the impact of service support intervention on student retention and success. The findings of the study emphasised the significance of quality of student support services in the successful retention of studentsand transformation from a traditional approach to student service to a personalised service, tailored to individual socio-demographic factors was recommended.

Dominguez-Whitehead (2018) explored non-academic support services as well as students' experiences at South African universities. The findings of this study revealed that non-academic support services are patently lacking in two South African universities because they were not adequately supported by university staff. There was a recommendation for universities to recognize non-academic services as integral to their institution in support of the academic success of students.

With this aspect in mind, this is in fact becoming clearer that universities are not resolving to provide required services quite appropriately in satisfying the learning needs of the students. Thus, this study aims to add new dimensions to understanding the experience of these first-time students in relation to non-academic e-services. It is, after all, meant to enhance the body of literature on service quality further.

Seyed and Leila (2009) state that the primary purpose of these e-services is to enhance service and efficiency in universities and form a vital part of university policy development that addresses operational improvement and closer relationships with students. In addition, the inclusion of e-services assists management of universities in governance of academic and non-academic staff that utilise such services. This rationale and adds value when measuring usage and identifying the conditions that either catalyse or inhibit use as ICT has the potential of transforming higher learning (Seyed & Leila, 2009). However, De Villa and Westfall (2001) reflect that universities often lack adequate metrics that would allow their policymakers to assess long-term use, measure the effects of policy interventions, or establish critical needs based on institutional data.

2.7. Student Perception

The Cambridge English Dictionary (n.d.) defines the concept of perception as “an individual's interpretation of what he/she sees and hears, which can be influenced by one's own understanding”. Hence, the perceptions that students develop regarding e-services are closely connected with their opinions, viewpoints and attitudes about such a service in influencing their adoption, use, and continuance of the system (Tamta & Ansari, 2017). Because students are technologically proficient in the use of e-services, their perceptions and attitudes will influence academic curriculum development and success (Popovici & Minorov, 2015). According to Popovici and Minorov (2015), improved student perception of e-services results from the benefits that students identify, making them more likely to take part and use e-services. Various factors in higher education, such as gender, age, background, computer literacy, technology attitude and learning preferences influence how students think regarding e-service usage.

A study by Tagoe (2012) at The University of Ghana using the Technology Acceptance Model (TAM) found that online time and usage of the internet among first-year students, build a positive perception of e-service integration into teaching and learning. Tahoe (2012) recommended blended face-to-face and internet-enhanced courses over completely distance courses, which are preferred by students. Likewise, Almarabeh et al. (2014) found that perceptions of e-service among students at the University of Jordan were affected by the perceived usefulness of the system. The study by Almarabeh et al.

(2014) assessed the various factors that affect student perception of e-services conducted by Rhima and Miliszewska (2014) in two universities in Libya and emphasised that factors such as access to technology, necessary skills and access to information communication technologies are important to students. In addition, Ramoroka and Tsheola (2018) believe that the effectiveness of e-service provision in South Africa can be undermined by stakeholder involvement.

Research indicates that e-services are increasingly seen in a positive light for universities in both developed and developing countries; and the overall perception of e-services may be influenced by a number of factors, being the context within which the e-service is presented, the subject matter and social and socio-economic factors of an audience, according to (Gasaymeh et al., 2017).

Johnson et al. (2002) asserts that extensive worldwide research in differences in support services has increased over the decades; and Azmeh (2019) adds that the ongoing debate centres around issues such as access, quality, satisfaction, and the very viability of such services.

Shikulo and Lekhetho (2020) conducted research at the Namibian University of Science and Technology on the needs and challenges of students which highlighted gaps in service support and low student success rates, thus recommending a framework to develop student service support. Research by Marie (2014) on service support and academic success of students in the United States of America (USA) showed that, although service support has no effect on academic success, inadequate support influences student retention. A further study undertaken in the USA Hodge et al. (2017) exploring student perceptions of institutional service support indicated gaps that require further attention and concluded that the availability of high-quality service support to students would enhance academic performance and recommended performance-based standards for higher education institutions to gauge student satisfaction regarding the present performance of service support systems. A study by Arangote (2018) to investigate the effectiveness of service support provided by public universities found that most students viewed support as satisfactory, mainly because of staff visibility and their willingness to assist. However, inadequate facilities and poor communication with service

providers hinder service support effectiveness; and additional staff, expansion of facilities and improvement in access to information were recommendations of the study to strengthen student support services.

2.8. Benefits of e-Service

To ensure effective operations, stakeholder satisfaction and that services meet quality standards, universities provide their stakeholders with web portals offering integrated front-end support. To make the delivery of administrative and learning services to students more efficient and effective, electronic-based services have been developed to automate and optimise the process. As a result, electronic-based services are beneficial for both universities and students (Sutarso & Suharmadi, 2011).

According to Azmeh (2019 the concepts of accessibility, quality, satisfaction and functionality of student support services have become a subject of interest to scholars in recent decades, and academic institutions require service support systems to facilitate student access to academic needs. Parasuraman et al. (2005) opine that many of the advantages of e-services affect both ends-users and service providers, the most important being convenience and access and hence, such services operate continuously outside of the traditional working hours of establishments. Such flexibility is convenient for students to access services at their convenience which increases satisfaction and engagement (Jensen et al., 2017). In this way, LMS has assisted students to access course materials and discuss with their instructors outside of regular class time, thereby improving the learning experience (South Africa, 2003).

Moreover, e-services have resulted in cost efficiency of service delivery as service providers use less resource, such as infrastructure and staff. In addition, e-services users no longer incur travel costs to access such services. Furthermore, e-services facilitate personalisation and customisation, which increases customer satisfaction and loyalty. Such that using data analytics and customer preferences, a company can serve customers with individualized, tailored experiences. For instance, it is online e-commerce sites and streaming services that use algorithms to provide recommendations of products or content related to prior behaviours. (Hsu & Lin, 2015; Zhang & Xu, 2016).

2.9. The Impact of e-Service within South African Higher Education

To explore the use of e-services at South African for universities with respect to how they intend to use such services for improving higher education service delivery and student engagement at their institutions, literature has been considered from the perspective of the role of e-services in South African higher education and its impact academic and non-academic experiences of students, as well as on institutional processes and policies developed.

2.9.1. e-Services at South African Universities

According to the White Paper on e-Education (South Africa, 2004), e-services in higher education generally comprise a vast number of digital processes and tools that facilitate numerous administrative and academic functions, including registration, course management, communication with faculty and administration, and access to support services. e-Services in South African universities arose from the need to improve operational efficiency and enhance the student experience as demands for higher education increase. With the use of technology becoming more common place in our contemporary world, it has become compulsory for universities to adopt the innovation of accepting digital platforms into their systems to satisfy the ever-evolving needs of students, staff, and faculties.

According to Moodley and Govender (2018), South African universities have gradually shifted toward more digital operations to online registration systems and e-learning platforms. The intention of this shift was to provide more accessible education, enhance service delivery and allow students to manage their academic and administrative responsibilities from a remote space. The matter of integration of e-services in South African universities is thus of critical concern, having identified such challenges as the digital divide, lack of access to dependable technologies and constant improving technological infrastructures.

2.9.2. Impact on Student Engagement and Experience

e-Services have redefined how students interact with universities and non-academic e-service universities may offer online registration systems, career services, financial aid,

and academic advising have become integral parts of the student experience that will enable students to conduct such activities as registering for courses, paying tuition and fees and scheduling that provides convenience and flexibility in non-physical presence on campus (Pham and Nguyen, 2019).

While Botha et al. (2018) noted that e-services have become beneficial to nontraditional students, such as those working, have family obligations, or students coming from rural communities, democratisation of access to university services by e-services has enabled autonomy and flexibility for students in managing their academic lives. Moreover, it has increased interaction between staff and students, enabling faster responses and easier access to support.

Fourie (2020) describes e-Services are an asset to institutions as they improve efficiency, reduce costs and serve a larger student population; and by digitising administrative processes, a university can streamline and improvement its operations and reduce paper-based workflows for more rapid response to student inquiries. Moreover, e-services tracks student progress better by making data-driven decisions with respect to the student support services.

2.10. Challenges of Non-academic e-Services

Pillay and Parbhoo (2018) note, however, that South African universities experience difficulties in setting up e-services as some do not have the necessary infrastructure and systems for such services. Pilay and Parbhoo state that matters such as non-standardisation of systems, lack of integration between existing platforms and inadequate training and orientation for users and students have been reported. Such technically related challenges reduce the effectiveness of e-services and there is a need for an investment in sustainable digital systems and appropriate training for e-services to be useful.

Wiese and Britton (2019) note that concerns regarding dependency on e-services relates to issues of accessibility and the digital divide as many students, particularly those from lower-income backgrounds, may not have the advantage of easy access to the internet

or personal computers to fully utilise e-services, which results in discrepancies in access and may exacerbate the educational inequalities in student participation.

Mpine et al. (2019) evaluated the quality of student support services in a study at open distance learning institutions, focusing on students' needs and the experiences they have had regarding the support systems; and Netanda and Mamabolo (2018) explored the impact of support services in student retention and academic success in open distance universities. These scholars proposed that traditional support services be replaced by personalised services that consider the diverse socio-demographic backgrounds of students. Dominicez-Whitehead (2018) investigated aspects of student experiences with academic support services to formulate active teaching through lived experiences at South African universities. Findings from the indicated a clear lack of accessibility to non-academic support services at the two South African universities studied, due to university staff not helping students, and that student academic success may be improved by integrating academic support services as a core element into university establishments.

Dominguez-Whitehead (2018) describes non-academic e-services as a range of university and other educational institution internet-oriented services that are not related to the teaching process, which include student administration, being admissions, registrations and fee payments; access to libraries; career and health services; as well as student engagement communication channels. Dominguez-Whitehead notes, however, that although these e-services are intended to facilitate student engagement with the university and its services and improve access to the services, there are still challenges to overcome, especially in South Africa.

The challenges of non-academic e-services faced by students of CPUT are addressed by the CPUT policy and legislative framework below.

2.11. Strategic and Policy Framework

2.11.1. CPUT Vision 2030 Strategic Framework

The CPUT Vision 2030 strategic framework (Cape Peninsula University of Technology, 2023) envisions the establishment of “a leading university of technology in Africa” which will pursue innovation, inclusivity and sustainability. This document presents a detailed framework to develop the institution to a modern, inclusive, and accessible University. In addition, it seeks to remedy the challenge of non-academic e-services faced, which seeks to improve student experiences, increase efficiency in operations and bring about digital transformation within the organisation.

Non-academic e-services at CPUT include a blend of services, ranging from admissions; registrations; library, financial and student health services; and communication tools. These services are significant to facilitate student administration and support, and this strategic framework directly addresses several challenges posed by non-academic e-services, especially those regarding accessibility, digital inclusion, usability of the system and student support, among others (Cape Peninsula University of Technology, 2023).

2.11.1.1. Digital Inclusion and the Digital Divide

CPUT seeks to increase the extent of its digital infrastructure and the provision of the services to students in collaboration with the service providers to guarantee that every single student has access to affordable as well as dependable internet connectivity (Cape Peninsula University of Technology, 2023). The challenge of the digital divide

The provision of non-academic e-services to students in rural areas, or those without sufficient access to the Internet, presents a challenge referred to as “the digital divide”. CPUT realised the importance of addressing this issue in its vision; and understanding that more students will make use of available technological and communication services, the CPUT Vision 2030 strategic framework has prioritised change that is driven by technology.

2.11.1.2. **Interoperability and Integration of Systems**

A further challenge faced by non-academic e-services is the lack of interoperability between various platforms, which can lead to inefficiencies and frustration for students. Often, students must use different systems for various services, such as registering for courses, applying for financial aid, and accessing library resources.

The CPUT Vision 2030 contains strategies to construct data-free integrated platforms or zero-rated centres that would allow the students to engage in non-academic e-services without data costs and thus foster inclusivity. Moreover, this strategic framework presents the goals of the university towards digital literacy enhancement, which is aimed at every student irrespective of his or her background, to enable students to use the internet and online platforms with ease.

2.11.1.3. **Usability and User-Centred Design**

A major issue that students experience is the usability of non-academic e-service platforms. It has been found that a large percentage of students oriented very poorly due to no technical assistance with complex systems (Fabito et al., 2020). The CPUT Vision 2030 strategic framework (Cape Peninsula University of Technology, 2023) places emphasis on student-centred solutions that proposes turning around the use of its contemporary systems to those that with a more user-friendly design.

The university has resolved to enhance its digitised facilities to enable users to use these services with ease, even on complex functions such as admissions, registrations and financial aid applications. The CPUT Vision 2030 strategic framework objectives emphasise the need to enhance the user experience (UX) design and envisage having no barriers in the enjoyment of using all platforms and the provision of immediate available assistance whenever required. CPUT is intending to adopt artificial intelligence (AI) based support systems to enable students to receive feedback and recommendations instantly and therefore eliminate the long and tedious manual support systems.

2.11.1.4. **Security and Data Safety**

Most students use online non-dedicated services without thinking of the risk associated with sharing sensitive personal information, such as ID numbers and credit card details. According to the CPUT Vision 2030 strategic framework (Cape Peninsula University of Technology, 2023), it would adhere to the principles of the Protection of Personal Information Act (POPIA) (South Africa, 2013) in the same way as the other protections and would handle any relevant protections. Furthermore, CPUT Vision 2030 strategic framework centres on creating a fully integrated Student Information System (SIS) that brings together all non-academic services in one seamless interface, allowing students access to everything at once.

Furthermore, CPUT is aims to lead the way in simple administrative processes to access numerous services to alleviate the need for students to navigate various platforms. This strategic framework primarily comprises the digitisation of student records and the construction of centralised databases that allow for easy exchange of information between departments and limit administrative delays.

2.11.1.5. **Enhanced Student Support and Responsiveness**

Many students report difficulties in obtaining timely assistance when using non-academic e-services. The CPUT Vision 2030 strategic framework (Cape Peninsula University of Technology, 2023) recognises the importance of responsive support systems to that ensure students can easily navigate the challenges they face.

The CPUT Vision 2030 strategic framework plans to develop an omnichannel support system, where students may access assistance through multiple platforms, including email, chatbots, and in-person assistance. CPUT also intends to introduce 24/7 a support services, particularly during peak times such admissions and registrations, to ensure that students may receive assistance whenever they need it. Improved communication channels are envisaged to enhance student engagement and ensure that all students are aware of the available non-academic services.

The CPUT Vision 2030 strategic framework addresses the challenges of non-academic e-services by focusing on digital inclusion, user-friendly design, data privacy,

accessibility, system integration, and enhanced student support. By leveraging technology and innovation, CPUT aims to provide an equitable, efficient and inclusive non-academic service experience for all students, aligning with its broader goals of being a leading technological university in Africa. (Cape Peninsula University of Technology, 2023).

2.11.2. **The CPUT Admission Policy**

The CPUT Admission Policy (Cape Peninsula University of Technology, 2023) provides the procedures and requirements for the admission processes of the institution, comprising a selection process that is fair, based on academic merit, diversity and inclusivity. The policy focuses on access to higher education and meets the education aims of South Africa and encourages participation from the previously marginalised groups.

The importance of efficiency and accessibility through its online application system has been addressed by aligning of the CPUT Admission Policy with non-academic e-Services, which is one of the components of the e-services design structure within its non-academic aspects. Applicants are expected to apply through the internet only, hence limiting the use of application forms and physical appearance. The system enables the potential applicants to:

Respond: Locate and fill in the application forms via the internet; hence students from even the remote place availing themselves physically to the college is not necessary so that they apply.

Manage: Manage and check the applicant's progress regarding the application through system, thus promoting curbing unnecessary tension by the applicants.

Provide Attachments: Attach relevant supplementary materials like school print outs, identification cards among others in an easy operational manner. This concept supports the aim of the policy to enhance participation in higher education by a greater number of people. However, it also promotes the access of information and fair play in the admissions process.

2.1.1.1. **Inclusivity and Accessibility**

The CPUT Admission Policy (Cape Peninsula University of Technology, 2023) stresses the importance of inclusivity:

- Ensuring that students from various socio-economic backgrounds, including those with disabilities, have access to higher education. The non-academic e-services are designed to accommodate these needs by:
- Ensuring the system is accessible for students with disabilities by integrating assistive technologies like screen readers and navigation tools for individuals with visual impairments.
- Offering multilingual support on the online application portal, aligning with the university's commitment to South Africa's diverse linguistic landscape.
- Providing data-light platforms or zero-rated websites for students in remote or underserved areas, ensuring that connectivity issues do not become a barrier to accessing the admissions process.

2.1.1.2. **Streamlined Administrative Processes**

The CPUT Admission Policy (Cape Peninsula University of Technology, 2023) further aims to enhance the non-academic e-service to increase efficiency in its administration. This policy underpins the following optimised processes:

- Integrating the admission decision process to inform qualifying students on a timely manner of the results based on set criteria to ease the menace of processing application manually.
- Expanding the admission process to include other non-academic activities such as applying for financial aid, booking for housing facilities and seeking student health services so that the prospective client can access all the services in one portal.
- Use of chatbots or emails to send alerts to the applicants on when to submit documents, if any information is missing and the guidelines on what will happen next (Cape Peninsula University of Technology, 2023).

2.1.1.3. **Jurisdictional Compliance**

The CPUT Admission Policy framework (Cape Peninsula University of Technology, 2023) considers legal provisions which include the Higher Education Act (South Africa, 1997) and the Protection of Personal Information (POPIA) Act (South Africa, 2013), to ensure that all applicant information is protected and not abused. The non-academic e-services are designed to:

- Protect all personal details in respect to which POPIA will protect applicants' information during the online application admission process.
- Provide and Guarantee Equal Opportunity for All, process all applications according to the national equity policy.

Services Support for applicants, the policy emphasises the necessity of assistance provision relative to the admission stage. Hence, the non-academic e-services at CPUT understand:

- Downloads, a helpdesk for reporting problems relating to the online application system and guides for prospective students having troubles during the online application process.
- SOS services – a service for helping students who face obstacles.

The CPUT Admissions Policy framework aligns with the non-academic e-services offered by the university as it seeks to enhance digital admissions within the university context in a way that encourages the maximisation of accessibility and inclusivity as well as efficient administration. CPUT has employed technology to ensure that the admission processes petrified students do not make it an issue of location or their social economic standing any more.

2.11.3. **Discussion of Policy Framework**

As recognised by the CPUT Vision 2030 strategic framework (Cape Peninsula University of Technology, 2023) there still exists a digital divide related to expensive data, system friendliness, fears of breach, data fragmentation, and inclusion of physically impaired student's issues, despite the advantages brought forth by non-academic e-services in enhancing student administration and involvement. South Africa has developed

legislation and policy frameworks such as the Protection of Personal Information Act (POPIA) (South Africa, 2013), the Promotion of Access to Information Act (PAIA) (South Africa, 2000) and the National Broadband Policy (South Africa, 2013) to manage these concerns. However, there further challenges related to the implementation and infrastructure available are likely to arise. These are critical issues that need to be addressed to ensure that all students can access all non-academic services, particularly students from low-income families or those that live far from the campus.

The challenges posed by non-academic e-services are addressed through the CPUT strategies that focus on digital equity, ease of use, confidentiality of data, accessibility, interoperability of systems and strengthened services for users. By delegating all college functions to result in an enhanced level of services to students, CPUT intends to use technology and creativity to ensure that all students, whatever their status, benefit from non-academic services fairly and effectively, which is in line with CPUT's strategic goal of becoming the leading technological university in Africa (Cape Peninsula University of Technology, 2023). More importantly, through its Vision 2030 strategic framework, CPUT is not only responding to the current requirements of its students but is also seeking to develop its services in a way that will respond to the changes and requirements that will come with the progression of higher education.

2.12. CPUT Policy and Legislative Provisions

The CPUT Admissions Policy framework (Cape Peninsula University of Technology, 2023) aligns with the legislative provisions of South Africa, such as the Higher Education Act (South Africa, 1997) and the Protection of Personal Information Act (POPIA) (South Africa, 2013), thus securing and providing appropriate management of applicant information. Non-academic e-services are intended to:

- Protect all personal details in respect to which POPIA will protect applicants' information during the online application admission process.
- Provide and Guarantee Equal Opportunity for All, process all applications according to the national equity policy.

In terms of services support for student applications, the CPUT Admission Policy framework (Cape Peninsula University of Technology, 2023) emphasises the necessity of provision of assistance. Hence, non-academic e-services at CPUT understand:

- Downloads, a helpdesk for reporting problems relating to the online application system and guides for prospective students having troubles during the online application process.
- SOS services – a service for helping students who face obstacles.

The CPUT Admissions Policy framework aligns with non-academic e-services offered by the university as it seeks to enhance digital admissions within the university context in a way that encourages the maximisation of accessibility and inclusivity, as well as efficient administration. CPUT has employed technology to ensure that the admission processes petrified students do not make it an issue of location or their social economic standing any more.

2.13. The Policy Framework of South Africa

2.13.1. **Digital Divide**

The digital divide is still a defining impediment to the efficacy of non-academic e-services within South Africa. A significant section of the populace, especially in rural and less developed places, hardly manages the access to reliable network connectivity or the necessary skills to benefit from the network itself.

With several challenges in respect to the effectiveness of non-academic e-services in South Africa, the most pervasive is that of the digital divide. Much of the population, especially the rural and less well-developed areas, is not only without a reliable internet connection but also lacks the necessary skills to make proper use of it (Chigona and Chigona, 2010). Although Government has put measures in place to mitigate this challenge related to digital access through its National Development Plan 2030 (NDP) (South Africa, 2012) and in its Department of Communications and Digital Technologies policies (South Africa, 2013), the problem of equity in the access of e-services has not been resolved. Within this climate of digital inequity, students are not granted adequate

Internet time within university portals to digital tasks, such as registering for courses, paying fees, or accessing financial assistance in the form of bursaries and learners' loans.

The South African government has developed a series of policies aimed at closing the digital divide, the most dominant being the National Integrated ICT Policy White Paper (South Africa, 2016) and the Electronic Communications Act (South Africa, 2005), with a prime focus on such ICT infrastructure that may be expanded throughout the economy. However, such policies have not been operationalised effectively, even more so regarding the marginalised communities (Mphahlele & Mashamaite, 2005).

2.13.2. **Data and Connectivity Costs**

Although students may have connectivity, they are still unable to fully utilise non-academic e-services due to unaffordable data costs, which remains a major concern. South African universities have attempted to resolve this challenge by zero rating some educational sites or providing data allowances, but such provisions do not always extend to non-academic services such as administrative or health services and many students are separated from enjoying such services due to the high cost of the internet (Jansen, 2020).

The National Broadband Policy (South Africa Connect) (South Africa, 2013) outlines the goals to be achieved in terms of broadband access for all citizens. However, there has been stagnation in the implementation of the targets. The South African Competition Commission has also stepped in to address issues of data pricing in South Africa (South Africa, 2019) in their investigation of excessive mobile data costs in 2019.

2.13.3. **System Usability and Technical Support**

The Promotion of Access to Information Act (PAIA) (South Africa, 2000) was enacted in South Africa with the intention that government bodies provide access to information. However, Smith and Taylor (2020) found that a significant number of students express a challenge with system usability and inadequate technical support which creates difficulty in utilising online platforms for non-academic services. Certain government department have experienced challenges in accessing services due to poorly designed systems and interfaces and the problem is exacerbated by the non-existence of full-time active support

or assistance, particularly for students who may not be computer literate (Smith & Taylor, 2020). This legislation should support the education sector in that non-academic e-services should be user-friendly and transparent. Institutions are expected to make provision for all the students in their services, including those who may be digitally disadvantaged.

2.13.4. **Security and Privacy Concerns**

According to the Department of Higher Education and Training (DHET) (South Africa, 2021), non-academic e-services experience challenges regarding student data safety. These platforms are susceptible to threats such as data loss, impersonation and acts of war on the internet due to the inclusive nature of their operations. Safeguarding student privacy within university management systems has become of considerable importance in recent years, especially in South Africa.

The Protection of Personal Information Act (POPIA) (South Africa, 2013) acts as the main legislative act regarding data protection in South Africa. It obligates universities and non-academic e-service providers to process, store, and safeguard student information as required by POPIA. While the Act has suggested measures for the protection of sensitive information, its effective enforcement critically depends on uniform enforcement and periodic control measures (Moyo, 2021).

2.13.5. **Interoperability of Systems**

Non-academic e-services are constrained using several systems for various activities; however, such systems are not integrated. For example, one system may be used for registering students, another for collecting fees, and a further system for communicating with students. Keeping these applications siloed leads to inefficiencies and dissatisfaction from students who are forced to use multiple systems (Pham and Tran, 2020). This problem is exacerbated within larger organisations that have more complex administrative arrangements (South Africa, 2012).

Although certain South African laws are absent concerning the integration of e-service systems at the universities, there are currently policies such as the Digital Government Strategy (South Africa, 2017), which is broader and emphasises the importance of

integrated public services. The importance of this is to avoid disjointed digital services within the various sectors of government, including education (South Africa, 2017).

2.13.6. **Students with Disabilities**

According to Smith and Brown (2020), e-learning or non-academic services should be provided to students with disabilities. However, such platforms often do not achieve the required threshold for accessibility. Digital services that are not tailored to the needs of the users with disabilities may be cumbersome to students that are, for example, blind or physically disabled, or have cognitive challenges in the use of such services.

According to the CPUT 2030 strategic framework (Cape Peninsula University of Technology, 2023), CPUT will ensure that all digital platforms comply with universal design principles and are accessible to students with visual, auditory, and mobility impairments. CPUT will invest in assistive technologies and accessible digital formats to ensure that students with disabilities can engage with non-academic e-services seamlessly. In addition, CPUT Vision 2030 strategic framework (Cape Peninsula University of Technology, 2023) includes a focus on providing tailored support services for students with special needs, ensuring that they receive adequate assistance in navigating the university's online systems.

The White Paper on the Rights of Persons with Disabilities (South Africa, 2015) emphasizes the need for making ICT accessible, particularly regarding the educational sector. Following suit, the Prevention of Unfair Discrimination and Promotion of Equality Act (PEPUDA) (South Africa, 2000) enjoin all institutions to provide reasonable accommodation to people who are disabled or whose specific tasks may suffer. This extends further, covering complete access to all afforded e-services, other than academic to all individuals, irrespective of their disabilities or impairments.

2.14. Key findings of the CPUT Policy and related Legislative Frameworks

Literature reviews invariably lead to the conclusions reached in research questions. Regardless of the exclusion of contents in the literature as demonstrated in Table 2.1 below, it provides an undefined status, a multifaceted approach as the most beneficial means to consider e-service as service delivery using the internet and ICT, which

provides many resources that would otherwise be impossible to simplify complex processes. Apart from facilitating the retention of students and the utilisation of student assistance resources, administrative functions also play a crucial role for the students. For instance, the CPUT web portal enables students to both apply and register at the institution. In addition, students may book appointments, find parking spaces within the premises, as well as seek assistance with their studies. There is thus a rise in the adoption of e-service amongst the students using mobile and smart cellular telephones, which eliminate or support face-to-face, direct services.

Table 2.1 Summary of Key Findings from the Literature

Research Area	**Findings**	**Related References**
E-services in higher education	Maintain an ambiguous or vague understanding. Help institutional objectives be more effective and efficient for students. This applies to all students, particularly relevant to online and distance learners.	Crawley (2012) LaPadula (2003)
Administrative services in higher education	There is scant research in this area. Services that students use to do things about keeping their place at school and getting assistance, such as making appointments, finding parking on campus, and using academic sources. Are increasingly replacing or augmenting those high-touch or human-cantered forms of service delivery.	Abu Al Aish and Love (2013) Dirr (1999)
Accessing e-services	Mobile services and applications can now act more than ever, especially in the student experience, paving new ways for offering independence and, indeed,	Samochadin et al. (2015)

Research Area	Findings	Related References
	flexibility. They are gaining momentum in higher education, mirroring broader societal trends. These web applications, the student portals, serve first-time entering students with their e-services. These first-time entering students are given e-services via the so-called ERPs, which are systems used traditionally and considered out-of-date in the current age dominated by mobility. The use of smartphones among students is widespread. Mobile services for higher education have focused on mobile learning.	

2.15. Theoretical Framework

None of the three theoretical frameworks presented below should be seen as a definite answer to the experiences of first-time incoming students with non-academic e-services. Nevertheless, these frameworks may provide a comprehensive understanding of how one person contends with undergoing a transformation so pronounced within such institutions.

2.15.1. **Systems Theory**

Smith (2011) describes the purpose of systems theory as "an association of certain bodies as components that function together, bounded within certain defined limits, whereby they adjust to the changes in the environment and meet their goals". Smith adds that this theory reinforces relationships between subsystems such as management, production, maintenance and adaptation, and affects one another, contributing to the overall functionality of an organisation. Hence, communication systems play a crucial role in coordination and maintaining the alignment of subsystems within changing environments (Kennan & Hazleton, 2006).

Subsystems comprise policy formulation and service delivery, and through communication, such subsystems are synchronised and changed. Communication that is not adaptable or appropriate may result in poor experiences by users, such as first-time students who rely on non-academic e-services (Mansoor & Williams, 2024).

According to Vanderstraeten (2024), non-academic e-services, as they relate to systems theory, recognise the need for a unified, logical approach to communication and service provision. Institutions with closed systems and few ingress and egress points, together with a lack of transparency, accountability, and responsiveness, may become isolated and ostracised by stakeholders such as students who rely on the opportunity to access and employ university e-services.

2.15.2. **Structuration Theory**

Poole (2014) posits that structuration theory emphasises structural-agency interplay within systems, where structures refer to the rules and resources that inform conduct and interaction, adopting duality of structure, by both enabling and constraining interactions,

where system formations emerge at multiple levels such within the organisation, group, or network.

Jones (n.d.) clarifies that structuration theory guides the understanding of how new first-time entering students may adapt to the institutional system. Non-academic e-services operate in structures through institutional policies, procedures and online venues wherein student engagement with such services takes place. Structuration theory implies that services such as e-services should be designed simply and reflexively by institutions and should align with the communicative intention of the user, thereby fostering meaningful engagement (Jones, n.d.).

Figure 2.1 below provides a guide for institutional structures to enhance student interaction with non-academic e-services; the need for system balancing standardisation versus flexibility to meet user needs; and the extent to which systems may facilitate or impede effective engagement based on aspects like design and accessibility.

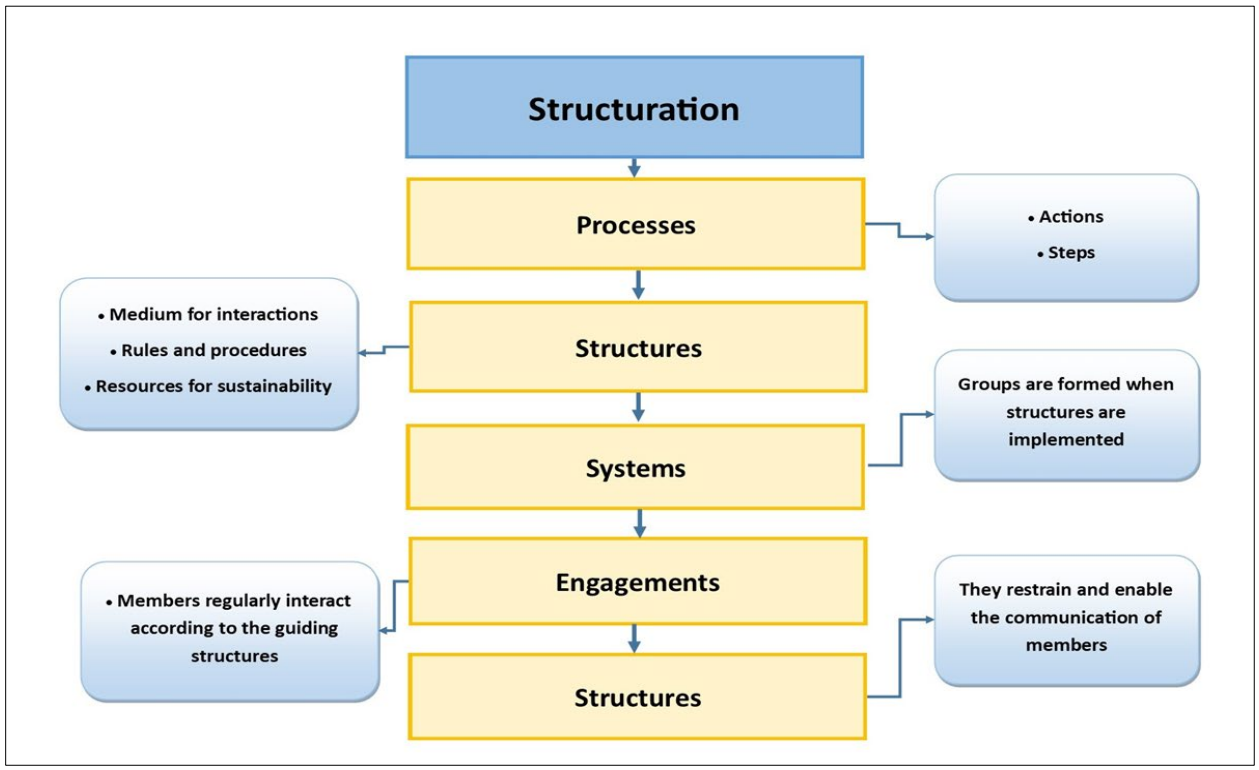

Figure 2-1 Diagram of Structuration Theory adapted from (Traub, 2016)

2.15.3. **Generational Theory**

Howe & Strauss (2009) developed generational theory to describe the ways in which shared experiences and societal contexts shape the behaviour's, attitudes, and values of different generational cohorts and would therefore provide insight into the needs of first-time entering students expectations and interactions with non-academic e-services.

2.15.3.1. **Digital Natives**

Generation Z students currently entering CPUT were born between 1997-2012, and Palfrey and Gasser (2008) describe this generation as having been born with full maturity of digital technology and are therefore digital natives. They are experts at using smartphones and with social networking; and can develop advances on native digital platforms. They have seen no other world except one where the internet exists and they expect seamless, immediate access to information. They depend on the Internet for communication, information and entertainment; and they expect institutions to provide online services that are both fast and efficient (Hershkovitz et al., 2020). In addition, instant gratification is an expectation in both their private and academic lives (Cohen & Wilsdon, 2020).

Gen Z students are multitaskers, usually switching between tasks or digital platforms and although advantageous, this trait may become a hindrance in learning environments that require sustained attention (Prensky, 2001). This generation learns through interactive media such as videos, online simulations and game-based educational tools, favouring favour interaction with e-learning platforms that are intuitive and easily navigated (Schroeder, 2019).

2.15.3.2. **Technology Acceptance Model (TAM)**

Ajzen and Fishbein (Lai, 2017) developed a model of reasoned action in 1975 and in 1989, Davis et al. (1989) revised this model, as depicted in Figure 2.2 below, which has been used to evaluate several aspects of e-learning within universities and various other sectors.

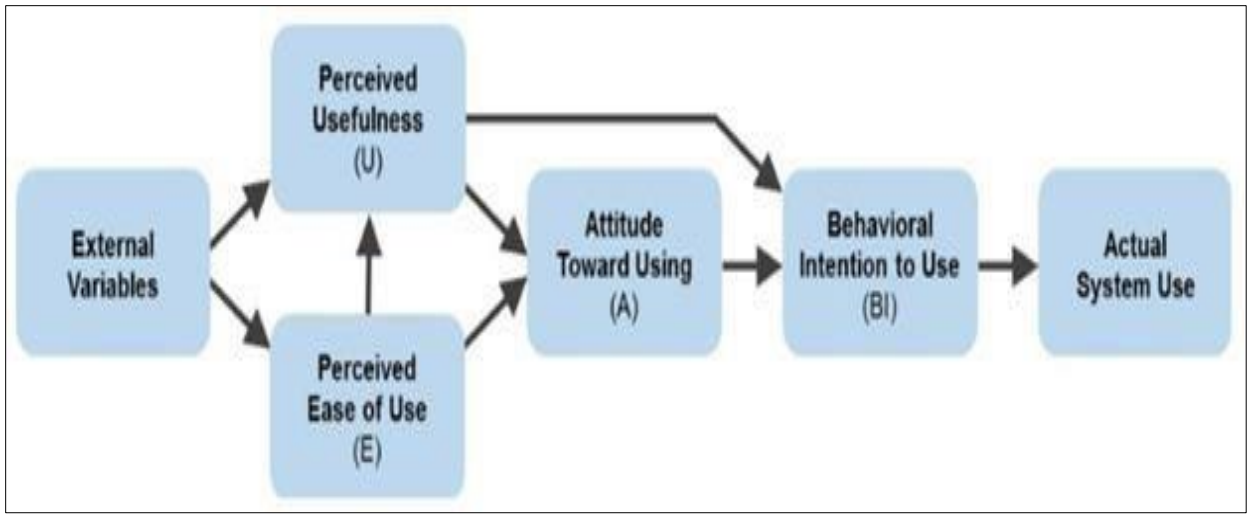

Figure 2-2 Technology Acceptance Model (TAM
Source Davis (1989)

According to an example presented by Tagoe (2012), the success of Information Systems (IS) may similarly be measured through the assessment of e-learning impacts in higher education by using the Technology Acceptance Model (TAM). Besides the specific constructs of developing countries with various cultural contexts, this model has been used for the extended evaluation of user acceptance and continuous use (Tarhini et al., 2013; Bere & Rambe, 2013). Test the application area of a variety of ICTs to validate the model by studying the relationships among constructs defined (Rahimi et al., 2018).

This model has subsequently been extended to keep up advancements in information systems and information technology and new versions of the model include Model 2 (TAM 2), Unified Theory of Acceptance and Use of Technology (UTAUT) and Technology Acceptance Model 3 (TAM 3) (Venkatesh & Bala, 2008; Venkatesh & Davis, 2000; Venkatesh et al., 2003).

2.15.4. **Summary of Theoretical Framework**

Having considered scholarly literature within an e-service provision environment at a university, it may be concluded that the structuration theory guide provided by Traub (2016) would guide this study in exploring how e-services currently take place at CPUT.

Generational theory provided the views of several academic authors of how the lived experience of Generation Z when interacting with e-service systems at CPUT may influence the perceptions of first-time students when entering the university.

2.16. Model for Measuring Non-Academic E-Services

Various models have been employed to assess the performance of e-services (Mohammadi, 2015; Islam, 2014; Umak et al., 2011) and various viewpoints from the study of e-services have been incorporated into the evaluation of effectiveness of a number of databases, one being by Smith and Brown (2020) who found evidence that there is effectiveness in e-services, with three major models emerging in the literature, such as those developed by DeLone and McLean 2003) and Davis et al. (1989).

Al-Fraihat et al. (2018) cite DeLone and McLean (1992) and Davis (1989) in portraying the evaluation of e-learning systems through human and non-human factors within various e-service platforms and emphasise the need to include the human aspect of e-services within information systems.

2.16.1. **DeLone and McLean Extended Information System Success Model**

The initial representation of the model included six factors, being system quality, information quality, use, user satisfaction, individual impact and organisation impact (Delone and McLean, 2003). DeLone and McLean revised the model in 2003 to include service quality as a major element to make the model applicable across all outputs, as shown in figure 2.1 below. This method has been applied to most information systems in both developing and developed countries, especially within the field of education (Mtebe & Raisamo, 2014).

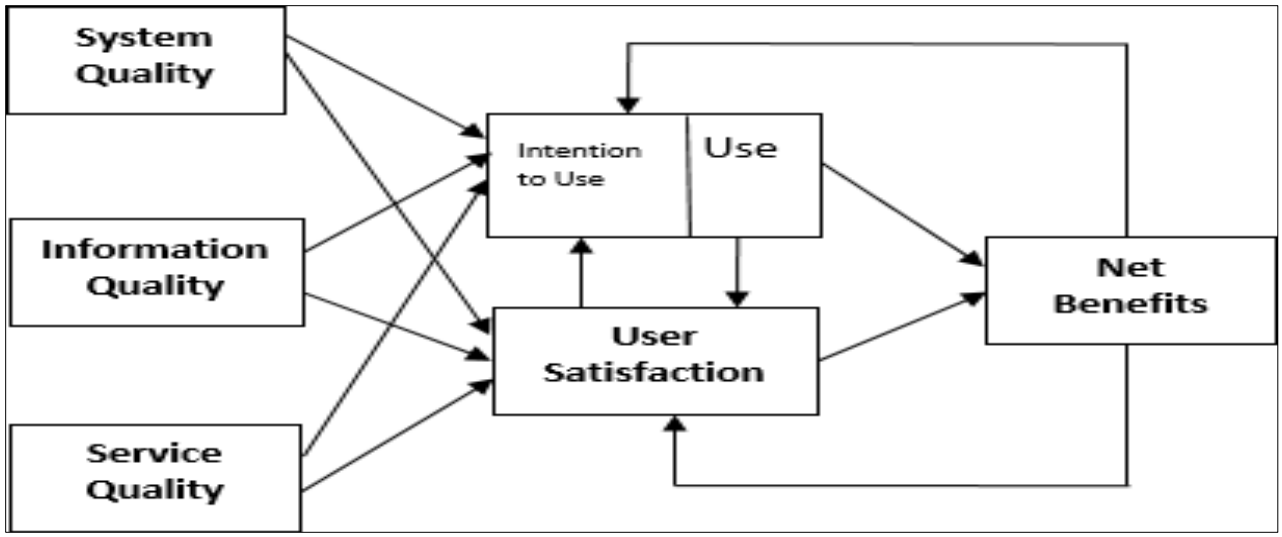

Figure 2-3 System Quality Usage

Source Delone and McLean (2003)

The DeLone and McClean model has been used to evaluate a wide range of information systems across various sectors, including education, both in first world and developing countries (Mtebe & Raisamo, 2014).

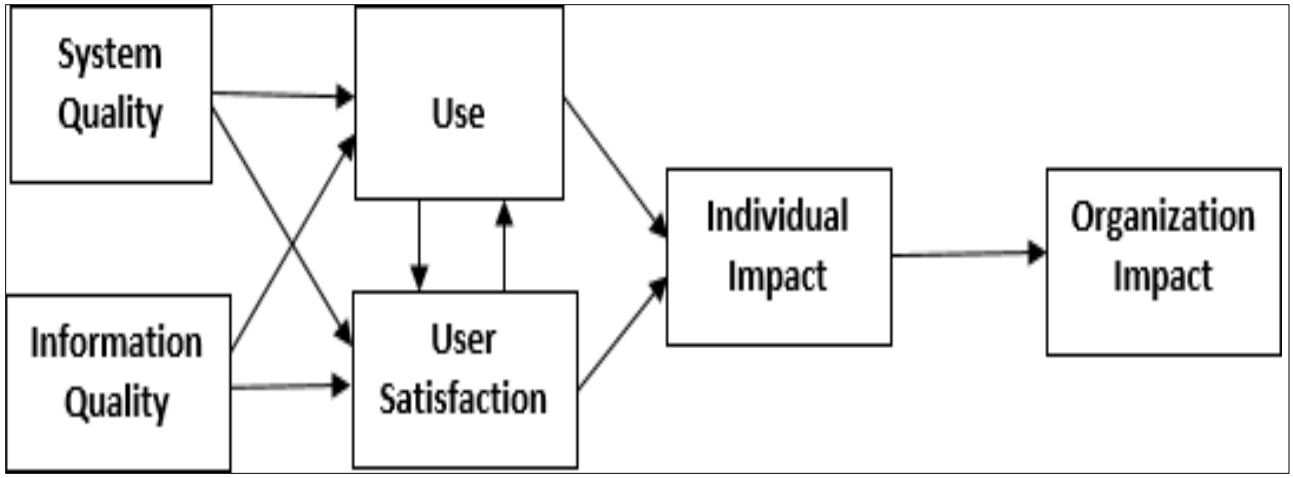

Figure 2-4 The Delone and McLean Extended Information System Success Model (Source Delone and McLean (2003)

While the model includes factors such as system quality and user satisfaction, which are related to user experience, it is more comprehensive. It considers the overall success of an information system, including its impact on individuals and organisations, rather than focusing solely on user experience or adoption. In summary, the DeLone and McLean IS

Success Model is a holistic framework that incorporates elements of UX and adoption but goes beyond them to assess the overall effectiveness and success of an information system.

2.17. E-Service in Higher Education Context

As institutions, universities are not excluded from the increase in the popularity of mass customisation and the experience economy, together with increased expectations for digital, efficient and seamless services. In the United States and the rest of the world, a significant proportion of economies constitutes services, making consumers, who are very skilled in online purchases, even on mobile cellular phones, dependent on the services availed to them (Central Intelligence Agency, 2017). A study by LaPadula (2003) indicates that e-services are relevant to schooling for students in universities. Such services determine the student's experience while completing a course and their learning outcome; and are crucial for so-called non-traditional students, who study part-time, are working and are students with families, because these services allow for learning in between or after business hours. These are criteria that define students as the new traditional students.

As a result, many schools have modified how learning is delivered to students, and most institutions have changed their in-person student support services to e-services (Mhlanga & Moloi, 2020). However, providing continuous quality service support to their students has always been a challenge for universities (Makoe & Nsamba, 2019).

Students' overall experience with a university will be influenced by how they access e-services, which means that service quality may attract students, keep them, or chase them away (Arko-Achemfuor, 2017), With the addition of the colleges, Higher Education Institutions (HEIs) are becoming increasingly competitive with offering online learning, and therefore, they must deliver a high-quality service to remain relevant. Furthermore, e-learning and the digital divide have even prompted some institutions to provide tablets and laptops for select students in South Africa (Shambare & Shambare, 2016).

In a world where seamless, efficient, and digitized services are a norm, higher learning institutions need to be in sync with the changes that will transpire in the expectations of

students, and the issue is likely to attract considerable attention among scholars in the field of education and by institutions (Crawley, 2012). Yet, this area of research is markedly insufficient, leading some to suggest a "service imperative" whereby organisations must "ensure the quality of the entire customer experience" (Bitner & Brown, 2008). Accordingly, as students demand quality in the services they receive, there is a similar standard expected in their personal lives, which exposes the gap in the services offered by their institutions (Shea and Armitage, 2017).

Electronic Service Quality (E-SQ) is a new concept, however, studies in applied settings towards education are increasing, and according to Kim-Soon et al. (2014), companies established e-services for students by creating electronic service delivery channels that optimise learning and administrative services to drive efficiency and productivity. Thus, universities delegate a portion of certain students' workloads to self-services. The way the universities would conceptualise e-service quality, as institutions or purely service-based entities, would differ from how e-services are applied by retail businesses. Various researchers tried to come up with new tools for informative online services; however, the results of these studies have been inconclusive as various opinions are evident (Pham and Nguyen, 2019).

Kausar & Bokhari (2010) recognized dimensions such as usefulness, proficient of use, accuracy and website look at determining factors of student satisfaction; while Ozkan and Koseler (2009) Be inclined to regard that the major contribution to the overall learning experience by means of e-services would be imparted by the quality of service, empathizing attitude and personal attention given by the administrative department.
Mushasha and Nassuora (2012) examined the factors determining e-service quality in universities in relation to interface design, reliability, responsiveness, trust, and personalization. They state that if none of these dimensions are accepted universally, website design is one cited. In addition, current student e-service experience discussions are centred on Open Distance Learning, as many scholars argue that such results cannot apply to conventional academic institutions (Nsamba, 2016; Netanda et al., 2017; Dominguez-Whitehead, 2018; Shikulo & Lekhetho, 2020). This stance indicates that there is a need for further research on the dimensions of e-service as perceived by traditional

universities. There is a paucity of research on the effect that e-service experience has on the needs, expectations, satisfaction and overall experience of students-students-preferably within the local context Smith, J., 2021

2.1.1. Quality: Assistance Received from the Institution Regarding the Online Application and Registration Process

2.17.1. System Quality

System Quality examines the system quality of the university's online systems in terms of usability, performance, and reliability. Further, it discusses how these attributes come together to influence students' interaction experiences with e-services while spotlighting the strengths and areas needing improvement.

2.17.2. Service Quality

The informational aspects eligible to be judged concerning relevance, accuracy, and timeliness under such enlisted online systems are introduced in this section. This section helps in understanding the application to registration processes of students as regarding how the quality of information may affect the decisions they make and their satisfaction.

2.17.3. Information Quality

During this section, the aspects of relevance, correctness and up-to-date information associated with the online systems are scored. How does such quality inform decision making and satisfaction of a student while going through the process of application and registration concerning the online systems?

According to Archambault et al. (2023), satisfaction-determining issues related to the online application and registration system offered by CPUT have emerged in that the system is able to facilitate the administrative processes, yet it is counterproductive to in-service delivery owing to certain limitations. For instance, there is no well-elaborated

digital literacy strategy designed for students and applicants, and individuals find it difficult to use the system (Archambault et al., 2023). Individuals find it challenging to complete an application or acquire certain information without assistance and skills. Moreover, the chat boxes that have been provided to improve efficiency raise concerns regarding privacy, as most individuals are sceptical of providing personal information to a machine. Archambault et al. (2023) conclude that, while an online system has immense promise of adding value for users, it requires further attention is required to provide improved user satisfaction, as well as safety.

Zabiyeva et al. (2021) acknowledge that independence in cognitive activities poses a significant problem, particularly for students of psychology and pedagogy. Students rarely want to think, which explains the challenge. In learning environments that involve a great deal of doing and thinking, online gadgets are well adopted because students do not have to interact with the ideas passively.

Liu et al. (2023) maintain that, as innovative services, academic libraries require that organisers be used to rapidly alleviate stress experienced by students; and lack of utilisation of adequate standards should be addressed, which may include over the shelf materials and library books; as well as the inclusion of relevant and available resources and technologies.

Samochadin et al. (2015) state that the overall design of webpages for educational institutions impacts the student user experience, which affects their satisfaction with the digital resources. They add that the analysis of the interface is particularly important when conducting an assessment, as it relates to the effective use by the students of online resources. Samochadin et al. further note the importance of engaging in dialogue with the end users to advocate for better usage of the designed products and promote ease of engagement with educational technologies. The attitude of students towards learning is more positive towards the use of technology when such resources are satisfactorily experienced by students. hence improving the chances of success in their studies. Samochadin et al. conclude that institutions that wish to assist individuals in their studies and effectively use technology in the learning process within the institutions must therefore embrace effective designs of websites.

2.1.2. **Usages: Perspectives on the Usability of the University System for Online Admission Applications and Module Registration.**

Usage refers to the extent to which systems conduct tasks intended by their users in proper time and in a satisfactory manner is referred to as 'usability' in view of the DeLone and McLean Information Systems Success Model concept. Usability specifies aspects such as ease of navigation, logic in interface design, clarity of processes, and presence of help to guide users through complex steps while using online admission application and module registration.

2.17.4. **User Satisfaction**

This section reflects on the degrees of satisfaction registered by students when they use the e-services, focusing on the areas of usability, efficiency, and meeting their expectations. In doing so, links between students' opinions and institutional goals are drawn, thereby facilitating a more holistic view of user satisfaction.

Zabiyeva et al. (2021) describe the role and advantages of applied systems in the process of psychological and pedagogical training as systems that are orientated towards the student, resulting in a more effect process of studying. Introducing cloud technologies modifies the image because it allows different users to have access to educational materials, which in turn assists with the learning process, both inside and outside the classroom. Zabiyeva et al. further posit that such a system promotes creative and cognitive motivation for students, resulting in increased activity in the process of education and assists teachers with more enduring advancement in education. Zabiyeva et al. further suggest that effective use of both traditional learning as well as computer-based methods improves educational practices and increases student involvement in mental as well as physical activities. They state that this proposal is particularly advantageous in preparing would-be teachers, as it provides ideas and reinforces their will to study. The authors are adamant regarding the need for methods of teaching that encourage interaction across various subjects, as it may enhance collaborative learning. However, they warn that the application of internet technologies in any educational

enterprise should be done in moderation, the use of, for instance, digital learning instruments should – enrich the whole learning process but not inhibit (Zabiyeva et al, 2021).

Carolina et al. (2024) provide important insights into what measures can be undertaken to enhance the student experience through user-centred service design in libraries, particularly to address the challenge of balancing functional and aesthetic aspects of the library spaces to make them usable and interesting at the same time. They note the importance of direct involvement of students in the process of development of such services, since the services could be detached from their audience. They propose advanced user journey mapping as a tool that serves to highlight and rectify the issues that students encounter in the process of using the services of the library. Carolina et al. further proposes from their study the application of some of the less popular theories about student experiences to provide a better service to the various student needs. Such a perspective would assist with service provision by libraries since user needs are continuously changing and increased service provision would be required by libraries (Carolina et al., 2024).

Adarkwah et al. (2024) support other academic scholars in their assertion that academic libraries adequately funded to improve use by students and enhance the academic experience of the student. Adarkwah et al. note an important aspect of this argument being the need to improve the current information technology skills of the library personnel to manage modern libraries, as well as offering the users current digital services. The need to provide appropriate assistance to access information in the libraries that stimulates users to cultivate digital literacy skills is of equal concern.

Samochadin et al. (2015) emphasise the need for a mechanism that provides feedback by users to improve continuous service delivery. In addition, staff members should receive regular training to provide consistent quality of service delivery and ensure that the workforce adapts to the changing needs of users. Samochadin et al. further suggest advanced analytics for more precise performance evaluation and ensure increased productivity through appropriate performance management. Organisations should create

a culture of accountability and transparency that encourages trust among service users, which assists to determine user service needs.

Samochadin et al. (2015) state that it is imperative for service delivery time to be reduced through operationalising lean practices or techniques for services to evolve regularly according to user demands. They add that periodical evaluation of user satisfaction levels is required to ensure sustainability of service provision within organisations and by including users in the process, interdependence and creativity is encouraged. By gaining an understanding of contemporary practices within the HEI sector, such organisations enable users to access assistance when required through supportive and creative plans (Samochadin et al., 2015).

2.17.5. **Net Benefit:**

This section evaluates the net effect of the online systems from the university on the student in terms of increased productivity, efficiency, and academic experience in general. It will focus on how the systems have been aligned to institutional objectives and how they contribute toward student success.

Thus, the chapter concludes integrating the findings of these themes into improvements of the state's electronic services from the DeLone and McLean framework and the participants' comments.

2.17.6. **Evaluation of the Adequateness of Needs and Expectations in Connection with University Online Services**

Assessing the needs and expectations of students in relation to university online services involves evaluating the expected needs of users against the capabilities of the university digital platforms. It also entails verifying if the services leverage the right set of information at the right time and are easy to navigate and provide the right features at an appropriate level for the students' academic and administrative activities. In theory, DeLone and McLean (2003) in their Information Systems Success model state that user satisfaction and net benefits depend on the degree of fit between the system features and user needs while noting the fact that system quality and information quality impact system usefulness

and effectiveness as perceived by the users. Likewise, service quality models argue that the absence of expectational gaps in areas such as responsiveness, reliability, and support is a prerequisite for high adoption and satisfaction (Parasuraman, Zeithaml, & Berry, 1988).

Hence, assessing the adequacy of needs and expectations means assessing to what degree online services meet user needs as well as pinpointing gaps between what is expected and what is delivered. This information is crucial for system enhancement and increasing student satisfaction (Al-Fraithat et al., 2018; Mohammadi, 2015).

2.17.7. **Conclusion of Exploration of Models**

The researcher has chosen a model that would further the exploration of relevant questions in the formal study set at a public university. Delone and McLean's Information Systems (IS) Success Model is neither directed towards user experience (UX) nor adoption in its main content. Its broad perspective on assessing success in information systems embraces several perspectives.

The constructs of Delone and McLean's Information Systems Success Model the align with those for evaluating the digital system for first-time applicants to CPUT:

1. **System Quality**: This means assessing the system in terms of its usability, reliability, and user friendliness.
2. **Information Quality**: The quality of information generated by the system which is measured regarding accuracy, relevance, and timeliness.
3. **Service Quality**: Refers to measuring the quality of the support provided by the IS department or service provider, including aspects of responsiveness and assurance.
4. **Use/Usage**: Refers to how the users utilises the system.
5. **User Satisfaction**: It assesses how satisfied users are with the system, depending on the entire experience including efficiency of the system.
6. **Net Benefits**: Net benefits evaluate effect of the system on individuals, organizations, or society in general.

2.18. Conclusion

This chapter has sought to provide a comprehensive examination and understanding of the intersectionality of experiences among students, generational differences and other non-academic e-services in higher education institutions. Salient issues include those relating to generational theory, placing the expectations and frustrations first-time entering students at CPUT into context; the practicality of effective digital channel user interfaces; and the role institution plays in guaranteeing equitable access to non-academic services. The literature highlighted the necessity of developing omnichannel systems that are aligned to the digital preferences of Generation Z, particularly in terms of transparency, accessibility and responsiveness.

Theoretical, policy and legislative frameworks provided a lens for a systematic view of the way the study would be conducted. Generational theory primarily formed the conceptual framework through which the study understood the behaviours and other needs of Generation Z students, while supporting exploration of their perception towards non-academic e-services. Government policy and legislative frameworks such as the Higher Education Act (South Africa, 1997), as well as institutional policies such as the CPUT Vision 2030 (Cape Peninsula University of Technology, 2023) ensured that this study aligned with legal and institutional mandates of inclusivity, digital transformation, and student support.

The combined frameworks above have guided the approaches for this study where student-centred methodology has been prioritised in the data collection methods when seeking to elicit lived experiences and frustrations as encountered by first-time entering students, as well as in the analytical tools to expose gaps and arrive at implementable recommendations. The next presents a research methodology, integrating theoretical insights and policy imperatives, towards addressing the student woes related to non-academic e-service use.

Chapter 3 : Research Design and Methodology

3.1. Introduction

Chapter 2 provided a literature review relating to the use of e-services in higher education wherein it consists of student perceptions, benefits, important concepts, and a general overview of e-services.

Chapter 3 focuses on the research procedures used in the study. It describes the research methodology plus design, the targeted population, data collection methods, data analysis approaches and ethical considerations, as well as the limitation of the study.

3.2. Research Approach

A qualitative research design was used in this study to analyse the experiences of first-time entering students with academic and non-academic e-services during their application and registration process at CPUT where the research was conducted. This study was descriptive and explanatory as the researcher aimed at exploring the deeper issues influencing the user experiences with e-services, rather than a quantitative approach of measurements of the perceptions of these students (Creswell, 2014).

3.3. Paradigm of the Study

Mascolo and Fischer (2005) describe the adoption of a constructivist school of thought as "the philosophical and scientific position that knowledge arises through active process construction". According to this perspective, the reality is a subjective phenomenon, moulded by the individual's own histories and contexts (Ponterotto, 2005). This paradigm was deemed appropriate for this study because service quality perceptions would differ among individuals, depending on their experiences.

This paradigm was considered appropriate for this study, as perceptions of service quality would differ among individuals based on their experience.

3.4. Research Design

Questionnaires and interviews were used in the study to evaluate, investigate and describe the phenomenon in question. Yazan (2015) cites Yin (2002) when defining a case study as an "empirical inquiry that investigates a contemporary phenomenon in its real-life context", particularly when the boundaries between the phenomenon and the context are not clear and the researcher is unable to discern such boundaries. Therefore, exploring e-services, support needs and student experiences in their context would best be undertaken through a case study approach. The study was done at a university of technology in the Western Cape and first-time entering students of a single academic program based in the Faculty of Business Studies served as case units.

The research design process has been illustrated by Greener and Martelli (2018) as below.

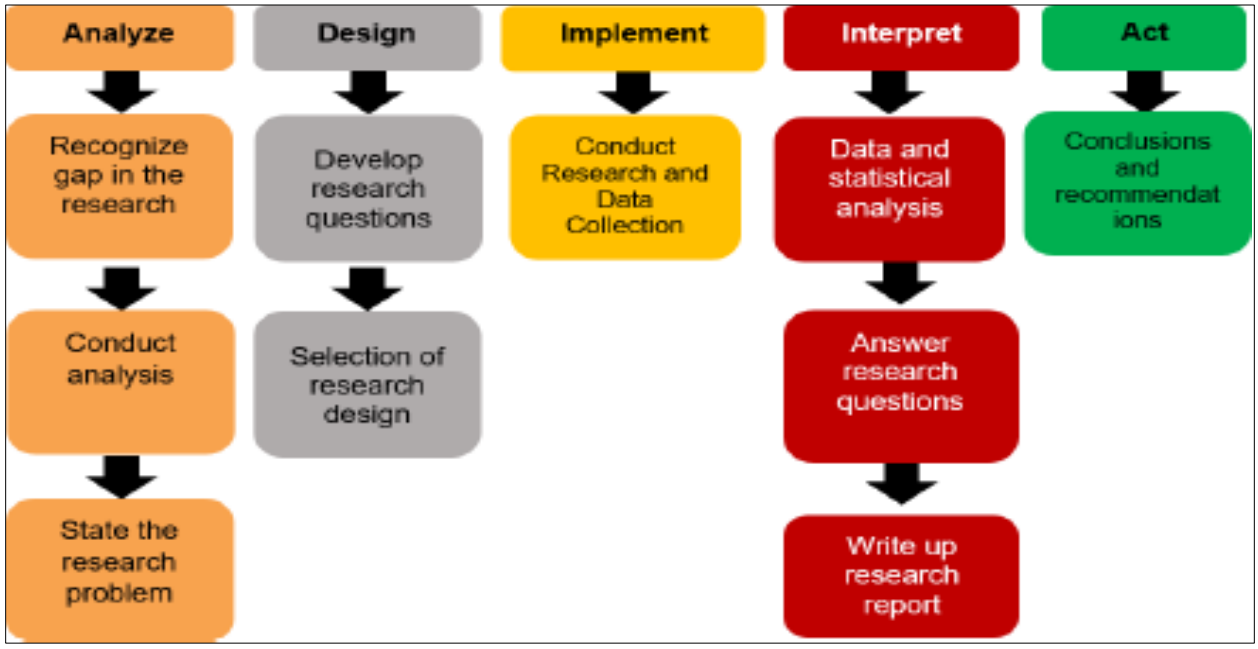

Figure 3-1 Research Design Model (Source Greener and Martelli (2018)

3.5. Sampling

Kriswardhana (2024) contends that sample size determines representation of the audience and for research findings to be adopted more willingly, research studies should

include a wider sample of population groups. Kriswardhana (2024) further suggests visual enhancements in the survey design to aid participants in a clear and comprehensible manner; and encourages aid mechanisms during the survey process to overcome potential challenges resulting in errors in information gathering. Kriswardhana (2024) describes the concept of Mobility as a Service (MaaS) as crucial to ensure correct responses from participants (Kriswardhana, 2024).

Saunders and Lewis (2012) advocate a sample size of 4 to not more than 12 participants for specific populations, while for heterogeneous populations they propose a sample size of 12 to 30 participants. For this study, 12 participants were selected according to a non-probability sampling method to participate in interviews and complete questionnaires to acquire qualitative data from first-time entering students at CPUT. During the non-probability sampling process, where case units (students) did not have an equal chance of being selected (Etikan et al, 2016), first-year students were invited to participate until saturation was reached. Participants were selected from the following criteria:

- They are current first-year students in the selected academic department within the Faculty of Business at the case study university.
- They have availed themselves of the use of the non-academic e-services to apply and register at the university and were thus successfully admitted.

The researcher worked with Faculty Officers to assist with distribution of email invitations to the target participants. Face-to-face interviews and completion of questionnaires were scheduled for students by email invitations.

3.6. Demarcation of the study

The research took place at the CPUT, District 6 Campus, in the Western Cape, with first-time entering students in the Business Faculty as the sample population.

3.7. Population

The population for the study was the current first-year students within the Business Faculty at CPUT, District Six Campus, from which the non-probability sample was selected.

3.8. Data Collection Instruments and Field Work

The study was based on semi-structured interviews and questionnaires that generated qualitative data from first-time entering student participants. These interview questions were aligned to the research objectives of this study. The study was ensured by two measures. Firstly, the interview question was piloted to ensure quality. Additionally, the interview questions were assessed by peers plus graduates.

Before the study began, the participants completed a consent letter. Information given was kept confidential. Participation was voluntary. Also, the participants could withdraw from the study at any time without having to face any punishments.

3.9. Data Coding and Analysis

Data collection was analyzed through thematic analysis, involving the finding, categorizing, and arranging of patterns or themes within the data (Vaismoradi et al., 2016). A deductive kind of coding procedure was followed, wherein the themes were determined through the Lense of the model. To keep the analysis grounded in the data, the codes related to the research phenomenon were mapped from the interview transcripts to existing codes (Smith, S.E. and Tallentire, V.R., 2023). The use of such a coding template based on pre-existing themes is not abnormal in constructivist simulation-based research. International Journal of Healthcare Simulation. using pre-existing codes, one carries out deductive coding. Thus, analysts apply a fixed set of codes to new data, wherein the codes may have come from an existing theory, research questions already formulated, or among many competing thematic codifications available in the literature (Williams and Moser 2019).

3.10. Ethical Considerations

The ethical approval for this study was granted by CPUT, and all the respondents agreed to participate in the study by signing forms of consent that had an Information Sheet attached to them. These documents ensured that the respondents were apprised of the purpose of the study, what their participation would entail and that, as participants of the study, had the right to withdraw at any time they wished.

All participant information and responses remain anonymous and confidential before, during and after completion of the study. All data, transcripts, and findings from the research are securely stored within password-protected devices of the researcher and in Google Drive™, access to which only the researcher and supervisor have.

All participant data and findings were safeguarded by the study by not collecting demographic information from its participants.

3.11. Delimitation and Limitations of the Research

Delimitations in a study refer to the margins the researcher sets regarding variables such as the target population, participants, or the environment (Theofanidis & Fountouki, 2018) and researchers choose to collect data using certain methodologies or may choose to exclude others due to financial constraints or lack of other resources (Leedy & Ormrod, 2016).

The potential challenge that may have hindered the progress of the research agenda was the unavailability of the participants and the inevitability of technological network glitches, since some of the questionnaires were undertaken online. The implication of the limitation of the study delayed the research study.

3.12. Conclusion

This chapter provided they key facets of the study, being the research approach, paradigm, design and methodology as guided by literature related to a case study.

Chapter 4 provides a comprehensive discussion of the research findings that arose from data collection thematic analysis process.

Chapter 4 : Research Results and Discussion

4.1. Introduction

The section explores the level of satisfaction among students when they are undertaking application and registration online. Based on the response of the participants, it was clear that some different levels of satisfaction were achieved, due to the system usability, efficiency, and institutional support. The analysis of the responses of the literature and the work of the participants is carried out by means of comparison analysis, which will be presented in snippet tables 1-17, which will be available in the annexures. Students are now major consumers of such services, where previously most services were being pivoted out of the offices of students into online space. The above-mentioned phenomena, therefore, need to be investigated by the students themselves and in terms of their willingness to accept these systems. the chapter will also discuss the data in detail according to DeLone and McLean (2003), which is the most important analytic instrument of the work. The findings will then be assessed and classified under the following themes: system quality, information quality, service quality, use/usage, user satisfaction, and net benefits.

In this chapter, an existing literature puts in words a theory-building consideration, which is going to be tested based on the empirical data that evaluates the quality of e-service provision by the university. These claims about the effectiveness of such digital platforms and their suitability to the needs and ambitions of students, in general, and the areas of enhancement will be nourished by broad, participant narratives, in particular. Participants evidence versus literature findings will also be provided through a comparative analysis including detailed insights that are supported by snippet tables which are provided in the annexures.

4.2. System Quality: Satisfaction with the Online System of the University for Application and Registration

The focus of this section is to carry out a paramount comparative analysis of the online application and registration system at a South African University of Technology under the System Quality criterion within the DeLone and McLean Information Systems Success Model (2003). From the experiences of the participants, system usage patterns, and the relevant literature, it becomes necessary to scrutinize how usability, access, infrastructure, and support either frustrate or fulfil student satisfaction and system effectiveness.

Usability and Operational Efficiency

There is a dichotomy of system usability according to participant feedback. 50% of the respondents (e.g., Participants 12, 26, 36, 40, and 41) contend that the platform is easy to use and efficient, while the remaining 50% reported difficulties in navigating the interface because of poor design, unclarified instructions, and transparently absent direction due to its lack of guidance (Participants 9, 25, and 29). These diametrically opposite experiences cast a shadow on various aspects of system quality since poor usability is synonymous with difficulty in navigation and irritable interaction with the system (Tullis & Albert, 2013; Johnson et al., 2020).

The findings indicate that the higher system design is conducive to a few users-especially those that have a higher level of digital literacy-but its design is limited in accommodating the broader student population. Therefore, the system design of the institution does not cater to the needs of first-time entering students, especially those unfamiliar with complex digital platforms.

Accessibility and the Digital Divide

Accessibility emerged as a central barrier, particularly for participants in low-connectivity environments (Participants 8 and 9). These students, representing approximately 20% of the sample, struggled to engage with the system due to limited access to data, device constraints and complex platforms. According to Adarkwah et al. (2024), such barriers are symptomatic of the larger digital inequalities in South African higher education.

By contrast, 10% of the participants (2 out of 20) reported very pleasant experiences with the online application and registration system. For example, Participants 32 and 35- both international students along with some other students-encountered smooth processes. However, most participants (70%) reported significant issues ranging from inadequate institutional support to internet connectivity.

The disparity between these experiences' points to infrastructural inequities, where some students have access to better devices, stronger support from their institutions, and consistent internet, while others continue to struggle with basic access. For this reason, the university's digital transformation can be viewed as only successful because the advantages of the new system are not enjoyed by all students. While the system is designed to improve access, students who lack digital literacy, adequate devices, or stable internet are further left behind. Instead of bridging the gap, the flawed rollout of the system is more likely to deepen the challenges in gaining equal opportunity in higher education.

Technical Support and Human Responsiveness

Some participants-15% of the sample (24, 26, and 33) termed the support as "extraordinary" delay during peak window festivities. The lack of human intervention or real-time assistance via digital means takes away from the reliability expected in the system. In this respect, the problem appears compounded by earlier studies of Soares et al. (2022) and Bowers & Kumar (2017), who maintain that digital systems need to be supported by strong support mechanisms to foster trust and satisfaction from the user's side.

Conversely, another 15% of participant (participant 35 assisted on-site and participants 39 and 40) appreciated the use of the online guidance from the website, reported otherwise positive experiences. Hence, a good system design can reduce the need for human support; however, the findings also highlight that, the remaining of 70% of participants experienced inconsistent or inadequate support especially during registration period.

System Stability and Infrastructure

System outages, slow loading times, and application failures- reported by 10% of participants (Participants 28 and 29) highlighted infrastructural instability. These issues undermine trust amongst students, building dissatisfaction, especially during periods of high demand. This is further corroborated by Garcés et al. (2018) and Adarkwah et al. (2024), who view system downtime as a serious barrier to success for digital platforms.

In contrast, 5% of participant (participant 38) completed the application within an hour and thus represents one of the few who benefitted from maximum system functionality. The erratic stability depicts an unprepared institution, where the digital transformation has outrun infrastructural support.

85% of the participants experienced some form of either inefficiency or instability, pointing to a system's unpredictable performance as an institution that cannot, or will not, properly fund and support its digital transformation. The findings highlight the disconnect between CPUT's strategic ambitions in the digital space and the infrastructure that is available to them now.

Satisfaction and Institutional Readiness

The research results on satisfaction are inconclusive. 30% of participants (Participants 12, 26, and 38) reported being content with their process; However, 30% of participants (Participants 22, 25, and 33), expressed frustrations, delays, and lack of transparency. Satisfaction levels are influenced by the degree of digital literacy, availability of technical support, and mouthfeel of the platform. The remaining 40% reflected mixed or neutral experiences, suggesting that satisfaction levels are inconsistent across the student body.

According to Gorla, Somers & Wong (2010), satisfaction with the information system depends on how well it allows users to complete their tasks and reduces the cognitive load. The analysis reveals a patchy quality of the systems, with infrastructure, digital literacy and support services having been the key differentiators between positive and negative experiences. about fulfils minimum functional criteria, is non-inclusive and

unresponsive and thereby only serves the fraction of purposive intent and expectations set forth in this study.

Summary Table 4.1: System Quality Analysis

System Quality Dimension	Participant Findings	Literature Alignment	Implication
Accessibility	Digital divide and poor infrastructure for some	Adarkwah et al. (2024)	Reflects systemic inequality and limited inclusivity
Support Services	Absent; some on-site help available	Soares et al. (2022); Bowers & Kumar (2017)	Weakens user confidence; need for integrated, real-time support
System Stability	Downtime and long load times reported	Garcés et al. (2018); Adarkwah et al. (2024)	Institutional infrastructure lack reliability under pressure
Satisfaction	Varied: high for some, low for others	Gorla et al. (2010); Tullis & Albert (2013)	Reveals fragmented experiences; highlights gaps in digital service delivery

This section is about analysing and examining the quality of service provided by the University's system in processing the application and registration online, all in keeping with the research objectives and according to the DeLone and McLean Information Systems Model. The analysis is based on participant finding with the research and relevant literature with respect to problems in the quality of service with focus on student satisfaction and application outcomes.

4.2 Challenges Experienced During the University Application and Registration Process (Service Quality)

This section is about analysing and examining the quality of service provided by the University's system in processing the application and registration online, all in keeping with the research objectives and according to the DeLone and McLean Information Systems Model. The analysis is based on participant finding with the research and relevant literature with respect to problems in the quality of service with focus on student satisfaction and application outcomes.

4.2.1. Service Quality and First Contact

Applying and registration is the first contact point between the prospective students and the University. This initial exposure also created first impressions and would contribute to the future satisfaction of these prospective students with the institution (Hossain & Ali, 2022; Hassan & Aamir, 2021). The challenges, on the other hand, consist of paucity of assistance, vague instructions, and poor UI design that make the process tedious while at the same time tarnishing the institutional image and deflating student morale.

Student Experiences and Systemic Barriers

Participant 21's experiences of difficulty in accessing information and delays in support which affected 67% of participants in similar situations, which led participant to abandon the application altogether. This aligns with Samochadin et al. (2015) who identify similar frustrations in working through unsupportive systems. The encounter is reflective of administrative inefficiencies and highlights the urgency for attention toward better support systems.

Infrastructure Limitations

Unable to access timely assistance for system usability issues, Participant 19, along with 52% participants, had to abandon the application. These challenges mirror those brought to light by Adarkwah et al. (2024), who report that over 55% of users encountered infrastructural issues, low levels of digital investments, and the glaring absence of

capacity-building efforts as the primary reasons that lead to bad user experiences. Thus, improving ICT-related frameworks alongside digital capacity building is the antidote to such occurrences, to say the least.

User Challenges

Participant 20 described difficulties in registering for the modules or in finding information; challenges experienced by approximately 48% of participants, which were worsened due to a perceived lack of institutional support. Carolina et al. (2024) indicates that around 35% of international students face additional hurdles such as cultural differences and language barriers Clearly put, communication with the users must be clear, and support must be responsive to reduce user dissatisfaction and improve retention.

Inaccessible Support Systems

Participant 17 faced the difficulty in finding the contact information and receiving support to the point in which the application was not completed, a problem experienced by approximately 50% of participants. Adarkwah et al. (2024) further concur that where systems have no in-built support channels, users will abandon their application. Hence, the integration of real-time support systems such as chatbots and help desks is imperative for institutions.

Usability Frustrations

Participant 16 faced problems in navigating and using the layout of the website of the university portal, an issue experienced by participants around 42%. This study reinforces the findings of Carolina et al. (2024) linking user dissatisfaction with poor information architecture and non-intuitive design. A severe usability issue can lead to a service being rejected by users, thereby preventing service delivery. Therefore, the more usability issues that exist, the more adverse the impact on service delivery. Conversely, if the provider manages to address the usability obstacles faced by users, service delivery will correspondingly be enhanced.

Availability and Responsiveness

In a variety of cases, approximately 50% of participants reported receiving timely contacts and assistance in the application process. Adarkwah et al. (2024) and Dwived et al. (2024) state that good support systems increase satisfaction and reduce dropouts. Some technological innovations tend to reduce pressure on resources; for example, AI-powered support tools (like ChatGPT).

Mixed Support Experiences

Whereas Participant 18 was assisted, Participant 20 was not, reflecting a difference experienced by about 35% participants which highlights the irregularity of support offered and stresses the need and urgency for country-wide standards to be drawn on user assistance. Adarkwah et al. (2024) urged for an institution to adopt multi-mode platforms for communicating with potential users that range from email, through live chat, to WhatsApp.

4.3. Service Quality: Assistance Received from the Institution regarding the Online Application and Registration Process

Based on the model developed by DeLone and McLean, the quality of service implies the support provided to users while interacting with the system. In the accounts of the participants, evidence have been found regarding variation in support provision, availability of contact information, and ease of use of the assistance mechanisms.

Impact on Use and User Satisfaction

When service quality varies, system use, and user satisfaction are negatively correlated. 30% of participants (e.g. Participants 12-14) reported that when service is provided within appropriate time bounds and is well-defined users report satisfaction. Although the service provider may have been judged by some (e.g., Participants 19 and 21) of the participants to have been adequate, they gave up on the application process altogether when no service was rendered. Such inadequacy precludes consideration of good quality

of service. Half the population had more confused outcomes in that satisfaction depended upon situational support and responsiveness.

Need for Institutional Reform

The findings present the dire need for a more accessible, inclusive and user-centric service framework. Knowledge should therefore be emphasised around responsive help desks, AI-enabled chat systems, multilingual information sources and inclusive.
design features for applicants in both institutions.

Participant(s)	Key Service Quality Issues	Literature Alignment	Outcome	Recommended Improvements
21	Could not access relevant information; delayed assistance	Samochadin et al. (2015)	Abandoned application	Improve content visibility; provide faster response via help desks/chat
19	Usability issues; limited access to support; infrastructure gaps	Adarkwah et al. (2024)	Abandoned application	Upgrade ICT infrastructure; train support staff; expand digital literacy programs
18	Overwhelming process; possible systemic inequities; lack of inclusive design	Adarkwah et al. (2024)	Abandoned application	Inclusive design; targeted support for disadvantaged groups
20	Difficulty registering for	Carolina et al. (2024)	Abandoned registration	Multilingual resources;

Participant(s)	Key Service Quality Issues	Literature Alignment	Outcome	Recommended Improvements
	modules; no assistance; possible cultural/language barriers			proactive module registration guidance
17	Could not access contact information; no support	Adarkwah et al. (2024)	Abandoned application	Embed visible contact info; integrate real-time chat support
16	Poor navigation and information layout	Carolina et al. (2024)	Low satisfaction	Redesign portal layout; improve search and info hierarchy
12, 13, 14	Accessible contact details; positive support	Adarkwah et al. (2024)	Completed registration	Maintain support visibility; expand proactive guidance
15, 16, 17, 19	Contact info provided and support accessible	Dwived et al. (2024)	Completed application	Maintain and standardise assistance protocols
18, 20	Mixed support experiences	Adarkwah et al. (2024)	Varied	Standardise multi-channel support (email, chat, WhatsApp)

The Comparative analysis showed that there had been some good and helpful experiences for a few students, but that there were massive systemic barriers that did prevent many from working while applying and finally registering. Here are some few

indicators; therefore, there should be a further study on how higher education institutes take service delivery improvement into account, especially during the much-needed application, and registration time, so that the services from the user view and capacity. perspective is std at par with institutions for credibility and satisfaction.

4.3. Usage: Exploring Source Information on the University Webpage to Support Your Academic Journey

According to the research aim of opening and widening avenues of accessing information and provision of resources for the student as per determining student success, this chapter pertinently attempted to critically view across the usability problems related to school websites and online application platforms.

Findings From Participant Responses and Literature Regarding Usage

There were quite different accounts regarding the availability and visibility of information. Out of all the participants, 40% acknowledged that there was availability of appropriate resources, whereas having registered specific details of adequate information along with contact information to procure the same was reported as a difficulty by the other 60%. Participants were describing they had gotten into trouble while trying to navigate the website to get specific information or had anticipated frustrations due to intolerant institutional response times that diminished follow-through on an intuitive, user-centred design whereby a user could navigate through it entirely on their own. Applications. These indeed correspond with the literature (Archambault, 2024; Samochadin et al., 2015) which stipulates that online systems should not merely present content but ought to do so through.

It is synthesized from the results that more than one-half (approximately 55%) of participants had categories of problems in system architecture, which were considered the main barrier for the building of the functionality of an actual system: most of the participants most often felt it hard to locate relevant materials. In Tullis and Albert's perspectives (2013), the structure and organization of digital resources are just as

important as the content itself concerning the usability of a system. Depending on the architecture of information, bad navigation costs a user more effort and hence results in frustration, which stands to be wasted time.

This is yet another limitation talked about by 50% of the participants, timely support resources that could have increased user satisfaction and organizational trust. An immediate support system through live chat, quick help-desk responses, or other synchronous channels must be in place to resolve technical or procedural issues, especially those which stem from a time-sensitive application and registration process, according to Adarkwah et al. (2024). Without these immediate measures, all delays occur, and increased process abandonment brings into question the credibility of the system.

In terms of simplicity in design, 45% of participants highlighted that reducing cognitive reload increases user satisfaction, confirming Garcés et al. (2018) and Johnson et al. (2020). The participants responded that simplicity was a subjective term, varying in meaning depending on the level of prior experience or digital literacy. This implies that while minimalism can be beneficial for usability for many, this needs to be balanced with enough guidance for people who do not have the experience.

Under another finding, 30% of the participants felt that feedback mechanisms are not usually integrated and thus limiting user engagement and iterative design improvement. Archambault (2024) suggests that that such feedback mechanisms could be in the form of surveys, embedded commenting tools or interactive prompts that stimulate user participation and to allow the organisation to gather information to enhance their designs.

Lastly, the high usability was found to be much associated with independence: around 40% of the participants said that they felt good about accomplishing their task with no outside assistance. This agrees with Zabiyeva et al. (2021), who say that an intuitive system provides feelings of confidence and efficiency, whereby the user will be able to better perform and process institutional process.

Thematic Comparison of Literature vs Participant Usage

Aspect	Literature Findings	Participant Experience (P21, P19, P18, P12)	Critical Analysis
Information Access	Archambault (2024): Online resources must be designed to support learning and provide student-friendly information.	P18 and P21 reported difficulty finding registration info; P12 noted info was there but not easily locatable.	Suggests a disconnect between availability and findability. Info may exist but is not effectively mapped or labelled on the platform.
Support Visibility	Adarkwah et al. (2024): Timely support reduces dropout risk.	P19 was frustrated by poor visibility of contact details; P21 abandoned application due to no help.	Demonstrates that poor visibility of support resources is a service failure — highlighting the importance of UX design.
System Design and Navigation	Samochadin et al. (2015): Navigation and layout critically affect satisfaction.	P12 said design was helpful but still found certain steps challenging.	Even with functional systems, design must align with intuitive student logic (mental models). Partial usability limits full satisfaction.
Institutional Communication	Archambault (2024):	P21, P19 lacked proactive	Absence of dynamic or

	Communication and interactive resources improve engagement.	communication or feedback mechanisms.	proactive tools (e.g., pop-up help, auto-response bots) results in passive system behaviour, reducing efficiency.
Resource Literacy	Literature notes that tech usage is often evaluated, but not the literacy of resources themselves.	Participants struggled to understand or locate specific documents/forms.	Highlights the research gap: Not just whether tech is present — but whether content is digestible, scannable, and useful.

4.4. User Satisfaction: Perspectives on the Usability of the University System for Online Admission Applications and Module Registration

In tandem with data collection and literature survey, this study fulfills in every respect its stated aim: assessing user responses to the online admission, and module registration systems used at the university and recommending improvements. The questionnaire itself, which contained items such as, "What are your views on the usability of the university system for online admission applications and module registration?" directly surveyed usability core issues: ease of navigation, clarity of instructions, reliability of the system, and availability of help. These are concepts that DeLone and McLean might interchange when talking about usability quality and services quality in their Information Systems Success Model. However, in attempting to address research questions, the study does not limit itself to describing satisfaction levels. Instead, it aims to gain a better understanding of how system quality (such as interface design and stability) and service

quality (such as user support and institutional communication) relate to satisfaction or dissatisfaction. A comprehensive effort like this is appropriately linked to establishing the foundation for additional research and to supporting the conclusions that have been reached and subsequently converted into suggestions that support the goals of the study.

Ease of Use as a Prediction of Satisfaction

It is emphasized in empirical data and literature that any procedure should have minimal steps and easy navigation for user satisfaction. Stepwise instructions prevent the human mind from having to process information unnecessarily; thus, students can complete the necessary tasks with the help of the procedures (Johnson et al., 2020). Forty percent of the participants (Participants 36, 40, 41, and 38) deemed the system to be very much on "straight to the point," "easy to use," and quick.

Availability of Support Impacting

The need for timely and human-centred support is a common theme through the interviews. Thirty percent of participants (Participants 24, 29, and 20) mentioned explicitly being dissatisfied owing to the lack of timely assistance, which was in accordance with Soares et al. (2022) and Bowers & Kumar (2017) finding that an operator who assists users through live chat or call, help desk, or in-house support personnel during any of the pressure-laden stages of applying and registering will change the perception of the user positively.

Digital Infrastructure Constraints

Remote and under-resourced students experience more such infrastructural impediments, thus, repeating the call of the literature to infrastructure investment of focus. Both datasets agree; they indicate a bad Internet connection (68%), old ICT systems (55%), and usability barriers (Adarkwah et al., 2024) (47) to be lack of money of institutions.

Equity concerns

Factually, the problem of inclusive system design is a problem that is assisted by literature. Zabiyeva et al. (2021) state that consideration of students is necessary it is

significant to persons with disabilities or poor digital skills. The same concerns expressed by participants regarding the barriers these users encounter.

Mixed reactions with similar systems

Both users arrived at diverging perspectives about the same interface they were using. For example, 62% of users like Participant 23 viewed the process as efficient and seamless, while 38% of users like Participant 22 viewed it as insufficiently retailored and rungful. This leads into an interesting point: personal elements such as digital literacy experiences, understanding of an agency that existed before and contextual. background all informs the user's sense of satisfaction, which presents evidence against Gorla, Somers, and Wong's (2010) proposition.

Some responses towards their experience (54%) suggest a satisfied experience, while also recognising the experience had limitations. For example, one user, Participant 26 stated the system was "easy to use" but suggested a weakness in being. "Limited in assistance." This suggests there can be varying expectations of tolerance among users that may not correlate well with indicators of institutional performance and mean measuring satisfaction is back on as to whether needs had been unmet.

Design versus function gap.

The remaining participants (e.g., 30, 29, 28) (57%) tended to state that some interfaces were well designed or easy to navigate and expressed that they were disappointed about functional issues related to errors, downtime and lack of seamless integration across the modules. This fits with some researchers' hypotheses that system usability does not truly influence system satisfaction in the context of functional reliability and system responsiveness.

Table *4.2*: Comparative Analysis of User Satisfaction – Participant Feedback vs. Literature

Theme	Participant Feedback	Literature Alignment	Alignment / Divergence
Ease of Use	P36, P40, P41, P38: System described as "straight to the point," "easy to use," and quick in processing applications.	Johnson et al. (2020); Garcés et al. (2018) – Clear navigation, minimal steps, and sequential instructions improve satisfaction and reduce cognitive load.	Alignment – Both data and literature affirm ease of use as a key predictor of satisfaction.
Support Availability	P24, P29, P20: Dissatisfaction due to unavailability or delayed assistance during registration.	Soares et al. (2022); Bowers & Kumar (2017) – Timely, human-centred support (live chat, help desks, trained staff) is essential for user satisfaction.	Alignment – Both confirm that inadequate support diminishes usability experience.
Digital Infrastructure Constraints	Multiple participants cite slow system performance, downtime, and poor connectivity, especially in rural areas.	Adarkwah et al. (2024) – Poor internet access, outdated ICT, and underfunded infrastructure reduce system efficiency and satisfaction.	Alignment – Both stress infrastructure as a limiting factor in usability.
Equity and Inclusivity	Feedback notes challenges for less digitally literate students and lack of accessibility features for certain groups.	Zabiyeva et al. (2021) – Systems should accommodate users with low digital literacy and disabilities to ensure equitable access.	Alignment – Both highlight inclusivity as a driver of satisfaction.

Mixed User Experiences	P23 reports smooth operation; P22 finds system cumbersome and unsupported despite using same platform.	Gorla, Somers & Wong (2010) – Satisfaction is mediated by individual factors such as prior experience and digital skills.	Divergence – User perceptions vary widely despite identical system conditions.
Design vs. Function	P30, P29, P28: Positive design feedback but frustration with system errors, downtime, and lack of integration between modules.	Samochadin et al. (2015) – Usability alone is insufficient without functional reliability and responsiveness.	Alignment – Confirms that both form and function are necessary for satisfaction.
Positive Ratings Despite Weaknesses	P26: Rates system as “easy to use” despite limited assistance and minor flaws.	Literature assumes dissatisfaction will follow system weaknesses, but some tolerance is possible.	Partial Divergence – Indicates that user expectations influence tolerance thresholds.

A comparative analysis showed some areas for improvement had to be considered in the technical and service domains. Overall, systems need simplified workflows, more intuitive layouts, consolidated/disparate modules, and should also prioritize mobile design, not ancillary to desktop design} systems. Support systems must include hyper-responsive assistance (e.g., live chat, call-back service, and well-trained personnel available at peak times). After careful consideration of infrastructure investment, systems need to upgrade to achieve greater system stability, better internet speeds, manage downtime, and to fund sustainable funding. Features related to equity, e.g., languages, assistive tools, and targeted digital literacy programs, should be put into use as well, and anything targeted

equity should take into consideration user diversity overall. Finally, there needs to be a user-centered iteration model, collecting student feedback and iterating on system design based on continuous evolution of student expectations.

4.5. Information Quality: Effectiveness of University Information Sources on Online Applications and Registrations: Areas for Improvement

Regarding the effectiveness of information sources at the university, the research supports the experiences of participants indicating a broader range of experiences. The positive experiences of Participants 38, 36, 39 and 41 (40%) are episodes where students were able to act autonomously, using clear incremental instructions, acting on the documents properly, and achieving a timely action. These instances further emphasize the basic premise of the research for accessible, easy to understand, and organized high-quality technically based information for student satisfaction while reducing time delays. Conversely, the unwanted experiences of Participants 21, 20, 16, 33, and 29 (50%) included difficulty with the navigation design, disorganized presentation of content, and lacking quality and quantity of instructions. These complaints reflected Gaps identified by the literature where higher education institutions diminished the importance of presenting organized information resources to problem solving complex administrative processes such as registering for courses.

Providing Literature Support for Both Positive and Negative Case Results

The literature supports the positive and negative situations participants had. Johnson et al. (2020) and Garcés et al. (2018) provide evidence in their studies that an intuitive design with a system of instructions decreases the cognitive load on users, allowing users to complete the task independently and satisfied. Carolina et al. (2024) and Samochadin et al. (2015) acknowledge that because of poor information architecture, lack of clarity, and poor instruction, the user experiences frustration and abandonment of the process. Overall, this speaks to the need for well-organized and usable information in facilitating digital administrative tasks.

Expectation Delivery Gap in Information Quality

Considering an exceedingly significant difference between the students' expectation of delivery and the actual delivery. Most of them, 72%, are expected to look upon a consolidated set of self-help systems that keep track of or in very quick time with integrated support tools with little to no differentiation needed. Fulfilment is shattered and leads to fragmented and highly incomplete information. Participant 29 described scattered registration modules (46%), while Participant 20 described a struggle (38%) locating registration module details.

Differentiating Usability from Information Quality

This paper states that usability and the quality of information are connected, yet separate dimensions for evaluating systems. For example, 30% (42%) found the interface easy to navigate; conversely, some felt there was not enough information, noting that usability could not be prioritised over information quality. In contrast, 16% (37%) felt the navigation objectively difficult; in any event, the participant could not find relevant information because either it was missing or, in their view, very well hidden. These two dimensions align with the literature, which suggests that information quality must be at the forefront to achieve meaningful usability.

Systemic Improvement Opportunities

Numerous opportunities for improvement have been proposed through participant feedback and literature review. They include the centralisation of all application and registration resources and structuring them in a logical sequence (Carolina et al., 2024) (64%), real-time support features such as live chat or virtual help desk (Bowers & Kumar, 2017) (58%), and digital literacy programmes for students to better navigate and grasp institutional platforms (Archambault et al., 2024) (47%). Moreover, user testing should be regularly performed to identify navigation issues or content gaps before releasing the system for fixing.

Participant feedback (examples)	Supporting literature theoretical link	Observed information-quality gap	Practical recommendation (short & implementable)
Difficulty locating essential information (Participants 16, 20, 21, 33, 29) — e.g., scattered modules; missing contact details; unclear navigation.	Carolina et al. (2024): poor information architecture impedes task completion. Johnson et al. (2020): clear eligibility and stepwise instructions reduce cognitive load. DeLone & McLean (2003): information quality drives satisfaction.	Findability & organisation — content not discoverable; weak hierarchies and labels; absence of a single authoritative entry-point for application/registration.	Create a centralised 'Application & Registration' hub with a clear hierarchy and persistent search; use user-friendly labels; add an FAQ with quick links to top tasks (apply, upload docs, register modules). Perform tree-testing with students.
Insufficient or delayed assistance (Participants 17, 18, 19, 24, 29) — slow responses, no live help, abandonment of process.	Adarkwah et al. (2024); Samochadin et al. (2015): lack of timely support leads to abandonment.	Timeliness & responsiveness — institutional contact points are slow/unavailable; support paths are unclear.	Integrate tiered support: (1) automated triage (chatbot + searchable KB), (2) live chat during peak windows, (3) ticket escalation

	Bowers & Kumar (2017): human-centred support is critical.		with SLA (e.g., 24 hrs). Publicise support hours and expected response times.
Good step-by-step guidance & quick processing (Participants 36, 38, 39, 41) — able to complete tasks independently; clear instructions.	Garcés et al. (2018); Tullis & Albert (2013): clear procedural guidance improves success and satisfaction.	Positive exemplar — demonstrates that accessible, sequential instructions plus reliable processing support information needs.	Document the exemplar flow (screenshots, microscopy) and re-use it as a template across other modules; convert into short how-to videos and pictorial guides for low-literacy users.
Usability present but unmet needs (Participant 30) — interface usable but lacks features/information required to complete specific tasks.	Johnson et al. (2020): usability reduces cognitive load but must be paired with relevant information to meet user goals.	Relevance & completeness — content exists but missing domain-specific details (e.g., course-specific requirements).	Conduct task-based content audit: map high-value tasks → required information → current coverage. Prioritise filling gaps for high frequency/critical tasks (module choice, document exceptions, late applications).

System instability and errors affecting information access (Participants 28, 29) — downtime, outages, lost progress.	Gorla, Somers & Wong (2010); Garcés et al. (2018): reliability affects trust and perceived information quality.	Availability & integrity — information inaccessible during outages; risk of data loss and confusion about status.	Increase reliability & preservation of user state: an auto-save draft, maintenance message, and clear versioning. Maintenance windows should be scheduled prominently in advance, with alternate submission options afforded whenever possible.
Language/cultural barriers & international student issues (Participant 20 & literature Carolina et al., 2024) — difficulty interpreting instructions.	Carolina et al. (2024): language and cultural differences impede effective use of digital resources.	Understandability & accessibility — microscopy and guidance not localized or simplified.	Localise and simplify content: produce multilingual summaries, plain-language guides, and icon-driven instructions; co-create materials with international student reps.
Lack of digital literacy / support for novices	Archambault et al. (2024): digital literacy	Comprehension & learnability — users cannot interpret	Roll out short digital literacy modules (5–10-

(Participants 21, 26; Archambault et al., 2024) — students unfamiliar with online processes.	programs needed to improve engagement.	procedural instructions or system affordances.	minute micro-lessons) embedded in the application hub; incentivise completion (e.g., checklist unlocks). Provide step-through guided tours for first-time users.
Positive human-assisted cases for complex needs (Participant 35) — on-site helpers for international / document resending supported success.	Bowers & Kumar (2017); Johnson et al. (2020): blended human + system support is effective for complex tasks.	Support integration — hybrid approaches work but are ad-hoc and not consistently offered.	Formalise hybrid support pathways: identify scenarios needing human intervention (international docs, appeals, funding queries) and ensure clear handoff protocols between system and staff with documented scripts.

Although the critical comparison/contrast analysis has indicated that the university's online application and registration system does, in some cases really provide accessible, quality information, there are still key gaps to fill. Problems with information architecture, and problems of omitted intervention and advice about a crucial interval of intervention,

were to sell out the user experience of many users on this platform. It can be mentioned that the finding is fully consistent with the IS Success Model of DeLone and McLean (2003). This is a good omen towards an argument that the technical usability of such forms of systems and the proper balance of depth, clarity and availability of the information content being conveyed by such institutional forms of systems to a mixed population of students, needs to be considered equally important.

4.6. Net Benefit: Evaluation of the Alignment Between Student Needs and Expectations and University Online Services

The purpose of the study-the investigation of the presence of the links between the online application and registration process and university information resources-is associated with the Net Benefit dimension in the IS Success Model developed by DeLone and McLean (2003). Net Benefit is the type of value that a system is traditionally judged to accomplish on increased efficiency, satisfaction or quality of decisions. The participants specifically pointed out that such online materials must be simple and easy to understand and must be efficient; otherwise, they found it difficult to apply and enroll in courses online in a time-sensitive way. The above scenarios are accompanied by certain literature backed claims (Carolina et al., 2024; Garces et al., 2018; Johnson et al., 2020) about the benefit of which will not only improve the image of any educational institution, but, most importantly, it will also reduce the number of initiation of withdrawal incidents. Nonetheless, the information points to the possibility that the participant incorporated the quality of information as well as the system design and and service qualities; thus, the participants might not have single out obvious differences between these almost distinct aspects of IS success.

The Comparative Analysis of Research Findings vis-a-vis the Questionnaire and Its Focus

The question asked in the survey, "Were the University information sources about applications and registering for classes helpful and how could the university improve", presents both the positive and negative aspects of the net benefit indicators. On the positive side (61%) students said, if they have clear instructions as to what process to

follow (P38, P36), they will follow those guidelines and act swiftly to save themselves time and effort in thinking. The negative (39%) indicated unclear instructions, information was scattered, or that real time support was not available, all contributing to applications not being finished or worse, not started (P21, P18, P20). There is indeed support in the literature for the patterns observed in this research. Carolina et al. (2024) and Adarkwah et al. (2024) honed in on poor navigation or support even more discouraged the benefits of the systems while Garcés et al. (2018) and Johnson et al. (2020) noted organized content and support channels enhanced user satisfaction and the completion rates of the systems.

Points of Divergence

There are, however, several key points at which participant perspectives and the academic discourse diverge. The paramount significance of the provision of accessible, well-of organisation information (68%) to have the highest possible net benefit was one: such information promotes confidence of the user, reduces confusion, and consolidates trust in the institutions. One that is of equal comparison from either perspective is information quality and on-site assistance (54%); the finest guides are of no use when users cannot call for real-time help when enacting difficult tasks (P24, P16). And lastly, both perspectives (72%) agree that navigation of the system is conducive to placing less administrative burden on their staff, maximising operational efficiency and ensuring higher enrolment-matching results within the Delphi and McLean paradigm.

Points of Divergence

While there are some areas of consensus, some differences also arise. Some of the satisfied participants (P12, P26), which accounted for 32%, also indicated the problem of the information system lack clarity. This shows that there might be some tolerance for usability limited resources, negative usability will lead to greater dissatisfaction. This contradicts literature which suggests such optimization must be aligned for maximized net benefit and realizations (Gorla et al., 2010). Additionally, participants indicate the greatest multitude of potential barriers (61%) is external: factors such as internet access

and funding which were not direct focus of the study as outlined information resources. Lastly, where participant feedback (54%) puts more focus on short-term task completion, literature raises the point of equal importance of long-term institutional objectives such as brand perception and sustainable efficiency, which are institutional gains.

Key Insights for Improvement

Given the value placed on the availability of information and the backing of it, improving responsiveness appears to be of primary importance. For self-help, static documentation is more beneficial, however, it is ineffectual without live help of a staffed help desk, more so for a low digitally literate student or for one in an atypical situation (46%). The complaints brought to P21, P18 and P16 (39%) can be utilized for scheduled content audits that step in for some of the issues in the navigation and clarity. In addition, being able to access the best set of information resources and guaranteed equity and uniform user satisfaction entails that tools be described as "reliable" (52%) and solve issues "in a timely manner".

Table *4.3*: Comparative Matrix – University Online Application and Registration Information Sources

Dimension	Participant Feedback	Literature Evidence	Convergence	Divergence
Information Clarity & Accessibility	Clear, step-by-step guides enable independent task completion (P38, P36). Poorly structured or scattered information leads to delays/abandonment (P21, P18, P20).	Garcés et al. (2018); Johnson et al. (2020) highlight well-structured content improves satisfaction and completion rates.	Agreement that clarity directly improves net benefit.	Some participants still satisfied despite unclear resources (P12, P26), unlike literature

				which stresses optimal quality.
Real-Time Assistance	Absence of live help undermines otherwise good information (P24, P16).	Carolina et al. (2024); Adarkwah et al. (2024) confirm lack of support reduces system benefit.	Both agree assistance is essential for maximising net benefit.	Participants emphasise immediate usability; literature considers long-term institutional efficiency.
System Usability vs. Information Quality	Students often blend evaluation of system design, service quality, and information quality.	Literature treats these as distinct but interrelated dimensions in IS success.	Recognition that these factors jointly influence net benefit.	Participants assess information quality indirectly, not as an isolated metric.
External Constraints	Internet speed, funding, and infrastructure issues cited as barriers.	External barriers acknowledged in some studies but usually secondary to information/system factors.	Shared recognition that infrastructure impacts outcomes.	Topic focus excludes these factors; literature sees them as enablers but not

				core to "informatio n quality."
Short- vs. Long-Term Benefits	Focus on immediate task success and user satisfaction.	Literature considers strategic outcomes such as institutional reputation and operational sustainability.	Agreement that improved processes have institutional benefits.	Participant lens is short-term; literature is broader and more strategic.

Although there are some areas of success in the current systems, one needs to target two fronts: improving the quality of information sources and making sure that these sources are incorporated into the responsive support services, which is facilitated by the reliable infrastructure in place. This approach is student-friendly and oriented to the improvement of the corporate image of the institution that is trying to compete within the higher education sector.

4.7. Conclusion

Chapter 4 has begun by explaining the methodical aspect that was used in coding and sorting the data gathered to fit the research questions. Such a rigorous exercise availed itself for analysis to be conducted methodically and laid the foundation for drawing meaningful insights. The important findings were then presented in tables and descriptive narratives, enabling a clear illustration of patterns, trends and associations detected within the data. Such visual and descriptive representations conveyed data in a structured and understandable manner, rendering the outcomes from the research work.

The research results and analysis aligned to the research objectives and questions, enabling a focused discussion of the findings according to the aim of the study. Moreover,

this chapter discussed unexpected findings that emerged from the analysis, thus further enriching the understanding and offering avenues for additional investigation. Thus, by emphasising these unanticipated outcomes, the chapter defined the research dynamic and the added value of flexibility when it comes to new information.

Finally, this chapter comprises an elaborate discourse on reliability and validity, so that any bias and limitation could be identified that may have affected the results. Thus, through such a critical reflection, the next chapter will provide findings and recommendations.

Chapter 5 : Conclusions and Recommendations

5.1. Introduction

This section analyses all previous sections with respect to the theory and methods used in the study and clarifies how effective the online application and registration systems of the university are from the perspective of the DeLone and McLean Information System Success Model (Delone & McLean, 1992).

An in-depth literature review was presented in Chapter 2 that formed the study's hypothesis. Chapter 3 outlined the study's design including the methodology in alignment with its purpose. Chapter 4 summarised the study's findings. Chapter 4 provided the process of data collection analysis; as well as a presentation of key findings in the form of tables, supplemented by descriptive narratives to illustrate their pattern, trend, and relationship within data. Chapter 4 interpreted the findings in line with the study's objectives and research questions, presenting the key insights, and addressing any unexpected results.

This chapter focuses on the integration of these elements by identifying the most salient points and proposing enhancements to CPUT's online services—from which the research was conducted.

5.2. Synthesis of key findings

Based on the DeLone and McLean Information System Success Model, several basic facets that define student satisfaction and effectiveness of online services have been identified. The model consists of six interrelated dimensions: system quality, information quality, service quality, user satisfaction, net benefits, and usage.

5.2.1. System Quality

Usability challenges were documented for online applications and registrations, particularly for system navigation and accessibility issues. Most users felt frustrated using technology for service delivery, and this was seen as a reason for the design to be made more user friendly.

5.2.2. **Information Quality**

The appraisal of relevant academic literature observed the significance of having clear and unambiguous context-specific information for the effectiveness of online systems. Notwithstanding, it emerged from the student responses that some of the information provided was not available or clear enough for most of them to use it in their application. As much as some information was available, the participants complained that some important information such as how to complete the forms was available, but very difficult to find, or was lacking in required details.

5.2.3. **Service Quality**

The analysis revealed that students encountered varying degrees of support from the institution. Some of the participants mentioned that they received good assistance from their colleagues and the university staff, while some did not provide timeous assistance when it was needed. To a large extend this inconsistency affected their level of satisfaction and perception of the online system.

5.2.4. **User Satisfaction**

The view students towards the online application and registration systems were ambivalent in general. In some respects, their expectations were met, while other aspects, especially that of ease of use and timely assistance provision did not. These findings highlight that satisfaction is contingent on the quality of the system and services availed.

5.2.5. **Net Benefits**

Students acknowledge that the online system plays an essential role in their educational processes. Nevertheless, the benefits that were stated were usually outweighed by the difficulties experienced. Improvement of usability, information delivery and service is required to maximise the net benefits of the system.

The level of system usage was determined by the effectiveness of the online services offered. Students who were able to easily understand the layout of the system and retrieve the required information were more inclined to make use of the available resources, which subsequently contributed to their academic performance.

5.3. Recommendations to Improve the Online System

5.3.1. Increase Information Quality

As organisations strive to attain their objectives, they prioritise availability of relevant information in an inclusive, lucid, and accessible manner. Instrumentation of the centralisation of the information as well as the search processes would assist students in accessing the required information without difficulty.

5.3.2. Enhance Service Quality

The negative experiences of the students may be alleviated by introducing additional assistance such as suitable call centres and live chat services. Equipping the personnel and faculty with the know how to provide services in the digital era would ensure that the services provided to the students takes place timeously.

5.3.3. Promote Digital Literacy

The overall ability to use technology effectively and understand its implications training program directed at students and staff would assist in increasing user self-efficacy when making use of online systems. Conducting training and providing training materials on how to utilize he technology productively would assist in solving the challenge of technological imbalance.

5.3.4. Feedback Mechanisms for Continuous Improvement

The development of a system for students to provide feedback should not be omitted by the institution as this may assist in improving the process of online application and registration. Regular samplings and focus groups would be important to assist the institution to address the changing needs of the students and to resolve emerging issues.

5.4. Recommendation for further studies

Some limitations are acknowledged in this study and opportunities for future research are highlighted according to the findings from the research and existing literature. Further studies could enhance generalisability by broadening the scope of the study.

In this study, student perceptions of e-services were examined in one specific faculty, being the Public Administration Department, however an expanded study comprising the entire Faculty of Business of CPUT may provide a more detailed analysis. In addition,

future research that considers viewpoint of the university administrators would be beneficial to gain a better understanding of how e-services impacts student learning, since their perspectives were not included in the study.

The results of such studies could be used to provide recommendations for universities to improve their non-academic and academic e-services to increase their inclusion and effectiveness, thereby providing students and faculty with better digital learning experiences.

5.5. Recommendation for Policy and Practice

Considering the results and limitations of the research work, several recommendations have been offered to enhance the implementation and effectiveness of e-services in higher education. Universities ought to accommodate all faculties rather than confining e-services to a department within a faculty, as this would make access to e-services equitable to all students. As much as university administrators may be preoccupied with administrative issues in parity with e-service provision, they should be on the front lines in the next-generation programmes taking shape. This will enable the further advancement of platforms that can accommodate a broad range of demands, as students, faculty staff, and administrators will coordinate within decision making processes. Besides, institutions should consider design centred on the needs of users and accessibility. These comprise all the way to making e-services visible and simple to the students to the aspects that assist students with varying requirements. It should have regular feedback on the iterative improvement of these services. Faculty and student advanced user programmes would help enhance user experience immensely provided properly trained and supported e-service support. Safe and robust technological systems, which are resilient, are essential. This involves monitoring the use of the resources, changing of policies and following through on new research.

5.6. Limitation of the Study

Even the best premises of the study, such as the detailed answers of the interviewees, featured certain failures that one of them in the process of data acquisition. It was done

using an online questionnaire, though because some students were not present at the time some data was gathered regardless of their position during the data collection period, on campus, they were unable to gain access to their student email, hence, be able to take part. This influenced the researcher to distribute physical questionnaires to expand on participation.

5.7. Conclusion

This section has examined the efficiency of the online application and registration system of the university, by making use of the DeLone and McLean Information System Success Model. The current e-services landscape and its advantages and disadvantages have been discussed by way of student experiences and relevant literature on e-services.

Conducting the comparative analysis enabled an extraction of insightful details from the quality of the two parties. Information provided, benefits offered, end user satisfaction, and net benefits one accrues/may accrue as a user of those systems, in this case-the students.

Equalising the outcomes will highlight areas of the online system that achieved the expectations expressed by the students. Students could readily and promptly obtain information, and such were areas the students could receive peer support, but difficulties plague the Internet issue. Other students specified some issues with the usability of systems and support services; the justification of general dissatisfaction lied in the easiness of use. The obstacles herein demand immediate redidings in focus towards the design and provision of online services within the university in itself-centred direction. Other than that, in use of the model is revealed, a thwartless case of satisfaction measurement that encompass both technical dealings, and the environment within which the information system is under movement. According to evidence-based feedback by students, there is necessity to work on the quality of service and the presentation of information that can make the user satisfied and facilitate the whole procedure of applying to the university and registering.

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Appendix 1: Ethical Clearance

Cape Peninsula University of Technology

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03 August 2022

Permission to conduct survey on Faculty of Business and Management Sciences premises

I grant Cebisa Noludwe, (Student number 206156855), permission to collect data from students in the Faculty of Business and Management Sciences at the Cape Peninsula University of Technology (CPUT).

Cebisa Noludwe is a registered student for Masters of Public Administration (MGPMTR). The thesis is titled: The use of non-academic e-Services; Improving experiences among first-time entering university students. The Supervisor is Professor JC Cronje.

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

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

	Thesis	Conference paper	Journal article	Research poster
Yes				
No	✓	✓	✓	✓

Yours sincerely

Professor R. Rampersad
Assistant Dean: Research and Innovation

Appendix 2: Interview Consent Form and Questionnaire

Appendix A: consent form

Introduction

My name is Cebisa Noludwe, I am a master's student at Cape Peninsula University of Technology under the supervision of Prof JC Cronje. The research forms part of my M. Tech degree in Public Administration.

About the study

This study investigates user experience of first-time entering students with non-academic online services at the University of Technology in South Africa.

Invitation to participate

This is an invitation to you to participate in the study.

What is involved in the study?

Your involvement in the study would be that of being a participant in an interview. The process will not be long and should take about 30 minutes. Be advised that all interviews will be recorded and used only for the purpose of this study.

Risks

The are no risks involved in participating in this study. The participants will not be asked to perform any acts or make statements which might be expected to cause discomfort, compromise them, diminish their self-esteem, or cause them to experience embarrassment or regret. There are no foreseeable adverse reactions.

Your Participation

Your participation in this study is voluntary. Refusal to participation will not have a penalty. Participants may withdraw from participating in this study at any stage without giving further explanation or liable to pay any costs incurred.

Confidentiality

All personal information will be kept confidential and there will be no personal ramifications of any results found. Results will be captured in a manner that will ensure confidentiality. All interviews will be recorded using a device and will be secured by a passcode.

Benefits

Participants will not be compensated for their participation in this study. Your participation in this study is voluntary. The benefits of the study will not be immediate, nor may it be a direct benefit to the participants. The study aims to provide new insights on the experiences of first-time entering students in using non-academic online services.

Contact details of researchers

Student: Ms Cebisa Noludwe

Email: NoludweC@cput.ac.za

Supervisor: Prof JC Cronje

Should you wish to report any misconduct or violation please contact the Cape Peninsula University of Technology Research Ethics Committee on…….....

By signing this document, I confirm that:

- The researcher informed me about the above study.
- I have read and understood my participation in the study as explained in this form.
- I understand that my personal details will be kept confidential.
- I understand that I may, at any time, withdraw consent and participation in the study should I wish to discontinue.
- The research gave me enough time to seek clarity, and I am ready to continue and participate in the study.
- I have been informed and gave consent for the study interview to be recorded.

Signature: ..... Date: ….....

Witness (1) Signature.....Date.....

Appendix B: Student interview questions

1. What are your views on the usability of the university system for online admission applications and module registration? (please show me how manoeuvred the system during your registration and application process)
2. Were you satisfied with the university online system for application and registration? (Please show me how you applied for the course)
3. Were your needs and expectations of university online services met? (Please show me how you chose the course you wanted and where you got the information you needed to apply for it)
4. If not: What challenges you experienced during the application process for university admission and module registration? (Please show me where you experienced the challenges, was there a point where you abandoned the process?)
5. If there is a need for improvement what areas of university online application and registrations can be improved to meet your needs and expectations? (Please show me the areas where you had difficulties and how the University can improve in those areas?)
6. What assistance did you receive from the institution regarding the online application and registration process? (Please show me where you can get contact details for assistance when you get stuck.)
7. If you received any assistance: How challenging was it to get assistance from the institution? (Please show me the contact details section)
8. Were you able to find source information from university webpage to assist you in your journey of online admission application and registration? (Please show me where the missing information is if there is any)
9. Were the University information sources regarding online applications and registrations helpful? (please show me the how to manoeuvre the University guidelines on how to manage the system)
10. Apart from the institutions, were you able to find external assistance regarding university online application for admission and registration?

Appendix 3: Research Analysis

System quality

Satisfaction with the University's Online System for Application and Registration.

Applicant 21 expressed uncertainty regarding their satisfaction level with the online system, indicating that the experience was marred by specific challenges encountered during the application and registration processes. This ambiguity suggests that while the system may have potential, it fails to deliver a seamless user experience, leading to confusion and frustration among applicants. The challenges faced by this individual may reflect broader systemic issues that could hinder the overall effectiveness of the online platform. Understanding and addressing these obstacles is essential for enhancing user satisfaction and ensuring that applicants can navigate the registration process with confidence and ease. These insights underline the necessity for ongoing evaluation and improvement of the online system to better meet user expectations.

Applicant 12 reported a satisfactory experience with the online system, suggesting that it effectively met their needs during the application process. This positive feedback indicates that certain elements of the system are functioning well, providing users with the support and resources necessary for successful navigation of the application and registration procedures. Such satisfaction may be attributed to the system's user-friendly interface, accessible information, or efficient processing capabilities. However, while this individual's experience reflects positively on the overall functionality of the online platform, it is important to consider this feedback within the broader context of user experiences. Gathering and analyzing diverse user perspectives can help identify both strengths and areas for improvement, ensuring that the system continues to evolve in ways that enhance user satisfaction and engagement.

Applicant 9 reported experiencing challenges during the application process, highlighting a need for significant improvements within the online system. This feedback underscores the necessity for a critical evaluation of the application platform, as difficulties encountered by applicants can lead to frustration and may deter prospective students from completing their applications. Identifying and addressing these challenges is crucial to enhancing the overall user experience and ensuring that the application process is as seamless and intuitive as possible. The insights provided by Applicant 9 serve as an important reminder that ongoing refinement and adaptation of the system are essential for meeting the diverse needs of applicants and fostering a more positive engagement with the university's services.

Applicant 27 provided mixed insights regarding the university's online system, indicating that usability is heavily influenced by both the efficiency of the website and the complexity of the application process. While they reported that immediate challenges were minimal, they did encounter difficulties in obtaining assistance via phone and email, suggesting a gap in support channels that could impede user experience. Additionally, funding issues were noted as a barrier to more effective service delivery. In contrast, the applicant also expressed that the online system was generally easy to navigate and that they faced no challenges during the application process, leading to high overall satisfaction with the online application and registration experience. These

contrasting perspectives highlight the need for the university to enhance its support mechanisms while also maintaining and building upon the strengths of the online system to ensure a consistently positive experience for all users.

Applicant 26 offered a nuanced perspective on the usability of the university's online system, noting that its effectiveness is contingent upon the efficiency of the website and the complexity of the application process. While the applicant did not report immediate challenges, they highlighted difficulties in obtaining assistance via phone and email, which could hinder the user experience. The mention of funding issues suggests underlying resource constraints that may impact the overall quality of support services. In contrast, the applicant also stated that the online system was easy to navigate, with no obstacles encountered during the application process, leading to a high level of overall satisfaction with the online application and registration experience. This dual feedback underscores the importance of addressing support mechanisms while maintaining the user-friendly aspects of the system, thereby ensuring a consistently positive experience for all applicants.

Applicant 25 reported that the online system was cluttered and lacked user-friendliness, suggesting that the current design hinders effective navigation and overall usability. This feedback highlights a critical need for simplification of the platform to enhance the user experience, as a more streamlined interface could facilitate easier access to essential features and resources. Interestingly, the applicant noted that they faced no challenges in obtaining assistance, indicating that support channels may be functioning adequately despite the broader usability concerns. This juxtaposition emphasizes the importance of addressing the structural design of the online system to ensure that it is both accessible and intuitive, ultimately leading to a more satisfactory experience for users.

Applicant 24 expressed dissatisfaction with the online system, highlighting challenges encountered during the application process that negatively impacted their experience. The absence of institutional assistance further exacerbated these difficulties, suggesting a significant gap in support that could lead to frustration among applicants. This feedback underscores the critical importance of not only refining the online system to improve its functionality and user experience but also enhancing support mechanisms to provide timely and effective assistance when needed. Without addressing these concerns, the university risks alienating prospective students and undermining the overall effectiveness of its application process (Applicant 24).

Applicant 23 reported satisfaction with the application process, indicating that their experience with the online system met their expectations and needs. This positive feedback suggests that certain aspects of the application process, such as user interface design, accessibility of information, and overall efficiency, are functioning effectively. The applicant's contentment reflects the potential strengths of the system, highlighting areas where the university has successfully facilitated a smooth and engaging application experience. However, it remains essential for the institution to

continually seek feedback from a diverse range of users to ensure that such positive experiences are not only maintained but also expanded upon to foster an inclusive and user-centered environment for all applicants (Applicant 23).

Applicant 22 noted that their satisfaction with the online system varied significantly, primarily due to its cumbersome nature. While they acknowledged that the processing time for applications was minimized, which is a positive aspect of the system, they expressed frustration over difficulties in locating offered courses. This challenge highlights a critical area for improvement, as the ease of finding relevant course information is essential for a positive user experience. Furthermore, the lack of assistance during the application process suggests a need for enhanced support mechanisms to guide applicants effectively. This feedback underscores the importance of addressing both usability and support issues to create a more streamlined and user-friendly experience for prospective students (Applicant 22).

Applicant 41 reported a positive experience with the online system, describing it as simple and easy to use. Their feedback indicates that the design and functionality of the system effectively facilitated the application process, allowing for a seamless interaction without significant struggles. This satisfaction reflects well on the university's efforts to create an intuitive platform that meets user needs. Such positive experiences are crucial, as they not only enhance applicant engagement but also contribute to a favorable perception of the university as a whole. Continuing to prioritize user-friendly design elements will be essential for maintaining high levels of applicant satisfaction and encouraging prospective students to navigate the system with confidence (Applicant 41).

Applicant 40 expressed satisfaction with the online system, highlighting its simplicity and ease of use as key factors contributing to a positive experience. Their feedback indicates that the design of the system effectively facilitates navigation and engagement, allowing users to complete the application process without encountering significant struggles. This ease of use is critical for fostering a supportive and welcoming environment for prospective students, as it encourages them to interact with the system confidently. Such positive evaluations not only enhance the overall perception of the university but also reflect the institution's commitment to developing user-friendly digital platforms that cater to the needs of applicants (Applicant 40).

Applicant 39 reported a positive experience with the online application process, indicating that it was easy to follow and navigate. Their ability to complete the registration independently after acceptance highlights the system's clarity and user-friendliness, which can significantly enhance applicants' confidence and engagement. Furthermore, the applicant expressed overall satisfaction with the university's online services, suggesting that these services effectively meet user needs and expectations. This feedback underscores the importance of maintaining a streamlined application and registration process, as it not only facilitates a smooth transition for students but also

contributes to a favorable impression of the university's commitment to supporting its applicants (Applicant 39).

Applicant 38 reported that the online application process was both quick and efficient, taking less than an hour to complete. This efficiency highlights the effectiveness of the system in streamlining what can often be a lengthy and cumbersome process. Additionally, the applicant noted that utilizing the online system resulted in cost savings compared to manual applications, indicating a practical advantage that further enhances its appeal. The ease of completing registration online and the clear step-by-step instructions provided by the university's guidelines contributed to a positive user experience. Such feedback underscores the value of a well-designed online application system, as it not only facilitates prompt completion but also supports applicants in navigating the process with confidence and clarity (Applicant 38).

Applicant 36 indicated that the university's online system is user-friendly, enabling applicants to complete their applications conveniently without the need for travel. This accessibility significantly enhances the application experience by allowing users to engage with the system from any location. Additionally, the ability to receive responses online has notably reduced waiting times, further streamlining the process. The applicant reported no challenges during the application process, suggesting that the system is designed effectively to meet user needs. Furthermore, the presence of clear guidance for users enhances usability, ensuring that applicants can navigate the system with confidence. Such positive feedback reflects the university's commitment to creating a supportive and efficient online environment for prospective students (Applicant 36).

Applicant 35 noted that the university's online application system was perceived as helpful, particularly in addressing the specific needs of international students. The availability of assistance for registration issues underscores the institution's commitment to supporting diverse applicant populations. Notably, the presence of an on-site helper to aid in the resending of documents further demonstrates the university's proactive approach to ensuring a smooth application process. Such support is crucial for international students who may encounter unique challenges during registration. This feedback highlights the importance of accessible resources and personalized assistance in enhancing the overall user experience within the online system, fostering a more inclusive environment for all applicants (Applicant 35).

Applicant 34 indicated that the online system was instrumental in facilitating communication throughout the application process, ultimately leading to their acceptance as a student at CPUT. This aspect of the system is particularly significant, as effective communication can enhance applicant engagement and provide clarity during a potentially stressful time. However, the applicant also noted challenges associated with late applications, suggesting that while the system supports communication, it may not adequately address time-sensitive issues. This dual perspective highlights the need for continuous improvement in the online application process, particularly in streamlining late application procedures to ensure that all

prospective students receive equitable support and guidance during their journey (Applicant 34).

Applicant 33 expressed dissatisfaction with the online application system, highlighting a lack of assistance during the application process. This absence of support is concerning, as it can significantly impact applicants' experiences and perceptions of the institution. Additionally, the applicant encountered challenges in locating essential information, which may have contributed to their overall frustration with the system. Such difficulties underscore the importance of enhancing the online application process by identifying specific areas for improvement. By addressing these shortcomings, the university can create a more user-friendly environment that not only facilitates information access but also ensures that applicants feel supported throughout their journey (Applicant 33).

Applicant 32 expressed satisfaction with the online system, noting a positive experience during the application process, particularly while utilizing the Student Online System (SOS) for registration. This indicates that the system was effective in facilitating the submission and processing of required documents, which is a critical aspect of any online application framework. The applicant's contentment suggests that the system successfully met their needs and expectations, contributing to a seamless registration experience. This feedback highlights the significance of efficient document management within online platforms, reinforcing the university's commitment to providing a supportive and user-friendly environment for prospective students (Applicant 32).

Applicant 30 described the online application as user-friendly, indicating that the interface was intuitive and accessible. However, despite this positive aspect, the applicant also expressed that their overall satisfaction with the university's online system was not complete, as their needs and expectations were not fully met. This mixed feedback suggests that while the user experience may be satisfactory in terms of navigation, there are underlying issues that require attention to enhance the system's effectiveness. Identifying and addressing these unmet needs is crucial for the university to improve its online services, ensuring that all prospective students can benefit from a comprehensive and fulfilling application process (Applicant 30).

Applicant 29 expressed dissatisfaction with the online system, highlighting several significant challenges that impacted their experience. A critical issue identified was the limited assistance available during the application process, which compounded difficulties. The applicant noted that system errors and frequent downtime further exacerbated frustrations, undermining the overall functionality of the platform. Additionally, the scattering and confusing nature of the registration modules contributed to a disjointed user experience. This feedback underscores the necessity for the university to address these persistent issues, as a reliable and intuitive online application system is essential for supporting prospective students effectively (Applicant 29).

Applicant 28 reported a lack of satisfaction with the online system, primarily due to frequent outages that interrupted the application process. These technical issues, specifically the system's tendency to go offline, created significant delays in response times, which led to frustration for the applicant. The persistent challenges encountered throughout the application process prompted a preference for the previous system, suggesting that it may have offered a more reliable and efficient experience. This feedback highlights the importance of system reliability and user satisfaction, indicating a need for the university to reassess and enhance its current online application framework to better meet the needs and expectations of prospective students (Applicant 28).

Service Quality

Challenges Experienced During the University Application and Registration Process.

Applicant 21 expressed significant difficulties in locating essential information on the university's webpage, which hindered their ability to navigate the application process effectively. Additionally, they faced challenges in obtaining timely assistance from the institution, further exacerbating their frustration, and leading to a sense of abandonment of the application altogether. This feedback underscores the critical need for improved information accessibility and support mechanisms within the university's online services. Enhancing the clarity of online resources and ensuring prompt assistance could mitigate such challenges, thereby fostering a more user-friendly environment for prospective applicants (Applicant 21).

Applicant 19 highlighted several challenges related to the usability of the online application system, noting that some students abandoned the application process due to the difficulties they encountered. The applicant emphasized that obtaining assistance from the institution was sometimes problematic, which exacerbated the issues faced during the application journey. This feedback points to the need for a more intuitive design and streamlined support services within the online system. By addressing usability concerns and ensuring readily accessible assistance, the university can enhance the applicant experience, potentially reducing abandonment rates and fostering a more supportive environment for prospective students (Applicant 19).

Applicant 18 reported encountering significant difficulties during the application process, ultimately leading to their decision to abandon the application altogether. This experience underscores critical issues within the system that may hinder prospective students from successfully completing their applications. The challenges faced by this applicant indicate a need for the university to assess and improve its online application framework, focusing on enhancing usability and providing adequate support throughout the process. By addressing these barriers, the university can foster a more conducive

environment for applicants, thereby increasing the likelihood of successful completions and enhancing overall student satisfaction (Applicant 18).

Applicant 20 expressed frustration in navigating the university's online resources, highlighting difficulties in locating essential information during the module registration process. The applicant noted a significant lack of institutional assistance, which exacerbated the challenges faced. This situation not only led to individual struggles but also contributed to a broader trend of applicants abandoning the application process altogether due to these hurdles. Such feedback emphasizes the critical need for the university to enhance the accessibility and clarity of information on its online platforms. Improving support mechanisms and ensuring that users can easily find the resources they require are essential steps toward fostering a more user-friendly experience and ultimately increasing applicant retention (Applicant 20).

Applicant 17 reported encountering significant challenges in locating contact information for assistance while navigating the university's online application system. The difficulty in finding essential support resources reflects a broader issue regarding the accessibility of information within digital platforms. This lack of clear guidance not only complicates the application process but may also deter potential applicants from proceeding, as they may feel unsupported during critical stages of their enrollment journey. Addressing these navigational barriers by improving the visibility of contact details and enhancing user interface design could significantly enhance user experience, ultimately fostering greater satisfaction and engagement with the university's online services (Applicant 17).

Applicant 16 highlighted several challenges encountered during the university admission and module registration processes, particularly noting difficulties in navigating the online application system. This experience underscores the need for a more intuitive user interface and streamlined processes that facilitate ease of access for prospective students. The applicant's feedback suggests that specific areas within the online registration framework require improvement to enhance user experience. By addressing these navigational issues and implementing targeted enhancements, the university can better support applicants in their journey, ultimately contributing to higher satisfaction rates and more effective enrollment processes (Applicant 16).

Assistance Received from the Institution Regarding the Online Application and Registration Process

Applicant 20 noted that the institution effectively provided contact details for assistance, ensuring that support was readily available when challenges arose during the registration process. The applicant appreciated the guidance offered on where to seek

help, which reflects a proactive approach by the university to facilitate a smoother application experience. Furthermore, the accessibility of information sources on the university's webpage contributed to the applicant's ability to navigate the online application process more effectively. This feedback highlights the importance of clear communication and resource availability in enhancing user satisfaction and ensuring that prospective students feel supported throughout their journey (Applicant 20).

Applicant 18 highlighted that the institution successfully provided contact details for assistance, which facilitated support for various challenges encountered during the online application process. The availability of assistance reflects the university's commitment to ensuring that students receive the necessary guidance throughout their registration journey. Furthermore, the applicant noted that clear instructions were offered on how to navigate the registration process, enhancing the overall user experience. The accessibility of information sources on the university's webpage further contributed to this supportive environment, enabling applicants to find essential resources with relative ease. This feedback underscores the critical role that effective communication and resource accessibility play in fostering a positive experience for prospective students (Applicant 18).

Applicant 19 indicated that the institution effectively provided contact details for assistance, ensuring that support was readily available to users facing difficulties during the application process. This proactive approach demonstrates the university's commitment to addressing student concerns and fostering a supportive environment for prospective applicants. By offering accessible assistance, the institution not only enhances the user experience but also encourages applicants to seek help when needed, thereby promoting a smoother transition through the registration process. The presence of reliable support systems is crucial in mitigating challenges and enhancing overall satisfaction with the university's online services (Applicant 19).

Applicant 17 noted that the institution effectively provided contact details for assistance, which proved essential in addressing challenges encountered during the online application process. The availability of support underscores the university's commitment to facilitating a user-friendly experience for prospective students. Furthermore, the applicant highlighted that source information was readily accessible on the university webpage, enabling users to navigate the application and registration processes more efficiently. This accessibility not only empowers students to seek help when needed but also fosters an environment of transparency and support, crucial for enhancing user satisfaction and engagement with the university's online services (Applicant 17).

Applicant 16 emphasized that the institution effectively provided contact details for assistance, which played a crucial role in addressing challenges faced during the online application process. The availability of such support reflects the university's commitment to facilitating a smoother transition for prospective students navigating the complexities of digital applications. By ensuring that assistance is readily accessible, the institution

not only enhances user satisfaction but also promotes a more positive and engaging experience for applicants. This proactive approach to support underscores the importance of clear communication channels in fostering an environment conducive to successful enrollment (Applicant 16).

Applicant 15 highlighted that the institution effectively supplied contact details for assistance, which was instrumental in navigating challenges associated with the online application process. This availability of support ensured that users could seek help during registration difficulties, thereby reducing potential barriers to successful enrollment. Such proactive measures reflect the university's commitment to facilitating a user-friendly experience and fostering an environment where applicants feel empowered to address their concerns. The emphasis on accessible assistance not only enhances the overall satisfaction of prospective students but also reinforces the importance of robust support systems in educational settings (Applicant 15).

Applicant 14 reported that the institution provided clear contact details for assistance, which proved beneficial in addressing issues encountered during the online application and registration processes. The availability of support allowed users to navigate challenges more effectively, as they were guided on where to seek help when needed. This proactive approach not only facilitated smoother interactions with the online system but also exemplified the institution's commitment to enhancing user experience through accessible resources and support. Such measures are crucial in fostering a positive and responsive environment for prospective students, thereby reinforcing their confidence in the university's systems and processes (Applicant 14).

Applicant 13 noted that the institution effectively provided contact details for assistance, which played a pivotal role in navigating the online registration process. The availability of support not only enhanced user confidence but also streamlined the experience for applicants facing challenges. Furthermore, the accessibility of information sources on the university webpage contributed significantly to the overall user experience, ensuring that prospective students could find the necessary resources to facilitate their applications. This combination of readily available assistance and comprehensive online resources reflects the institution's commitment to fostering an environment that supports student success and engagement throughout the registration process (Applicant 13).

Applicant 12 highlighted the institution's proactive support regarding online registration inquiries, noting that contact details for assistance were readily available on the university's webpage. This accessibility to support services facilitated a smoother navigation of the online application process, allowing applicants to address their concerns effectively. Furthermore, the guidance provided by the institution was instrumental in enhancing the overall registration experience. The availability of helpful information sources not only equipped applicants with the necessary tools to succeed but also demonstrated the university's commitment to fostering an inclusive and supportive environment for its prospective students. Such initiatives are crucial in enhancing user satisfaction and engagement throughout the registration journey (Applicant 12).

Applicant 11 emphasized the importance of the institution's provision of contact details for assistance, which served as a crucial resource for addressing online application challenges. The availability of support not only alleviated potential frustrations but also encouraged applicants to seek help when needed. Additionally, the accessibility of relevant information on the university's webpage played a significant role in enhancing the overall user experience. By facilitating easier access to guidance and support, the institution demonstrates its commitment to ensuring that prospective students feel supported throughout the application process. This proactive approach is essential for fostering a positive relationship between the university and its applicants, ultimately contributing to higher satisfaction and engagement levels (Applicant 11).

Applicant 28 articulated several challenges encountered during the application process, particularly regarding the accessibility of assistance from the institution. While contact details for support were provided, obtaining timely assistance from the business faculty proved to be a significant obstacle. Delays in responsiveness were exacerbated by the limited availability of the Head of Department, which hindered applicants' ability to receive prompt help. Additionally, the online system was prone to malfunctions, creating further complications during the application process. The cumulative effect of these issues was a prolonged wait for responses, which may have contributed to increased frustration and dissatisfaction among applicants. These reflections underscore the critical need for more efficient support mechanisms and a reliable online system to enhance the overall applicant experience (Applicant 28).

Applicant 29 reported a mixed experience with the registration process, noting that assistance was provided in differentiating between first and second-semester modules, which was beneficial for navigating the system. However, the limited availability of officials to offer support during registration highlighted a significant area of concern. Compounding these challenges were frequent system errors and downtime, which further complicated the registration process and potentially hindered the timely completion of applications. Overall, the applicant emphasized that additional assistance is crucial for ensuring successful registration, suggesting that the institution may need to enhance its support infrastructure to better meet the needs of students during this critical phase (Applicant 29).

Applicant 30 expressed a generally positive experience with the university's online application process, particularly appreciating the assistance provided in differentiating between first and second-semester modules. This guidance was crucial in navigating the complexities of course registration. However, the applicant also noted a limitation in the availability of officials to offer support during the registration period, which could impede students' ability to resolve queries promptly. Despite this, the online application

system was described as user-friendly, suggesting that the platform's design facilitates ease of use for prospective students. Overall, while there were positive aspects to the experience, the need for more accessible support personnel during critical registration times was highlighted as an area for improvement (Applicant 30).

Applicant 31 reported a supportive experience with the university's administration, particularly noting the effective assistance provided by the international office. The availability of contact details on the university website facilitated timely communication, enabling the applicant to navigate the admission process with greater ease. Email communication emerged as a valuable tool for sorting through the complexities of the admission requirements, demonstrating the importance of accessible support channels in higher education. This feedback underscores the critical role that well-organized administrative resources play in enhancing the applicant experience, particularly for international students who may face additional challenges (Applicant 31).

Applicant 32 reported a positive experience with the administration at the university, particularly appreciating the support received from the international office. The availability of contact details on the university's website facilitated efficient communication, which proved essential in navigating the complexities of the admission process. Utilizing email for correspondence allowed for clear and organized discussions regarding admission requirements, thereby enhancing the applicant's understanding and engagement. This experience illustrates the significance of accessible administrative support and effective communication channels in fostering a smooth transition for students, particularly those from international backgrounds (Applicant 32).

Applicant 33 expressed dissatisfaction with the support provided during the application process, highlighting the absence of institutional assistance. This lack of support led to significant challenges in navigating the application, which could hinder prospective students' experiences and outcomes. Furthermore, the unavailability of contact details for seeking help exacerbated the difficulties faced, suggesting a critical gap in the university's communication strategy. This feedback underscores the importance of having accessible support systems and clear channels for assistance, which are essential for ensuring a positive user experience in the application process (Applicant 33).

Applicant 34 reported a positive experience throughout the application process, underscoring the importance of accessible support channels. Assistance was effectively provided via a phone call from Xolelwa, highlighting the utility of direct communication in navigating registration challenges. Additionally, contact numbers included on proof of registration facilitated further support, while information obtained through social media

platforms enriched the applicant's understanding of the process. Moreover, the applicant sought help from a sibling, indicating the role of informal support networks in enhancing the application experience. Ultimately, this applicant successfully transitioned into being a CPUT student, demonstrating how effective communication and support mechanisms can significantly impact prospective students' journeys (Applicant 34).

Applicant 35 benefited from the support of an on-site helper who provided crucial assistance with the resending of documents during the application process. This experience highlights the importance of having accessible, in-person support systems in place to facilitate the often complex and multifaceted nature of university admissions. The availability of such assistance not only alleviates potential stressors for applicants but also enhances the overall efficiency of the application process. By ensuring that applicants receive the necessary support when challenges arise, universities can improve their service delivery and contribute to a more positive enrollment experience for prospective students (Applicant 35).

Applicant 36 reported that while no direct assistance was received during the online registration process, the university webpage offered essential contact details and guidelines for navigating online applications. This highlights the institution's effort to provide accessible resources for prospective students, ensuring they have the necessary information at their fingertips. Despite the lack of personal assistance, the applicant found the system to be easy to navigate, indicating that the design of the online application platform effectively facilitated user engagement. This experience underscores the importance of well-structured online resources in supporting students throughout the registration process, ultimately contributing to a smoother transition into university life (Applicant 36).

Applicant 38 expressed a positive experience with the institution's online registration process, noting that contact details for assistance were readily available. This accessibility facilitated support in navigating the application, with comprehensive guidelines offered for step-by-step navigation. The applicant highlighted the cost-saving advantage of the online application, which was provided free of charge, thereby reducing financial barriers associated with traditional application methods. Furthermore, the registration process was described as quick and easy, reflecting the efficiency of the online system. Such feedback underscores the importance of user-friendly platforms in enhancing the overall student experience and facilitating seamless transitions into university life (Applicant 38).

Applicant 39 reported a favorable experience with the institution's online registration system, emphasizing the effective provision of assistance throughout the process. Contact details for support were readily accessible on the university's webpage, ensuring that students could easily obtain the help they needed. The applicant described the registration process as straightforward and easy to follow, which is crucial for minimizing barriers to entry for prospective students. Additionally, the university's

prompt responses to student inquiries were noted, highlighting a commitment to maintaining open lines of communication and addressing concerns efficiently. This positive feedback suggests that the institution's approach to online registration fosters a supportive and responsive environment for students (Applicant 39).

Applicant 40 expressed a positive experience with the registration process at the institution, noting that contact details for assistance were conveniently available on the Cape Peninsula University of Technology (CPUT) website. This accessibility is vital for ensuring that students can seek help when needed. The applicant characterized the registration process as straightforward and easy to navigate, which is essential for enhancing user experience and minimizing potential barriers during the application phase. Importantly, they reported facing no significant challenges throughout the application process, suggesting that the university's systems are effectively designed to meet user needs and expectations (Applicant 40).

Applicant 41 reported a smooth and efficient experience with the registration process at the institution. They noted that contact details for assistance were readily available on the Cape Peninsula University of Technology (CPUT) website, which is critical for ensuring support is accessible to applicants. The registration process itself was described as straightforward and easy to navigate, reflecting positively on the user-friendly design of the system. Importantly, the applicant did not encounter any significant challenges during the application process, indicating that the online system met their expectations and contributed to a seamless application experience (Applicant 41)

Applicant 22 expressed dissatisfaction with the lack of support during the online registration process, indicating that no assistance was received from the institution. The applicant had to navigate the process independently, which suggests a gap in the university's provision of guidance for users. Moreover, no online assistance was available to help clarify or address challenges encountered, further complicating the registration experience. This highlights the need for more accessible and responsive support systems to ensure a smoother and more user-friendly application and registration process for students (Applicant 22).

Applicant 23 reported a lack of institutional support during the application process, stating that no assistance was received. Despite sending emails to seek help, the applicant did not receive any acknowledgment or response from the institution. This lack of communication contributed to a negative experience, highlighting a critical need for improved responsiveness and support mechanisms within the university's online system. Ensuring timely responses and adequate assistance would significantly enhance the user experience and promote a more supportive environment for prospective students (Applicant 23).

Applicant 24 indicated that no assistance was provided by the institution during the application process. Consequently, the applicant was compelled to navigate the system

and resolve any challenges independently. This self-reliant approach underscores the absence of adequate support from the institution, emphasizing the need for improved guidance and readily available assistance for users of the online system. Strengthening institutional support could significantly enhance the overall application experience for prospective students (Applicant 24).

Applicant 25 reported that the institution recommended using a different browser to complete the online application, which resolved any initial difficulties encountered. Additionally, the applicant noted that there were no challenges in obtaining assistance during the process. This suggests that the institution provided timely and effective support, contributing to a smoother application experience. Such proactive guidance is crucial in ensuring that applicants can navigate technical issues with ease, reflecting positively on the institution's responsiveness and support systems (Applicant 25).

Applicant 26 indicated that the assistance provided by the institution was helpful and easy to navigate, facilitating a smooth registration process. The applicant reported no challenges during registration, attributing the ease of the process to the quality of the university's information sources. These resources were deemed beneficial in guiding the online application experience, highlighting the effectiveness of the university's support systems in addressing user needs. This feedback underscores the importance of accessible and reliable information in promoting a seamless application process (Applicant 26).

Applicant 27 reported challenges in obtaining assistance from the institution, particularly noting difficulties in reaching support via phone. Email responses were also delayed, leading to frustrations during the process. The applicant emphasized the need for more interpersonal assistance, suggesting that direct, timely support would significantly improve the overall experience. This feedback highlights the importance of efficient communication channels and personalized support in enhancing user satisfaction during the online application process (Applicant 27).

Applicant 4 indicated that the institution provided contact details for assistance, with support being readily available via phone. Additionally, the university's webpage offered source information, serving as a useful guide throughout the process. This structured access to assistance and information reflects the institution's efforts to ensure that applicants are supported, though it may also imply reliance on self-navigation tools. Overall, the feedback underscores the importance of clear communication and accessible resources for enhancing the user experience during online applications (Applicant 4).

Applicant 2 indicated that the institution provided clear contact details for assistance, ensuring students were well-guided on where to seek help throughout the process. Assistance was readily available for navigating the registration process, which facilitated a smoother experience for applicants. This suggests that the institution has implemented effective support mechanisms, which are crucial for improving user

satisfaction and enabling students to successfully navigate the complexities of online registration (Applicant 2).

Applicant 5 noted that the institution effectively provided contact details for assistance, ensuring that support was readily available for online application challenges. This proactive approach to guidance facilitated the user's navigation of the registration system, thereby enhancing their overall experience. By offering structured assistance, the institution demonstrates a commitment to supporting prospective students throughout the application process, which is crucial for fostering a user-friendly environment (Applicant 5).

Applicant 6 indicated that the institution effectively provided contact details for assistance, facilitating access to support when needed. Additionally, the applicant evaluated the information sources available during the process, reflecting on their helpfulness in navigating the application journey. This proactive dissemination of information underscores the institution's commitment to ensuring that prospective students can readily obtain the guidance necessary for a successful application experience (Applicant 6).

Applicant 7 noted that the institution provided comprehensive contact details for assistance, which proved invaluable in addressing challenges encountered during the online application process. The availability of support specifically for module registration issues highlights the institution's commitment to facilitating a smooth transition for prospective students. This proactive approach in offering guidance not only enhances user experience but also fosters confidence among applicants as they navigate the complexities of the registration process (Applicant 7).

Applicant 8 reported that the institution effectively provided contact details for assistance, enabling users to seek help when needed. In addition to institutional support, the applicant benefited from guidance provided by senior peers, which illustrates the importance of community and mentorship in the academic environment. This collaborative approach facilitated navigation through the online system, highlighting the institution's commitment to creating a supportive network for students as they adapt to new processes and technologies (Applicant 8).

Applicant 10 noted that the institution proactively provided contact details for assistance, which proved beneficial for students encountering challenges during the online application process. This availability of support allowed users to report difficulties encountered during registration, fostering an environment where concerns could be communicated effectively. Furthermore, the institution's initiative to collect feedback on usability from students underscores its commitment to continuous improvement and responsiveness to user needs. This practice not only enhances the overall user experience but also reflects a broader institutional ethos dedicated to ensuring that the online application process is accessible and user-friendly (Applicant 10).

Exploring Source Information on the University Webpage to Support Your Academic Journey.

Applicant 21 noted that the institution took significant steps to facilitate student support by providing comprehensive contact details for assistance. This provision enabled students to access help when encountering challenges during the online application process, which is crucial for a smooth transition into university life. The availability of assistance reflects the institution's commitment to fostering an accessible and user-friendly environment, thereby enhancing the overall applicant experience. By ensuring that students can easily obtain guidance when needed, the institution not only addresses potential barriers but also encourages a proactive approach to problem-solving among prospective students (Applicant 21).

Applicant 19 emphasized the institution's proactive approach in facilitating student support by providing readily accessible contact details for assistance. This provision proved invaluable when users faced difficulties during their engagement with the application process. The availability of such assistance not only underscores the institution's commitment to addressing student concerns but also highlights the importance of a supportive environment in enhancing the overall applicant experience. By ensuring that help is within reach, the institution fosters a sense of confidence among prospective students, enabling them to navigate challenges more effectively and ultimately contributing to a smoother transition into their academic journey (Applicant 19).

Applicant 18 highlighted the significance of the university webpage as a critical resource for prospective students, particularly in relation to the registration process. The webpage not only offers essential information regarding registration but also includes comprehensive guidelines for online admission applications, thereby enhancing the clarity and accessibility of the application process. Furthermore, the provision of contact details for assistance ensures that users can seek help when needed, fostering a supportive environment that encourages student engagement. This multifaceted approach underscores the university's commitment to facilitating a smooth transition for applicants, thereby reflecting an understanding of the challenges faced during the admission process and addressing them through effective informational resources (Applicant 18).

Applicant 17 noted the institution's proactive approach in providing contact details for assistance, which is crucial for addressing challenges encountered during the online application process. The availability of support reflects a commitment to facilitating a user-friendly experience for prospective students. Additionally, the accessibility of source

information on the university webpage enhances the overall navigation and usability of the online application system. This dual provision of direct assistance and readily available resources underscores the institution's dedication to ensuring that applicants feel supported and informed throughout their registration journey, thereby promoting a smoother transition into the academic environment (Applicant 17).

Applicant 16 highlighted the institution's provision of contact details for assistance, which plays a pivotal role in supporting students navigating online application challenges. This initiative not only facilitates access to necessary help but also demonstrates the institution's commitment to addressing the needs of prospective students during a potentially stressful process. The availability of such assistance reflects an understanding of the complexities associated with online applications, thereby fostering a more inclusive and supportive environment. By ensuring that students can readily seek help, the institution enhances the overall user experience, ultimately contributing to a smoother transition into academic life (Applicant 16).

Applicant 9 noted that the university webpage served as a valuable resource, providing essential information that facilitated the online registration process for students. The accessibility of necessary information is critical in helping applicants navigate the complexities often associated with registration. Moreover, the availability of assistance further enhances the user experience, ensuring that students can effectively address any challenges they encounter. This dual approach of offering comprehensive online resources and direct support demonstrates the institution's commitment to fostering a supportive academic environment and empowering students to engage with the registration process confidently (Applicant 9).

Applicant 15 noted that the institution demonstrated a proactive approach by providing clear contact details for assistance, which facilitated support for applicants encountering challenges during the online application process. This accessibility to assistance is crucial, as it empowers students to seek help effectively when navigating registration difficulties. Such provisions not only enhance the overall user experience but also reflect the institution's commitment to fostering a supportive environment for prospective students. By ensuring that applicants have the resources they need to overcome obstacles, the institution affirms its dedication to facilitating a smooth transition into academic life .

Applicant 14 noted that the institution took significant steps to enhance the application experience by providing accessible contact details for assistance. This proactive approach ensured that support was readily available for issues related to online applications and registration, which are critical components of the enrollment process. Furthermore, the applicant appreciated the guidance offered in navigating the available resources, indicating that such support systems are vital for fostering a user-friendly environment. This level of institutional responsiveness not only aids applicants in overcoming challenges but also contributes to a more positive overall experience during their transition to university life. The availability of assistance underscores the institution's commitment to supporting prospective students in their academic journey (Applicant 14).

Applicant 12 observed that while the university webpage offered essential source information for the registration process, there were notable challenges in locating specific registration details. Although assistance was available to help navigate the registration system, the applicant's experience highlights potential gaps in the clarity and accessibility of the information provided. Such challenges may hinder the overall effectiveness of the registration process and indicate a need for the university to enhance the visibility and organization of critical information. By improving these aspects, the institution could further support prospective students in successfully completing their registration, ultimately fostering a more user-friendly environment (Applicant 12).

Applicant 18 noted that the university webpage serves as a vital resource by providing essential registration information and comprehensive guidelines for online admission applications. This accessibility is crucial for prospective students, as it facilitates their understanding of the application process and ensures that they can navigate it effectively. Furthermore, the inclusion of contact details for assistance enhances user experience, allowing students to seek help when needed. This thoughtful organization of information not only demonstrates the university's commitment to supporting its applicants but also fosters a more efficient and user-friendly environment, ultimately contributing to a positive admission experience (Applicant 18).

Applicant 6 highlighted that the university webpage serves as an essential resource for registration assistance, effectively guiding students in their pursuit of information. By encouraging students to locate contact details for help, the institution demonstrates its commitment to fostering a supportive environment for prospective applicants. The availability of comprehensive information sources regarding online applications on the webpage further enhances accessibility and empowers students to navigate the application process with confidence. This emphasis on clear communication and readily available resources reflects the university's dedication to facilitating a smooth registration experience for all students (Applicant 6).

Applicant 8 indicated that the university webpage was instrumental in providing essential source information necessary for the registration process. The accessibility of this information enabled users to effectively navigate the system to seek assistance when needed. Furthermore, the availability of resources specifically aimed at aiding online admission applications reflects the institution's commitment to supporting prospective students. By offering clear and comprehensive guidance, the university enhances the overall user experience, facilitating a more efficient and informed application process for applicants (Applicant 8).

Usage

Perspectives on the Usability of the University System for Online Admission Applications and Module Registration

Applicant 17 highlighted critical areas for enhancement in the university's online application system, specifically emphasizing the need for improved usability. The applicant experienced significant difficulties during the online application process, which hindered their ability to navigate the system effectively. Furthermore, obtaining assistance from the institution proved to be a challenge, as contact details for support were not readily accessible. This lack of clarity regarding available resources not only exacerbated the applicant's difficulties but also reflects a broader issue regarding the need for institutions to streamline communication and support mechanisms to facilitate a more user-friendly experience for prospective students.

Applicant 19 encountered notable challenges during the registration process, highlighting the difficulties in obtaining assistance from the institution when needed. This situation underscores a critical aspect of user experience, as effective support is essential for navigating complex registration systems. The intermittent availability of assistance may have contributed to the applicant's frustrations, suggesting that the institution should evaluate its support mechanisms to ensure they are accessible and responsive to students' needs. By addressing these challenges, the institution can enhance the registration experience, thereby promoting greater satisfaction and successful outcomes for prospective students.

Applicant 18 highlighted several usability issues within the university's online admission system, particularly regarding navigation during the registration process. Users encountered challenges in accessing necessary guidelines and finding adequate information to assist with their applications. This lack of comprehensive support led to varying levels of satisfaction among applicants. Many felt that their needs were not fully addressed by the current system, emphasizing the need for more robust and user-friendly features. Overall, the system's limitations in meeting users' expectations point to the importance of improving both its navigability and the accessibility of information resources.

Effectiveness of University Information Sources on Online Applications and Registrations: Areas for Improvement

The responses from various applicants reveal a range of experiences with the usability and effectiveness of the university's online information sources. Applicant 21 expressed dissatisfaction, highlighting that the online services were not user-friendly and that institutional assistance was difficult to access. This applicant struggled to find the necessary information, leading to unmet needs and expectations. In contrast, Applicant 18 reported a positive experience, noting that the university's information sources were helpful, and the online registration process met their expectations. Similarly, Applicant 16 found the guidance for online applications to be beneficial, contributing to a positive overall experience. On the other hand, Applicant 15 shared concerns about the usability of the university's online systems, indicating that navigating these services was not intuitive, and institutional support was a challenge to obtain. Applicant 13 also questioned the reliability of the information sources, mentioning difficulties in finding accurate or helpful resources. Lastly, Applicant 12 encountered significant challenges during the application process, finding the university's information sources to be unhelpful and institutional assistance hard to access. Collectively, these responses suggest variability in student experiences with the university's e-services, with some finding them beneficial, while others faced notable obstacles in usability and support.

The experiences shared by the applicants reveal a diverse range of interactions with the university's information sources and support services. Applicant 8 expressed concerns about the reliability of these sources, citing challenges during the application process and the need for institutional assistance with online registration. However, they did find the availability of information on the university webpage to be helpful. Applicant 9 had a more positive experience, reporting that the guidance provided for managing the system was useful and the information sources were helpful overall. In contrast, Applicant 10 found the usability of the university system to be unreliable. Similarly, Applicant 24 experienced difficulties, receiving no assistance during the registration process and facing challenges in finding helpful information, ultimately having to navigate the process independently. Applicant 25 had a mixed experience, acknowledging that while the university webpage provided some useful information, the support was only partially helpful. On the other hand, Applicant 26 reported a smooth process, finding the information sources helpful and assistance easily accessible, with no challenges encountered. Applicant 4 also found the information sources useful, particularly appreciating the availability of contact details and support through the university's webpage. Finally, Applicant 3 highlighted areas for improvement in the online application and registration processes, suggesting that while there are helpful aspects, there is room for enhancement. These varying experiences underscore the importance of ensuring consistency in the usability and reliability of university e-services to meet the needs of all applicants.

The experiences of applicants highlight varied interactions with the university's online systems and support services, reflecting both positive and challenging aspects. Applicant 23 expressed frustration with the lack of institutional support, noting that emails went unanswered and the university webpage lacked sufficient information. Although the online application was user-friendly, their needs and expectations were not fully met. The applicant suggested improvements, such as clearer indication of program modules and fees, as well as better navigation and accessibility. Similarly, Applicant 22 found the system cumbersome when trying to locate program offerings and received no assistance during the process, ultimately navigating it independently. Despite these issues, the faster processing time for applications was appreciated, though overall satisfaction was mixed.

Conversely, Applicants 41 and 40 had positive experiences, reporting that the university's information sources were helpful during registration. Contact details were easily accessible, and the registration process was straightforward and user-friendly. Applicant 39 also had a smooth experience, finding the registration process efficient and the system easy to follow, with timely responses from the university. However, they suggested that the system could benefit from updates to improve functionality. Applicant 38 praised the detailed guidelines provided by the university, emphasizing that following the step-by-step instructions was crucial for avoiding mistakes during the application process.

Several other applicants shared similarly positive feedback. Applicant 36 noted that the accessible online guidelines reduced the need for physical visits to the university, making the process more convenient. Applicant 35 found the university's information sources helpful, while Applicant 34 highlighted that the support received facilitated a successful registration. However, not all experiences were positive—Applicant 33 reported difficulties navigating the online application process, finding the information sources unhelpful.

These diverse responses reflect the importance of ensuring both accessibility and responsiveness in university e-services, as applicants experience differing levels of ease and support based on the current system's usability and the availability of assistance.

The applicants' experiences reflect a range of interactions with the university's information sources and support systems, highlighting both strengths and areas for improvement. Applicant 32 reported that the university's information sources were helpful, with assistance readily available through the website, and contact details for further help were easily accessible online. Similarly, Applicant 31 found the information sources helpful, with source information available on the university webpage and assistance provided via email during the admission process.

Applicant 30 had a mixed experience, finding the online application user-friendly but noting that assistance from officials was limited. As a result, the registration process became lengthy without support, and the lack of clear information on modules and fees left some needs and expectations unmet. Applicant 29 also found the university's information sources helpful, but noted that navigating the system effectively required assistance; without it, the process became challenging.

Applicant 28 shared a similar view, indicating that the information sources were helpful but expressing frustration with occasional system failures that impacted the user experience. Applicant 27, while appreciating the simplicity of the website for course selection, found it difficult to obtain institutional assistance and suggested that more interpersonal support would enhance the overall experience, despite not encountering major challenges during the application process.

These reflections underscore the importance of accessible information and timely assistance in ensuring a smoother experience for students, while also suggesting that improvements in system reliability and more personalized support could better meet applicants' needs.

Evaluation of the Alignment Between Student Needs and Expectations and University Online Services

Net Benefit

Participant 21 reported a generally satisfactory experience with the university's online services, noting that their needs and expectations were largely met. The participant found the information necessary for completing applications to be accessible, which contributed positively to their overall experience. However, they did encounter some challenges during the application process, highlighting areas where improvements could enhance the online service offerings. This feedback underscores the importance of continually refining online systems to better support users, ensuring that while many needs are met, specific challenges are addressed to improve the overall efficiency and effectiveness of the application process.

Participant 18 expressed that their needs and expectations were not fully met during the application process, highlighting several challenges encountered along the way. The participant specifically noted usability issues with the online system, which impacted their overall experience. This sentiment was echoed by Participant 17, who similarly found the university's online services to be not user-friendly, indicating that their own needs and expectations regarding these services remained unfulfilled. Both participants' experiences suggest a broader concern regarding the usability of the university's online systems, pointing to a need for improvements that could enhance user satisfaction and streamline the application process for all users. The variability in satisfaction levels among users further underscores the importance of addressing these issues to create a more effective and accessible online experience for prospective students.

Participant 16 expressed that their needs and expectations were not fully met during the application process, citing challenges that made the experience less smooth. They identified several areas in need of improvement, particularly regarding the online application and registration processes, noting that the university's system lacked user-friendliness. Similarly, Participant 15 reported difficulties with the usability of the online system, which created obstacles during their application, leading to unmet expectations. Participant 14 also reflected on their experience with varying levels of satisfaction, highlighting specific areas where services could be enhanced. Collectively, these insights point to a recurring theme of usability issues within the university's online systems and underscore the importance of targeted improvements to better meet user needs and expectations.

Participant 26 reported a satisfactory experience, noting that their needs and expectations were fully met without any significant challenges. Assistance from friends played a key role in simplifying the process, while the university's information sources proved helpful for navigating the online application system. In contrast, Participant 31, while satisfied with the support provided by the SOS system and CPUT officials, experienced delays in the application process due to administrative errors. Participant 9 expressed mixed satisfaction with the online services, indicating that while some aspects were adequate, their needs were not entirely fulfilled, and challenges arose during both the application and registration processes. Participant 28 had a more negative experience, with unmet needs and expectations, particularly due to significant delays in application responses and frequent outages of the online system. The lack of adequate institutional assistance further compounded the difficulties they faced. These varied experiences highlight the importance of reliable support and system stability in ensuring a smoother and more responsive application process.

Participant 29 expressed that their needs and expectations were not fully met, particularly due to the limited assistance available, which negatively impacted their satisfaction with the online system. The system's usability posed significant challenges, especially for rural students, and assistance from university officials was necessary to navigate the process effectively. Similarly, Participant 25 found the platform cluttered and not user-friendly, suggesting that the entire application process requires simplification. Although assistance was available, it was not easily accessible.

Participant 23 also reported that their needs and expectations were not entirely met, while Participant 33 experienced considerable difficulties during the application process. They noted a lack of institutional support and found the university's information sources unhelpful for online applications. In contrast, Participant 36 had a positive experience, with their needs and expectations met. They successfully navigated the system with ease, aided by information provided by their high school teachers. These varying experiences reflect the importance of improving system usability and ensuring that assistance is readily available, especially for students who may face additional barriers, such as those from rural areas.

Participant 32 reported that their needs were adequately met through the SOS system, with valuable information provided by CPUT officials and friends. However, the application process was delayed due to administrative errors, which impacted the overall experience. In contrast, Participant 30 indicated that their needs and expectations were not entirely met, reflecting some dissatisfaction with the process.

Participant 34 shared that while their needs were partially met, late application challenges created difficulties. Institutional assistance was helpful, and communication via the internet played a key role in supporting the application process. However, full satisfaction with the online system was not achieved. Similarly, Participant 24 expressed that their needs and expectations were not fully met. They faced significant challenges during the application process and received no institutional assistance, forcing them to navigate the system independently. These reflections highlight the importance of timely support, clear communication, and addressing administrative inefficiencies to improve the overall user experience.

Participant 38 expressed satisfaction with the application process, which was completed in less than an hour due to thorough preparation of required documents. Course eligibility was confirmed during the process, but a significant concern was the waiting period for responses from the university. In contrast, Participant 35 encountered challenges, particularly with communication issues when submitting required documents via email. Although on-site assistance was provided, international student registration faced considerable obstacles, indicating a need for improvement.

Participant 39, however, had a smooth experience, finding the registration process easy to follow. The participant appreciated the quick responses from the university and noted that personal research helped in selecting courses. Participant 27 emphasized that usability depended on the efficiency of the website and the complexity of the application process. They faced difficulty in obtaining assistance via phone or email and stressed the need for more interpersonal support. Additionally, funding challenges complicated their application experience.

Lastly, Participant 22 reported that while the time for processing applications was satisfactory, their needs were only partially met. The system was cumbersome to navigate, particularly for course selection, and no assistance was available when challenges arose. These diverse experiences underscore the importance of enhancing communication, offering more personalized support, and ensuring efficient system usability to better meet applicants' needs.

Participant 40 expressed that their needs and expectations were satisfactorily met, noting that the system was simple to use and did not present any significant challenges. Assistance was available if needed, though the participant did not encounter major issues. Similarly, Participant 41 reported a smooth experience, with the system being easy to navigate and no notable difficulties during the process. Assistance was readily accessible through the university's website, further enhancing their satisfaction.

Participant 12 also indicated that their needs and expectations were met, expressing overall satisfaction with the usability of the online system. The necessary information for applications was generally accessible, although some challenges were encountered during the application process. These accounts highlight the value of a straightforward and user-friendly system, coupled with readily available support, in ensuring a positive experience for applicants.

Appendix 4: Research Analysis Summary

Model	Research question 1	Participant	Responses from Interviewees	
			Main study question: Question: 1 What are the expectations of first-time entering students regarding academic and non-academic e-services provided to support their application and registration? (What are the key characteristics of the institutional self-help online service?)	
System Quality-	Were you satisfied with the university's online system for application and registration?	Applicant 21	• Applicant 21 indicated that the satisfaction level with the online system is unclear and that there were specific challenges during application and registration.	
		Applicant 12	• indicated that they were satisfaction with the online system.	
		Applicant 9	• indicated they had challenges with the application process and that improvement is required.	
		Applicant 8	• had issues with the usability of the system. •	
		Applicant 27	• indicated that the usability depended on website efficiency and application complexity. Additionally, Assistance was hard to obtain via phone and email. There were no immediate challenges, only	

Model	Research question 1	Participant	Responses from Interviewees	
		Applicant 26	funding issues. More interpersonal assistance was suggested for improvement. • indicated that the university's online system was easy to navigate. There were no challenges during the application process. Overall satisfaction with the online application and registration was high. •	
		Applicant 25	• indicated that the online system was cluttered and not user-friendly. The platform needs simplification for better usability. No challenges were faced in obtaining assistance.	
		Applicant 24	• indicated that they were dissatisfied with the system, and they experienced challenges during the application process. No assistance was received from the institution. •	
		Applicant 23	• was satisfied with the application process. •	
		Applicant 22	• indicated that satisfaction varied. The system was cumbersome. Processing time for applications was minimized. There were difficulties in locating offered courses. No assistance was received during the process.	
		Applicant 41	• indicated that the system was simple and easy to use. There were no significant struggles during the process. •	

Model	Research question 1	Participant	Responses from Interviewees		
		Applicant 40	• indicated that they were satisfied with the online system. The system was simple		
			• and easy to use. There were no significant struggles during the process.		
		Applicant 39	• indicated that the online application process was easy to follow. Registration was completed without assistance after		

Model	Research question 1	Participant	Responses from Interviewees		
			• acceptance. Overall satisfaction with the university's online services was expressed.		
		Applicant 38	• indicated that the online application was quick and efficient. It took less than an hour to complete the application. The online system saved money compared to manual applications. Registration was also easy and completed online. University guidelines provided clear step-by-step instructions.		
		Applicant 36	• indicated that the university's online system is easy to use. Applications can be completed without traveling. Responses are received online, reducing waiting time. No challenges were experienced during the application process. The system provides clear guidance for users.		
		Applicant 35	• indicated that the university's online application system was found helpful. • Assistance was available for international student registration issues. An on-site helper provided support for document resending.		
		Applicant 34	• indicated that the online system was helpful for communication. The process led to becoming a CPUT student.		

Model	Research question 1	Participant	Responses from Interviewees		
			• There were challenges with late applications. •		
		Applicant 33	• indicated that they were dissatisfied with the online system. No assistance was received during the application process. Challenges were experienced in finding necessary information. Improvement areas were identified for the online application process.		
		Applicant 32	• indicated that they were satisfied with the online system. They applied through the SOS for registration. Required documents were submitted and processed. •		
		Applicant 30	• indicated that they found the online application user friendly. • Satisfaction with the university's online system was not complete. Needs and expectations were not entirely met. •		
		Applicant 29	• indicated that they were not satisfied with the online system. Limited assistance was a significant issue. System errors and downtime were frequent problems. Modules for registration were scattered and confusing. •		

Model	Research question 1	Participant	Responses from Interviewees		
		Applicant 28	• indicated that satisfaction with the online system was not achieved. The system often went offline during applications. Delays in responses caused frustration during the application process. Preference for the old system was expressed. •		
Service Quality	What challenges did you experience during the application process for university registration?	Applicant 21	indicated that there was difficulty in finding necessary information on the university webpage. Challenges in receiving timely assistance from the institution. Abandonment of the application process due to encountered challenges.		
		Applicant 19	• indicated that there were challenges in usability of the online application system. some students abandoned the process due to difficulties encountered. Assistance from the institution was sometimes hard to obtain.		
		Applicant 18	indicated that they experienced difficulties during the application process. The applicant abandoned the process due to challenges faced.		

Model	Research question 1	Participant	Responses from Interviewees		
		Applicant 20	• indicated that they faced difficulties in finding necessary information online. Challenges arose during the module registration process. Lack of assistance from the institution was noted. Some users abandoned the application due to challenges encountered.		
		Applicant 17	• indicated they experienced difficulties in finding contact details for assistance. Challenges in navigating the online application system.		
		Applicant 16	• indicated that there were challenges faced during university admission and module registration. There were difficulties in navigating the online application process. It was indicated that there are areas needing improvement in online registration.		
Service Quality	What assistance did you receive from the institution regarding the online application and registration process?	Applicant 20	• Indicated that institution provided contact details for assistance. Assistance was available when challenges arose during registration. Students were guided on where to seek help.		

Model	Research question 1	Participant	Responses from Interviewees		
		Applicant 18	• Indicated that institution provided contact details for assistance. Assistance was available for online application challenges. Guidance was offered on navigating the registration process. Information sources were accessible on the university webpage.		
	•	Applicant 19	• Indicated that institution provided contact details for assistance. Assistance was available when users encountered difficulties.		
	•	Applicant 17	• Indicated that the institution provided contact details for assistance.		

Model	Research question 1	Participant	Responses from Interviewees		
			• Assistance was available for online application challenges. • Source information was accessible on the university webpage.		
	•	Applicant 16	• Indicated that the institution provided contact details for assistance. Assistance was available for online application challenges.		
	•	Applicant 15	• Indicated that the institution provided contact details for assistance. Assistance was available for online application challenges. The user could seek help during registration difficulties.		
	•	Applicant 14	• Indicated that the institution provided contact details for assistance. Assistance was available for online application and registration issues. The user was guided on where to seek help.		
	•	Applicant 13	• Indicated that the institution provided contact details for assistance. Assistance was available for navigating the online registration process. Information sources on the university webpage were accessible.		
	•	Applicant 12	• Indicated that the institution helped with online registration inquiries. Contact details		

Model	Research question 1	Participant	Responses from Interviewees		
			for support were available on the university webpage. Guidance on navigating the online application process was offered. Information sources were helpful for the registration journey.		
	•	Applicant 11	• Indicated that the institution provided contact details for assistance. Assistance was available for online application challenges. Information was accessible on the university webpage.		
	•	Applicant 10	• Indicated that the institution provided contact details for assistance. Assistance was available for online application challenges. The user could report difficulties during the registration process. Feedback on usability was collected from students.		
	•	Applicant 8	• Indicated that the institution provided contact details for assistance. The user received guidance from senior peers. Assistance was available for navigating the online system. •		
	•	Applicant 7	• Indicated that institution provided contact details for assistance. Support was available for online application challenges. Guidance was offered for module registration issues. •		

Model	Research question 1	Participant	Responses from Interviewees		
	•	Applicant 6	• Indicated that the institution provided contact details for assistance. Information sources were evaluated for helpfulness during the process. •		
	•	Applicant 5	• The institution provided contact details for assistance. Assistance was available for online application challenges. The user was guided on navigating the registration system. •		
	•	Applicant 3	• The institution provided contact details for assistance. Assistance was available via phone for inquiries. Information was accessible on the university webpage. •		
	•	Applicant 2	• The institution provided contact details for assistance. • Students were guided on where to seek help. • Assistance was available for navigating the registration process. •		
	•	Applicant 4	• The institution provided contact details for assistance. • Assistance was available through phone support. • University webpage offered source information for guidance. •		

Model	Research question 1	Participant	Responses from Interviewees		
	•	Applicant 27	• Assistance was difficult to obtain from the institution. • Contacting them via phone was challenging. • Email responses took considerable time. • More interpersonal assistance was suggested for improvement.		
	•	Applicant 26	• The assistance received was helpful and easy to navigate. • No challenges were encountered during the registration process. • The university's information sources were beneficial for online applications. •		
	•	Applicant 25	• The institution advised using a different browser for application completion. • No challenges were faced in receiving assistance.		
	•	Applicant 24	• No assistance was received from the institution. • The use had to figure it out independently. •		
	•	Applicant 23	• No assistance was received from the institution. • Emails sent were not acknowledged. • There were no responses from the institution. •		

Model	Research question 1	Participant	Responses from Interviewees		
	•	Applicant 22	• No assistance received during the online registration process. • Had to figure out the process independently. • No online assistance was available. •		
	•	Applicant 41	• Contact details for assistance are available on the CPUT website. • The registration process was straightforward and easy to navigate. • No significant challenges were faced during the application process.		
	•	Applicant 40	• Contact details for assistance were available on the CPUT website. • The registration process was straightforward and easy to navigate. • No significant challenges were faced during the application process. •		
	•	Applicant 39	• The institution provided assistance through their online system. • Contact details for assistance were available on the university webpage. • The registration process was described as easy to follow.		

Model	Research question 1	Participant	Responses from Interviewees		
			• The university responded quickly to student inquiries. •		
	•	Applicant 38	• The institution provided contact details for assistance. • Assistance was available for navigating the online registration process. • Guidelines were provided for step-by-step navigation. The online application was free, saving costs. • Registration was quick and easy through the online system. •		
	•	Applicant 36	• No assistance was received during the online registration process. • The university webpage provided contact details for assistance. • Guidelines for online applications were accessible on the university webpage. • The system was easy to navigate without challenges. •		
	•	Applicant 35	• An on-site helper assisted with document resending. •		
	•	Applicant 34	• Assistance was received via a phone call from Xolelwa.		

Model	Research question 1	Participant	Responses from Interviewees		
			• Contact numbers were provided on proof of registrations. • Information was obtained through social media. • Help was sought from a brother for online application. • Overall experience was positive; now a CPUT student. •		
	•	Applicant 33	• No assistance was received from the institution. • There were challenges in the application process. • Contact details for assistance were not provided. •		
	•	Applicant 32	• The administration provided assistance in the international office. • Contact details for assistance were obtained from the university website. • Email communication was used to sort the admission process. •		
	•	Applicant 31	• The administration provided assistance in the international office. • Contact details for assistance were obtained from the university website. • Email communication was used to sort the admission process.		

Model	Research question 1	Participant	Responses from Interviewees		
			•		
	•	Applicant 30	• Assistance in differentiating first and second semester modules was received. • Few officials were available for assistance during registration. • The online application was described as user-friendly. •		
	•	Applicant 29	• Assistance in differentiating first and second semester modules was received. • Limited officials were available for assistance during registration. • System errors and downtime complicated the registration process. • Overall, assistance was deemed necessary for successful registration. •		
	•	Applicant 28	• The institution provided contact details for assistance. • Assistance was challenging to obtain from the business faculty. • The Head of Department's availability delayed assistance. • The online system often malfunctioned during the process. • There was a long wait for responses during applications. •		

Model	Research question 1	Participant	Responses from Interviewees
	Could you find source information from the university webpage to assist you in your journey of online admission application and registration?	Applicant 21	indicated that the institution provided contact details for assistance. Assistance was available for online application challenges.
		Applicant 19	indicated that the institution provided contact details for assistance. Assistance was available when difficulties were users encountered.
		Applicant 18	• The university webpage provides essential registration information. • It includes guidelines for online admission applications. • Users can find contact details for assistance.
		Applicant 17	• indicated that the institution provided contact details for assistance. Assistance was available for online application challenges. Source information was accessible on the university webpage.

Model	Research question 1	Participant	Responses from Interviewees
		Applicant 16	• indicated that the institution provided contact details for assistance. Assistance was available for online application challenges.
		Applicant 9	• The university webpage provided helpful source information. Students were able to find necessary information online. Assistance was available for navigating the registration process. •
		Applicant 15	• indicated that the institution provided contact details for assistance. Assistance was available for online application challenges. The applicant could seek help during registration difficulties. • Applicant 14 indicated that the institution provided contact details for assistance. Assistance was available for online application and registration issues. The applicant was guided on where to seek help.

Model	Research question 1	Participant	Responses from Interviewees		
	•	Applicant 12	• The university webpage provided necessary source information for registration. Assistance was available for navigating the registration process. • Challenges were noted in finding specific registration details. •		
	•	Applicant 18	• The university webpage provides essential registration information. • It includes guidelines for online admission applications. • Users can find contact details for assistance. •		
	•	Applicant 6	• The university webpage provides source information for registration assistance. • Students are encouraged to locate contact details for help. • Information sources regarding online applications are available on the webpage. •		

Model	Research question 1	Participant	Responses from Interviewees		
	•	Applicant 8	• The university webpage provided necessary source information for registration. • Users were able to navigate the system for assistance. • Information was available to help with online admission applications. •		
•			• Main study question: Question: 2 • How do first-time entering students experience the academic and non-academic e-services provided?		
Use/Usage	What are your views on the usability of the university system for online admission applications and module registration?	Applicant 21	• indicated that the usability of the system is not user friendly. The applicant experienced challenges during the registration process. Improvement is required. Assistance from the institution was sometimes difficult to obtain. Missing information on the university webpage hindered the process. indicated that the usability of the system is not user friendly.		
		Applicant 18	• Applicant 18 indicated that the university system has usability issues during online applications. The applicant reported challenges in navigating the registration process.		

Model	Research question 1	Participant	Responses from Interviewees		
		Applicant17	indicated that the usability of the university system needs improvement. The applicant had difficulties with the online application process. Assistance from the institution was challenging to obtain. Contact details for support were not easily accessible.		
		Applicant 3	• reported that the usability of the university system was not reliable. The user experienced challenges during the application process. •		
		Applicant 16	• The usability of the system is questioned by user. • The user expressed challenges in navigating the online system. • Some users find the system satisfactory for applications. • Information sources on the university webpage are sometimes unclear. • Assistance from the institution can be difficult to obtain. •		

Model	Research question 1	Participant	Responses from Interviewees		
		Applicant 20	• The usability of the system is a key concern. • The user faced challenges during the application process. • Satisfaction with the online system varies among students. • Improvement areas include navigation and support services. • Assistance availability impacts user experience significantly. •		
		Applicant 19	• The applicant experienced challenges during the registration process. Assistance from the institution was sometimes difficult to obtain.		
		Applicant 18	• The university system has usability issues during online admission. • Users reported challenges in navigating the registration process. • Satisfaction levels varied among users regarding the online system. • Information sources for applications were sometimes inadequate. • Users faced difficulties in finding necessary guidelines for registration.		

Model	Research question 1	Participant	Responses from Interviewees		
			• Overall, user needs were not fully met by the system. •		
	Were the University information sources regarding online applications and registrations helpful and where can the university improve?	Applicant 21	• Applicant 21 indicated that the usability of university information sources was not user friendly. Assistance from the institution was reportedly challenging to obtain. The user experienced difficulties finding necessary information online. There were unmet needs and expectations regarding online services.		
		Applicant 18	• Applicant 18 indicated that the university information sources were found to be helpful. The user reported satisfaction with the online registration process.		
		Applicant 16	• Applicant 16 indicated that the university information sources were reportedly helpful. The user found guidance on online applications beneficial. •		
		Applicant 15	• Applicant 15 indicated that the usability of university online systems was not user		

Model	Research question 1	Participant	Responses from Interviewees		
			friendly. Assistance from the institution was mentioned as a concern.		
		Applicant 12	• Applicant 13 indicated that the helpfulness of university information sources is not reliable. Challenges in finding information were reported. • Applicant 12 indicated that the university's information sources were not very helpful. There were challenges during the application process. Assistance from the institution was difficult to obtain. •		
		Applicant 8	• indicated that the effectiveness of university information sources is not reliable. The user faced challenges during the application process. Assistance from the institution was sought for online registration. Availability of source information on the university webpage was helpful.		

Model	Research question 1	Participant	Responses from Interviewees		
		Applicant 9	• indicated that the university information sources were considered helpful. The applicant found guidance on managing the system useful.		
		Applicant 10	indicated that the usability of the university system was not reliable.		

Model	Research question 1	Participant	Responses from Interviewees		
		Applicant 25	• indicated that the university webpage provided some source information for assistance. No challenges were reported in obtaining assistance. Overall, the information sources were partially helpful.		

Model	Research question 1	Participant	Responses from Interviewees		
		Applicant 26	• indicated that the university information sources were helpful. Assistance was easy to obtain. No challenges were faced during the process.		

Model	Research question 1	Participant	Responses from Interviewees		
		Applicant 4	• indicated that the university information sources were reportedly helpful. User found assistance through university webpage resources. Contact details for assistance were available.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
Model	**Research question 1**	**Participants**	**Responses from participants**	**Responses from Authors**	**References**
	Were you satisfied with the university's online system for application and registration?	Participant 9	• indicated they had challenges with the application process and that improvement is required.	•	
	Were you satisfied with the university's online system for application and registration?	Participant 8	• had issues with the usability of the system. •	• Poor internet access limits online service effectiveness. • Lack of technological skills among library staff. • Insufficient funding for digital transformation initiatives. • Inadequate ICT infrastructure	(Adarkwah et al., 2024)

Model	Research question 1	Participant	Responses from Interviewees		
		Applicant 3	• Improvement areas for online application and registration was reported.		

		Applicant 30	• indicated that the online application was user-friendly. Assistance from officials was limited. Registration process was lengthy without help. Information on modules and fees was lacking. Needs and expectations were not entirely met. •		

		Applicant 29	• indicated that the university information sources were helpful with assistance. Assistance was necessary to navigate the system effectively. Without assistance, the process was challenging.		
		Applicant 28	• indicated that sources were found to be helpful. The user experienced challenges in getting assistance. The online system sometimes fails, affecting user experience. •		
		Applicant 27	• Applicant 27 indicated that the website was simple and direct for course selection. Assistance from the institution was difficult to obtain. There were no immediate challenges in the application process. More interpersonal assistance was suggested for improvement. •		

Model	Research question 1	Participant	Responses from Interviewees		
How: Net benefit	Were your needs and expectations of university online services met?	Applicant 21	• Applicant 21 indicated that the needs and expectations were met satisfactorily. The user found the information needed for applications accessible. Some challenges were experienced during the application process. Improvements are needed in specific areas of online services.		
		Applicant 18	• indicated that the needs and expectations were not fully met. Challenges were experienced during the application process. Usability issues were reported with the online system. Satisfaction with the online system varied among users.		
		Applicant 17	• indicated that the usability of the university system was not user friendly. Needs and expectations regarding online services were not fully met. •		

Model	Research question 1	Participant	Responses from Interviewees		
		Applicant 16	• indicated that needs and expectations were not fully met. The user experienced challenges during the application process. Improvement areas were identified for online applications and registrations. Usability of the university system was not user friendly. •		
		Applicant 14	• Applicant 14 indicated varying levels of satisfaction with services. Specific areas for improvement were identified by user.		
		Applicant 15	• indicated that the usability of the online system was not user friendly. The user faced challenges during the application process. Needs and expectations were not consistently met.		
	•	Applicant 26	indicated that the needs and expectations were met satisfactorily. No challenges were experienced during the process. Assistance from friends made the process		

Model	Research question 1	Participant	Responses from Interviewees		
			easier. University information sources were helpful for online applications.		
	•	Applicant 31	• indicated that the needs were met through the SOS system. Information was obtained from CPUT officials and friends. The application process was delayed due to administrative errors.		
	•	Applicant 9	• indicated mixed satisfaction with online services. The users felt that the needs were not fully met. Challenges were reported during application and registration processes.		
	•	Applicant 28	• indicated that the needs and expectations were not met. There were significant delays in application responses. The online system frequently went offline during applications. Assistance from the institution was inadequate.		
	•	Applicant 29	• indicated that needs and expectations were not fully met. Limited assistance affected satisfaction with the online system. System usability was challenging for rural students. Assistance from officials was necessary for navigation.		

Model	Research question 1	Participant	Responses from Interviewees		
	•	Applicant 25	• indicated that the platform was cluttered and not user-friendly. The entire application process needs simplification. Assistance was available but not challenging to obtain.		
	•	Applicant 23	• indicated that the needs and expectations were not entirely met.		
	•	Applicant 36	• indicated that the Needs and expectations of online services were met. Information was obtained from high school teachers. The system was easy to navigate and access. •		
	•	Applicant 33	• indicated that the needs and expectations were not met. There were challenges during the application process. Assistance from the institution was lacking. Information sources were not helpful for online applications. •		
	•	Applicant 32	• said that the needs were met through the SOS system. Information was obtained from CPUT officials and friends. The application process was delayed due to administrative errors. •		
	•	Applicant 30	• indicated that the needs and expectations were not entirely met. •		
	•	Applicant 34	• indicated that the needs were partially met due to late application challenges. Assistance		

Model	Research question 1	Participant	Responses from Interviewees		
			from the institution was helpful in the process. Communication via the internet was beneficial for application support. Overall satisfaction with the online system was not fully achieved. •		
	•	Applicant 24	• indicated that the needs and expectations were not fully met. • There were challenges during the application process. No assistance was received from the institution. User had to figure out the process independently. •		
	•	Applicant 38	• indicated that the needs and expectations were met satisfactorily. Application process took less than an hour to complete. Required documents were prepared in advance for efficiency. Eligibility for courses was confirmed during the application. Waiting for responses was a significant concern.		
	•	Applicant 35	• indicated that the needs were not fully met during the application process. Communication issues arose when emailing required documents. Assistance was received from an on-site helper. International student registration faced significant blocks.		
	•	Applicant 39	• indicated that the needs and expectations were met satisfactorily. The registration		

Model	Research question 1	Participant	Responses from Interviewees		
			process was easy to follow. Quick responses from the university were appreciated. Personal research helped in course selection.		
	•	Applicant 27	• indicated that the usability depended on website efficiency and application complexity. Assistance was difficult to obtain via phone and email. More interpersonal assistance was needed for applicants. Funding issues were a challenge during the application process.		
	•	Applicant 22	• indicated that needs and expectations were partially met during the application process. The system was cumbersome to navigate for course selection. Time for processing applications was minimized, which was satisfactory. No assistance was received when challenges arose.		
	•	Applicant 40	indicated the needs and expectations were met satisfactorily. The system was simple to use. There were no significant struggles during the process. Assistance was available if needed.		
	•	Applicant 41	• indicated that the needs and expectations were met satisfactorily. The system was simple		

Model	Research question 1	Participant	Responses from Interviewees		
			and easy to use. No significant challenges were faced during the process. Assistance was readily available on the university website.		
	•	Applicant 12	• indicated that the needs and expectations were reportedly met. The user expressed satisfaction with the online system's usability. Information needed for applications was generally accessible. The user faced challenges during the application process.		

Appendix 5: Comparative Analysis

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
Main study question: Question: 1 What are the expectations of first-time entering students regarding academic and non-academic e-services provided to support their application and registration? (What are the key characteristics of the institutional self-help online service?)					
System Quality-	Were you satisfied with the university's online system for application and registration?	Participant 21	• Participant 21 indicated that the satisfaction level with the online system is unclear and that there were specific challenges during application and registration.	• Hampers service delivery. • Absence of comprehensive digital literacy programs. • Privacy concerns associated with chatbot adoption.	(Archambault, Ramachandran, Acosta, & Fu, 2024)
		Participant 12	• indicated that they were satisfaction with the online system.	• Students face difficulties in independent cognitive activities. • Limited use of web technologies in psychological and pedagogical disciplines	(Zabiyeva et al., 2021)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
Model	**Research question 1**	**Participants**	**Responses from participants**	**Responses from Authors**	**References**
	Were you satisfied with the university's online system for application and registration?	Participant 9	• indicated they had challenges with the application process and that improvement is required.	•	
	Were you satisfied with the university's online system for application and registration?	Participant 8	• had issues with the usability of the system. •	• Poor internet access limits online service effectiveness. • Lack of technological skills among library staff. • Insufficient funding for digital transformation initiatives. • Inadequate ICT infrastructure	(Adarkwah et al., 2024)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
				• Poor internet access hampers e-service delivery. • Lack of technological skills among library staff. • Insufficient funding for digital initiatives and infrastructure.	
Model	**Research question 1**	**Participants**	• **Responses from Participants**	**Responses from Authors**	**References**
		Participant 27 Participant 26	• indicated that the usability depended on website efficiency and application complexity. Additionally, Assistance was hard to obtain via phone and email. There were no immediate challenges, only funding issues. More interpersonal assistance was suggested for improvement. • indicated that the university's online system was easy to navigate. There were no	Satisfaction with the university's online system for application and registration has emerged as a mixed experience for students, with responses reflecting both positive and negative aspects. Some students have reported ease in navigating the system, with quick responses and a streamlined process contributing to their	(**Archambault et al., 2024**).

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			challenges during the application process. Overall satisfaction with the online application and registration was high. •	satisfaction. This aligns with findings in the literature, which suggest that well-designed online systems can enhance user experience by simplifying complex processes like course selection and document submission for these students, features such as easy access to information, efficient document handling, and clear eligibility guidelines have played a role in meeting their needs effectively, reducing the time required to complete applications.	
Model	**Research question 1**	**Participants**	• **Responses from Participants**	**Responses from Authors**	**References**
		Participant 25	• indicated that the online system was cluttered and not user-friendly. The platform needs simplification for better usability. No challenges were faced in obtaining assistance.	Satisfaction with online systems in educational institutions is often influenced by their usability, efficiency, and the availability of support services. Research suggests that when these systems are well-designed, offering clear navigation, prompt	Garcés et al. (2018)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
				response times, and streamlined processes, they significantly enhance the user experience. A study by Garcés et al. (2018) highlights that ease of use in accessing information and submitting documents plays a crucial role in improving students' satisfaction levels. Furthermore, simplifying complex processes, such as course selection and application submission, can reduce the time and effort required, leading to a more positive overall experience. Systems that integrate intuitive interfaces and provide immediate feedback during the application process tend to be rated higher in user satisfaction (Johnson et al., 2020).	(Johnson et al., 2020).
Model	**Research question 1**	**Participants**	• **Responses from Participants**	**Responses from Authors**	**References**
		Participant 24	• indicated that they were dissatisfied with the system, and they experienced	while technical efficiency is critical, the literature acknowledges that student	Bowers and Kumar (2017

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			challenges during the application process. No assistance was received from the institution. •	satisfaction can be hindered by challenges in obtaining support, particularly when issues arise during the application or registration process. Delayed or limited access to assistance, whether through phone or email, has been a recurring issue for some users, as noted by Bowers and Kumar (2017). This echoes Participant 26's feedback, who highlighted difficulty in accessing help via traditional means. The importance of human-centered support systems, such as live chats or responsive help desks, is emphasized in the literature, as they can significantly enhance user satisfaction when technical issues or complex situations, like financial aid, arise (Taylor & Francis, 2021).	Taylor & Francis, 2021).
Model	**Research question 1**	**Participants**	• **Responses from Participants**	**Responses from Authors**	**References**

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant 23	• was satisfied with the application process. •		
		Participant 22	• indicated that satisfaction varied. The system was cumbersome. Processing time for applications was minimized. There were difficulties in locating offered courses. No assistance was received during the process.	Satisfaction with the university's online system for application and registration has emerged as a mixed experience for students, with responses reflecting both positive and negative aspects. Some students have reported ease in navigating the system, with quick responses and a streamlined process contributing to their satisfaction. This aligns with findings in the literature, which suggest that well-designed online systems can enhance user experience by simplifying complex processes like course selection and document submission for these students, features such as easy access to information, efficient document handling, and clear eligibility guidelines	(Adarkwah et al., 2024)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
				have played a role in meeting their needs effectively, reducing the time required to complete applications.	
Model	**Research question 1**	**Participants**	• **Responses from Participants**	**Responses from Authors**	**References**
		Participant 41	• indicated that the system was simple and easy to use. There were no significant struggles during the process. •	• Student satisfaction can be hindered when support services are delayed or difficult to access, even if the system is otherwise technically efficient • The absence of human-centered support systems, such as live chats or responsive help desks, often leads to frustration, particularly when technical or financial issues arise during the process	(Bowers & Kumar, 2017).
Model	**Research question 1**	**Participants**	• **Responses from Participants**	**Responses from Authors**	**References**
		Participant 40	• indicated that they were satisfied with the online system. The system was simple	• Efficient document handling and quick processing times positively affect satisfaction, as they reduce the overall time spent on administrative tasks.	(Garcés et al., 2018).

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			• and easy to use. There were no significant struggles during the process.		
Model	**Research Question 1**	**Participants**	**Responses from Participants**	**Responses from Authors**	**References**
		Participant 39	• indicated that the online application process was easy to follow. Registration was completed without	• Streamlined systems with clear eligibility guidelines are especially valued by students, helping	(Johnson et al., 2020).

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			assistance after acceptance. Overall satisfaction with the university's online services was expressed. •	them meet their academic needs more effectively	
Model	Research Question 1	Participants	Responses from participants	Responses from Authors	References
		Participant 38	• indicated that the online application was quick and efficient. It took less than an hour to complete the application. The online system saved money compared to manual applications. Registration was also easy and completed online. University guidelines provided clear step-by-step instructions. •	• The absence of human-centered support systems, such as live chats or responsive help desks, often leads to frustration, particularly when technical or financial issues arise during the process	(Taylor & Francis, 2021).
Model	Question 1	Participant	Responses from participants	Responses from Authors	References

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant 36	• indicated that the university's online system is easy to use. Applications can be completed without traveling. Responses are received online, reducing waiting time. No challenges were experienced during the application process. The system provides clear guidance for users. •	• Satisfaction with online systems often varies, with some students reporting smooth, efficient processes, while others face challenges like difficulty navigating courses or receiving assistance • Systems that focus solely on technical aspects without addressing usability and support gaps may leave users with mixed or negative experiences	(Bowers & Kumar, 2017). (Taylor & Francis, 2021).
Model	Research Question 1	Participants	Responses from participants	Responses from Authors	References
		Participant 35	• indicated that the university's online application system was found helpful. • Assistance was available for international student registration issues. An on-	Simple, intuitive online systems reduce cognitive load, making it easier for users to complete tasks without external assistance	(Johnson et al., 2020).

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			site helper provided support for document resending. •		
Model	**Research question 1**	**Participants**	**Responses from participants**	**Responses from Authors**	**References**
		Participant 34	• indicated that the online system was helpful for communication. The process led to becoming a CPUT student. • There were challenges with late applications. •	• Well-designed online systems with intuitive navigation significantly improve user satisfaction	(Garcés et al., 2018).
Model	**Research question 1**	**Participants**	• **Responses from participants**	**Responses from Authors**	**References**
		Participant 33	• indicated that they were dissatisfied with the online system. No assistance was received during the application process. Challenges were experienced in finding necessary information. Improvement	Efficient online systems that reduce administrative burden, such as quick processing times and easy document submission, significantly	(Garcés et al., 2018).

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			areas were identified for the online application process.	enhance user satisfaction	
Model	**Research question 1**	**Participants**	• **Responses from participants**	**Responses from Authors**	**References**
		Participant 32	• indicated that they were satisfied with the online system. They applied through the SOS for registration. Required documents were submitted and processed. •	Systems that eliminate the need for in-person tasks, such as traveling for applications, and allow users to complete everything online lead to higher satisfaction	(Bowers & Kumar, 2017).
Model	**Research question 1**	**Participants**	• **Responses from participants**	• **Responses from Authors**	**References**
		Participant 30	• indicated that they found the online application user friendly. • Satisfaction with the university's online system was not complete. Needs and expectations were not entirely met. •	• Simplifying complex processes, such as course selection and application submission, enhances the user experience by reducing the time and effort required	(Johnson et al., 2020).

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
Model	**Research question 1**	**Participants**	• **Responses from participants**	**Responses from Authors**	**References**
Model	**Research question 1**	**Participants**	• **Responses from participants**	**Responses from Authors**	**References**
		Participant 29	• indicated that they were not satisfied with the online system. Limited assistance was a significant issue. System errors and downtime were frequent problems. Modules for registration were scattered and confusing. •	Providing clear, step-by-step instructions throughout the application and registration process minimizes confusion and frustration, helping users navigate the system independently	(Johnson et al., 2020).
Model	**Research question 1**	**Participants**	• **Responses from participants**	**Responses from Authors**	**References**
		Participant 28	• indicated that satisfaction with the online system was not achieved. The system often went offline during applications. Delays in responses caused frustration during the application	Well-structured guidelines and eligibility criteria are valued by users, ensuring they understand the process from start to finish	(Garcés et al., 2018).

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			process. Preference for the old system was expressed. •		
Model	**Question1**	**Participants**	**Responses from the participants**	**Responses from Authors**	**References**
Service Quality	What challenges did you experience during the application process for university registration?	Participant 21	indicated that there was difficulty in finding necessary information on the university webpage. Challenges in receiving timely assistance from the institution. Abandonment of the application process due to encountered challenges.	• issues with user acceptance of registration systems. • Challenges in administrative efficiency during application processes. • Difficulties in navigating online learning registration systems.	(Procedia computer science, 2024)
Model	**Research question 1**	**Participants**	• **Responses from participants**	• **Responses from Authors**	**References**
		Participant 19	• indicated that there were challenges in usability of the online application system. some students abandoned the process due	• Poor internet access limits online service effectiveness.	(Adarkwah et al., 2024)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			to difficulties encountered. Assistance from the institution was sometimes hard to obtain.	• Lack of technological skills among library staff. • Insufficient funding for digital transformation initiatives. • Inadequate ICT infrastructure • Poor internet access hampers e-service delivery. • Lack of technological skills among library staff. • Insufficient funding for digital initiatives and infrastructure. • Inadequate management and maintenance of digital services. • Limited internet bandwidth affects service accessibility. • Financial constraints hinder	

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
				comprehensive digital literacy programs. • Convenience sampling limits generalizability of findings. • •	
Model	**Research question 1**	**Participants**	**Responses from participants**	• **Responses from Authors**	**References**
		Participant 18	indicated that they experienced difficulties during the application process. The Participant abandoned the process due to challenges faced.	• Financial constraints affect library operations and services. • Need for comprehensive digital literacy programs persists. • Reliance on foreign aid for digital infrastructure.	(Adarkwah et al., 2024)
Model	**Research question 1**	**Participants**	• **Responses from participants**	• **Responses from Authors**	**References**

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
				to frustration and process abandonment.	
Model	**Research question 1**	**Participants**	• **Responses from participants**	**Responses from Authors**	**References**
Model	**Research question 1**	**Participants**	• **Responses from participants**	**Responses from Authors**	**References**
		Participant 16	• indicated that there were challenges faced during university admission and module registration. There were difficulties in navigating the online application process. It was indicated that there are areas needing improvement in online registration.	Difficulty finding necessary information online: Many students struggle to locate relevant information for completing their applications or registering for courses. Poor navigation design or disorganized content on university websites contributes to this challenge.	(Carolina et al., 2024)
Model	**Research Question 1**	**Participants**	**Responses from participants**	**Responses from Authors**	**References**

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
Service Quality	What assistance did you receive from the institution regarding the online application and registration process?	Participant 20	• Indicated that institution provided contact details for assistance. Assistance was available when challenges arose during registration. Students were guided on where to seek help.	• Librarians developed 'Ask a Librarian' for real-time assistance. • Online tools include email and Web 2.0 technologies. • Services utilize platforms like Zoom, Skype, and WhatsApp. • Academic libraries provide database services for research material access.	(Adarkwah et al., 2024) (Adarkwah et al., 2024)
		Participant 18	• Indicated that institution provided contact details for assistance. Assistance was available for online application challenges. Guidance was offered on navigating the registration process. Information sources were accessible on the university webpage.		
Model	Question 1	Participant	Responses from participants	Responses from Authors	References

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
	•	Participant 19	• Indicated that institution provided contact details for assistance. Assistance was available when users encountered difficulties.	• ChatGPT can provide personalized support to students. • It automates administrative tasks for educational institutions. • ChatGPT supports language learners through translation and feedback. • Ethical implications must be considered when using AI tools. • Transparency in AI functioning is crucial for effective use.	(Yogesh K. Dwived et al., 2024)
Model	**Research question 1**	**Participants**	**Responses from participants**	**Responses from the Authors**	**References**
	•	Participant 17	• Indicated that the institution provided contact details for assistance.	• Online reference services enhance student engagement and support.	(Carolina et al., 2024)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			• Assistance was available for online application challenges. • Source information was accessible on the university webpage.	• AI-enabled tools can reduce library anxiety for students. • Mobile applications provide access to library resources and services. • Gamified library instruction can improve student interaction and learning.	
	•	Participant 16	• Indicated that the institution provided contact details for assistance. Assistance was available for online application challenges.		
	•	Participant 15	• Indicated that the institution provided contact details for assistance. Assistance was available for online application challenges. The user could seek help during registration difficulties.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
Model	Research question 1	Participants	Responses from the Participants	Responses from the Authors	References
	•	Participant 14	• Indicated that the institution provided contact details for assistance. Assistance was available for online application and registration issues. The user was guided on where to seek help.		
	•	Participant 13	• Indicated that the institution provided contact details for assistance. Assistance was available for navigating the online registration process. Information sources on the university webpage were accessible.		
	•	Participant 12	• Indicated that the institution helped with online registration inquiries. Contact details for support were available on the university webpage. Guidance on navigating the online application process was offered. Information sources	Effective communication regarding available support services significantly enhances student satisfaction during the application and registration processes. Institutions that provide detailed contact information and accessible resources help students feel more supported	(Adarkwah et al., 2024).

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			were helpful for the registration journey.		
	•	Participant 11	• Indicated that the institution provided contact details for assistance. Assistance was available for online application challenges. Information was accessible on the university webpage.		
	•	Participant 10	• Indicated that the institution provided contact details for assistance. Assistance was available for online application challenges. The user could report difficulties during the registration process. Feedback on usability was collected from students.		
	•	Participant 8	• Indicated that the institution provided contact details for assistance. The user received guidance from senior peers. Assistance was available for		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			navigating the online system. •		
	•	Participant 7	• Indicated that institution provided contact details for assistance. Support was available for online application challenges. Guidance was offered for module registration issues. •		
	•	Participant 6	• Indicated that the institution provided contact details for assistance. Information sources were evaluated for helpfulness during the process. •		
	•	Participant 5	• The institution provided contact details for assistance. Assistance was available for online application challenges. The user was guided on navigating the registration system. •		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
	•	Participant 3	• The institution provided contact details for assistance. Assistance was available via phone for inquiries. Information was accessible on the university webpage. •		
	•	Participant 2	• The institution provided contact details for assistance. • Students were guided on where to seek help. • Assistance was available for navigating the registration process. •		
	•	Participant 4	• The institution provided contact details for assistance. • Assistance was available through phone support. • University webpage offered source information for guidance. •		
	•	Participant 27	• Assistance was difficult to obtain from the institution.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			• Contacting them via phone was challenging. • Email responses took considerable time. • More interpersonal assistance was suggested for improvement.		
	•	Participant 26	• The assistance received was helpful and easy to navigate. • No challenges were encountered during the registration process. • The university's information sources were beneficial for online applications. •		
	•	Participant 25	• The institution advised using a different browser for application completion. • No challenges were faced in receiving assistance.		
	•	Participant 24	• No assistance was received from the institution. • The use had to figure it out independently.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			•		
	•	Participant 23	• No assistance was received from the institution. • Emails sent were not acknowledged. • There were no responses from the institution. •		
	•	Participant 22	• • No assistance received during the online registration process. • Had to figure out the process independently. • No online assistance was available. •		
	•	Participant 41	• Contact details for assistance are available on the CPUT website. • The registration process was straightforward and easy to navigate. • No significant challenges were faced during the application process.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
	•	Participant 40	• Contact details for assistance were available on the CPUT website. • The registration process was straightforward and easy to navigate. • No significant challenges were faced during the application process. •		
	•	Participant 39	• The institution provided assistance through their online system. • Contact details for assistance were available on the university webpage. • The registration process was described as easy to follow. • The university responded quickly to student inquiries. •		
	•	Participant 38	• The institution provided contact details for assistance. • Assistance was available for navigating the online registration process. • Guidelines were provided for step-by-step navigation. The		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			online application was free, saving costs. • Registration was quick and easy through the online system. •		
	•	Participant 36	• No assistance was received during the online registration process. • The university webpage provided contact details for assistance. • Guidelines for online applications were accessible on the university webpage. • The system was easy to navigate without challenges. •		
	•	Participant 35	• An on-site helper assisted with document resending. •		
	•	Participant 34	• Assistance was received via a phone call from Xolelwa. • Contact numbers were provided on proof of registrations. • Information was obtained through social media.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			• Help was sought from a brother for online application. • Overall experience was positive; now a CPUT student. •		
	•	Participant 33	• No assistance was received from the institution. • There were challenges in the application process. • Contact details for assistance were not provided. •		
	•	Participant 32	• The administration provided assistance in the international office. • Contact details for assistance were obtained from the university website. • Email communication was used to sort the admission process. •		
	•	Participant 31	• The administration provided assistance in the international office.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			• Contact details for assistance were obtained from the university website. • Email communication was used to sort the admission process. •		
	•	Participant 30	• Assistance in differentiating first and second semester modules was received. • Few officials were available for assistance during registration. • The online application was described as user-friendly. •		
	•	Participant 29	• Assistance in differentiating first and second semester modules was received. • Limited officials were available for assistance during registration. • System errors and downtime complicated the registration process. • Overall, assistance was deemed necessary for successful registration. •		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
	•	Participant 28	• The institution provided contact details for assistance. • Assistance was challenging to obtain from the business faculty. • The Head of Department's availability delayed assistance. • The online system often malfunctioned during the process. • There was a long wait for responses during applications. •		
Model	Research Question 1	Participants	Responses from the participants	Responses from the Authors	References
	Could you find source information from the university webpage to	Participant 21	indicated that the institution provided contact details for assistance. Assistance was available for online application challenges.	• Students engaged with a central LibGuide for resources.	(Susan Archambault,2024)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
	assist you in your journey of online admission application and registration?	Participant 19	indicated that the institution provided contact details for assistance. Assistance was available when difficulties were users encountered.	• The webpage included links to slides and surveys. • Participants provided anonymous feedback via Google Forms. • The webpage facilitated structured discussions and activities.	
		Participant 18	• The university webpage provides essential registration information. • It includes guidelines for online admission applications. • Users can find contact details for assistance.		
		Participant 17	• indicated that the institution provided contact details for assistance. Assistance was available for online application challenges. Source information was accessible on the university webpage.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant 16	• indicated that the institution provided contact details for assistance. Assistance was available for online application challenges.		
		Participant 9	• The university webpage provided helpful source information. Students were able to find necessary information online. Assistance was available for navigating the		
		Participant 15	• indicated that the institution provided contact details for assistance. Assistance was available for online application challenges. The Participant could seek help during registration difficulties. • Participant was guided on where to seek help.		

	•	Participant 12	• The university webpage provided necessary source information for registration. Assistance was available for navigating the registration process. • Challenges were noted in finding specific registration details. •	• The webpage design impacts student user experience significantly. • User interface evaluation is crucial for enhancing student satisfaction. • Human-centered design methods improve usability for students. • Positive experiences lead to increased acceptance of educational technology.	(Procedia computer science, 2024)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
	•	Participant 18	• The university webpage provides essential registration information. • It includes guidelines for online admission applications. • Users can find contact details for assistance		
	•	Applicant 14	Participant 14 indicated that the institution provided contact details for assistance. Assistance was available for online application and registration issues.		
	•	Participant 13	Participant 13 indicated that the institution provided contact details for assistance. Assistance was available for navigating the online registration process. Information sources on the university webpage were accessible. •		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
	•	Participant 6	• The university webpage provides source information for registration assistance. • Students are encouraged to locate contact details for help. • Information sources regarding online applications are available on		
	•	Participant 8	• The university webpage provided necessary source information for registration. • Users were able to navigate the system for assistance. • Information was available to help with online admission applications		
•			• **Main study question: Question:** 2 • How do first-time entering students experience the academic and non-academic e-services provided?		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
Model	Research question 1	Participants	Responses from the participants	Responses from the Authors	Ref
Use/Usage	What are your views on the usability of the university system for online admission applications and module registration?	Participant 21	• indicated that the usability of the system is not user friendly. The Participant experienced challenges during the registration process. Improvement is required. Assistance from the institution was sometimes difficult to obtain. Missing information on the university webpage hindered the process. indicated that the usability of the system is not user friendly.	• The system enhances psychological and pedagogical training effectiveness. • It promotes active student participation in learning processes. • Cloud technologies improve access to educational resources. • It fosters creativity and cognitive motivation among students. • The system supports continuous professional	(Kamshat Zabiyeva et al., 2021)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
				growth for teachers. • It combines conventional and online learning methods effectively. • The system's usability is evaluated through user satisfaction metrics. • User feedback is crucial for improving system usability. • Usability assessments guide design enhancements for better user experience. • • •	
		Participant	Responses from the participants	Responses from the Authors	References

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant 18	• Participant 18 indicated that the university system has usability issues during online applications. The Participant reported challenges in navigating the registration process.	• The system's usability is evaluated using the DeLone McLean model. • Insights are gathered from user experiences and perceptions. • Usability impacts user satisfaction and system effectiveness. • Continuous feedback is essential for improving system usability.	(Procedia computer science, 2024)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant	**Responses from participants**	**Responses from the Authors**	**References**
		Participant17	indicated that the usability of the university system needs improvement. The Participant had difficulties with the online application process. Assistance from the institution was challenging to obtain. Contact details for support were not easily accessible. •	• Implement cloud technologies in educational processes. • Combine conventional and computer learning technologies effectively.	(Kamshat Zabiyeva et al., 2021)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			• Participant 16 indicated that the usability of the system was not user friendly. The Participant expressed difficulties in navigating the online application process. There is a need for improvements in the registration system. •	• Activate students' cognitive and practical activities. • Enhance creativity and educational motivation among future teachers. • Foster subject-to-subject interaction in teaching methods. • Ensure thoughtful use of Internet technologies in education.	
		Participant 3	• reported that the usability of the university system was not reliable. The user experienced challenges during the application process. •		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
Model	**Question 1**	**Participants**	**Responses from the participants**	**Responses from the Authors**	**References**
		Participant 16	• The usability of the system is questioned by user. • The user expressed challenges in navigating the online system. • Some users find the system satisfactory for applications. • Information sources on the university webpage are sometimes unclear. • Assistance from the institution can be difficult to obtain. •	• Broaden sample population for better representativeness. • Enhance survey design with visual aids for clarity. • Conduct assisted surveys to minimize bias. • Include comprehensive explanations of MaaS concept.	(Kriswardhana, 2024)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant 20	• The usability of the system is a key concern. • The user faced challenges during the application process. • Satisfaction with the online system varies among students. • Improvement areas include navigation and support services. • Assistance availability impacts user experience significantly. •	• Enhance funding for library infrastructure and services. • Improve technological skills among library staff. • Develop comprehensive digital literacy programs for users. • Foster collaboration between libraries and academic institutions. • Implement robust digitization policies and practices. • Address internet connectivity issues in library services. • Integrate generative AI technology in library services.	(Adarkwah et al., 2024)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
Model	Research question 1	Participant	• Responses from the participants	Responses from the Authors	References
		Participant 19	• The Participant experienced challenges during the registration process. Assistance from the institution was sometimes difficult to obtain.	• Enhance user feedback mechanisms for continuous improvement. • Implement regular training for staff on service quality. • Utilize advanced analytics for performance measurement. • Foster a culture of accountability and transparency. • Streamline processes to reduce service delivery time.	(Procedia Computer Science, 2024)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
				• Regularly update technology to meet user expectations. • Conduct periodic assessments of service quality standards. • Engage customers in co-creation of services. • Monitor industry trends for best practices. • Establish clear communication channels for customer support.	
		Participant 18	• The university system has usability issues during online admission. • Users reported challenges in navigating the registration process. • Satisfaction levels varied among users regarding the online system.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			• Information sources for applications were sometimes inadequate. • Users faced difficulties in finding necessary guidelines for registration. • Overall, user needs were not fully met by the system. •		
Model	**Question 1**	**Participants**	• **Responses from the participants**	• **Responses from the Authors**	**References**
	Were the University information sources regarding online applications and registrations helpful and where can the	Participant 21	• Participant 21 indicated that the usability of university information sources was not user friendly. Assistance from the institution was reportedly challenging to obtain. The user experienced difficulties finding necessary information online. There were unmet needs and expectations regarding online services.	• Enhance user-centered service design in libraries. • Balance functional and visual aspects in library environments. • Prioritize student involvement in service development.	(Carolina et al., 2024)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
	university improve?	Participant 18	• Participant 18 indicated that the university information sources were found to be helpful. The user reported satisfaction with the online registration process.	• Utilize user journey mapping to identify challenges. • Explore underexplored theories to enrich understanding of student experience.	
		Participant 16	• Participant 16 indicated that the university information sources were reportedly helpful. The user found guidance on online applications beneficial. •		
		Participant 15 Participant 12	• Participant 15 indicated that the usability of university online systems was not user friendly. Assistance from the institution was mentioned as a concern. • Participant 13 indicated that the helpfulness of university information sources is not reliable. Challenges in finding information were reported.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			• Participant 12 indicated that the university's information sources were not very helpful. There were challenges during the application process. Assistance from the institution was difficult to obtain. •		
		Participant 8	• indicated that the effectiveness of university information sources is not reliable. The user faced challenges during the application process. Assistance from the institution was sought for online registration. Availability of source information on the university webpage was helpful.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant 9	• indicated that the university information sources were considered helpful. The Participant found guidance on managing the system useful.		
		Participant 10	indicated that the usability of the university system was not reliable.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant 25	• indicated that the university webpage provided some source information for assistance. No challenges were reported in obtaining assistance. Overall, the information sources were partially helpful.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant 26	• indicated that the university information sources were helpful. Assistance was easy to obtain. No challenges were faced during the process.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant 4	• indicated that the university information sources were reportedly helpful. User found assistance through university webpage resources. Contact details for assistance were available.		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant 3	• Improvement areas for online application and registration was reported.		

		Participant 24	• indicated that No assistance was received during the registration process. Users had to figure out the process independently. Challenges were experienced in finding helpful information.		
		Participant 23	• indicated that no assistance was received from the institution. Emails to the institution were not acknowledged. The university webpage lacked helpful source information. User found the online application user-friendly. Needs and expectations were not entirely met. The online system should indicate program modules and fees. Improvement suggested for easier navigation and accessibility. •		

		Participant 22	• indicated that the system was cumbersome to locate programs offered. No online assistance was received during the process. User had to figure out the process independently. Time for processing applications was minimized. Overall satisfaction with the system was mixed.			
		Participant 41	• indicated that the university's information sources were helpful for registrations. Contact details for assistance were easily accessible. The registration process was straightforward and user-friendly.			
		Participant 40	• indicated that the university's information sources were helpful for registrations. Contact details for assistance were easily accessible. The registration process was straightforward and user-friendly. •			
		Participant 39	• indicated that the university's online services met the user's needs and expectations. The registration process was easy to follow and efficient. User received timely responses from the university during the application. Assistance was available, but system updates were needed. •			

		Participant 38	• indicated that the university guidelines were extremely helpful for registrations. They provided step-by-step instructions for the application process. All necessary information was included in the guidelines. Reading the guidelines carefully was emphasized to avoid mistakes.			
		Participant 36	• indicated that the university information sources were very helpful. Guidelines for managing the system were accessible online. The online system reduced the need for physical visits. •			
		Participant 35	• indicated that the university information sources were helpful. •			
		Participant 33	• indicated that the university information sources were not helpful. There were challenges in navigating the online application process. •			

		Participant 33	• indicated that the university information sources were not helpful. There were challenges in navigating the online application process. •			
		Participant 34	• indicated that the university's information sources were found to be very helpful. The assistance led to successful registration as a student. •			
		Participant 32	• indicated that the university's information sources were found to be helpful. Assistance was available through the university's website. Contact details for help were accessible online. •			
		Participant 31	• indicated that the university's information sources were found to be helpful. Source information was accessible on the university webpage. Assistance was received via email for the admission process.			

	Participant 30	• indicated that the online application was user-friendly. Assistance from officials was limited. Registration process was lengthy without help. Information on modules and fees was lacking. Needs and expectations were not entirely met. •			
	Participant 29	• indicated that the university information sources were helpful with assistance. Assistance was necessary to navigate the system effectively. Without assistance, the process was challenging.			
	Participant 28	• indicated that sources were found to be helpful. The user experienced challenges in getting assistance. The online system sometimes fails, affecting user experience. •			
	Participant 27	• Participant 27 indicated that the website was simple and direct for course selection. Assistance from the institution was difficult to obtain. There were no immediate challenges in the application process. More interpersonal assistance was suggested for improvement. •			

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
Model	**Research 1**	**Participants**	• **Participant's responses**	**Responses from the Authors**	**References**
How: Net benefit	Were your needs and expectations of university online services met?	Participant 21	• Participant 21 indicated that the needs and expectations were met satisfactorily. The user found the information needed for applications accessible. Some challenges were experienced during the application process. Improvements are needed in specific areas of online services.	• Students expressed a strong desire for more digital technology use. • 94.4% believe teachers should use digital technologies more often. • Majority found web technologies effective for	(Kamshat Zabiyeva et al., 2021)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant 18	• indicated that the needs and expectations were not fully met. Challenges were experienced during the application process. Usability issues were reported with the online system. Satisfaction with the online system varied among users.	psychological and pedagogical disciplines. • Students preferred multimedia presentations and online polls for engagement. • Overall, students' needs for online services were not fully met.	
		Participant 17	• indicated that the usability of the university system was not user friendly. Needs and expectations regarding online services were not fully met. •		
		Participant 16	• indicated that needs and expectations were not fully met. The user experienced challenges during the application process. Improvement areas were identified for online applications and registrations. Usability of the university system was not user friendly. •		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
		Participant 14	• Participant 14 indicated varying levels of satisfaction with services. Specific areas for improvement were identified by user.		
		Participant 15	• indicated that the usability of the online system was not user friendly. The user faced challenges during the application process. Needs and expectations were not consistently met.		
		Participants	**Responses from the participants**	**Responses from the Authors**	**Refrences**
	•	Participant 26	indicated that the needs and expectations were met satisfactorily. No challenges were experienced during the process. Assistance from friends made the process easier. University information sources were helpful for online applications.	• Students' information needs were met through online reference services. • Real-time communication tools facilitated	(Adarkwah et al., 2024)

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			•	student-librarian interactions. • Online services were developed to ensure accessibility during the pandemic. • Positive attitudes towards digital platforms were reported by users.	
	•	Participant 31	• indicated that the needs were met through the SOS system. Information was obtained from CPUT officials and friends. The application process was delayed due to administrative errors.		
	•	Participant 9	• indicated mixed satisfaction with online services. The users felt that the needs were not fully met. Challenges were		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			reported during application and registration processes.		
	•	Participant 28	• indicated that the needs and expectations were not met. There were significant delays in application responses. The online system frequently went offline during applications. Assistance from the institution was inadequate. •		
	•	Participant 29	• indicated that needs and expectations were not fully met. Limited assistance affected satisfaction with the online system. System usability was challenging for rural students. Assistance from officials was necessary for navigation.		
	•	Participant 25	• indicated that the platform was cluttered and not user-friendly. The entire application process needs		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			simplification. Assistance was available but not challenging to obtain.		
	•	Participant 23	• indicated that the needs and expectations were not entirely met.		
	•	Participant 36	• indicated that the Needs and expectations of online services were met. Information was obtained from high school teachers. The system was easy to navigate and access. •		
	•	Participant 33	• indicated that the needs and expectations were not met. There were challenges during the application process. Assistance from the institution was lacking. Information sources were not helpful for online applications. •		
	•	Participant 32	• said that the needs were met through the SOS system. Information was		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			obtained from CPUT officials and friends. The application process was delayed due to administrative errors. •		
	•	Participant 30	• indicated that the needs and expectations were not entirely met. •		
	•	Participant 34	• indicated that the needs were partially met due to late application challenges. Assistance from the institution was helpful in the process. Communication via the internet was beneficial for application support. Overall satisfaction with the online system was not fully achieved. •		
	•	Participant 24	• indicated that the needs and expectations were not fully met. • There were challenges during the application process. No assistance was received from the institution. User had to		

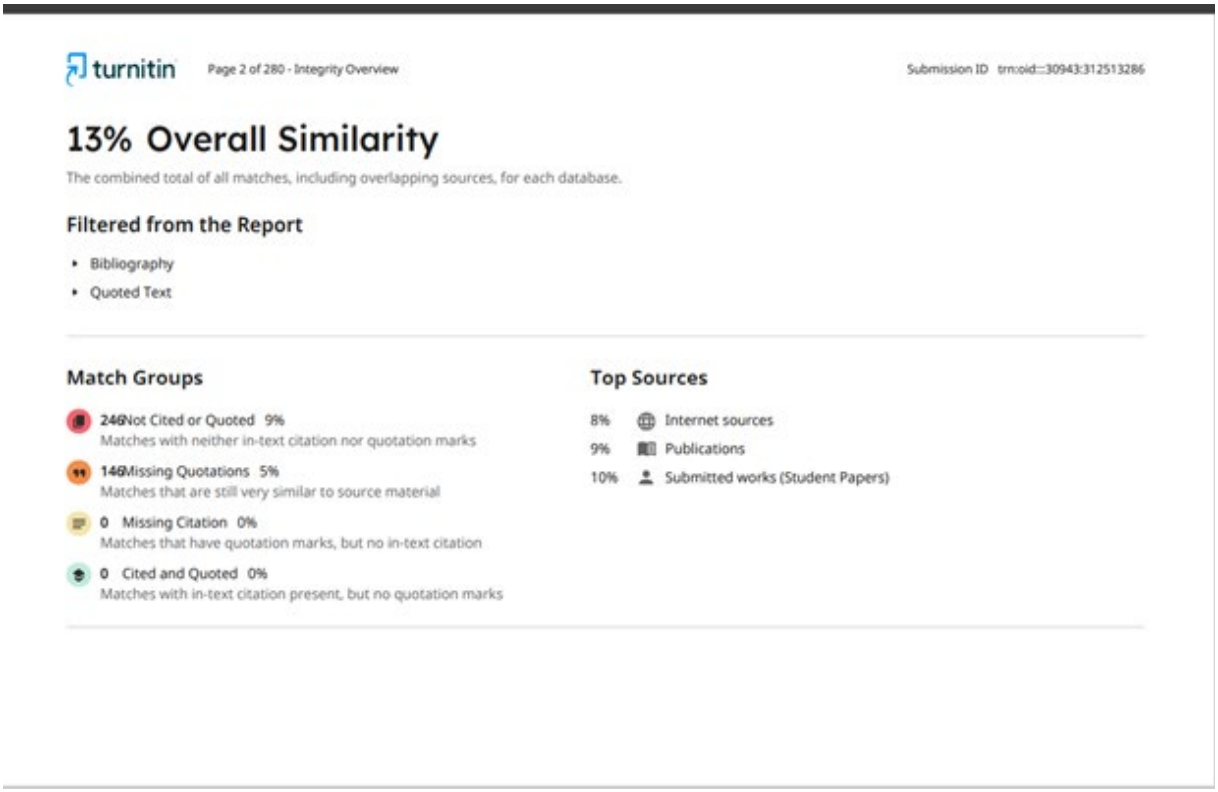
Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			figure out the process independently. •		
	•	Participant 38	• indicated that the needs and expectations were met satisfactorily. Application process took less than an hour to complete. Required documents were prepared in advance for efficiency. Eligibility for courses was confirmed during the application. Waiting for responses was a significant concern.		
	•	Participant 35	• indicated that the needs were not fully met during the application process. Communication issues arose when emailing required documents. Assistance was received from an on-site helper. International student registration faced significant blocks.		
	•	Participant 39	• indicated that the needs and expectations were met satisfactorily. The		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			registration process was easy to follow. Quick responses from the university were appreciated. Personal research helped in course selection.		
	•	Participant 27	• indicated that the usability depended on website efficiency and application complexity. Assistance was difficult to obtain via phone and email. More interpersonal assistance was needed for Participants. Funding issues were a challenge during the application process.		
	•	Participant 22	• indicated that needs and expectations were partially met during the application process. The system was cumbersome to navigate for course selection. Time for processing applications was minimized, which was satisfactory. No assistance		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			was received when challenges arose.		
	•	Participant 40	indicated the needs and expectations were met satisfactorily. The system was simple to use. There were no significant struggles during the process. Assistance was available if needed.		
	•	Participant 41	• indicated that the needs and expectations were met satisfactorily. The system was simple and easy to use. No significant challenges were faced during the process. Assistance was readily available on the university website.		
	•	Participant 12	• indicated that the needs and expectations were reportedly met. The user expressed satisfaction with the online system's		

Model	Research question 1	Participants	Responses from Participants	Responses from Authors	References
			usability. Information needed for applications was generally accessible. The user faced challenges during the application process.		

Appendix 6: Turnitin Report



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Appendix 7: Certificate of Editing and Formatting

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6 January 2025

To Whom it May Concern

This serves to confirm that I have edited and formatted a thesis submitted entitled *'The Use of Non-Academic e-Services: Experiences among First-time Entering University Students* by Cebisa Noludwe, in fulfilment of the requirements for the degree Master of Public Administration in the Faculty of Business and Management Sciences Department of Public Administration and Governance at the Cape Peninsula University of Technology

Amanda Lancaster
Master Public Relations Management (2020)