ADOPTION OF TECHNOLOGY AT THE FACULTY OF NATURAL AND AGRICULTURAL SCIENCES, UNIVERSITY OF THE FREE STATE

by

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The research project submitted to the UFS Business School in the Faculty of Economic and Management Sciences in partial fulfilment of the requirements for the degree of Master in Business Administration at the University of the Free State.

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I declare that the research project hereby handed in for the qualification Master's in Business Administration at the UFS Business School at the University of the Free State is my own independent work and that I have not previously submitted the same work, either as a whole or in part, for a qualification at/in another university/faculty.

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Acknowledgments

"Success is no accident. It is hard work, perseverance, learning, studying, sacrifice, and most of all, love for what you are doing". – Pelé, Brazilian Soccer Great

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Abstract

With an emphasis on improving technological competencies, removing obstacles, and promoting an adaptable culture, this study considered the factors influencing technology adoption among academic and support staff in the Faculty of Natural and Agricultural Sciences, University of the Free State. The primary objective of the research is to explore the readiness of faculty members to adopt to technological challenges presented in the workplace.

Utilising the qualitative methodology approach made it possible to fully comprehend the experiences, viewpoints, and difficulties that the participants had with integrating technology into their daily tasks. Semi-structured interviews allowed for the collection of data to be rich and detailed. Recurrent themes and subthemes were then identified from the collected data using thematic analysis.

The results show that four main themes—competence and skill development, training and support, adoption challenges, and adoption benefits—influence technology adoption. Successful integration was based on competence and abilities, emphasising the necessity of continuous training initiatives and organised assistance to handle both basic and advanced technical skills. systematic training approach that includes peer mentorship and ongoing support systems, increase staff confidence and engagement with new tools. The necessity for flexible policies, and adequate financial investment to fully address these difficulties are highlighted by the identification of challenges like budgetary restrictions, governance limits, and opposition to change as major roadblocks. A competitive edge for employees who actively embraced new technologies, enhanced performance, and increased operational efficiency were among the perceived advantages of technology adoption, which stood out despite these obstacles.

The study suggests several tactics to improve technology integration and adoption. It is crucial to create a comprehensive programme for technological competencies such as training, and ongoing assistance. Furthermore, cultivating a culture of continuous development promotes flexibility and skill enhancement, bolstered by organised feedback loops and official acknowledgment of talent advancement. Adaptable governance policies are also crucial since they allow for staff demands to be met with flexibility and responsiveness while offering the

structure required to regulate technology use. By strategically allocating resources to address financial challenges, training programmes and equipment are adequately supported, reducing resource-related obstacles. Lastly, staff commitment and motivation are increased by emphasising the advantages of technology adoption through real-world examples and success stories. To encourage a sustainable, forward-looking strategy for technology use in the faculty, this research emphasises the significance of coordinating technology adoption initiatives with organisational objectives.

Keywords: UTAUT, Technology adoption, technological competencies, training and support, organisational challenges, continuous development, governance policies, resource allocation

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Abbreviations

4IR	Fourth Industrial Revolution
AI	Artificial Intelligence
ICT	Information Communication Technology
IT	Information Technology
NAS	Faculty of Natural and Agricultural Sciences
POPIA	Protection of Personal Information Act
TAM	Technology Acceptance Model
TTM	Transtheoretical Model
UFS	University of the Free State
UTAUT	Unified Theory of Acceptance and Use of Technology

CHAPTER 1 INTRODUCTION

1.1 Background

Marikyan and Papagiannidis (2023:3) reveal that adopting and utilising information technology can have short and long-term positive effects on individuals and organisations, including increased productivity, cost and time savings, and convenience. Yadav (2019:49) confirms that “the internet environment and several innovative tools are radically changing higher education.” The swift progression of information and communication technology has resulted in numerous modifications to education and the organisation of higher education institutions. There is a form of "disruptive innovation and catalytic change" happening at colleges and universities (Yadav, 2019:49). Vision 130 of the University of the Free State (UFS, 2022), insinuates that adopting technology will completely change how business is conducted and give UFS the competitive advantage above other universities in South Africa.

According to Aruleba, Jere and Matarirano (2022:172), adoption of technology has had a tremendous impact on the education industry across the globe. Adopting technology in the faculty provides numerous benefits, such as lower labour costs and a sustainable competitive advantage. Being part of an academic institution, the faculty relies heavily on information communication technology (ICT) to implement procedures such as processing many student applications, ensuring the correctness of student air trees, enrolment caps, and examination results, all within short periods. These are to name a few.

Support and academic staff in educational institutions experience a higher sense of value when they understand academic freedom, which includes operational changes (Balim, 2022:187). Horváth and Szabó (2019:121) argue that the benefits of adopting new technology, which brings about operational changes, are not gained if the institution experiences low utilisation by the intended user/s.

Bijaniaram, Tehrani, Noori and Pak (2023:6) suggest that with the adoption of new technologies, the acceptance of change starts within individuals and could be affected by

the perception of how the technologies affect their job performance. It is the assumption that the willingness, or lack thereof, of academics and support staff to utilise technology might create a barrier to the adoption thereof. Lack of digital literacy, budget constraints, lack of leadership for change, lack of strategic planning, and attitudes and beliefs can all be barriers to adopting technology.

Pre-COVID-19, the traditional university system was characterised by face-to-face teaching and learning (Ngcamu, 2019:7). Globally, the higher education environment was upended by the COVID-19 pandemic. Pillay and Jarbandhan (2023:91) note that the pandemic made pre-existing issues in the South African education sector worse. For academic staff, the situation posed a distinct obstacle for postgraduate researchers and their mentors, as they had to traverse uncharted ground to sustain the pace of their PhD work. Postgraduate students in the Faculty of Natural and Agricultural Sciences (NAS) of the UFS experienced difficulties whilst doing their postgraduate studies. These included the need to be part of a diverse, and inclusive research community; postponed trials; missed deadlines; lack of financing; switch to online team and supervisor meetings; and mandated working from home. This also led to the exclusion of some postgraduate students in the faculty because they did not meet the prescribed residential periods of their qualifications. For the NAS academics to facilitate innovation in their practices and adapt to the fundamental transformation of the Fourth Industrial Revolution (4IR), they had to continually enhance their technology abilities by attending additional information technology (IT) seminars or courses to sharpen their existing knowledge. Thus, ICT proficiency is crucial since online instruction, the result of the COVID-19 lockdown will inevitably become part of the norm (Ndevu, 2023:30).

For support staff, universities were forced to restrict access to campus during COVID-19 lockdowns. Consequently, the systems, business procedures, and practices of support staff were impacted and disrupted. This resulted in work from home and, online meetings, which presented its own challenges such as unreliable internet connectivity. According to Ngcamu (2019:11), both academic and support staff, are often afraid to utilise digital tools; older employees lack confidence and feel uneasy when using digital platforms. Support as well as academic staff, were forced to work in drastically diverse environments

on numerous occasions during the pandemic, which presented complications. They were thrust into entirely new situations and responsibilities, which resulted in a variety of pressures within the institutions. These were novel situations where virtual and online learning opened new curricular needs for students so that they did not fall behind in their studies.

Prior to the pandemic, many support staff rarely used Microsoft Teams and similar programmes. Support staff facilitated procedures related to essential service components of quality assurance and application to online teaching and learning either alone or in tandem with other facilitators. In these unpredictable times, particularly while working from home, the importance of developing one's skills, perseverance, knowledge, and resilience were imperative.

For some departments in NAS this was a huge challenge, in some instances it even resulted in disciplinary hearings as some staff misused the work from home policy by not adhering to their contractual obligations such as working hours. The staff of NAS did not only experience technological challenges but also mental health problems during this period. This was due to the working from home, working alone, and balancing work with non-work-related concerns including childcare, interpersonal connections, and family obligations because there were no work-life boundaries. Dining rooms and tables became desks and offices, couches became office chairs, kitchens and bathrooms became shared workspaces. This can make it difficult to focus, and not being able to mentally unplug or separate from work once the day is over can result in burnout and other forms of increased stress as well as decreased productivity and mental health (Kotera & Winson, 2021:205).

Therefore, the COVID-19 pandemic restriction significantly impacted faculty members' digital competencies. Even though the restrictions have been lifted, the pandemic indicated a gap in that the adoption of technology is needed. This is still current because the onset of pandemics is unpredictable forcing institutions into hybrid teaching, learning and research approaches again. Also, there are additional stressors of on-campus protests, often forcing institutions to move to the hybrid approach.

1.2 Problem Statement

The use of technology in higher education has become essential to not only contemporary teaching strategies but also operational aspects involving both academic and support staff. The adoption of technology has created new opportunities and problems for higher education institutions (Silander & Stigmar, 2019:275). Chatterjee and Bhattacharjee (2020:3445) add that the adoption of technology offers countless chances to improve governance, with added efficacy and efficiency. It is important for higher education institutions to adopt technology since it benefits students, academics, support staff, and researchers greatly (Chatterjee & Bhattacharjee, 2020:3445). Therefore, it is necessary to encourage all stakeholders to embrace the adoption, which is anticipated to bring about overall improvements to higher education systems.

But even with all its potential advantages, adopting technology in higher education institutions is frequently fraught with difficulties. It is imperative that these issues be resolved before technology can be adopted effectively to improve teaching, learning, and administrative procedures in NAS. *The problem is that the seamless adoption and application of technology in the faculty is hindered by a multitude of problems*. These difficulties are multifaceted:

Agility: Elgohary and Abdelazyz (2020:2) state that a system of people, procedures, technology, culture, and structures make up an organisation. Universities must possess the agility to adopt new technologies to stay ahead of the rapid changes occurring in a technologically sophisticated market to thrive in a highly competitive environment. Moreover, the success of not only the faculty but also the university hinges on its capacity to convince staff members to embrace technological innovations as well as to apply them. But employees are inherently resistant to change, especially the older employees.

Academic disciplines: Given that technologies are used to varying degrees in different subject areas, authors contend that some hurdles are dependent on the academic discipline of the instructor (Mercader & Gairín, 2020:4). Mercader and Gairin (2020:4) specifically draws attention to the fact that instructors in the social sciences and

humanities use digital tools less frequently than those in other scientific disciplines such as NAS.

Financial restraints: Gkrimpizi, Peristeras and Magnisalis (2023:09) share that digital transformation necessitates a substantial initial cost outlay. Research from universities show that the largest obstacles to digital transformations are financial costs and investment in financial instruments. To be more precise, the biggest obstacle is the absence of public funding for change. Because initial investment costs are significant, higher education institutions' internal financial resources are typically insufficient to support the entire digital transformation process (Gkrimpizi et al., 2023:09).

Views and attitudes: Internal elements of the person, such as attitudes and ideas about their skills and the value of technology, are associated with transformation hurdles (Gkrimpizi et al., 2023:10). Their attitudes on the deployment of digital technology influence the shift, either favourably or unfavourably. It will be easier for academics who lack technological proficiency but have a favourable outlook to acquire the skills necessary to integrate ICT into teaching and learning processes. Gkrimpizi et al. (2023:11) says that enhancing ICT abilities requires a shift in negative attitudes. It is still difficult to persuade those who are resistant to change to adopt new perspectives and ways of acting.

Therefore, if NAS does not adopt and embrace technology, the faculty will be left behind in this digital era. A reduction in educational quality will be experienced, and restricted access to research and information will be experiences. Deterioration in competitiveness will be prevalent with ineffective administrative procedures, and trouble adjusting to change. In today's increasingly digital and interconnected world, a university may be severely disadvantaged if it does not embrace and integrate technology. Adopting technology is crucial for raising standards of instruction, increasing administrative effectiveness, and preserving competitiveness in the field of higher education (Gkrimpizi et al., 2023:3).

A comprehensive strategy that includes capacity building, infrastructure development, stakeholder involvement, strategic planning, and policy intervention is needed to address

these issues. Higher education institutions can use technology adoption power to build innovative, inclusive, and engaging learning environments, which equip students for success in the digital era by overcoming these obstacles. In the end, administrators, teachers, students, legislators, and technology providers must work together to overcome obstacles, seize opportunities, and use technology as a catalyst for improved student learning if higher education is to adopt technology successfully.

1.3 Research Questions

1.3.1 Primary research question

In what ways is NAS ready to adopt to the technology challenges presented in the workplace?

1.3.2 Secondary research questions

I. What is the perceived competency of the staff members in using the existing technology at NAS?

II. What are the training needs of staff required to work with (operate) innovative technologies in NAS?

III. What are the challenges experienced or associated with the adoption of technology in the NAS?

1.4 Objectives

1.4.1 Primary research objective

- The primary objective of the research is to explore the readiness to adapt to technological challenges presented in the workplace for faculty from NAS.

1.4.2 Secondary research objectives

- To explore the level of technology competency in academic and support staff within NAS?
- To identify the training needs of academic and support staff within NAS?
- To analyse challenges experienced/associated with the adoption of technology within NAS?

1.5 Research Methodology

Goundar (2012:9) explains research methodology as the method/s by which a researcher may proceed with research. Research methodology involves learning the various techniques that can be used in conducting research and conducting tests, experiments, surveys, and critical studies (Goundar, 2012:9).

1.6 Epistemological Stance

Epistemology, according to Bryman and Bell (2014:12), is cantered on the issue of what constitutes appropriate knowledge within a discipline. Bryman and Bell (2014:12) identified three primary epistemological positions: positivism, realism and interpretivism. The researcher used the interpretivist or post-positivist paradigm. Post-positivism aided the researcher in comprehending the realities and difficulties associated with faculty technology uptake.

1.7 Research Design

A research design collects, investigates, interprets, and reports information in research studies (Boru, 2018:1). The research design used in this study was a **qualitative research design,** which according to Goundar (2012:19), is an extremely subjective field of study with the aim to comprehend feelings, impressions, and points of view rather than just numbers.

Qualitative research uses verbal data rather than numerical data (Busetto, Wick & Gumbinger, 2020:01). Additionally, it helped the researcher become more conscious and critical of how well the chosen method and study problem fit together. The researcher was able to capture the evolving views of academic staff regarding the use of technology not only in the classroom but also in broader educational contexts with the use of the qualitative study design.

1.8 Sampling

According to Mweshi and Sakyi (2020:180), sampling is the process by which a researcher selects individual items from a larger population for close study through probabilistic and non-probabilistic methods. Support and academic staff made up the small sample group. Quota sampling was employed to ensure that both academic and support staff were represented in the study. The population size of NAS comprises 375 and a sample size of 11 was identified for the interviews.

1.9 Data Gathering Method

Semi-structured interviews were the primary method of qualitative data gathering during this study. The purpose of the collection tool was to identify the variables that affect faculty members' acceptance and uptake of new technologies.

1.10 Data Analysis

A deductive approach to thematic analysis was used for this study. Lochmiller (2021) confirms this form of analysis is principally concerned with identifying patterns, which are then reported as a researcher-generated theme. Dos Santos (2021) demonstrates that using thematic analysis is a flexible method not tied to a specific philosophical orientation.

1.11 Trustworthiness

Ederio, Inocian, Calaca and Espiritu (2023:2722) confirms that it is important for the researcher to establish whether the research study's conclusions are credible, transportable, confirmable, and dependable.

1.12 Ethical Considerations

In any research, shielding individuals by applying applicable ethical principles is paramount. This protects the individual completing the survey/questionnaire and the researcher. This qualitative study adhered to the following principles of ethical considerations:

I. Permission obtained - Ethical clearance and permission was obtained from the General/Human Research Ethics Committee of the UFS as the research involved staff of the NAS.

II. Confidentiality. Maintaining confidentiality ensures that the information gathered is safe and only available to those who need it to carry out the research effectively. Data pseudonymisation was employed to protect participant identities by creating fictitious names.

III. Informed consent. Informed consent is described by Salkind (2012) as the procedure through which probable participants in a study consent to a minimum set of standards, including the understanding of what a research study is about, what role the participant plays, potential risks and benefits, and the participant's rights. The study's participants were fully aware of and comprehended its purpose. Prior to the semi-structured interviews, consent forms were given to participants, who had to read and sign them.

IV. Voluntary participation. The participants were informed by the researcher that their participation in the study was entirely voluntary and that the study was being conducted for academic purposes. During the research, participants had the option to leave the study at any point without giving a reason.

V. No harm. During the study, no participants experienced any physical or psychological injury or risk of harm. Before the study began, participants were told of all potential risks of harm (if any), to acquire their informed consent. A list of "Who to contact" was given to participants in case they felt violated.

VI. Ethical data management. The Protection of Personal Information Act 4 of 2013 (POPIA; Republic of South Africa, 2013) guaranteed that the proper security measures were implemented and adhered to. For a duration of five years, every piece of data will be electronically preserved. No soft copies were used.

VII. Conflict of interest. The researcher employed appropriate tactics to ensure that the benefits of the research outweighed any potential hazards to the participants or the organisation. The information gathered is kept private and anonymous.

1.13 Demarcation of Study

This study is about Adoption of Technology NAS. Academic and support staff was involved in this study. The field of study is in 4IR.

1.14 Structure of the Research

1.14.1 Chapter One

Chapter one introduces the study.

1.14.2 Chapter Two

Chapter two depicts an overview of the literature on technology adoption.

1.14.3 Chapter Three

The research methodology chapter outlines the use of qualitative research concerning the objective of this study. It also provides more information on how the data was collected and analysed and highlights the ethical considerations applied.

1.14.4 Chapter Four

This chapter presents the data analysed together with the relevant findings. Initial findings will be collected through a recording device, followed by thorough discussions of the significant results.

1.14.5 Chapter Five

This chapter concludes and summarises the study by providing general recommendations. It also includes potential areas for improvement, followed by a conclusion that ensures that the critical objectives of the study have been addressed.

1.15 Conclusion

With this study, the researcher will assess whether NAS is ready to adapt to the technological challenges presented in the workplace. Should this research be viable, the

staff of the faculty will experience efficiency and quality processes, increased productivity, improved competitiveness between other universities, and enhanced decision-making with data-based tools.

CHAPTER 2 : LITERATURE REVIEW ON THE ADOPTION OF TECHNOLOGY

2.1 Introduction

This chapter reviews literature relevant to the adoption of technology in higher education. The first section presents a historical overview of technology. The second section touches on the positive and negative influence of 4IR on the current workplace. Thirdly, various models related to technology adoption, including the UTAUT theoretical model, will be discussed. Technology adoption in higher education and the strategies used to lead, advance, and effectively enact change are discussed.

2.2 Historical Overview of Technology

Throughout history, the world has experienced three eras of technological advancement. The first industrial revolution started in the 18th Century, in the steam engine era, by displaying mechanical systems. The second industrial revolution originated in the 19th Century when people learned how to generate and harness electricity. The third industrial revolution took place in the information milieu by utilizing electronics and IT to automate systems in the 20th Century. From this, 4IR has eventually evolved as an outcome of industrial developments, allowing machines to become more intellectual and automated.

Masinde and Roux (2020:33) share that:

> …the fourth industrial revolution, often known as industry 4.0 or 4IR, differs from the first three in two key areas. Firstly, it combines the Internet of Things, the Internet of Systems, and cyber-physical systems. Second, because the technologies supporting 4IR can process information cognitively much like people, they are no longer limited to mechanical tasks.

The only issue is that certain entities are unwilling or unable to adopt this new technology.

Figure 2.1 illustrates the relationship between innovation and industrialisation from the standpoint of technological innovation driving industrialisation. The 4IR has profound effects on organisations, labour, and government. It also presents a distinct set of

opportunities and problems. Although technical advancements have accelerated industrialisation, the opposite is also true. Figure 2.1 shows innovation in the form of new technological advancements and emerging technologies, which come from novel technology combinations, sparked by industrialisation (Beharry & Fai Pun, 2020:45). As more businesses adopt the underlying technology of 4IR, the potential for financial gains from this approach becomes increasingly evident. The only worrying aspect is the chance that governments might not use or control these new technologies and the reluctance or refusal of specific organisations, such as universities, to adapt to them (Masinde & Roux, 2020:34).

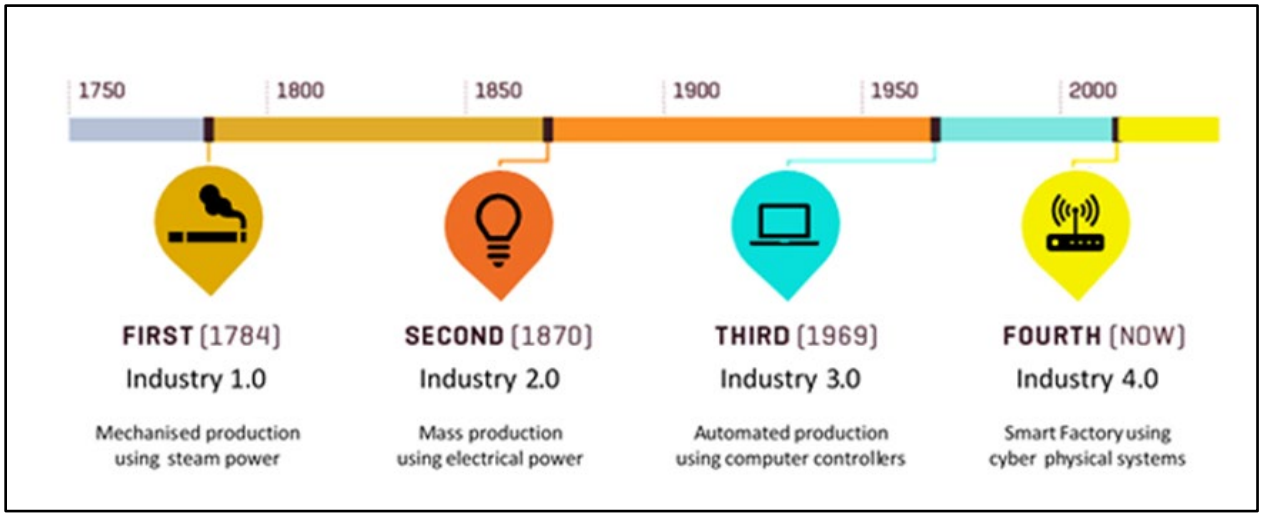


Figure 2.1: Recording of the Innovation-Industrialisation Relationship
Source: Beharry and Fai Pun (2020:45)

2.3 4IR and the Influence on the Current Workplace

The 4IR, which is currently underway, is characterised by a dizzying pace of technical advancements and developments that are changing communities, organisations, and the environment (Gorski, Gligorea, Gorski & Oancea , 2022:187). Technological change is a megatrend significantly changing economies, cultures, and the environment. In addition to technological advancements, the “Black Swan” event—the COVID-19 epidemic—has significantly impacted digital transformation's pace, scope, and priorities. Gorski et al.

(2022:188) state that it is the combining of "technologies and their interaction across the physical, digital, and biological domains" that comprises 4IR.

Two categories of interactions describe the transition brought about by these developing technologies. Firstly, machine-to-machine, which does not involve human intervention. Secondly, human-to-computer/machine, in which case people communicate and work together with intelligent systems (Gorski et al., 2022:188). The forms of interaction are depicted in Figure 2.2.

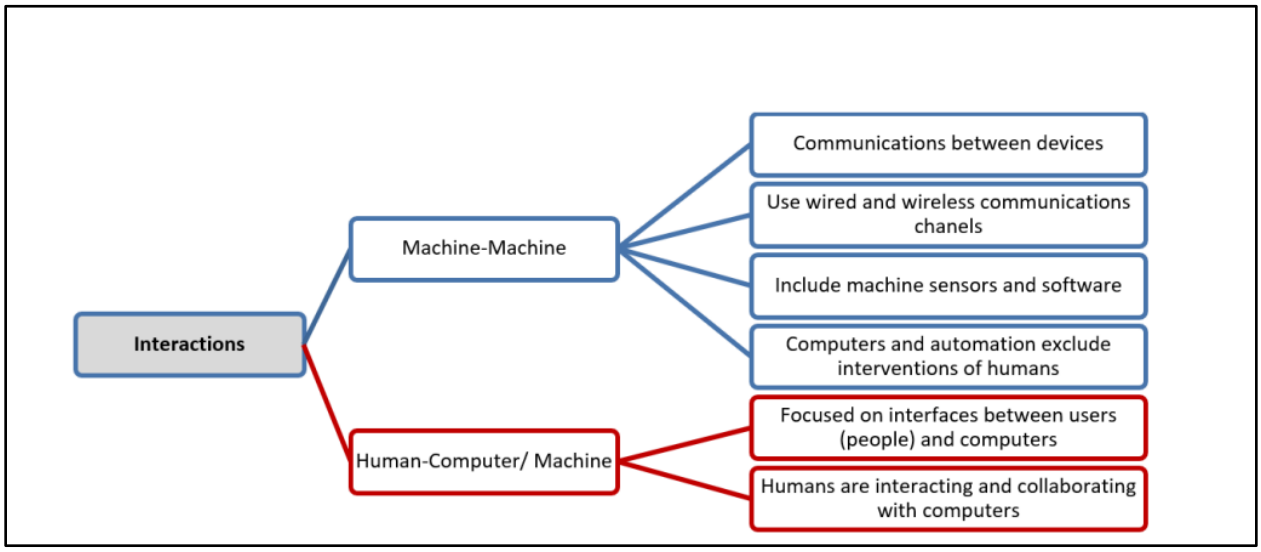


Figure 2.2: Exact forms of interaction in 4IR
Source: Gorski et al. (2022:189)

Traditionally, when discussing the workforce, the focus was primarily on the employees. The term "workforce ecosystem" is used increasingly these days. It encompasses traditional and internal employees as well as two other significant participant categories, namely intelligent technology for workforce augmentation and the external workforce, which include gig workers, freelancers, service providers, contractors, developers, and accessory providers (Figure 2.3).

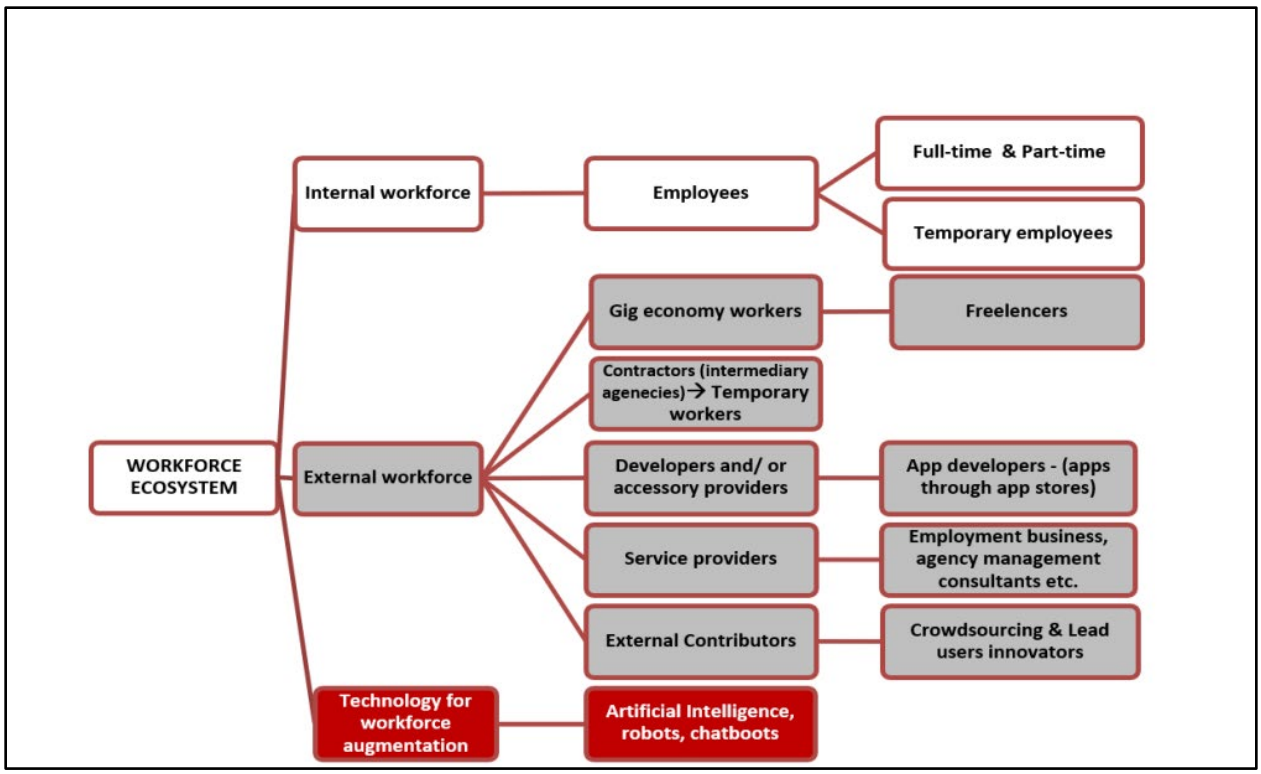


Figure 2.3: Workforce ecosystem: classifications of workers

Source: Gorski et al. (2022:190)

In Figure 2.3 it is evident that although workforce ecosystems differ greatly between organisations, they all share a few traits. Ecosystems facilitate the creation of value, depend on the complementarities among ecosystem participants, and have interdependencies among participants, meaning workers' successes or failures are dependent on one another.

An additional crucial component of the workforce ecosystem is the workplace. Most internal workers (employees) had full- or part-time jobs in physical offices before the COVID-19 pandemic. The internet transition was a disruptive change brought about in part by the pandemic. The combination of working from home, the office, or any location has become increasingly popular among employees. Amidst social isolation caused by the pandemic, workers are starting to enjoy additional perks like flexibility when working from home. Many people's interests, goals, and expectations about being able to work from home are met by the hybrid workplace model. (Gorski et al., 2022:190).

Stofile, de Braine and Dhanpat (2023:3) say that studying work identity is becoming more and more relevant as the world undergoes constant change and development, especially in the labour market. Work identity is further referred to by Stofile et al. (2023:3) as a person's "...work-based self-concept, which influences the roles people take on and the corresponding behaviours they exhibit when carrying out their work." It comprises a blend of organisational, occupational, and other identities. Positive employee identification with the organisation, the work environment, and job-related activities foster engagement, boosting output and performance. Thus, the work identity of employees is essential to accomplishing organisational objectives.

Positive employee identification with the organisation, the work environment, and job-related activities foster engagement, improving output and performance (Karanika-Murray, Duncan, Pontes, & Griffiths, 2015). Thus, the work identity of employees is essential to accomplish organisational objectives. The 4IR is transforming the workplace and employees' skills to succeed; therefore, managers or leaders must handle which factors influence the organisation's performance. Thus, 4IR affects leadership as well.

Competence also plays an important role in the adoption of technology (Bartolome, 2024:51) . Competency is the primary requirement for any person to perform their job responsibilities effectively (Silviana & Pudjiarti, 2024:73). Sutrisno (2019) defines competency as the capacity to perform tasks and work in line with specified standards using a combination of knowledge, skills, and work attitudes. Competency includes a favourable work attitude in addition to technical knowledge and skills.

Sokfa (2021:376) notes that although governance presents as a challenge, technology governance seeks to maximise the positive effects of innovation and a wider spectrum of technologies on societies while minimising any potential negative effects. Technology governance is proving to be a challenging endeavour, which is discussed below.

- Leadership 4.0 and organisational performance

The 4IR called for new management techniques and a leadership style to keep up with rapid developments (Mayer, 2024:17). Amid the chaos and uncertainty brought about by

4IR, companies, managers, and leaders who can innovate, adapt, and work together will own the future. Therefore, the performance of organisations is significantly impacted by leadership 4.0. In the 4IR age, leadership 4.0 fosters ethical, inventive, cooperative, and flexible behaviours, which are critical to the success and performance of organisations going forward (Adekanmbi & Ukpere, 2022:5).

- Innovative work behaviour and organisational performance

Cooperative, innovative, skilled, and learning behaviours are examples of competencies and behaviours, which stimulate organisational success in the 4IR (Adekanmbi & Ukpere, 2022:5). There is a favourable correlation between organisational success and innovation according to Adekanmbi and Ukpere (2022:5).

- Leadership 4.0 and innovative behaviour

Adekanmbi and Ukpere (2022:5) postulate that leaders embrace leadership 4.0, fostering creativity in their subordinates. Adekanmbi and Ukpere. (2022:5) also say leadership 4.0 promotes innovative behaviour in 4IR. Leaders encourage their subordinates and followers to feel more incentivised to be creative. Leadership 4.0 also shapes innovative work behaviour in the workplace. Leadership 4.0 encourages followers to investigate or develop new constructive points of view, encouraging creative work practices. Mishra, Singh and Tripathy (2020:2) believe that the success of an organisation depends on its morale. It is important for Leadership 4.0 to understand the important relationship between employee performance and the success of an organisation when analysing factors leading to employee performance (Mishra et al., 2020:2). Therefore, leaders should constantly prioritise maintaining staff satisfaction and motivation to carry out their responsibilities. To foster and maintain this behaviour, leaders should ensure that the employees are properly trained and informed on the adoption of technology. Matsika and Zhou (2021:8) show that to facilitate support for the adoption of technology and the buy-in from staff, organisations should invest in properly training their employees to comprehend the emerging trends in the adoption of technology. If this is not done, it will lead to negativity in the organisation.

Over the past three centuries, revolutions have profoundly influenced our civilisations (Adekanmbi & Ukpere, 2023:143). The 4IR's resulting digitalisation and automation has had a significant and pervasive impact on the workplace and employees (Coldwell, 2019:1). Furthermore, Coldwell (2019:1) confirms that the development of digitalisation has brought about both advantages and disadvantages, much like globalisation. On the downside, the advent of robotic and automated industrial procedures resulted in the displacement of skilled professionals and the emergence of a low-paid underclass of workers. Numerous consequences are seen regarding the rate of both voluntary and involuntary turnover, unemployment, and workforce well-being. In the face of the automation wave, employees have attempted to become less disposable at an organisational level. Coldwell (2019:2) points out that maintaining a healthy work/life balance is influenced negatively by the pressure to maintain employment in the face of automation and rapid industrial change brought about by 4IR. This pressure has also forced workers to keep their citizenship behaviour far beyond formal office hours, which has led to the introduction of extreme forms of citizenship. Fierce civic engagement can create a "toxic" culture that spreads among staff and the company, which eventually results in entropy. Since most employees always have their business emails open on their phones, they are always reachable. Because of this, it is difficult to unwind and disengage from work entirely (Coldwell, 2019:2), which also affects employee’s well-being and mental health. The pressures brought on by rapid industrial change, automation, and information explosion of the 4IR may result in toxic forms of leadership. Coldwell (2019:5) explains that not all toxic leaders appear out of thin air; most are the product of socioeconomic forces, such as those brought about by 4IR, which firmly focuses on environmental sustainability and competitive efficiency through automation and technology.

2.4 Theories on the Adoption of Technology

Authors define the adoption of technology differently. Sony and Naik (2020:799) say technology adoption is a “technological evolution from embedded systems to Cyber-Physical Systems.” Skare and Soriano (2021:223) consider technology adoption as the initial usage of new technology by an individual, company, or other agent. Granić

(2022:9726) further refers to technology adoption as “the acceptance, integration, and embracement of any type of new technology.”

Additionally, technology acceptance is an attitude toward technology, which are influenced by various factors and is the initial stage of technology adoption (Granić, 2022:9726). Adoption hinges on the adopter's (person or organisation) perception of the concept, action, or product as novel or inventive. Many theories and models have been applied to individual technology adoption research to forecast and explain human behaviour regarding technology acceptance, adoption, and usage. Eze, Chinedu-Eze, and Bello (2019:02) identified technology’s ease of use, focus on users, and management, as the significant factors in adopting technology. Eze et al. (2019) also pointed out that the adoption of technology is a dynamic process, and none of the stages in the adoption process is static, and different factors can influence the adoption process at different stages.

Timing of technology implementation is essential. The importance of timing is pointed out by Maali, Lines, Smithwick, Hurtado and Sullivan (2020:358). Creating a realistic timetable and modifying workloads accordingly considers unforeseen obstacles, which may arise during the adoption process. Technical difficulties and a lack of technical maturity can be obstacles to successful technological transformation asserts Keyworth, Hart, Armitage and Tully (2018:15). Fostering cross-functional teamwork and a positive work environment for employees are also essential (Kumar, Singh & Chandel, 2018:16).

People adapt in different ways, which has different outcomes when people engage and interact with technology (Schmitz, Teng & Webb, 2016:665). Eze et al. (2019:2) postulate that most research is influenced by information systems and ICT in line with the third wave of the technological revolution. Even users who have unfavourable opinions of technology are forced to use it regardless of their personal preferences. Hence, it is illogical to consider their technology usage behaviour as a choice, in circumstances where users have little or no choice but to use it. However, such coerced use frequently results in user resistance, low morale, and dissatisfaction; on the other hand, enterprises experience decreased productivity, effectiveness, and job quality; and occasionally, adoption of

technology initiatives fail (Bhattacherjee, Davis, Connolly, Hikmet, Rowe, & Meissonier, 2017:396). Additionally, it is crucial to be informed of the situation in an external setting of the establishment (Vaishnavi, Suresh & Dutta, 2019:1294).

Linked to different theories are also models. Although there are several theories and models on the adoption of technology, the researcher identified five theories and models, which apply to this research. Each theory of model offers a thorough framework that forecasts the circumstances leading to the emergence of adoption of technology at a university. The theories and models in technology adoption are discussed in the next section.

2.5 Theories and Models in Technology Adoption

Taouab and Issor (2019:102) define a model as "a schematic representation of reality or the view of a person." The authors also confirm that organisations can use models to achieve goals, enhance performance, boost competitiveness; they can operate by following their plans, procedures, choices, personnel, activities, and outcomes (Taouab & Issor, 2019:102). Numerous theorists have discussed and referenced theories and models in the use of technology. Occasionally, authors also include explanatory models in their descriptions of the theories. The following section discusses a few of these theories and models.

2.5.1 Rogers Diffusion of Innovation Theory

García-Avilés (2020:2) states that Rogers created an innovation-decision process model to examine the stages of adoption, primarily information-gathering and information-processing activities, which are driven by the need to dispel doubt on the benefits and drawbacks of a particular innovation. The innovation-decision process entails an individual or other decision-making unit learning about an innovation, forming an attitude toward it, determining whether to accept or reject it, implementing the new concept, and having this decision validated (García-Avilés 2020:2). There are five stages in the decision process for innovation adoption, which are depicted in Figure 2.4 and subsequently discussed.

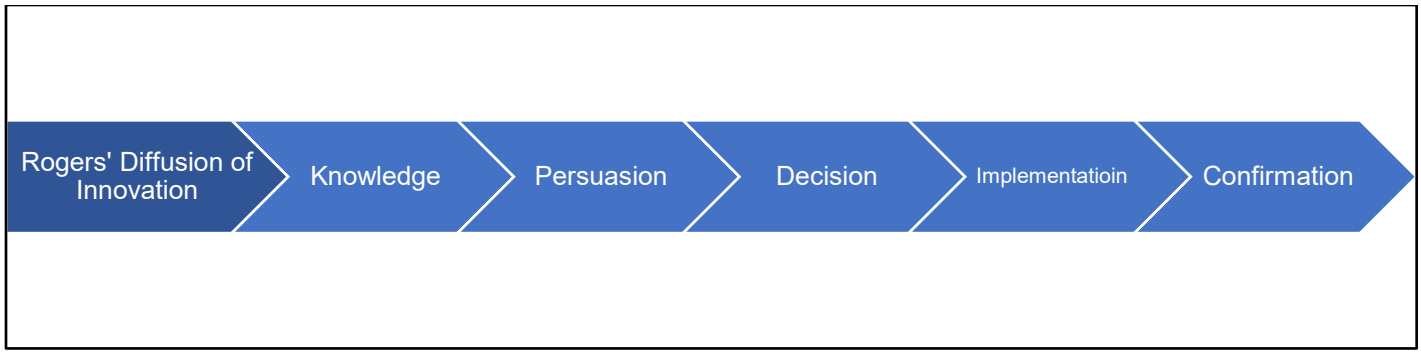


Figure 2.4: Stages of Rogers' Diffusion Innovation Theory/Model

Source: Frei-Landau, Muchnik-Rozanov and Avidov-Ungar (2022:12814)

Knowledge stage: entails acquiring cognitive knowledge, which includes exposing learners to the innovation, helping them become aware of it (awareness knowledge), and helping them find information on how to apply it effectively (how-to knowledge) (Frei-Landau et al., 2022: 12814).

Persuasion stage: emotion-focused, since attitudes toward innovation are developed during this stage. At this point, learners face ambiguity and may be influenced by peer group members' positive subjective evaluations of the technology as well as social encouragement to adopt the novel tool (Frei-Landau et al., 2022:12814).

Decision stage: is the moment at which a person chooses whether or not to employ the innovation; the more times they have had the chance to try it out, the more likely they are to choose to adopt it (Frei-Landau et al., 2022:12814).

Implementation stage: three incentives influence a decision to employ the innovation: peer pressure, authority figure pressure, and personal desire (Frei-Landau et al., 2022:12814).

Confirmation stage: the users analyse the procedure and the results, confirming their choice as they solidify their ultimate beliefs (Frei-Landau et al., 2022:12814).

According to Rogers (2003:1), some innovations will be accepted quicker than others if they provide greater relative advantage, compatibility, simplicity, trialability, and

observability. Rogers also noted that getting a new idea adopted, even when it has obvious advantages, is difficult.

2.5.2 Transtheoretical Model (TTM)

Prochaska and DiClemente created the transtheoretical model (TTM) in the 1970s to investigate how people's health behaviours evolved (LaMorte, 2019:1). It is predicated on an individual's capacity for decision-making and demonstrates a transformational process according to the individual's goals. The TTM functions under the presumption that behaviour changes gradually and ineffectively. Behaviour, especially habitual behaviour, is always changing because of a cyclical process (LaMorte, 2019:1). This cyclical process is shown below in Figure 2.5.

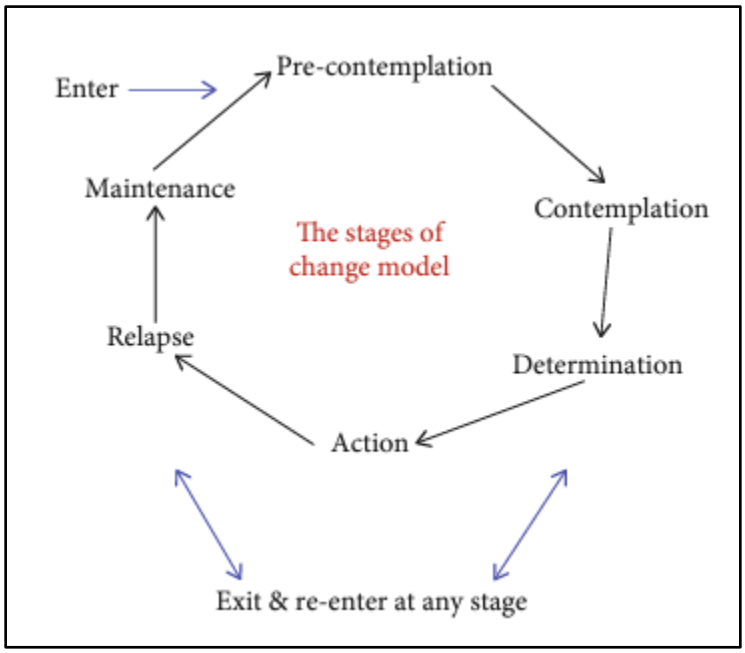


Figure 2.5: Transtheoretical model
Source: LaMorte (2019:1)

The fundamental tenet of TTM (Figure 2.5) is that behaviour changes are not sudden or definitive. According to this concept, every person will undergo six stages of change: pre-contemplation, contemplation, preparation, action, action maintenance, and behaviour termination.

2.5.3 Technology Acceptance Model (TAM)

Davis (1985) made the initial conjectures about TAM (Figure 2.6). The model explains people's behaviours around information technologies. However, TAM is regarded as an advancement of the theory of reasoned action. In any case, the fundamental idea is predicated on the features of technology and how well-received it is. Research using TAM has been criticised for shortcomings in methodology, limitations in application, and an emphasis on system usage characteristics at the expense of other important variables and linkages (Venkatesh & Bala, 2008:3). Even so, the theory's contributions cannot be overshadowed by its limitations. It has been demonstrated for nearly thirty years that TAM is theoretically robust and possesses great predictive ability to evaluate people's intentions to use technology. The TAM emerged as the first theory describing why people utilize information systems (Goodhue, 2007:220).

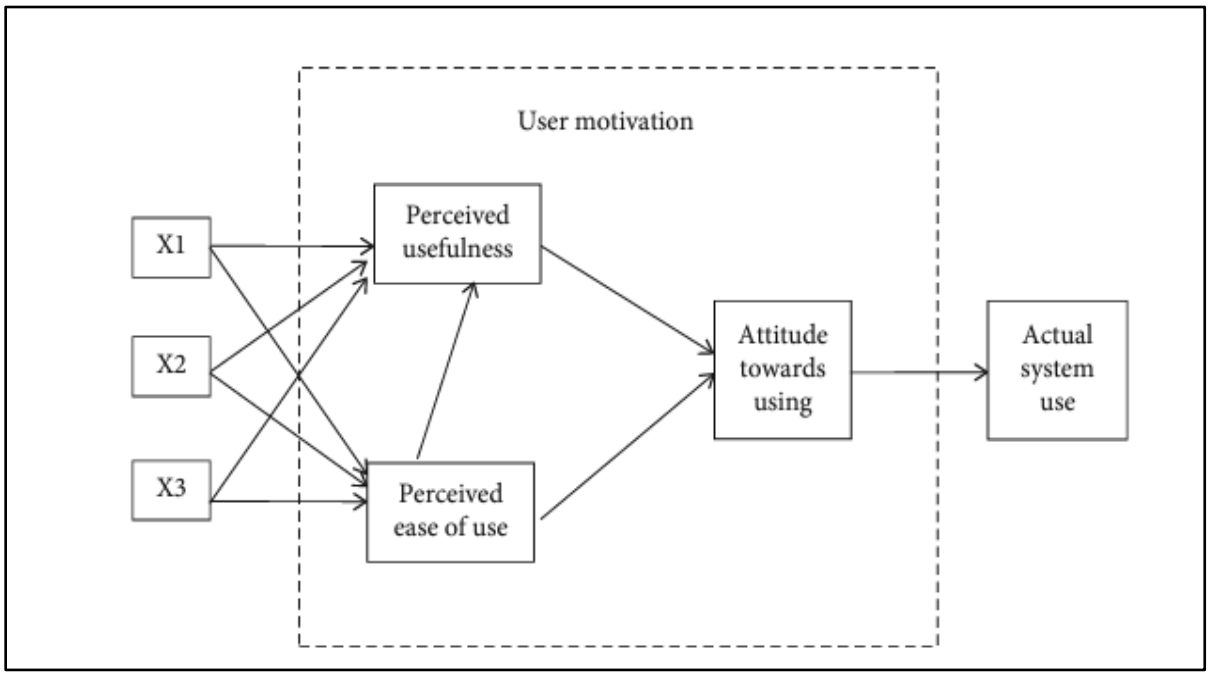


Figure 2.6: Original technology of acceptance model

Source: Dissanayake, Jayathilake, Wickramasuriya, Dissanayake, Kopiyawattage and Wasala (2022:5)

Hasyim, Wahyudi and Setiawan (2023:57) states that the TAM model (Figure 2.6) has grown in popularity and is employed in many research projects on the adoption of new

IT. The TAM demonstrates how utility and convenience of use have an impact on people's desire to adopt technological systems (Hasyim et al., 2023:57). The model gauges an individual's perceptions of the advantages and usability of a new technology. With this comes the issues of security measures and systems. Jones, McCarthy, Halawi and Mujtaba (2010:10) are of the belief that the human element is the weakest component of the security solution, or at least, vital to the safeguarding of data and information systems. An organisation will not fully profit from the technology if users are hesitant to embrace security measures and systems. This could be due to lack of training and knowledge. Jones et al. (2010:10) say that employees need to be trained in information security policies and practices. Management and training support have a positive influence on the acceptance of technology (Jones et al., 2010:10).

2.5.4 The final version of the Technology Acceptance Model

The final version of the TAM model displayed in Figure 2.7 is an extension of the TAM model shown in Figure 2.6. Venkatesh, Morris, Davis and Davis (2003) developed this to model to describe the perceived utility and intended use in relation to social influence and cognitive instrumental processes.

Figure 2.7 theorises that users' judgments on the effectiveness of systems are formed by their mental evaluation of how significant work goals align with the consequences of completing tasks on the system. Change management theories are extremely pertinent to the use of technology because they offer systematic methods for managing the transition and assisting staff in successfully embracing new tools, procedures, and systems. Since implementing new technology impacts an organisation's procedures and standards, it is regarded as an organisational shift (Maali et al., 2020:326). According to Maali et al. (2020:326), organisational change management is the process of implementing practices, which differ from the organisation's current practices to accomplish organisation-wide objectives. The implementation of organisational change techniques is critical to the successful adoption of all forms of technology (Maali et al., 2020).

Employers can increase acceptance and decrease resistance by using these theories to help staff navigate the practical and emotional aspects of embracing new technology. These models offer an organised method that promotes a culture of flexibility and ongoing development in addition to facilitating seamless technology integration.

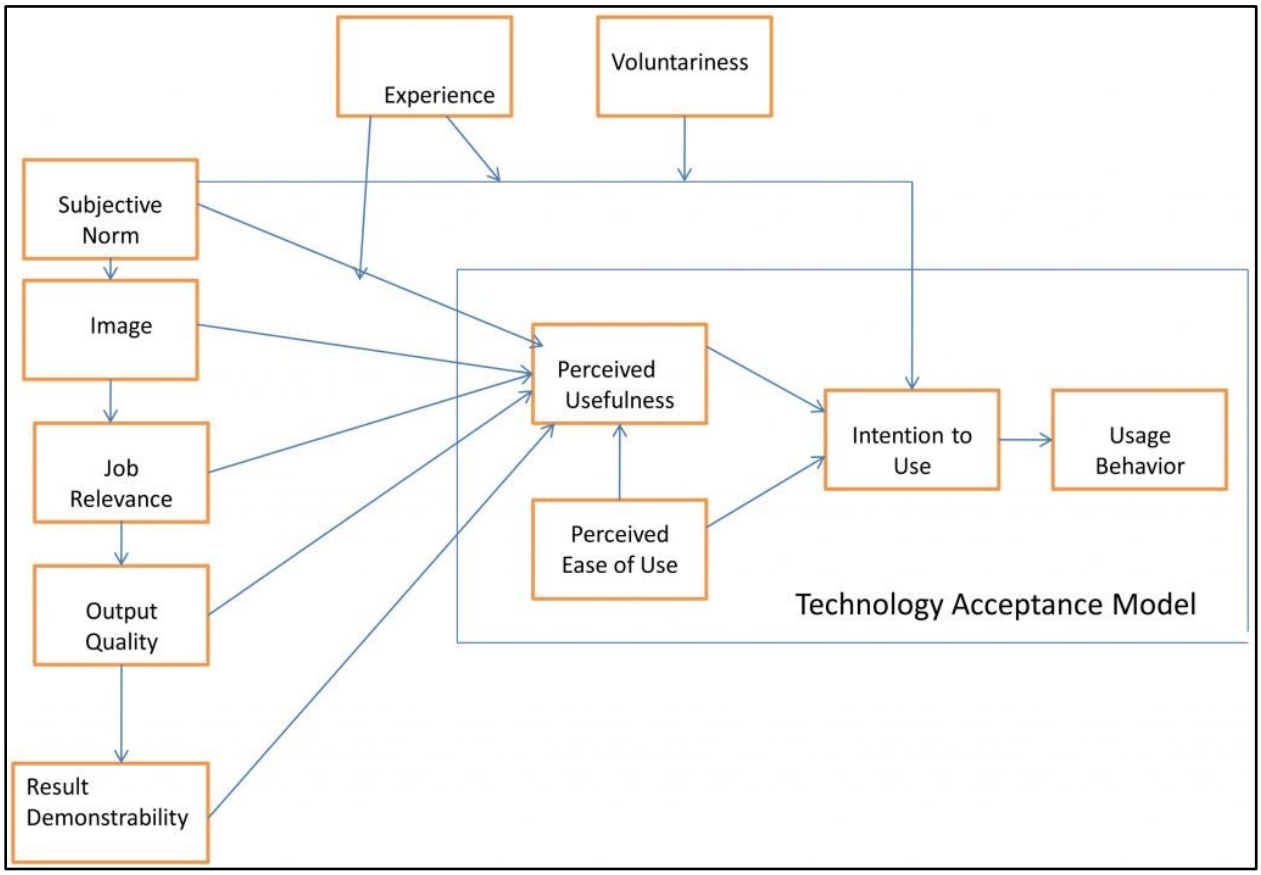


Figure 2.7: Final version of technology acceptance model
Source: Lai (2017:28)

According to Venkatesh et al. (2003:467), many empirical TAMs base perceived usefulness on usage intentions. Because it affects usage intentions and how these characteristics change over time as system usage increases, it is essential to comprehend the factors that define the perceived usefulness construct. Although the original TAM was based on perceived usefulness characteristics, same variables also enabled organisations to develop organisational actions that would increase user adoption and utilisation of new systems. The final version of the model has added

theoretical models of social impact mechanisms and instrumental cognitive processes (perceived ease of use, job relevance, etc.).

However, there are various theoretical frameworks and issues to consider when introducing new technologies in organisations. Therefore, the motivation for doing this qualitative research is to establish and flesh out these issues. For this to be done, the most effective and appropriate theoretical model should be used. This model will be presented next.

2.6 Theoretical Model

The existence of computer and IT in organisations has expanded considerably. Venkatesh et al. (2003:426) state that technology must be accepted and utilised by the company's employees for productivity to improve. Numerous theoretical models explain user adoption and technology acceptance. The basic model used by Venkatesh et al. (2003) to build the UTAUT model is shown in Figure 2.8.

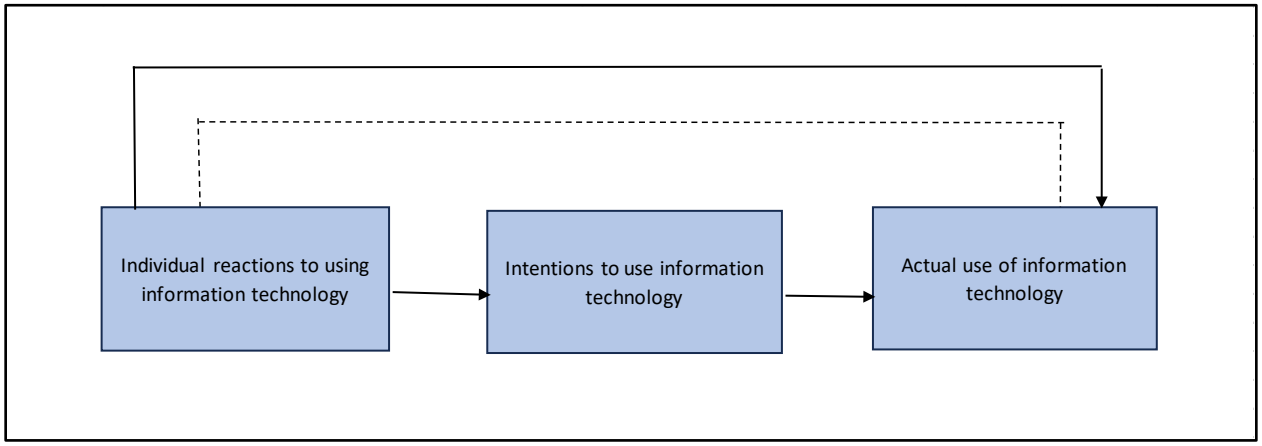


Figure 2.8: Basic Concept Underlying User Acceptance Models
Source: Venkatesh et al. (2003:427)

Venkatesh et al. (2003:467) believe that “UTAUT provides the foundation for investigating the acceptance and readiness of faculty members to accept and adapt to technology.” Figure 2.9 depicts the research model.

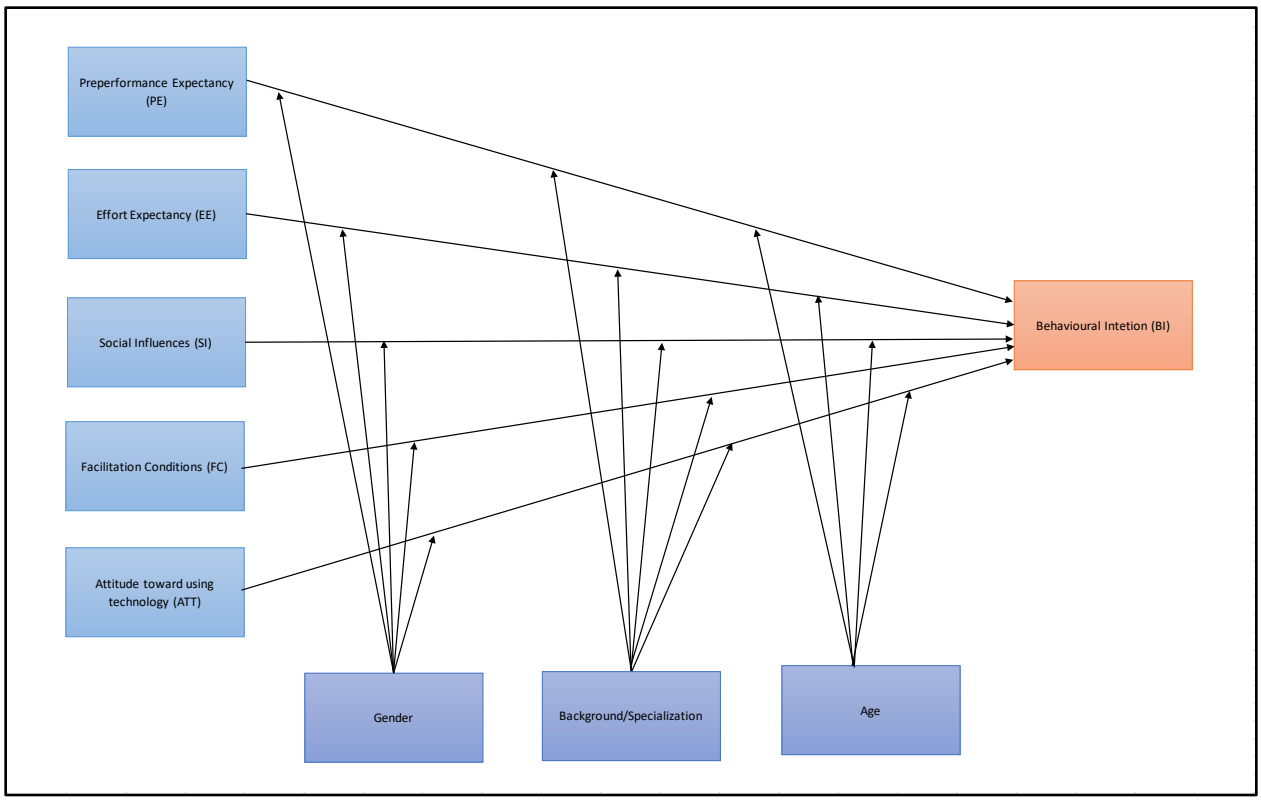


Figure 2.9: Unified Theory of Acceptance and Use of Technology (UTAUT) Model
Source: Venkatesh et al (2003:447)

The UTAUT consists of the following constructs as identified by Venkatesh et al. (2003:446) and explained as follows by Al-Riyami, Al-Maskari and Al-Ghnimi (2023:161–163, 167):

1. Performance Expectancy is the capability of technology to provide benefits and enhance the performance of the user.
2. Effort Expectancy, encompasses user expectations about the ease of using technology.
3. Social Influence is the degree to which others perceive the importance of utilizing the new system.
4. Facilitating Conditions, is the expected level of organisational and technical infrastructure supporting technology use.
5. Attitude Toward Using Technology, is an individual's overall affective reaction to using a system.

Behavioural Intention to use technology is influenced by these five constructs. Gender, background and age are moderating variables.

The UTAUT model will be applied because it is not a conventional model and has not been widely used to assess the adoption of technologies within a university setting. The researcher will apply it as a lens of concept. Make use of the UTAUT constructs to direct data collection and analysis instead of adopting it as a strict framework. Finding out how participants view and use technology can be aided by this.

Following data collection, UTAUT can be used to interpret results. If interview themes match UTAUT structures, the model can offer an organised means of explaining how people accept technology. Using identical data, Venkatesh et al. (2003:425) discovered that the UTAUT model could explain about 70 % of the variance pertaining to behavioural intention, while other models and theories could only account for 17 % to 53 % of the variance. Accordingly, the UTAUT model (Venkatesh et al., 2003:426) is useful in interpreting users' intentions to accept contemporary technologies such as artificial intelligence (AI).

The model was modified by researchers, who were successful in including new constructs appropriate for their research environment and removing others (Chong, 2013:523). According to Chatterjee and Bhattacharjee (2020:3446), research using the UTAUT model by Venkatesh et al. (2003) and with identical data, has superior explanatory power than other models or theories. Performance expectancy, effort expectancy, facilitating conditions, and social influence are the four exogenous components in the UTAUT paradigm. Furthermore, the UTAUT model encompasses eight other current models, which is another important factor in selecting this model for research. It is regarded as an all-inclusive paradigm for combining stakeholder acceptance, attitudes, and behaviours with AI adoption.

Chatterjee, Moody, Lowry, Chakraborty and Hardin (2020:1) concur that the adoption of technology is essential to establishing and preserving a sustainable competitive advantage in an organisation. Technology is the creation or use of new or modified goods or services that provide value for the parties involved in an organisation. Therefore, it is

thought that a key component of a successful strategic organisation is the adoption of technology.

It's a common misconception that older adults are less likely than younger adults to accept new technologies (Wilson 2021:1). Wilson (2021:1) says that there are a number of important reasons why people may be less inclined to embrace new technologies as they get older. First, older people are less likely to profit from new technology investments over shorter time horizons. Second, older people might have made investments in outdated technologies, which can be used in place of more modern ones. Third, poor adoption of technology may be caused by other life-cycle changes.

2.7 Conclusion

This chapter discussed the theories, models, and strategies needed to adopt technology in higher education. The UTAUT model provided the foundation for investigating the acceptance and readiness of faculty members to accept and adapt to technology. Adaptive and distributive leadership and their advantages were discussed as strategies to enable a smooth transition in adopting technology.

CHAPTER 3 : RESEARCH METHODOLOGY

3.1 Research Methodology

Goundar (2012:9) explains research methodology as the method/s by which a researcher may proceed with research. Research methodology involves learning the various techniques, which can be used in conducting tests, experiments, surveys, critical studies and research (Goundar 2012:9).

3.2 Epistemological Stance

Epistemology, according to Bryman and Bell (2014:12), is centred on the issue of what constitutes appropriate knowledge within a discipline. Bryman and Bell (2014:12) have identified three primary epistemological positions: positivism, realism and interpretivism. For this research, the interpretivist or post-positivist paradigm was used.

Chipindi, Serenje-Chipindi and Daka (2020:105) state that post-positivism is the offshoot of positivism, which is predicated on the idea that there is truth in the world to be found through impartial, verifiable methods. McMurtry (2020:197) states that post-positivism is dedicated to finding the truth but understands how tough it will be to do so in the end. With the adoption of technology, the use of post-positivism assisted the researcher in understanding the truth and challenges behind adopting technology at the faculty.

3.3 Research Design

A research design collects, investigates, interprets, and reports information in research studies (Boru 2018:1). Goundar (2012:19) suggests qualitative research as a highly subjective research discipline designed to look beyond percentages to understand feelings, impressions, and viewpoints. The research design used in this study was a **qualitative research design**. Qualitative research is defined by Busetto et al. (2020:1) as “the study of the nature of phenomena”, including “their quality, different manifestations, the context in which they appear or the perspectives from which they can be perceived”, but excluding “their range, frequency and place in an objectively determined chain of cause and effect”. Qualitative research uses verbal data rather than numerical data (Busetto et al., 2020:01). This design assisted the researcher in answering specific research questions that could not be answered using quantitative

designs. It also assist the researcher in becoming more aware and critical of the fit between the research problem and the chosen method. The qualitative research design assisted the researcher in capturing the changing attitudes of staff towards the adoption of technology in the faculty.

Ethnography was used for this qualitative research design. Bryman and Bell (2014:42) state that ethnography is the immersion, active engagement, and observation in the society the researcher wants to study to understand human interaction and cultures. Utilising this research design offered a thorough understanding of how elements influenced the process of integrating new technology in the faculty.

3.4 Sampling

According to Mweshi and Sakyi (2020:180), sampling is the process by which a researcher selects individual items from a larger population for close study through probabilistic and non-probabilistic methods. Qualitative studies rely on individuals who are articulate and reflective enough to provide knowledgeable descriptions of their experiences. The sampling group comprised academic staff and support staff. Hennink and Kaiser (2022:8) point out that having smaller groups and knowing the homogeneity of the population for data saturation in qualitative research is essential. Homogeneity occurs when there is less variation in the sampling population (Bryman & Bell, 2014:177).

As the sampling population was academic and support staff, the researcher was confident that the data received would be rich, valuable, and precise. The sample collection of academic staff who qualified for the research were from the NAS faculty working in different departments and included professors and permanent staff. The sample collection for the support staff who participated in the research were also from the NAS faculty, working in different departments and included permanent staff on a more junior level than academic staff. As the research aimed at establishing whether faculty staff were ready to adopt technology, **quota sampling** was used. Quota sampling was used to create a sample that accurately represented the population in terms of the proportions of individuals in various groups, including age, gender, ethnicity, socioeconomic status,

and area of residence, as well as combinations of these groups (Bryman & Bell 2014:180). The total staff complement of the NAS faculty were as follows:

Academic staff: Table 3.1 provides a breakdown of NAS academic staff according to rank. There are no explicit guidelines or procedures that inform the researcher on a sufficient sample size in qualitative research (Mocănașu 2020:182). The sample size of academic staff was determined by taking one-fifth (20 %) of each rank. Although a one-fifth (20 %) was used, flexibility was based on when data saturation occurred. Utilising one-fifth assisted the researcher in capturing enough variety to compare or examine variances across several subgroups. Diversity in various areas (e.g., departments, ranks and peromes levels) was required for the study.

Table 3.1: Number of academic staff according to rank in the Faculty of Natural and Agricultural Sciences

Rank	Population	Sample
Lecturer	125	8
Senior lecturer	71	5
Associate professor	47	3
Professor	30	2
TOTAL	273	18

Support staff: Table 3.2 provides a breakdown of NAS support staff according to rank. The sample size of the support staff was determined by taking one-fifth (20 %) of each rank. Although a one-fifth (20 %) was used, flexibility was based on when data saturation occurred.

Table 3.2: Number of support staff according to rank in the Faculty of Natural and Agricultural Sciences

Rank	Population	Sample
Assistant officer	15	1
Senior assistant officer	31	4
Officer	40	4
Chief officer	10	1
Assistant director	4	1
Deputy director	2	1
Director	0	0
TOTAL	102	12

The breakdown of staff assisted the researcher to establish how the faculty would accept the adoption of technology. A group of **30 staff** was selected from NAS to evaluate the readiness of the faculty to adopt technology. According to Pepperdine University (2020:1), the essential characteristics of the target population needed to address the research questions are known as inclusion criteria. The characteristics are the qualities that potential study participants must possess in order to be accepted into the study. The researcher selected the sample based on the number of staff at each peromnes level. The inclusion criteria for academic and support staff were as follows:

- Participants were over the age of 30 years.
- Had prior experience at the faculty before the COVID-19 pandemic.

This refined set of academic and support staff members brought unique perspectives on the difficulties and changes resulting from the pandemic, particularly with regards to the adoption of technology.

Exclusion criteria are explained as characteristics of participants who fit the inclusion requirements but exhibit extra traits, which could impede the study's success or raise their probability of an adverse outcome (Pepperdine University, 2020:1). The exclusion criteria for academic and support staff included:

- Any person employed for less than a year in the faculty.
- Younger than 30 years or older than 60 years (close to retirement).

3.5 Data Gathering Method

For this research, the researcher used a **qualitative data collection approach** comprising semi-structured interviews. The collection tool was used to determine the factors that influenced the adoption/acceptance of technologies within the faculty. The sample size for the research (30 academic and support staff) was small enough to process manually by identifying themes. A more complex process, using NVivo, can be used, for example, the creation of figures and diagrams. Each face-to-face interview had a runtime of 20 to 30 minutes, during which 11 semi-structured interview questions were asked. These questions were based on the constructs of the UTAUT model chosen for this study. The interview schedule can be found in Appendix A.

The researcher recruited participants by means of individual, not grouped, email communication. The majority of the participants held higher positions than the researcher. Those who were at a lower level than the researcher as well as those in higher positions were informed that their professional relationship with the researcher would not be compromised whether they choose to participate or not. The interviews were held when convenient for participants in a secure and private venue, where confidentiality was ensured. The interviews were scheduled 30 minutes apart should the researcher have interviewed more than one participant a day. This prevented participants from interacting with each other, and their identities were not revealed. The researcher obtained consent by asking participants to sign an informed consent document, and only the researcher knew who the participants were. Subsequent reporting of data and results of participants was confidential. The scripts were saved on a repository that was password protected. The researcher recorded the interviews using an audio recorder and

then transcribed the recordings verbatim before data analysis began. The transcript data was divided into themes. Themes were then identified, categorised, and outliers were identified. Any categorical data were analysed using NVivo software version (NVT14).

The questions for the interviews were designed to explore, interpret and understand the feelings the members of the faculty had towards the adoption of technology. These questions addressed specific issues in the study Examples of the questions the researcher made use of included:

- Direct questions: Do you think it is dangerous to adopt and use technology in the faculty? If so, what is the perception of this risk?
- Probing questions: Should the faculty adopt technology, what kind of effect do you anticipate this to have on academic and support staff?
- Follow-up questions: Encouraging interviewees to elaborate on their answers, such as, what do you mean by that?

Data saturation is used to characterise the point in the data collecting process where no new issues or insights are discovered and the data begins to repeat, signifying that an adequate sample size has been reached and that additional data collection is not required. According to Hennink and Kaiser (2022:2), data saturation is a crucial sign that a sample is large enough to adequately study the phenomena; the richness, complexity, and subtleties of the topics under study are captured; and that the data have content validity. To ensure reliable and meaningful data gathering for qualitative research, reaching data saturation is essential (Hennink & Kaiser, 2022:2). Saturation facilitated the researcher's ability to gather and evaluate data with knowledge. When saturation happened, the researcher knew that a theoretical gap had been fully or nearly filled by the study process. Data saturation assisted the researcher in knowing when to stop collecting data or whether the research methodologies needed to be modified. Interviews continued until data saturation. The interviews were a combination of academic and support depending on who accepted the electronic invitation.

3.6 Data Analysis

The search for themes is evident in many qualitative data analysis methods (Dos Santos, 2021). For this research, thematic analysis was conducted in a deductive manner. Lochmiller (2021) confirms this form of analysis is principally concerned with identifying patterns, which are then reported as a researcher-generated theme. Dos Santos (2021) demonstrate that using thematic analysis is a flexible method not tied to a specific philosophical orientation. Dos Santos (2021) further shares that this analysis aims to identify, analyse, and describe patterns or themes across a dataset. These explanations showed commonality in definitions.

Dos Santos (2021) describe the research approach in a deductive manner as an analysis involving a top-down method and is informed by the researcher's theoretical framework. The researcher's analysis was guided by themes identified in previous research on the topic. With this research, the researcher established the views, opinions, knowledge, experiences, or values from qualitative data relating to technology adoption in the faculty. Therefore, thematic analysis, conducted in a deductive manner, was utilised.

3.7 Trustworthiness

Ederio et al. (2023:2722) confirms that it is important for the researcher to establish whether the research study's conclusions are credible, transportable, confirmable, and dependable. Trustworthiness is about establishing these four things. For credibility, the researcher used triangulation to show that the findings were credible. Triangulation was done using the data received from individual interviews and the researched literature on the adoption of technology. For confirmability, findings were based on participants' responses and not any potential bias or personal motivations of the researcher. The researcher used inquiry audit in order to establish dependability, which required an outside person to review and examine the research process and the data analysis to ensure that the findings were consistent and could be repeated (Ederio et al., 2023:2721).

3.8 Ethical Considerations

In any research, shielding individuals by applying applicable ethical principles is paramount. This protects the individual completing the survey/questionnaire and the researcher.

3.9 Permission Obtained

Ethical clearance and permission was obtained from the General/Human Research Ethics Committee as the research involved staff of NAS (clearance number: UFS-HSD2024/0595), see Appendix B. The researcher then proceeded with the study. The researcher obtained written permission from the Dean of NAS, see Appendix C. This qualitative study adhered to the following principles of ethical considerations:

I. Confidentiality. The researcher explained the meaning of confidentiality to the participants. Confidentiality guaranteed that the data collected was secure but accessible to people responsible for conducting the research adequately. Data pseudonymisation was used, where the participants identify were protected by using pseudonyms. Confidentiality meant that the researcher knew who the study participants were but opted to exclude all identifying information from the research report (Nikko, Edsel, Ninia & Jarah, 2023).

II. Informed consent. Informed consent was described by Salkind (2012) as the procedure through which probable participants in a study consented to a minimum set of standards, including the understanding of what the research study was about, what role the participant played, potential risks and benefits, and the participant's rights. Participants fully understood and knew what was involved in this study. Before consenting, selected and proposed participants were provided with detailed information about the research. Participants received, read, and signed consent forms before the semi-structured interviews were conducted.

III. Voluntary participation. Participants had to be free to choose whether or not to join the study (Marshall, 2014). The researcher clarified with the participants that their involvement in the research was voluntary and that the study was only for academic purposes. Participants had the choice to withdraw at any time during the research without having to provide any reasons for leaving the study.

IV. No Harm. No participants were physically or psychologically harmed or at risk of being harmed during the study. Psychological harm pertained to sensitive questions that may have prompt negative emotions such as shame and anxiety (Nikko et al., 2023). Physical harm referred to pain or injury resulting from the implemented study procedures (Nikko et al., 2023). The researcher disclosed all possible risks of harm (if any) before informed consent was obtained. Participants were provided with a 'Who to contact' should a feeling of violation have occurred.

V. Ethical data management. Adherence to the POPIA (Republic of South Africa, 2013) ensured compliance. Password protection on documents and storage on the Cloud was used. Appropriate security safeguards were in place. All data will be stored electronically for a period of five years. No soft copies were used.

VI. Conflict of interest. The researcher was an employee of NAS and implemented suitable strategies to guarantee that the advantages of the study surpassed any possible risk to the participants or the establishment. The collected data remained anonymous and confidential.

3.10 Conclusion

To conclude, the research technique used in this study was carefully planned to guarantee the validity, dependability, and reliability of the findings. Through the use of qualitative methods, the researcher was able to fully comprehend the research problem. By using semi-structured interviews, a comprehensive dataset was produced that facilitated triangulation and strengthened the findings' robustness.

In order to minimise potential biases and guarantee representativeness, the sample techniques were carefully selected. The research process was kept honest by standardising data collection techniques and by adhering to ethical guidelines. The analysis was both comprehensive and in-depth as a result of thematic analysis of the data.

Overall, the validity, reliability, and trustworthiness of the study's conclusions was solidly established by the methodological rigour used throughout the research process. This strategy not only successfully responded to the research questions, but also established a standard for further study in this area. It was anticipated that the knowledge gathered

through this approach would have added considerably to the corpus of current knowledge and have had useful ramifications for stakeholders.

CHAPTER 4 : DATA ANALYSIS AND INTERPRETATION

In Chapter 3, the method of data collection and data analysis was discussed. In this chapter, the findings of the collected data and emerging themes are presented. An overview and dialogue about the participants' demographics is presented. The identified themes are then discussed, considering the information gathered from the participants' answers to the related semi-structured interview questions.

4.1 Introduction

Regarding priorities, difficulties, and utilisation circumstances, academic and support staff may implement or make use of technology differently. These variations result from their different positions, duties, and the ways in which technology complements their daily tasks. While support prioritise operational effectiveness and institutional efficiency when it comes to technology adoption, academic staff concentrate on the educational and research benefits of technology.

For this study, eleven semi-structured recorded interviews were conducted. The following results denoted the participants' voices and shed light on the research questions this study investigated. The primary aim of the research was to explore the readiness to adapt to technological challenges presented in the workplace and this chapter's themes were formed using deductive reasoning.

4.2 Demographics

Eleven participants from different peromnes levels indicated their willingness to participate in the study. Table 4.1 indicates the peromnes levels of the NAS academic and support staff who took part in the study.

Table 4.1: Peromnes levels of academic and support staff participants in the Faculty of Natural and Agricultural Sciences

Peromnes Level	Total
Junior Lecturer	1
Lecturer	2
Senior Assistant Officer	2
Senior Officer	1
Associate Professor	2
Full Professor	3
Total	**11**

A total of thirty academic and support staff representing different peromnes levels were chosen for this study, but data saturation was reached at eleven participants. Data saturation is met when no new problems or insights are found during data gathering and data starts to repeat, making future data collecting unnecessary (Hennink & Kaiser, 2022:2). Data saturation was met in this study by the continuous conducting of interviews until the researcher noticed recurrent themes and a lack of fresh insights or knowledge.

Academic staff ranged from lecturers to professors, and support staff ranged from assistant officers to deputy directors. All participants were employees of the NAS faculty working in different departments, over the age of 30 years, with prior experience at the faculty before COVID-19, and worked with different forms of technology. Even though Vice Deans have to be professors the institutions consider top management as support staff. Thus, the selected group of academics and support staff had unique insights into the challenges and adjustments, especially in relation to technology uptake. The sample included more academic staff and themes might be more contextualised to academic staff than support staff. Table 4.2 presents the demographics of the participants who took part in the study.

Table 4.2: Demographics of participants (n=11)

Participant	Age range (years)	Gender	Academic/Support	Peromnes Level
A	40 – 50	Female	Support	Senior Assistant Officer
B	30 – 40	Male	Academic	Junior Lecturer
C	40 – 50	Male	Support	Associate Professor
D	40 – 50	Male	Support	Associate Professor
E	30 – 40	Female	Academic	Lecturer
F	50 – 60	Male	Academic	Full Professor
G	50 – 60	Male	Academic	Professor
H	30 – 40	Male	Support	Senior Officer
I	40 – 50	Female	Support	Senior Assistant Officer
J	40 – 50	Male	Academic	Professor
K	40 – 50	Male	Academic	Lecturer

The one associate professor is in a management position and, therefore, is classified as support staff according to Human Resources.

The analysis of this study was conducted in three phases: transcribing, description-focused coding, and extracting major themes.

4.3 Transcribing

Transcribing, which was the first phase in conducting the analysis, was identified by Adu (2019:59) as the method of turning audio or video into text, mainly from focus groups or interviews. A total of thirty participants were identified to be interviewed, but after eleven interviews were concluded, data saturation was reached. The researcher transcribed the recordings because this was an opportunity to review the responses to each question posed to the participants. The researcher also immersed and familiarised herself with the data interpretation and analysis. NVivo was used to facilitate and present the data of the qualitative analysis in the dissertation. Before being entered into the NVivo programme,

the transcriptions of the interviews were carefully proofread for accuracy, and alphabetical letters ranging from A to K were assigned.

4.4 Description-Focused Coding

Description-focused coding, which was the second phase in the analysis, entailed describing places, actions, experiences, stories, or events (Adu 2019:28). This particular coding strategy created codes with a close relationship to the empirical indicators. The researcher chose this coding strategy because description-focused coding was suitable for research with the primary goal to identify or characterise behaviours, environments, phenomena, experiences, or events. The researcher was interested in how the faculty members would have adopted technology. Also, this coding method aligned with how the researcher structured the research questions.

The researcher analysed the eleven transcripts using NVivo. The research questions were labelled, for example, the competency of staff members. Containers were then created for the research questions to house the significant information relating to that research question. The researcher checked all participants' transcripts to identify information that best addressed the research questions. These were selected and added to the relevant research question container. A child code was created under the parent code (research question). An example of this is shown below in Figure 4.1.

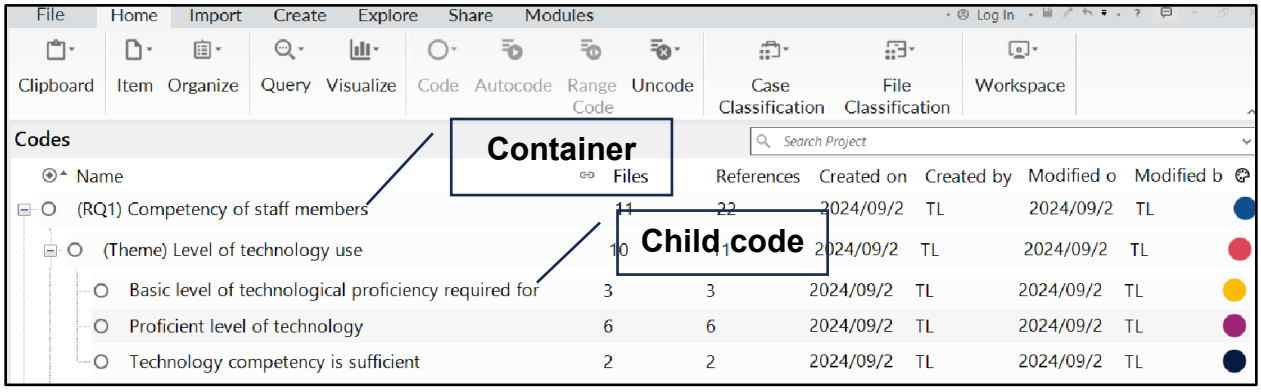
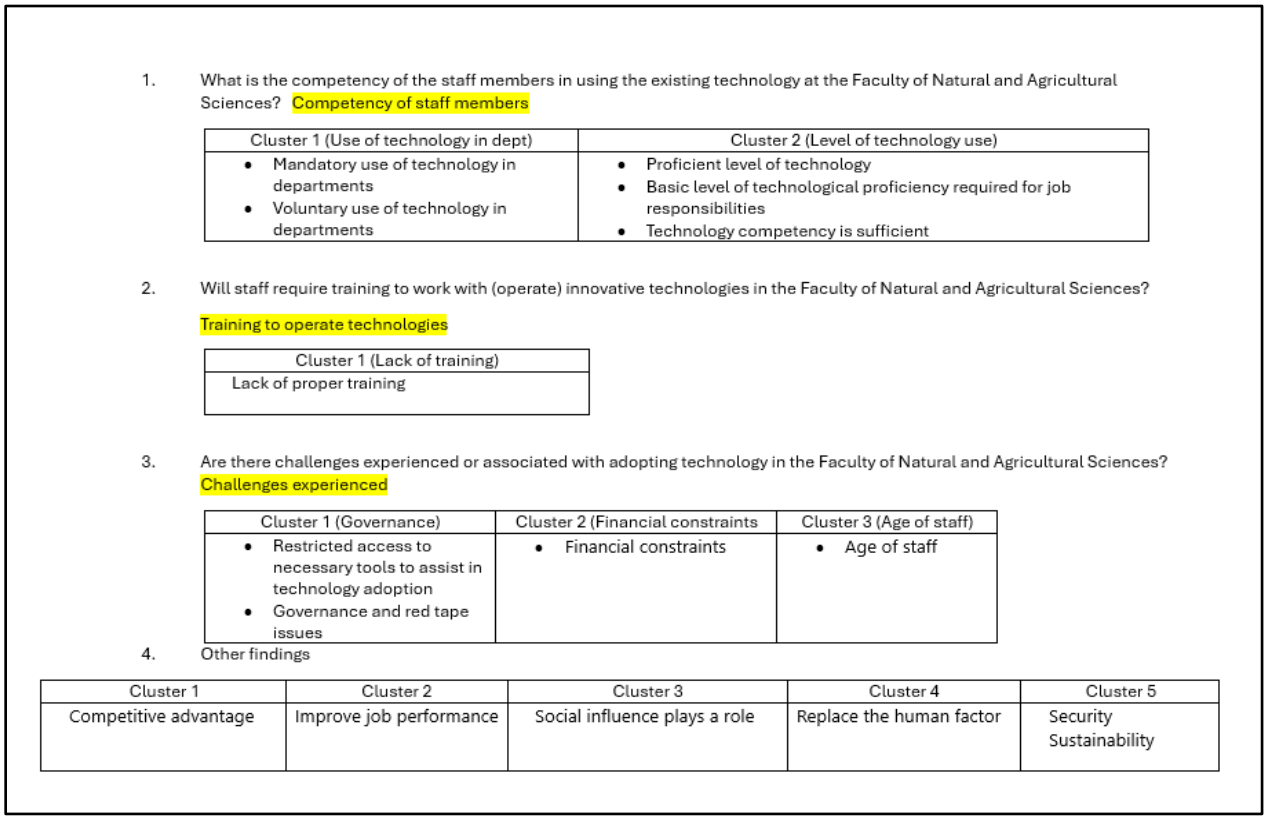


Figure 4.1: NVivo child code example

4.5 Categorisation and Extraction of Major Themes

The next phase of the analysis after identifying the codes was categorising them and extracting the major themes. Adu (2019:121) explains categorising as the process of clustering or sorting, because it involves clustering codes according to their shared characteristics. So, clusters of codes are called categories. Themes generally emerge as the consequence of the additional analysis of categories and reducing them to ideas, which reflect sets of codes and empirical indicators addressing the research question(s).

The categorisation and extraction of themes were done with NVivo. All the codes were exported into Excel. A Word document was then used to do the categorisation, see Figure 4.2. Each code was examined for commonalities, and based on that, were grouped into categories. The clusters were then labelled to form themes to address the research questions. Figure 4.3 shows an example of a theme.



1. What is the competency of the staff members in using the existing technology at the Faculty of Natural and Agricultural Sciences? Competency of staff members

Cluster 1 (Use of technology in dept)	Cluster 2 (Level of technology use)
• Mandatory use of technology in departments • Voluntary use of technology in departments	• Proficient level of technology • Basic level of technological proficiency required for job responsibilities • Technology competency is sufficient

2. Will staff require training to work with (operate) innovative technologies in the Faculty of Natural and Agricultural Sciences?

Training to operate technologies

Cluster 1 (Lack of training)
Lack of proper training

3. Are there challenges experienced or associated with adopting technology in the Faculty of Natural and Agricultural Sciences?

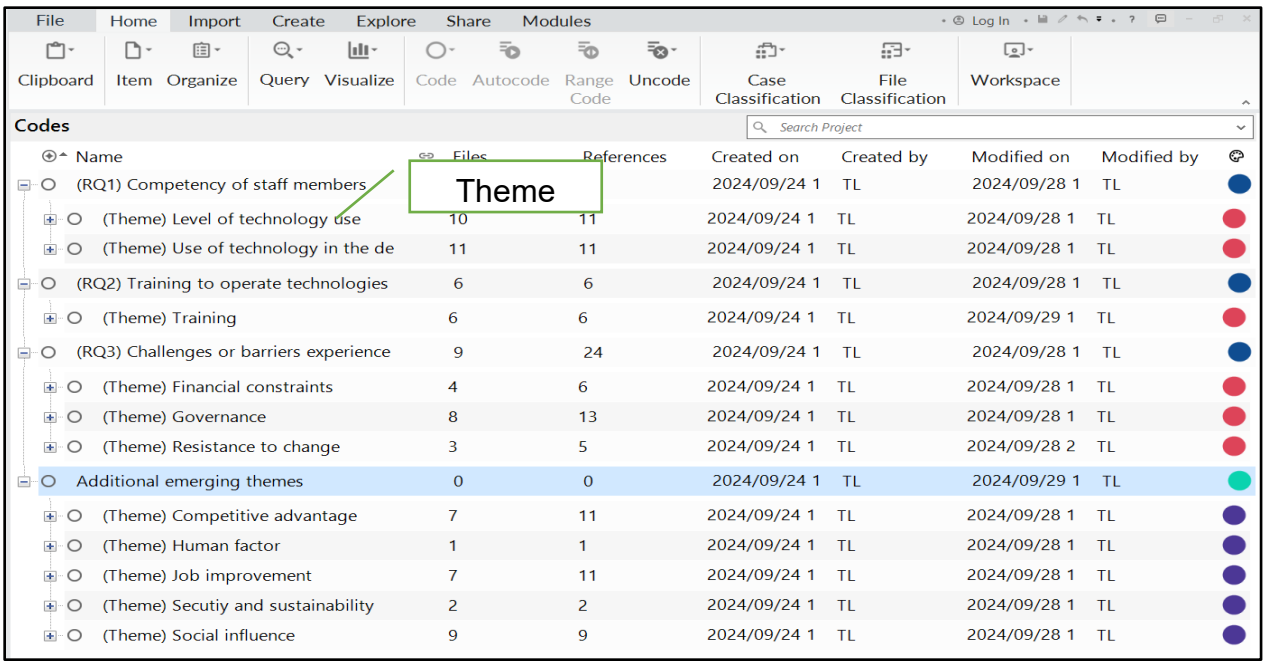
Challenges experienced

Cluster 1 (Governance)	Cluster 2 (Financial constraints	Cluster 3 (Age of staff)
• Restricted access to necessary tools to assist in technology adoption • Governance and red tape issues	• Financial constraints	• Age of staff

4. Other findings

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Competitive advantage	Improve job performance	Social influence plays a role	Replace the human factor	Security Sustainability

Figure 4.2: Categorisation



Name	Files	References	Created on	Created by	Modified on	Modified by
(RQ1) Competency of staff members			2024/09/24 1	TL	2024/09/28 1	TL
(Theme) Level of technology use	10	11	2024/09/24 1	TL	2024/09/28 1	TL
(Theme) Use of technology in the de	11	11	2024/09/24 1	TL	2024/09/28 1	TL
(RQ2) Training to operate technologies	6	6	2024/09/24 1	TL	2024/09/28 1	TL
(Theme) Training	6	6	2024/09/24 1	TL	2024/09/29 1	TL
(RQ3) Challenges or barriers experience	9	24	2024/09/24 1	TL	2024/09/28 1	TL
(Theme) Financial constraints	4	6	2024/09/24 1	TL	2024/09/28 1	TL
(Theme) Governance	8	13	2024/09/24 1	TL	2024/09/28 1	TL
(Theme) Resistance to change	3	5	2024/09/24 1	TL	2024/09/28 2	TL
Additional emerging themes	0	0	2024/09/24 1	TL	2024/09/29 1	TL
(Theme) Competitive advantage	7	11	2024/09/24 1	TL	2024/09/28 1	TL
(Theme) Human factor	1	1	2024/09/24 1	TL	2024/09/28 1	TL
(Theme) Job improvement	7	11	2024/09/24 1	TL	2024/09/28 1	TL
(Theme) Secutiy and sustainability	2	2	2024/09/24 1	TL	2024/09/28 1	TL
(Theme) Social influence	9	9	2024/09/24 1	TL	2024/09/28 1	TL

Figure 4.3: Example of a theme

4.6 Discussion

The themes from the thematic analysis are discussed in this section. Table 4.3 provides an overview of the themes and subthemes. The discussion includes common results from the literature along with the participants' varying perspectives. Moreover, NVIVO combined with a word frequency across all eleven transcripts was used to generate the word cloud shown in Figure 4.4.

Figure 4.4: Interview word cloud

The most common word was technology, which indicated that the participants understood and were knowledgeable about the concept of technology adoption in the faculty. The word cloud illustrated the participants' sentiments toward the concepts in the word cloud. The larger the font, the more often the word appeared in the interview transcripts.

Table 4.3: Overview of the themes and subthemes identified in the study

Main theme	Subthemes
Competency	• Level • Mandatory vs voluntary
Training	• Proper training • Security • Social influence
Challenges	• Finances • Limitations • Governance • Resistance to change • Age • Human factor
Benefits	• Competitive advantage • Improved performance

4.6.1 Theme 1: Competency

This theme focused on comprehending how participants in the faculty used technology in particular situations or daily lives. The theme linked with one of the six UTAUT structures, Effort Expectancy. The UTAUT model provided the foundation for investigating the acceptance and readiness of faculty members to accept and adapt to technology. The term competence described the assurance and skill that users believe they had when using a technology, which had a direct effect on their adoption and overall experience. In addition to their desire to use technology, participants' opinions of their competence also affected how satisfied and at ease they were incorporating it into their everyday routines.

4.6.1.1 Subtheme 1: Level

Most participants indicated that their level of technology use was proficient. Some participants indicated that they possessed a basic level of technology proficiency, and few indicated that their use of technology was sufficient. This subtheme placed emphasis on how participants experiences and acceptance of new technology were influenced by their differing levels of expertise, understanding, and confidence. The contrasts between highly competent and less experienced users of digital technologies, as well as how these disparities affect the system's usability and desire to be adopted were considered. Given that users with greater proficiency frequently view the technology as simpler to use and may require less assistance, can be especially linked to the UTAUT model's Effort Expectancy and Facilitating Conditions components.

Participant B (Academic): *"My level of technology competency is good and proficient."*

Participant C (Academic): *"Proficiency with various systems, website development, and new programmes."*

The support staff responses concentrated more on solving superficial, pressing problems associated with the basic Microsoft package such as Word or embracing the technology. Academic staff had a far more thorough examination of the variables that affected the adoption of technology, including the use of new technologies in the science field, software and how it influenced their research.

The participants' comfort and proficiency levels with current technology differed. While some were comfortable using technology, others showed a lack thereof. This could be tied to the different staff categories of support and academic. Participants who felt more capable overall were generally more eager to adopt technology. This relates to the literature by Silviana and Pudjiarti (2024:73), where competency leads to a favourable work attitude in addition to technical knowledge and skills. Those participants who felt less comfortable required more support and convincing to adopt the technology. This illustrates how crucial competency is in influencing users' first perceptions of technology adoption and continued use.

Some participants expressed that the use of technology in their day-to-day lives put them in good stead, and therefore, minimum to no training was needed. On the other hand, the staff who expressed the need for training would have benefited from receiving training. Matsika and Zhou (2021:8) supports this notion. The authors state that to facilitate support for the adoption of technology and the buy-in from staff, organisations should invest in training so that staff comprehend emerging trends in the adoption of technology. Additionally, a few faculty members thought that security and social influence played a role in adopting technology.

4.6.1.2 Subtheme 2: Mandatory/voluntary use

Most of the participants indicated that the use of technology in departments was mandatory. This subtheme highlighted variations in the ways that people interacted with technology. The subtheme was closely related to Social Influence and Behavioural Intention in the UTAUT model since the requirement to use the technology affected users' adoption decisions as well as their level of enthusiasm.

However, participant J (Academic), who fell under the voluntary case, indicated:
"…*the use of technology in my department is voluntary, but without technology, we will not be able to do anything if we don't adopt technology*."

This indicated the willingness to accept adoption.

Participant C (Academic): "*The department is in the process of making technology use compulsory, aiming to move from voluntary to mandatory adoption to improve job performance and streamline processes*."

Participant G (Academic): "*The use of technology in my department is mandatory; if we do not use it, then we do not exist*."

Participant H (Support): "*My usage of technology competency is above average. I was exposed to technology from a young age, and this put me in a good position*." The same participant mentioned, "*Technology is my driving force at work;* the *moment I see a manual task, I research a way that is easier to do.*"

Participant H (Support) highlighted an important factor. The vision of the faculty towards instilling technological principles in every process. This was in line with the organisation's Vision 130 strategy (UFS, 2022).

Participant Academic (F) has a different belief on whether technology use should be mandatory or voluntary in the department:

"I believe in chalk and talk, especially in my department. The hands-on approach works best."

This subtheme surfaced during the difference between mandatory and voluntary use of technology in the various departments. Participants' motivation, engagement, and general happiness were greatly influenced by the type of technology adoption—whether they were forced to use the system or given the opportunity to opt in. Most departments in the faculty used technology in many ways, spanning from sophisticated solutions for data analysis and online collaboration to simple administrative applications. Departments varied in the type and scope of use. This is consistent with the idea of Social Influence in the UTAUT paradigm, where user behaviour is influenced by institutional norms.

On the other hand, some participants thought using technology was optional and that adoption was promoted but not severely regulated. This is in keeping with the UTAUT model's Behavioural Intention, where users' commitment to technology is more significantly influenced by their own attitudes and perceptions of its utility. Mandatory versus voluntary users' perceptions and interactions with new technology are greatly influenced by use dynamics. Bhattacherjee et al. (2017:396) supports this by saying that users who have unfavourable opinions of technology are forced to use it regardless of their personal preferences. The authors state that such coerced use frequently results in user resistance, low morale, and dissatisfaction; on the other hand, enterprises experience decreased productivity, effectiveness, and job quality; and occasionally, adoption of technology initiatives fail (Bhattacherjee et al., 2017:396).

4.6.1.3 Summary of Theme 1:

In general, the competency theme highlighted the need for a systematic strategy to developing participants' competencies to achieve consistent and efficient technology use. To promote widespread and successful adoption, this entails offering assistance and training appropriate for different skill levels and striking a balance between required and optional use guidelines.

4.6.2 Theme 2: Training

The significance of training in promoting the uptake and efficient adoption of technology was one of the themes that came to light during the study. Training is an essential component of the larger Facilitating Conditions construct in the UTAUT model since it gives users the information and abilities they need to employ new technologies. A few participants frequently emphasised how their early impressions of technology usefulness were influenced by the existence or lack of scheduled training sessions. Some found that thorough training sessions gave them the groundwork to swiftly incorporate technology into their regular routines. Others experienced reluctance and dissatisfaction due to insufficient training, which eventually affected their readiness to fully embrace the technology.

4.6.2.1 Subtheme 1: Proper training

The discussion on proper training alludes to how the influence of the design and delivery of training programmes affect how users experience and accept new technology. This subtheme draws attention to how successful training can boost self-esteem, lower anxiety, and provide users with the skills they need to operate the technology efficiently. Additionally, it can identify weaknesses in current training initiatives and recommend enhancements.

Participant A (Support): "*I was never given proper training on how to use various programmes, which is a significant barrier to effectively using technology in my role*."

Participant C (Academic): "…*the lack of training is a barrier, not everyone is equipped with the necessary skills to use technology effectively*."

The remainder of the participants who did not mention the necessity of training were those who either used technology daily and were comfortable with it or who worked in the Computer Science department where the use of technology was their core skill. This was substantiated by the responses of the participants.

The UTAUT model's Facilitating Conditions highlights the value of tools that facilitate technology adoption. Training has become a key part of this support system. According to the UTAUT notion of Effort Expectancy, which states that a user's perception of a technology's ease of use directly affects their propensity to embrace it, this research demonstrates how well-designed training can lower the perceived complexity of a technology. According to this study, training continuity and quality were equally important for long-term adoption.

4.6.2.2 Subtheme 2: Security

It's critical to pay attention to participants' opinions or worries about the technology's security. Users' concerns about data privacy, system dependability, or whether the technology will be supported and updated in the future give rise to this theme. Given that security is a form of support infrastructure, it may be linked to both Facilitating Conditions and Social Influence within the framework of the UTAUT paradigm. Adoption may be influenced by security guarantees or worries.

Participant E (Academic): "*Security needs are a primary factor driving the acceptance and decision-making process of technology adoption*."

Security arose as subtheme in the participants' reflections, emphasising the significance of both data protection and long-term survival. Security is a concern as faculty members work with large quantities of sensitive data. The POPIA (South African Government, 2013) has to be taken into consideration. This can be handled properly and professionally if staff are given the proper training and support on security. Similarly, Jones et al.

(2010:10) confirms that employees need to be trained in information security policies and practices. Management and training support have a positive influence on the acceptance of technology (Jones et al., 2010:10).

4.6.2.3 Subtheme 3: Social influence

Social influence placed focus on how participants' decisions to embrace or utilise technology were influenced by the attitudes, behaviours, and perceptions of others. The degree to which people believe that significant others think they should utilise the new system is expressly referred to as Social Influence in the context of the UTAUT paradigm. Colleague influence, leadership support, and organisational culture are some examples of this subtheme. Most participants believed that social influence played a positive role in adopting technology. Few who were in the minority were sceptical.

Participant J (Academic): "*Students often resort to copying and pasting templates rather than creating original content."*

Participant C (Academic): *"… the proliferation of technology has led to the erosion of certain technologies and an overload of both useful and non-useful forms."*

Participant K (Academic): *"… this may lead to a decrease in their engagement with the material, students will become lazier, as they no longer need to visit libraries or type out materials from scratch."*

Social Influence, as defined by the UTAUT model, is the degree to which people believe that significant others anticipate their adoption of a new technology (Venkatesh et al., 2003). As most participants believed that social influence plays a role in adopting technology, it establishes a favourable atmosphere for adoption. This is in line with literature that indicates adoptees are in the persuasion phase of Rogers Diffusion Innovation Model (Frei-Landau et al., 2022:12814); participants face ambiguity and may be influenced by a group's positive subjective evaluations of technology as well as social encouragement to adopt technology. The study also identified drawbacks of social influence, such as participants' hesitancy due scepticism. This implies that, depending on

the attitudes that are prevalent in the social milieu, social influence can both help and hinder adoption.

4.6.2.4 Summary of Theme 2:

Overall, the training theme highlights how a multifaceted training strategy that incorporates peer support, security education, and skill-specific assistance strengthens effective technology adoption.

4.6.3 Theme 3: Challenges

Another theme participants across departments grappled with was challenges around the adoption of technology. Although these challenges varied, collectively they showed how challenging it was to adapt to and integrate technology. The challenges indicated extend to Facilitating Conditions as outlined in the UTAUT model. The subthemes focus on challenges experienced or associated with technology adoption in the faculty. Although there were potential advantages to technology, many participants faced challenges that negatively impacted their entire experience and willingness to adopt technology within the faculty.

4.6.3.1 Subtheme 3.1: Finances

Finances relate to how economic variables, including expenses, monetary constraints, and distribution of resources, affect the uptake and application of new technology. This subtheme examines how decisions about training, assistance, and access to digital tools are influenced by the financial outlay needed for new systems in the context of higher education, especially in a science faculty. Finance subtheme also addresses users' perceptions of the technology's worth in relation to its expenses. Since financial resources are frequently a crucial component in guaranteeing that users have the assistance and resources they need to successfully adopt new technologies, finance is vital to Facilitating Conditions within the UTAUT paradigm. The majority of the participants confirmed that financial constraints limited technology adoption.

Participant F (Academic): “*Financial constraints are a major barrier when it comes to the adoption of technology*.”

Participant H (Support): “*Funding is a significant barrier, with budget constraints affecting the ability to procure new technologies or processes*.”

For quite a few participants, having sufficient resources was essential to technology's effective adoption. This problem demonstrates how a lack of funding might prevent consumers from embracing new technology, which is consistent with the UTAUT model's Facilitating Conditions notion. According to these results, finances have a significant influence on how new technologies are adopted and used in higher education. While budgetary constraints present major obstacles to efficient use, sufficient financing can improve the user experience by giving access to the training and support that are required. Gkrimpizi et al. (2023:09) confirm this challenge by sharing that digital transformation necessitates a substantial initial cost outlay.

Research from universities shows that the largest obstacles to digital transformation are financial costs and investment in financial instruments. Gkrimpizi et al. (2023:09) also state that the biggest obstacle is the absence of public funding for change. Because initial investment costs are significant, higher education institutions' internal financial resources are typically insufficient to support the entire digital transformation process.

4.6.3.2 Subtheme 3.2: Governance and limitations

Some participants pointed out that governance and resistance to change were challenges or barriers to adopting technology. Thus, the focus of the subtheme is on how regulatory restrictions, organisational policies, and decision-making processes influence the uptake and application of new technology. This subtheme examines how regulations, policies, and administrative procedures affect the use of digital tools and the latitude users have to interact with them in a higher education setting. It also addresses restrictions on adherence to institutional policies, which may limit the use of technology. Because it deals with institutional and policy-related support—or lack thereof—that can either facilitate or impede users' participation with new technology, governance and limitations is related to

Facilitating Conditions in the UTAUT paradigm. Most participants noted that the governance and red tape of the organisation were perceived as challenges and barriers.

Participant G (Academic): "*UFS is very regulatory, restrictive, and has too much red tape*." The same participant says, "*They block everything that is needed for the department to be innovative*."

Participant H (Support): "*Institutional limitations, where faculty innovations may not align with the university's direction, leading to challenges in implementing new technologies*."

Participant B (Academic): "*The lengthy and bureaucratic process of obtaining the required technology is a deterrent and slows down the adoption rate*."

Participant B (Academic): "*There is an absence of support for software and expertise which is essential for the adoption of technology, and this leaves a gap in the organisational structure of UFS*."

Participant J (Academic): "*There are deficiencies in the organisational and technical infrastructure, such as unreliable Wi-Fi and restrictive system blocks, which are inadequate to support technology adoption effectively*."

Half of the participants felt that their access to the tools needed to adopt technology was restricted. Often, participants cited institutional regulations that either facilitated or hindered their capacity to adopt to technology. The study also identified a number of policy-related restrictions that made it more difficult to employ technology. Participants reported that they were unable to fully utilise platforms' features due to excessively restrictive institutional policies. Even though these limitations are frequently required to adhere to privacy standards or data protection laws, they might cause problems for users who attempt to use the technology to its fullest. The balancing act between guaranteeing security and giving users the flexibility they require is reflected in these limits.

The bureaucratic decision-making procedures that complicated or delayed the adoption of technology were another facet of this subtheme. Participants occasionally complained about the length of time it required to decide whether to grant access to new features or

update the system. This demonstrates how rigid, or sluggish governance procedures can serve as a barrier, decreasing the speed at which technology is adopted and stifling user excitement.

These results show that the context in which technology adoption takes place is significantly shaped by governance and limitations. By providing clear direction and assistance, effective governance can improve facilitating conditions and facilitate users' integration of new tools into their job. On the other hand, inflexible regulations and sluggish decision-making procedures may erect obstacles, reducing the potential advantages that users may experience from technology. To make sure that governance structures enhance rather than detract from the user experience, institutions must find a balance between compliance and flexibility. Sokfa (2021:376) says that although governance presents a challenge, technology governance seeks to maximise the positive effects of innovation and a wider spectrum of technologies on societies while minimising any potential negative effects.

4.6.3.3 Subtheme 3.3: Resistance to change

The subtheme, resistance to change emphasises the influence of users' hesitation or unwillingness to embrace new technology on the process of deployment. The psychological, cultural, and practical elements that lead to resistance, such as dread of the unknown, a lack of apparent advantages, age and a preference for conventional approaches, are examined under this subtheme. Resistance to change may be used to describe how staff, lecturers, or students respond to new digital tools and processes in the setting of higher education, as well as the obstacles, which may result from their hesitancy. This subtheme, which pertains to users' opinions on how simple new technology is to use and the social pressure to adopt it, is in line with Effort Expectancy and Social Influence in the UTAUT paradigm. Few participants identified staff age as a barrier or challenge to adopting technology.

Participant C (Academic): “*Due to age and attitude of some staff members it is a barrier to technology adoption*.”

Participant F (Academic): “*Because of my age, I prefer doing things the traditional way.”*

Participant H (Support) noted an important point. “*… the need for the buy-in from stakeholders in all departments are important to adopting new technology, some departments may resist changes to the existing processes.”*

Participant K (Academic): “*Older professors tend to resist adopting new technologies and prefer traditional methods.*”

Many participants were resistant because of their age. As the older participants expressed, technological resistance frequently occurs when users believe the new technology is difficult to learn. This relates to the UTAUT model's Effort Expectancy component. Users may be less likely to adopt technology and remain with tried-and-true tools and techniques if they perceive that it would take a lot of time and effort to learn. However, Wilson (2021:1) notes the common misconception that elderly adults are less likely than younger adults to accept new technologies. Wilson (2021:1) also states that there are a number of important reasons why people are less inclined to embrace new technologies as they get older. First, older people are less likely to profit from new technology investments over shorter time horizons. Second, older people might have made investments in outdated technology, which can be used in place of more modern ones. Third, poor adoption of technology may be caused by other life-cycle changes.

4.6.3.4 Subtheme 34: Human factor

When talking about the human factor as a subtheme, the emphasis is on how personal traits, attitudes, and behaviours affect new technological adoption and use. Aspects like user motivation, flexibility, receptivity to new experiences, and the part that personal preferences play in technology adoption can all be examined under this subtheme. The human factor may study how faculty staff needs and experiences influence their use of digital tools and systems in higher education. Because it deals with users' perceived ease of use, expected results, and readiness to adopt new technologies, this subtheme is related to Effort Expectancy and Performance Expectancy in the UTAUT model.

Participant E (Academic): "*Technology adoption leads to more efficient and effective job performance, despite potential complexities."*

Participant I (Support), who was in the minority, raised the concern that AI might have negative consequences, *"it might have negative consequences such as removing the human factor*."

Although the concern was in the minority, Coldwell (2019:1) confirms that the development of digitalisation has both advantages and disadvantages, much like globalisation. On the downside, the advent of robotic and automated industrial procedures has resulted in the displacement of skilled professionals and the emergence of a low-paid underclass of workers. This is a cause for concern. This provides insight into what could be causing delays or difficulties within the faculty in adopting technology.

These challenges align with literature from Elgohary and Abdelazyz (2020:2) who state that a system of people, procedures, technology, culture, and structures make up an organisation but employees are inherently resistant to change especially older employees.

Participants frequently mentioned financial challenges, governance, and limitations to resistance to change as major barriers. According to the UTAUT framework, these findings emphasise how important infrastructure and assistance are to effectively adopt technology in the faculty.

4.6.3.5 Summary of Theme 3

All things considered, the challenges theme shows that effective technology adoption necessitates a comprehensive strategy, which takes organisational, human, and financial factors into account.

4.6.4 Theme 4: Benefits of adopting technology

Benefits of adopting technology as a theme encompasses the advantages and beneficial effects of incorporating new technologies into procedures and workflows. Enhancements in user enjoyment, communication, productivity, efficiency, and learning outcomes can all

fall under this subject. It might examine how using digital tools improve teaching and learning, simplifies administrative work, or gives staff more access to resources in a higher education setting. This theme is strongly tied to Performance Expectancy in the UTAUT model, which measures users' perceived extent on how the technology would improve their ability to execute their jobs.

4.6.4.1 Subtheme 4.1: Competitive advantage

The subtheme, competitive advantage, emphasises how the implementation of new technology can place higher institutions in better positions than their rivals. This subtheme investigates how technology might provide a competitive advantage, including increased productivity or higher institutional standing. This relates to the perceived advantages that technology offers in terms of market advantage and strategic positioning, which is consistent with the Performance Expectancy construct of the UTAUT model. An equal number of participants stated that it is important for the faculty to adopt technology to maintain their competitive advantage and that it would lead to job improvement.

Participant A (Support): "… *feeling of positivity towards the adoption of technology as it opens up the faculty to new ideas, you learn more and it is empowering as an employee of the faculty and as an individual."*

Participant C (Academic): "The *world is moving towards technology; the faculty has to be on par so that they do not lag*."

Participant D (Academic): "*its critical role in maintaining competitiveness and enhancing job performance, particularly through reporting tools and PeopleSoft systems for daily tasks.*" The same participant suggested that "*the faculty should implement a policy to regularly test and update technological knowledge, ensuring a competitive advantage for both the faculty and students*."

Participant G (Academic): *"AI will play a big role in the faculty, it will change the way we do research especially in Science."*

Participants also emphasised how the faculty's reputation for creativity and progressive practices enhance the incorporation of technology. This illustrates how an institution's reputation in the academic world can be improved by being a pioneer in technology adoption, which can result in chances for joint research and more recognition in the field. In the highly competitive higher education market, where schools compete to stay relevant and garner funds and talent, this kind of positioning can be crucial.

Aruleba et al. (2022:172) note that adoption of technology has had a tremendous impact on the education industry across the globe. Adopting technology in the faculty provides numerous benefits, such as lower labour costs and a sustainable competitive advantage. Elgohary and Abdelazyz (2020:2) state that universities must possess the agility to adopt new technologies to stay ahead of the rapid changes occurring in a technologically sophisticated market in order to thrive in a highly competitive environment. Gkrimpizi et al. (2023:3) is of the view that adopting technology is crucial for raising standards of instruction, increasing administrative effectiveness, and preserving competitiveness in higher education

4.6.4.2 Subtheme 4.2: Improved performance

The emphasis is on how implementing new technologies enhances users' overall effectiveness, productivity, and efficiency in their jobs. This subtheme investigates how technology can improve results, expedite processes, and help users achieve their goals more successfully. In the context of higher education, improved performance could mean more effective instruction, better learning opportunities, simplified administrative duties, or better research results. This is in line with the UTAUT model's Performance Expectancy construct, which addresses the anticipated increases in productivity and effectiveness, which users encounter as a result of utilising the technology.

Participant C (Academic): "*Adopting technology will significantly enhance job performance, particularly in managing postgraduate submissions and research, by streamlining processes, reducing turnaround time and the workload.*"

Participant E (Academic): "*It leads to more efficient and effective job performance, despite potential complexities*."

Participant H (Support): "*Technological advancements can significantly reduce time spent on repetitive tasks, thereby improving job performance*."

Participant F (Academic) had a different outlook. Participant F (Academic): "*Adoption of technology is not ideal for teaching."*

The majority of the participants noted that technology adoption will positively affect job improvement and increase or maintain the faculty's competitive advantage. For many, the adoption of technology in the faculty will enhance the job performance of support staff, reduce time spent on administrative tasks, and provide more time to spend on teaching and researching (academic staff). The literature indicates that adopting technology is crucial for raising standards of instruction, increasing administrative effectiveness, and preserving competitiveness in higher education (Gkrimpizi et al., 2023:3). This is also aligned with the Performance Expectancy within the UTAUT concept, as participants continuously underline how technology will help them do their jobs more effectively and efficiently. Previous studies support these results and that show increased adoption of technology is associated with perceived performance advantages (Venkatesh et al., 2003). Chatterjee et al. (2020:1) concur that the adoption of technology is essential for establishing and preserving a sustainable competitive advantage in an organisation. It is evident that despite the challenges the participants face, they are amenable to the adoption of technology.

4.6.4.3 Summary of Theme 4

Benefits of adopting technology theme focuses on how technology may improve performance and provide strategic advantages, highlighting benefits the faculty and individuals receive from using digital tools.

4.7 Conclusion

Chapter 4 presented the key conclusions from the qualitative study of the eleven participants involved in evaluating whether NAS is ready to adopt technology. The thematic analysis identified several important themes. These results offer insightful information about the attitudes, experiences, and difficulties that participants might have encountered during the adoption process.

These results highlight the intricacy of the processes involved in adopting new technologies, showing how several elements work together to affect the faculty's adoption of technology. The understanding gained from this chapter provides the researcher with the platform to make recommendations in Chapter 5. In the following chapter, the themes found in this study will be examined in relation to, challenged by, or expanded upon in earlier research, and recommendations for future research and practices will be offered in light of these findings.

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This final chapter provides a summary, conclusions and recommendations based on the researcher's discoveries. The primary objective of this study was to explore the readiness to adopt to technological challenges presented in the workplace at NAS. To reach the primary research objective, the following secondary research objectives were identified:
To explore the level of technology competency in academic and support staff within NAS?

To identify the training needs of academic and support staff within NAS?

To analyse challenges experienced/associated with the adoption of technology within NAS?

This chapter presents the thematic analysis findings of the semi-structured interviews conducted on an individual basis with academic and support participants across peromnes levels within the faculty.

5.2 Conclusions

Chapter 5 provides an overview of the study in line with the main goals of the study, which were to explore the readiness to adopt to technological challenges presented in the faculty. The respective chapters provided the following:

Chapter 1 provided an overview of the study, and also the groundwork for investigating the readiness to adopt to technological challenges presented in the faculty. The chapter opens with the background of the study's history, followed by the problem statement highlighting the challenges. As a result, the aim and research questions that direct the study were developed with the purpose of investigating facets of the subject, including user abilities, difficulties, advantages, or adoption factors, giving the study a logical approach. The chapter concluded by outlining the research methodology, which identified the methods used to proceed with the research. All things considered, Chapter 1 lays forth the goal, significance, and course of the research, providing a solid framework for the following chapters.

In Chapter 2, the first secondary research objective was reached, which aimed to explore the level of technology competency among academic and support staff. To give a basic understanding of the abilities and knowledge needed for staff members to use technology effectively, this chapter examined previous research and frameworks, which evaluated technological competency in educational contexts. Chapter 2's analysis of the literature emphasised shared competency criteria and pinpointed the obstacles and advantages, which affected academic and support staff's preparedness to embrace new technologies. To grasp the results in subsequent chapters, it was essential to comprehend the existing skill levels, which was established in Chapter 2 by addressing this goal. The knowledge acquired provided a useful viewpoint on the elements impacting employees' technological proficiency and laying the groundwork for suggestions to raise proficiency levels within the faculty. In this study, the researcher used the UTAUT theoretical perspective, which was the most relevant to the study of technology adoption in the faculty. This model offered an organised method for investigating the factors that motivate faculty members to embrace new technologies.

Chapter 3 described the research approach used in this study on adoption of technology in NAS. This chapter offered a thorough explanation of the research methodology The research design used for the study was qualitative to assist the researcher in answering specific research questions. The study's data-gathering method included a qualitative data-gathering approach where semi-structured interviews were scheduled with participants. Quota sampling was used to select participants, which is described and guaranteed a representative sample for precise examination. Regarding data analysis, Chapter 3 outlined the methods for examining the gathered information, including thematic analysis for qualitative data. An overview of ethical issues, such as informed consent, confidentiality, voluntary participation, no harm, ethical data management and conflict of interest was included in the chapter. In conclusion, Chapter 3 offered a strong methodological basis for the study and bolstered its validity and reliability by outlining a precise and organised strategy to data collection, analysis, and ethical management.

In Chapter 4, the results of the data analysis were presented in line with the goals of the study on the adoption of technology in NAS. The study's major findings offered insightful

information about the process of adopting technology, especially in an academic setting. These findings are as follows:

- Successful adoption of new technology was significantly influenced by proficiency. Faculty members' capacity to adjust to new tools was influenced by differences in their confidence and competence levels. Successful technology adoption requires people to have both technical knowledge and confidence-building skills, which could only be achieved through effective training and support.
- Adoption was greatly influenced by organisational and individual obstacles, such as financial limitations, governance restrictions, and change aversion.
- Adoption of technology was typically seen as advantageous, providing advantages over competitors and better performance.

Competency, training, challenges, and beneficial aspects that affected user engagement and technology acceptability were among the major themes that surfaced. Participants emphasised problems such as finances, governance, and limitations (resources) with resistance to change, and the human factor under challenges. Together, these elements affected user preparedness to adopt technology and long-term involvement.

The benefits section explained how adopting technology resulted in improved performance and competitive advantages. The importance of technology was further supported by participants' reports of increased productivity, simpler procedures, and improved institutional reputation. The results indicated that user skills, training quality, and regulations regarding required versus optional use all impacted effective adoption in terms of competency. Competency gaps demonstrated the necessity of customised training initiatives to guarantee steady use and adoption of technology.

All things considered, Chapter 4 offered a thorough analysis of the data, emphasising the significance of removing obstacles, utilising benefits, and enhancing user competency to maximise technology adoption in NAS.

5.3 Recommendations

The recommendations are discussed according to the themes emerging from Chapter 4. Based on the study's findings, the following suggestions emphasise creating a positive atmosphere, developing critical skills, and removing obstacles to success.

5.3.1 Encourage a culture of adaptability and ongoing improvement in the use of technology

This recommendation is important, especially for a science faculty, because it creates an atmosphere that can keep up with quick changes, improve the calibre of research and instruction, and prepare students for future scientific demands. The faculty should, therefore, create an atmosphere where employees are inspired to test new technologies because they know they will have the assistance they need to adjust and learn. The faculty management should handle reluctance to change proactively by talking with employees about the advantages and offering tools to make transitions easier. This can be done in faculty board meetings and support staff forums. This suggestion equips the faculty to effectively handle upcoming technological advancements and meet changing needs by encouraging a culture of flexibility and continuous learning.

5.3.2 Create a comprehensive programme for enhancing technological competencies

The faculty should establish an integrated programme that places a high priority on ongoing skill development, peer support, mentorship, recognition, and easily accessible resources to guarantee that staff have the abilities and self-assurance needed to embrace new technology. The faculty, in conjunction with the Centre for Teaching and Learning can provide personnel with regular, customised training suited to their positions and skill levels to keep them up to date on new technologies. Computer Science, a faculty department, can create mentorship networks to foster a collaborative learning environment where seasoned users assist colleagues. The faculty should encourage employees to actively participate in technological skill-building by implementing a rewards programme, which recognises and rewards efforts to increase competency. Most importantly, the employees should always have access to help and training materials by

offering on-demand resources such as instructional manuals and specialised IT support. This will also assist in closing the competency gap, which was identified in the study.

5.3.3 Clearly define objectives and channels of communication for both mandatory and voluntary technology use

This recommendation should create a more engaged and encouraging work environment by making sure that employees are aware of the goals of both required and elective technology use through precise goal-setting and focused communication. The faculty should clearly state the rationale for mandatory and elective technology adoption, assisting employees in appreciating each tool's worth and connection to company objectives by promoting the use of technology, offer support and specialised training. This recommendation also mirrors Vision 130 (UFS, 2022) of the institution to ensure the efficiency of the staff support structures and systems. By 2028, the institution aims to increase the effectiveness of the academic project's support systems and operations and to digitise certain high-impact processes for increased responsiveness. In conjunction with Human Resources, the faculty should incorporate training and development into the performance management of faculty staff. This suggestion boosts user pleasure and the possibility of effective technology adoption by encouraging meaningful involvement through the promotion of transparency and purpose.

5.3.4 Implement a supportive governance framework to address financial and policy challenges

To overcome governance-related limitations, the recommendation is to create a flexible yet structured framework, which facilitates technology adoption by addressing financial constraints, policy challenges, and the need for standardised procedures. The faculty should, together with ICT services, establish a clear budgetary framework that allocates necessary funds for technology initiatives and training, supporting sustainable adoption practices. The faculty should develop a standardised approach to technology governance to ensure that all departments are aligned in their adoption practices, reducing variability and enhancing faculty-wide coherence. This governance framework supports seamless technology integration by addressing financial and procedural challenges and fostering a uniform adoption environment.

5.4 Limitations of the Study

To give a thorough understanding of the results, it is necessary to accept the limits that this study's execution revealed. The researcher identified two limitations in this study. Recognising these limitations is essential for placing the conclusions in context and identifying areas that require more research.

5.4.1 Potential technology evolution

Technology rapidly evolves, and some of the technologies used in the faculty may become outdated, impacting future findings' relevance. Continuous advancements may affect both the needs of faculty and the specific training or competency recommendations. Bell and Boko (2020:1) confirm that although there are still gaps in adoption around the globe, the speed of new technology creation and implementation has substantially accelerated in recent decades. The rate at which technologies are evolving and changing brings about new challenges. Therefore, it is necessary to update suggestions on technology use, training programmes, or performance enhancements regularly to conform to new and developing technical standards. This restriction implies that results are to be taken as pertinent to the technological environment at the time of the investigation. This could be addressed in future studies by carrying out follow-up studies.

5.4.2 Participant engagement and variability

The consistency of responses may have been affected by participant engagement levels as well as individual variances in technological familiarity and adoption readiness, which could have affected the study's findings and limited the findings' applicability to the entire faculty. Participants' levels of interest in the study's subjects differed, which could have affected the calibre and comprehensiveness of their answers. For example, different discipline requirements, attitudes toward technology adoption, and different levels of technological expertise among faculty members could have affected how technology was viewed and used. It might be difficult to draw broad findings that apply to the entire faculty or institution because of this heterogeneity, which can result in inconsistent responses. It would be advantageous to employ tactics geared at improving participant involvement, such as focused outreach, participation incentives, and ensuring the study themes align

with the participants' interests and experiences, to lessen these restrictions in subsequent research.

5.5 Conclusion

The study's conclusions provide a road map for improving faculty use of technology, emphasising the revolutionary potential of adaptive governance, supporting training, and strategic competency development. The faculty is well-positioned to establish a setting where employees may prosper in a technologically advanced society by tackling important issues and utilising technology's advantages. In addition to encouraging short-term enhancements, the suggested guidelines establish the groundwork for long-term expansion, adaptability, and creativity. The path to a fully integrated, technologically advanced faculty demonstrates a dedication to quality and ongoing development, establishing it as a pioneer in academic and research innovation. The faculty is taking a proactive stance by accepting these changes, creating a culture that changes, adapts, and meets the needs of an educational environment that is changing quickly.

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Appendix A

Interview schedule: August & September 2024

Date	Respondent	Time	Venue	Status
28 August 2024	1	10:00	Secure venue (face-to-face)	Complete
28 August 2024	2	13:00	Secure venue (face-to-face)	Complete
29 August 2024	3	08:00	Secure venue (face-to-face)	Complete
30 August 2024	4	12:30	Secure venue (face-to-face)	Complete
02 September 2024	5	12:30	Secure venue (face-to-face)	Complete
02 September 2024	6	15:00	Secure venue (face-to-face)	Complete
03 September 2024	7	11:00	Secure venue (face-to-face)	Complete
04 September 2024	8	09:00	Secure venue (face-to-face)	Complete
05 September 2024	9	09:00	Secure venue (face-to-face)	Complete
10 September 2024	10	13:00	Secure venue (face-to-face)	Complete
11 September 2024	11	14:00	Secure venue (face-to-face)	Complete

Appendix B

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA

UFS

GENERAL/HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

Registration Number: REC-112922-058

17-Aug-2024

Dear Mrs Tracy Isaacs

Application Approved

Research Project Title:
ADOPTION OF TECHNOLOGY AT THE FACULTY OF NATURAL AND AGRICULTURAL SCIENCE, UNIVERSITY OF THE FREE STATE

Ethical Clearance number:
UFS-HSD2024/0595

We are pleased to inform you that your application for ethical clearance has been approved. Your ethical clearance is valid for twelve (12) months from the date of issue. We request that any changes that may take place during the course of your study/research project be submitted via an Amendment on RIMS to the ethics office to ensure ethical transparency. Furthermore, you are requested to submit a Final Report on RIMS for your study/research project to the ethics office once the project has concluded. Should you require more time than the allotted 12 months to complete this research, please apply for an extension by submitting a Continuation/Report on RIMS. Thank you for submitting your proposal for ethical clearance. We wish you success with your research.

Yours sincerely,

Dr Adri Du Plessis
Chairperson: General/Human Research Ethics Committee

Dr Adri du Plessis
Digitally signed by Dr Adri du Plessis
Date: 2024.08.21 17:32:17 +02'00'

205 Nelson Mandela Drive
Park West
Bloemfontein 9301
South Africa

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Bloemfontein 9300
Tel:+27(0)514019337
duplessisA@ufs.ac.za
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Appendix C

UFS BUSINESS SCHOOL
BE WORTH MORE

Dear *Prof Paul Oberholster, Dean of Natural & Agricultural Sciences Faculty*

RE: Preliminary permission to conduct research at your organization

I am doing research and would like to request permission to conduct my research at *the Faculty of Natural and Agricultural Sciences*

DATE
28 March 2024

PRELIMINARY TITLE OF RESEARCH PROJECT*
ADOPTION OF TECHNOLOGY AT THE FACULTY OF NATURAL AND AGRICULTURAL SCIENCE FACULTY, UNIVERSITY OF THE FREE STATE

PRINCIPLE INVESTIGATOR
Tracy Lee Isaacs *2015060151* *0846043528*

FACULTY AND DEPARTMENT
Economic and Management Sciences Faculty
Business School

STUDY LEADER NAME AND CONTACT
Prof Liezel Massyn
051 401 7305

APPROVAL NEEDED
This study still needs ethical approval from the General Human Research Ethics (GHREC) committee at the University of the Free State. As part of the application for ethical clearance I need temporary approval from you to conduct the research in your organization. Once the Ethical Clearance certificate has been issued by the GHREC, the formal and final permission document and the data collection instruments will be provided to you for final consideration and approval.

Therefore, in order for me to complete my research, I need your permission to:

	Permission Requested (YES,NO, N/A)	Request Approved (YES, NO)
Collect data from *academic and support staff within the faculty of Natural and Agricultural Sciences.*	YES	

* The Title and objective of the study may change, based on the reviews performed by the supervisor and scientifi committee and the UFS. If the changes made has a significant impact on the permission requested, you will be informed as soon as possible

Access to internal data *insert a detailed description of the internal data that is needed*	NO	
Access to internal documentation *describe all the documents that you need access to in order to perform your study*	NO	
Including your organization's name in the study and the title of the study. If the answer is no, please also indicate whether I can still get access to the above if the study results are anonymized.	YES	
Using the data collected for future conference proceedings and or article publication.	YES	

ADDITIONAL STIPULATIONS

If you have any additional stipulations about the temporary request for permission to conduct research in your organization, please include those stipulations in the space provided.

Yours sincerely

Tracy Lee Isaacs

Approval Granted by:

Prof Paul Oberholster
Name, surname and signature of individual grating the permission

076 390 7689
Contact number

PO Box 339 (IB17)
Bloemfontein
South Africa
9301

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