DETERMINANTS OF PARTICIPATION OF MSUNDUZI LOCAL MUNICIPALITY'S PERI-URBAN HOUSEHOLDS IN THE DIGITAL FINANCE ECONOMY

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DECLARATION

I, Nelisiwe Fortunate Nyide, declare that this dissertation is a representation of my own work in conception and execution. This work has not been submitted in any form for another degree at any university or institution of higher learning. All information cited from published or unpublished works has been acknowledged.

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iNkosi yomusa inibusise – May the gracious Lord richly bless you!

ABSTRACT

Digital finance is an instrument that has the potential of improving access to finance to underprivileged groups such as peri-urban communities. Digital financial tools are capable of achieving traditional crisis management objectives with greater potency and accuracy than was historically possible. The financial services sector is in a process of accelerating change by adopting new business models based on convergent technological developments to increase customer participation in peri-urban areas. Therefore, the financial services sector can use digital finance to improve the availability of household financial services through diversified financial products, thus promoting the growth of household consumption. However, several studies maintain that determinants of digital finance participation of marginalised households, including peri-urban households, are generally underdetermined. Moreover, there is limited literature on the participation of South African households in the digital economy. Scholarly literature asserts that the level of participation of South Africans in digital finance is concerning. This is largely due to a lack of awareness and knowledge of digital financial services that are available to South African households.

This study seeks to bridge that gap by examining the determinants of participation of peri-urban households in digital finance in the financial services sector in KwaZulu-Natal, South Africa. A quantitative research approach was adopted to answer the research questions. This method was found to be suitable for this study given that the research objectives can be best measured using a structured survey that is quantitative in nature. The target population of this study consisted of peri-urban households located in the Greater Edendale area, which is the largest peri-urban area within the Msunduzi Local Municipality. The sample size for this study was 384 peri-urban households which were selected using purposive sampling, derived from non-probability sampling. The questionnaires were in English and were also translated into isiZulu in order to make it easier for respondents to participate in this study. The Statistical Package for the Social Sciences (SPSS) was used to compile the descriptive statistics.

The results of this study indicate that the general public in economically disadvantaged communities participates in digital financial transactions in the financial services sector on a regular basis. A Spearman correlation analysis found a substantial positive link between the usage of digital platforms by peri-urban families and their degree of participation in digital finance. This association was shown to be statistically significant (r = .649, n = 315, p < .001). However, the results of a Mann-Whitney U test showed that there was no statistically significant difference between genders with regard to involvement in digital finance (Z = -1.804, p = .071). A correlation analysis was undertaken to determine whether peri-urban households' awareness of digital financial services influenced their adoption of digital platforms. The Spearman correlation analysis (r = .768, n = 315, p < .001) showed a strong and significant relationship between peri-urban households' knowledge and awareness of digital financial services and their use of digital platforms. Additionally, a Spearman correlation analysis (r = -.524, n = 315, p < .001) revealed a significant negative association between peri-urban households' adoption of digital financial platforms and their digital literacy. This is despite the fact that literature argues that in South Africa, the adoption of digital financial services is negatively affected by a lack of information and knowledge which is prevalent among marginalised communities.

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LIST OF ABBREVIATIONS

ATM   Automated teller machine

DIT   Diffusion of Innovation Theory

FNB   First National Bank

ICT   Information and communication technology

MENAP   Middle East, North Africa, Afghanistan and Pakistan

SPSS   Statistical Package for the Social Sciences

TAM   Technology Acceptance Model

CHAPTER ONE

INTRODUCTION AND OVERVIEW OF THE STUDY

1.1   Introduction

Access to finance is largely recognised as pivotal in ensuring inclusive growth and is considered essential in reducing poverty. Therefore, digital financial inclusion may be a fundamental instrument that contributes positively to the lives of poor and marginalised communities (Aziz & Naima, 2021:6). Newly introduced business models which rely heavily on digital platforms are seen to be transforming the financial services sector and also have an impact on the rural population, rural households, and peri-urban communities. However, He and Li (2020:311) assert that underdeveloped societies, including peri-urban areas, are easily excluded from digital finance. The purpose of this chapter is to provide an overview of this study by discussing the research background and presenting the research problem. This chapter also presents the aim and objectives of this study, followed by the research questions. The chapter concludes with a discussion of the significance of the study and an explanation of the research method that was adopted.

1.2   Background of the study

Advancements in information and communication technologies (ICTs) and digital innovations have been confirmed to be driving ongoing social and geographical developments (Stratu-Strelet et al., 2021:1). Digital innovations and ICTs are known for their positive contribution towards the development of previously marginalised societies, including peri-urban communities (Kamath, 2018:378). Stratu-Strelet et al. (2021:1) are of the view that digital innovations have the potential of addressing political, social, and economic challenges. The rising digital innovations have been found to be significant drivers of growth in the financial services sector (Igoni, Onwumere & Ogiri, 2020:2), prompting heavy investing heavily in digital infrastructure by this sector (Ndubuisi, Otioma & Tetteh, 2021:2). According to Kelly (2014:9), digital

innovations in the financial services sector are a major strategic focus for commercial banks, which have large programmes in place to reposition their systems infrastructure to support digital finance.

The existing literature on the transformative potential of digital finance, particularly for underprivileged and marginalized communities such as peri-urban households, highlights its significant impact. Digital finance, encompassing tools and platforms that facilitate online financial transactions, offers a gateway to financial inclusion for these communities. He and Li (2020:295) contend that digital finance is an instrument that has the potential of improving access to finance to underprivileged groups such as peri-urban communities. Digital financial tools are capable of achieving traditional crisis management objectives with greater potency and accuracy than was historically possible. This may well be one advantage of the financial services sector in the current crisis (Arner et al., 2020:22). Li, Wu and Xiao (2020:322) state that the financial services sector can use digital finance to "improve the availability of household financial services through diversified financial products, thus promoting the growth of household consumption". Several studies maintain that the determinants of digital finance participation of marginalised households, including peri-urban households, are generally underdetermined (He & Li, 2020:295; Aziz & Naima, 2021:3). There is limited literature on the participation of South African households in the digital economy. Van Niekerk and Phaladi (2021:1) assert that the level of participation of South Africans in digital finance is concerning. This is largely due to a lack of awareness and knowledge of digital financial services that are available to South African households (Van Niekerk & Phaladi, 2021:1). The underutilisation of digital financial services in South African peri-urban households presents both a challenge and an opportunity. The challenge lies in bridging the gap in awareness and education regarding digital finance. However, this also represents an opportunity to drive economic inclusion and empowerment through targeted initiatives that promote digital literacy and financial education. By fostering a deeper understanding of digital finance, it is possible to enhance participation and leverage the benefits of digital innovations to support the socio-economic development of peri-urban communities.

1.3 Problem statement

The COVID-19 pandemic has shaken nations around the world. It has tested their healthcare infrastructure, battered their financial markets, and left whole populations in fear and lockdown. The primary measure taken to combat the spread of COVID-19 is 'social distancing', which has further embedded digitisation, e-commerce and financial technology into modern life (Ozili, 2020:4). As already mentioned, these digital developments are considered by several scholars to be catalysts for improving digital financial services, thus increasing the inclusion of previously marginalised communities (Aziz & Naima, 2021:6; Igoni et al., 2020:2; Ndubuisi et al., 2021:2). The financial services sector is in a process of accelerating change by adopting new business models based on convergent technological developments to increase customer participation in peri-urban areas (Ketterer, 2017:2). In recent years, the financial services sector has intensified the use of digital platforms to promote and deliver financial services and products to consumers. The use of digital finance is considered by He and Li (2020:295) as a new way of improving peri-urban households' access to financial services and related products. Newly introduced business models which rely heavily on digital platforms are not only transforming the financial services sector, but also have an impact on the rural population, rural households, and peri-urban communities.

According to Morgan, Huang and Trinh (2019:3), "improved access to financial services requires higher levels of digital financial literacy to make effective use of them and to avoid miss-selling, frauds such phishing, hacking attacks, unauthorized use of data, discriminatory treatment and behavioural issues such as excessive borrowing". Effectively using digital finance platforms requires one to possess technological sophistication, which is lacking among some consumers in marginalised communities (Morgan et al., 2019:1). For this reason, underdeveloped societies, including peri-urban areas, are easily excluded from digital finance (He & Li, 2020:311). According to Aziz and Naima (2021:5), owning a digital device and possessing digital skills facilitates access to financial resources. In spite of the aforementioned arguments, Ozili (2018:332) asserts that a large number of people in marginalised communities, including peri-urban households, own a digital device, and yet they do not participate

in digital financial services. This shows a gap that still exists in the literature concerning the determinants of participation of previously excluded consumers, which include peri-urban households. This argument is supported by He and Li (2020:295), who contend that the determinants of participation of peri-urban households in digital finance are mainly unknown. Literature shows that over the past few decades the introduction of information technology in the banking sector, and hence the development of digital finance, has increased the demand for research in industry and academia. The adoption of digital finance has not sufficiently permeated significant numbers of households (Shofawati, 2019:390). Little attention is given to the adoption of digital finance by peri-urban households in Africa, despite the widely documented benefits that come with this innovation. This points to the gap that still exists in this area (Jain & Raman, 2022:2). Hence, there is a need to ascertain and understand the determinants of participation of peri-urban households. This study seeks to bridge that gap by examining the determinants of participation of peri-urban households in digital finance in the financial services sector in KwaZulu-Natal, South Africa.

1.4   Research aim and objectives

In order to address the research problem that was presented in Section 1.3, the aim and objectives of this study were formulated as presented below.

1.4.1   Research aim

The aim of this study is to examine and identify the determinants of participation of peri-urban households in digital finance in order to facilitate the development of strategies to improve the participation of peri-urban households in the digital economy. This study is limited to the Msunduzi Local Municipality in the province of KwaZulu-Natal, South Africa.

1.4.2   Research objectives

This study seeks to address the research aim through the formulation of the following objectives:

i. to assess the level of awareness and knowledge of digital financial services by peri-urban households within the Msunduzi Local Municipality area;

ii. to examine the extent of participation of peri-urban households in digital finance in the financial services sector; and

iii. to establish factors influencing the participation of peri-urban households in digital finance in the financial services sector.

1.4.3 Research questions

Emanating from the research objectives, the following research questions were posed:

i. What is the level of awareness and knowledge of digital financial services by peri-urban households within the Msunduzi Local Municipality area?

ii. To what extent do peri-urban households participate in digital finance in the financial services sector?

iii. What factors influence the participation of peri-urban households in digital finance in the financial services sector?

1.5 Significance of the study

Access to finance is largely recognised as pivotal in ensuring inclusive growth and is considered essential in reducing poverty. Therefore, digital financial inclusion may be a fundamental instrument that contributes positively to the lives of poor and marginalised communities (Aziz & Naima, 2021:6). This study examines the determinants of participation of peri-urban households in the digital economy. It uncovers developments in digital finance in the financial services sector, thereby identifying challenges and opportunities in peri-urban areas. The results of this study are used to propose strategies that can be used by the financial services sector to improve the participation of peri-urban households in the digital economy and thus improve digital financial inclusion. This study contributes to the body of knowledge by establishing factors that affect the participation of poor and marginalised households

in digital finance. This bridges the gap that currently exists, as discussed in the research problem statement.

1.6   Research design

This study consists of a literature review and an empirical study. This is accordance with Stockemer's (2019:18) assertion that "good research starts with a theoretically derived research question". The literature review provides an in-depth review of digital finance challenges facing peri-urban households. It also guides the researcher in identifying and explaining the factors affecting the participation of peri-urban households in the digital economy. Thus, the historical review lays the foundation that guides the empirical study and provides insight into and understanding of the research problem.

1.6.1   Research method

In line with the above discussion, the research process that was followed in this study is illustrated in Figure 1.1 below.
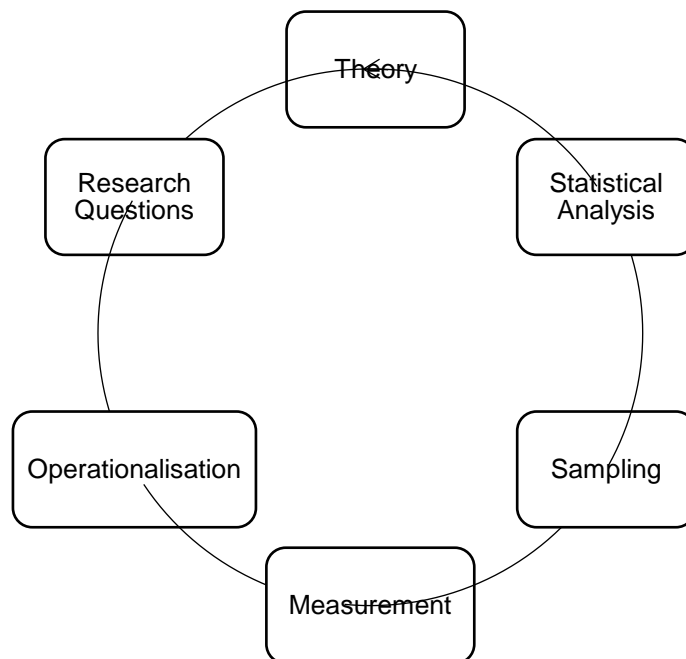
Figure 1.1: The proposed quantitative research process

A quantitative research approach was adopted to answer the research questions. Sekaran and Bougie (2016:2) state that a quantitative study is conducted by collecting numerical data, generally through structured questions. This method was found to be suitable for this study given that the research objectives can be best measured using a structured survey that is quantitative in nature (Sekaran & Bougie, 2016:129).

1.6.2 Population

Population is defined by Rahi (2017:3) as the pool from which the sample elements are drawn. Sekaran and Bougie (2016:236) add that population refers to the entire group of people, events, or things of interest that the researcher wishes to investigate. As already mentioned, this study was conducted in the Msunduzi Local Municipality in the province of KwaZulu-Natal, South Africa. According to the housing sector plan of the Msunduzi Local Municipality (2019:2), the municipality has an estimated population of 679 039 people, the majority of whom reside in the Greater Edendale area. The Greater Edendale area "is peri-urban in character with tracts of agricultural land interspersed with settlement, some of which includes high density housing in areas with limited services" (Msunduzi Local Municipality, 2019:2). It consists of the Edendale and Imbali townships, which have a combined population of 300 000 people (Msunduzi Local Municipality, 2019:56). The target population of this study consisted of all peri-urban households located in the Greater Edendale area, which is the largest peri-urban area within the Msunduzi Local Municipality as explained above.

1.6.3 Sampling strategy

In most cases, it is uneconomical, impractical and illogical for a researcher to involve every member of the population in a study (Stockemer, 2019:57). For this reason, scholars suggest that a sample from the population be selected instead (Stockemer, 2019:58; Sekaran & Bougie, 2016:236; Walliman, 2011:93). A sample is defined as a small group or subset selected out of a large group or population (Walliman, 2011:93; Stockemer, 2019:58). In determining the appropriate sampling strategy, this study

considered three restrictions: time, cost, and the availability of an updated total population listing of peri-urban households located in the Greater Edendale area. These variables are fundamentally important in the sampling process as they dictate the sampling strategy that a study should employ (Sekaran & Bougie, 2016:241). According to Sekaran and Bougie (2016:241) and Berndt (2020:225), a study of this nature should adopt a non-probability sampling strategy since a reliable updated listing of the population size is not available. Moreover, since this study sought to identify and examine the determinants of participation of peri-urban households in digital finance, the use of a random sampling strategy for the entire population would not have been appropriate. Therefore, purposive sampling, which is derived from non-probability sampling, was used in this study to select individuals who have bank accounts and mobile phones. This approach ensured that valuable information from relevant participants was obtained in order to address the research questions set out in this study (Stockemer, 2019:63).

1.6.4 Sample size

Roscoe (1975, as quoted by Sekaran & Bougie, 2016:264), posits that "sample sizes larger than 30 and less than 500 are appropriate for most research". However, Etikan and Babtope (2019:50) and Omair (2014:142) argue that the sample size should be estimated by considering the four factors below.

1.6.4.1 Population size

It has already been established that the population size is approximated in this study.

1.6.4.2 Margin of error

The margin of error is a statistic expressing an amount by which a data set might be inaccurate (Etikan & Babtope, 2019:52). A margin of error of 5% (e = ±0.05) was adopted for this study as this is considered acceptable in social research (Taherdoost, 2017:237) and in management studies (Etikan & Babtope, 2019:51).

1.6.4.3   Confidence level

The confidence level refers to the desired degree of confidence for the research conclusions (Berndt, 2020:224). A confidence level of 95% was adopted for this study, which is in line with similar studies (Omair, 2014:143; Taherdoost, 2017:237). A 95% confidence level corresponds with a Z-score of 1.96 (Berndt, 2020:224; Omair, 2014:143).

1.6.4.4   Standard deviation

The standard deviation refers to the degree of variance expected in responses (Etikan & Babtope, 2019:52). The recommended standard deviation for an approximated population size, which is 50%, was adopted for this study (Omair, 2014:144; Etikan & Babtope, 2019:50). Thus, the p-value is 0.5.

Using the following formula and the values explained above, the acceptable sample size for this study was calculated as follows (Berndt, 2020:224; Etikan & Babtope, 2019:50; Omair, 2014:143):

$$n = \frac{z^2 p(1-p)}{e^2}$$
$$n = \frac{1.96^2 0.5(1-0.5)}{0.05^2}$$
$$n = 384$$

The sample size for this study was 384 peri-urban households. Questionnaires were evenly distributed between the Edendale and Imbali townships.

1.6.5   Data collection

The empirical data were collected by means of questionnaires which were personally administered in order to ensure a high response rate and to clarify any doubts that respondents might have had (Sekaran & Bougie, 2016:143). The questionnaires were

in English and were also translated into isiZulu in order to make it easier for respondents to participate in this study.

1.6.6 Data analysis

Data analysis usually involves reducing accumulated data to a manageable size, developing summaries, looking for patterns, and applying statistical techniques (Sekaran & Bougie, 2016:273). The quantitative data that was collected from the respondents was recorded using numerical codes to categorise responses to each item on the research instrument. This was achieved through computerised analysis. The Statistical Package for the Social Sciences (SPSS) was used to compile the descriptive statistics.

1.6.7 Validity and reliability

1.6.7.1 Validity

Validity is described by Sekaran and Bougie (2016:150) as the extent to which the research findings accurately reflect the phenomena under study. In this study, the data collection instrument was examined by the research supervisor, who is an expert in the field, and comments were adopted accordingly. Moreover, the questionnaire was piloted in order to address any potential limitations and pitfalls in the data collection instrument. These processes formed part of content and face validity. Face validity indicates that the test items that are intended to measure a concept do, on the face of it, look like they measure the concept (Sekaran & Bougie, 2016:220). Content validity is similar to face validity except that the researcher seeks the opinion of experts in the field to ensure that the measure includes an adequate and representative set of items that tap the concept (Walliman, 2011:104; Creswell & Creswell, 2018:274).

1.6.7.2 Reliability

According to Sekaran and Bougie (2016:223), "the reliability of a measure indicates the extent to which it is without bias (error free) and hence ensures consistent measurement across time and across the various items in the instrument". The

Cronbach's alpha statistic was used to test the reliability of the research instrument. Cronbach's alpha is considered by many studies as an adequate and important measure of the reliability of the research instrument (Creswell & Creswell, 2018:215; Lekhanya, 2016:91).

1.6.8 Ethical considerations

This study adhered to Durban University of Technology's research ethics. This was achieved by providing the participants with a letter of information and a consent form. The letter of information and consent form indicated the following:

- Participation in this study is entirely voluntary and members may refuse or withdraw from the study if they wish to do so.
- Any information provided by participants in the study is confidential and there is no harm or risk associated with participation.
- All information obtained will be used for research purposes only and participants will not be identified by their names in any report of the completed study.
- Data will be collected anonymously, and names will not be linked with any information.
- Consent will be required from participants to indicate their willingness to participate in this study.

1.7   Overview of chapters

The dissertation for this study comprises five chapters.

1.7.1 Chapter One: Introduction and overview of the study

This chapter comprises the introduction and background to the study. It discusses the importance and the purpose of the study and defines the research problem. The objectives and research questions are stated to guide the flow of the research.

1.7.2 Chapter Two: Literature review

This chapter introduces the literature on the general digital finance challenges affecting emerging economies. It begins by defining key terms used in this study. This chapter outlines the field of digital finance in the financial services sector and the participation of peri-urban households in the digital economy. Factors affecting the participation of peri-urban households in the digital finance economy are also examined and discussed. Moreover, the theories which underpin the study are outlined.

1.7.3 Chapter Three: Research methodology

This chapter discusses the research design and methodology in detail, outlining the specific methods used to gather empirical information. The chapter also examines the design of the questionnaire that was used to collect data. The statistical techniques that were used to process and analyse the data are explained. In addition, the validity, reliability, and ethical considerations of this study are discussed.

1.7.4 Chapter Four: Data analysis and discussion

This chapter presents the findings obtained from the literature and the empirical study. The results are analysed and interpreted based on the data collected. The descriptive findings are presented in figures, charts, and tables.

1.7.5 Chapter Five: Conclusions and recommendations

This chapter summarises the study and its findings, and presents conclusions and recommendations in order to facilitate the development of strategies that are aimed at improving the participation of peri-urban households in the digital finance economy. The research objectives and questions are revisited and the limitations of the study, contributions to science, and areas for further research are presented.

1.8 Chapter summary

The introductory chapter has provided the background and overview of the study, the problem statement, and the aim and objectives of the study. In addition, the significance of the study and the research methodology have been outlined. Lastly, an overview of the dissertation's chapters has been presented to reflect the research path that guided this study.

The next chapter presents the literature review and the theoretical framework underpinning this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents and discusses the reviewed literature in the context of digital finance participation by peri-urban households. This study focuses on the participation of peri-urban households in digital finance, and this chapter highlights the development of digital finance and reviews its benefits. The chapter discusses the participation of marginalised households in general in this innovation by the banking sector, as well as the financial services sector's role in promoting the participation of marginalised households in digital finance. In addition, the chapter identifies and articulates factors and challenges that influence the participation of peri-urban households in digital finance. The gap that still exists in the literature as far as this study is concerned is identified and discussed to conclude this chapter.

2.2 Conceptual review

This section begins by introducing two key concepts that are used in this study: digital finance and peri-urban households.

2.2.1 Digital finance

There is no single and commonly accepted definition for digital finance. Ozili (2018:329) defines digital finance as financial services delivered through mobile phones, personal computers, the Internet, or cards linked to reliable digital payment systems. Gomber, Koch and Siering (2017:543) note that "traditionally, banks are the suppliers of financial services for individuals or companies". Therefore, this study uses the term 'financial services' to refer to services offered by the banking sector. Igoni et al. (2020:4) add that digital finance involves an environment of technological infrastructure that enables individuals and companies to have access to payments, savings and credit facilities via the Internet (online) without the need to visit a bank

branch or without dealing directly with financial service providers. Digital finance, which is also described as digitalisation of the financial industry, involves all electronic products and services of the financial sector, such as credit and chip cards, electronic exchange systems, automated teller machines (ATMs), and mobile and app services (Gomber et al., 2017:539). Digital finance offers affordable and convenient ways for peri-urban households to invest, apply for credit, access insurance offerings, and make payments. Therefore, it is important to focus on the challenges faced by peri-urban households in digital finance (Ravikumar, 2019:3435).

2.2.2 Peri-urban households

As intimated in the previous chapter, there are numerous definitions of peri-urban areas. Peri-urban areas are described as exhibiting "a blend of land uses, which are neither rural nor urban in the conventional sense" (Mortoja, Yigitcanlar & Mayere, 2020:1). Wandl and Mangoni (2017:1) describe a peri-urban area as a "territory that is a fragmented mix of urban and rural functions". Capodaglio (2017:2) adds that peri-urban areas are settlements in the proximity of urban areas that do not necessarily have the infrastructure and services that are available in urban areas. In the context of this study, peri-urban households are defined as groups of people living in blended spaces between urban centres, rural spaces, and transitional spaces that are subject to numerous physical, socio-demographic, cultural, and economic changes (Dadashpoor & Ahani, 2019:218).

2.3   The development of digital finance

It has already been explained that digital finance is the integration of financial services with digital technology. For this reason, Yin (2022:7) argues that the development of digital finance shares the same history as digital technology. Arner, Barberis and Buckley (2016:6) trace the development of digital finance as far back as the late 1800s to the introduction of the telegraph and installation of the transatlantic cable. At its inception stage, digital finance was characterised by telex networking, which was followed by the introduction of ATMs (Fairooz & Wickramasinghe, 2019:72). The first ATM was introduced by Barclays Bank in 1967 (Arner et al., 2016:4). Mia, Rahman

and Uddin (2007:38) observe that the innovation of digital finance evolved through "different generations of electronic transactions". Banking institutions provided their customers with electronic access by means of ATMs; this was followed by phone banking and Internet banking (Mia et al., 2007:38; Fairooz & Wickramasinghe, 2019:72).

Ongoing developments in information technology are significant drivers of change in the banking sector (Cornelius & Kwon, 2018). Digital innovation and transformation have significantly changed the pattern of how the banking sector operates, stays competitive, and retains existing customers while attracting new ones. Major shifts in the sector during the period from 1983 to 2015 have resulted in the proliferation of digital finance (Cornelius & Kwon, 2018; Yin, 2022:2). The exponential growth in the adoption of digital innovations in the banking sector was brought about by extensive Internet and digital device usage patterns (Gomber et al., 2017:538). Cost-efficiency, convenience and ease of use are some of the critical contributors towards the development of digital finance (Kusimba, 2018:247; Van Niekerk & Phaladi, 2021:6; Mignamissi & Djijo, 2021:2). Table 2.1 highlights the evolution of digital finance over time.

Table 2.1: Evolution of digital finance

Year	Revolution
1838 – 1960	The first major period of globalisation through the introduction of the telegraph and installation of the transatlantic cable
1967	Introduction of the first ATM by Barclays Bank
1983	Introduction of mobile phones
1995 - 2000	The first use of the World Wide Web to provide online financial solutions and the emergence and utilisation of the concept 'financial technology'
2000 - 2005	Financial technology is referred to as digital finance or e-finance The emergence of banks without physical branches
2005 - present	Full-scale digitalisation and globalisation of finance encompassing "finance and investment, operations and risk management, payments and infrastructure, data security and monetization and customer interface" (Arner et al., 2016:18)

Source: Author's research

The extent to which technology is used and the developments in the banking sector differ from region to region and country to country (Mignamissi & Djijo, 2021:3). Thus, digital finance is at an advanced stage in developed economies as compared to emerging and developing economies. For this reason, participation rates in digital finance in developing regions such as South Africa are still low despite the notable evolution already mentioned (Mignamissi & Djijo, 2021:3; Kamath, 2018:377; Van Niekerk & Phaladi, 2021:8).

2.4   Digital finance benefits

Several positive benefits of digital finance have been identified in the literature. According to Ozili (2018:330), digital finance can benefit financial services users, providers of digital finance, governments and the economy, each of which is discussed below.

2.4.1 Benefits to financial services users

The prevailing scholarly consensus identifies greater financial inclusion as one of the main advantages of digital finance (Ozili, 2018:330; Shofawati, 2019:390; Chen, 2016:237: Li et al., 2020:7). The innovative development of online banking has improved the inclusion of previously marginalised communities such as rural and peri-urban households (Li et al., 2020:7). Moreno-García, García-Santillán and Campero (2021:213) add that the digitisation of financial services has been beneficial to less developed communities in rural and peri-urban areas. Li et al (2020:7) indicate that digital finance increases the availability of financial services to users. Therefore, households benefit in terms of relief from liquidity constraints and growth in income and spending (Li et al., 2020:7; Shofawati, 2019:398).

Moreno-García et al. (2021:212) identify lower costs and fewer risks of using digital platforms to access financial services as further benefits of digital finance. The digitisation of financial services is considered to be an enabler for banks to lower costs "by reducing queuing lines in banking halls, reducing manual paperwork and documentation and maintaining fewer bank branches" (Ozili, 2018:331). Furthermore,

digital finance has been found to have helped the banking sector to reduce transaction costs and to improve the allocation of resources and the availability of financial services to users (Li et al., 2020:7; Rai & Sharma, 2019:600*). In addition to lowering costs and improving financial inclusion, digital finance allows customers to exercise greater control of their personal finance; it accelerates financial decision-making and improves the ability to make and receive payments (Shofawati, 2019:398*). For this reason, Ozili (2018:331) and Rai and Sharma (2019:600) are of the view that digital finance improves the well-being of customers and businesses.

2.4.2 Benefits to providers of digital finance

Digital innovation has not only enhanced the financial inclusion of previously excluded individuals and businesses, but has also enabled the banking sector to accurately provide timeous financial solutions to its customers (Farook & Sudalaimuthu, 2017:1354). Therefore, digital finance providers benefit through this innovation by improving their competitive edge significantly. According to Van Niekerk and Phaladi (2021:2), digital finance propels the financial services sector to reinvent itself, thereby ensuring the availability of innovative products at low cost. Modern technologies supporting digital finance cause companies to develop new business models which ultimately enhance efficiencies in their operations (He & Li, 2020:312). Moreover, these technologies improve the quality and diversity of banking services (Rai & Sharma, 2019:600). For this reason, banks are increasingly investing in digital infrastructure in order to enhance service quality, provide innovative products, and improve customer satisfaction (Aziz & Naima, 2021:1).

Digital finance technologies are increasingly being adopted by financial services providers to respond to shifting market dynamics (Cornelius & Kwon, 2018). The traditional banking distribution channels have changed dramatically because of disruptive innovations (Rai & Sharma, 2019:600). Several banks are closing their branches and redirecting their focus to digital services (Cornelius & Kwon, 2018). Furthermore, these innovations allow banks to partner with mobile network operators in the provision of financial services (Cornelius & Kwon, 2018). Thus, the adoption of digital finance technologies by banks ensures not only their survival, but also their

growth. It has already been noted that digital finance grows financial inclusion. Ghosh and Chaudhury (2022:354) contend that the utilisation of digital finance technology by service providers improves their competence to supply digital finance services to their customers.

2.4.3 Benefits to government

Digital finance expands the consumption demand of households, which benefits governments (Li et al., 2020:3). Several studies maintain that in many countries, economic growth and sustainable development have been restrained by insufficient household consumption (Li et al., 2020:3; Ghosh & Chaudhury, 2022:355; Hodson, 2021:862). To this end, Aziz and Naima (2021:20) emphasise that "government should focus on a digital skill and financial literacy-based approach to ensuring digital financial inclusion". An increase in financial inclusion inevitably improves tax revenue, which also benefits government (Shofawati, 2019:394).

2.4.4 Benefits to the economy

It has already been noted that digital finance is a catalyst for financial inclusion, which supports countries' economic growth and sustainable development. Jain and Raman (2022:1) add that a digitised economy facilitates the eradication of fake currency circulation. It is no surprise that, globally, financial service providers are moving their customers to the cashless economy (Ghosh & Chaudhury, 2022:355; Ozili, 2018:330). Ndubuisi et al. (2021:7) caution that "if economic actors lack access to the requisite digital and financial literacy skills to engage in productive economic activities, the expected benefit of digital infrastructure may not fully materialise".

2.5 Participation of marginalised households in digital finance

The digital economy is flourishing globally and there is a burgeoning body of research on digital financial services and financial inclusion. However, there is a relative lack of attention given to the participation of peri-urban households in the digital economy, particularly in Africa. For full and effective participation in the digital economy, digital

infrastructure must be available, and participants need to possess the requisite skills (Morgan et al., 2019:2; Ndubuisi et al., 2021:1). Factors influencing the participation of marginalised households in digital finance will be covered later in the chapter. The extent of participation of marginalised households in this innovation in Africa and other developing economies abroad is outlined in Table 2.2 below.

Table 2.2: Participation of marginalised households in digital finance

Authors, year of publication	Van Niekerk & Phaladi, 2021
Title and country	Digital Financial Services: Prospects and Challenges. South Africa
Summary	This is one of a very few studies conducted in South Africa in this research focus area. This study investigated the adoption of digital financial services by individuals and businesses. The authors point out that financial institutions are empowered by the Financial Sector Regulation Act 9 of 2017 to enhance the agenda of financial inclusion. The study notes that, in South Africa, the adoption of digital financial services is negatively affected by a lack of information and knowledge which is prevalent among rural communities. Van Niekerk and Phaladi (2021:19) recommend that the state, together with financial institutions, needs to proactively drive awareness campaigns in marginalised parts of the country in order to inform people about digital financial services. This points to the fact that there are still challenges in South Africa regarding the participation of marginalised households in digital finance.
Authors, year of publication	Ghosh & Chaudhury, 2022
Title and country	Determinants of digital finance in India. India

Summary	Ghosh and Chaudhury investigated the adoption of digital finance in India following the demonetisation of some denominations in the country's currency system. Despite the Indian government's drive towards a cashless economy, this study found that the majority of the country's citizens are not using digital finance. Interestingly, the wireless subscription rate is reported to have rapidly increased in the rural parts of the country. However, there are incongruencies between the availability of digital financial services and their use by Indian citizens.
Authors, year of publication	Igoni, Onwumere & Ogiri, 2020
Title and country	The Nigerian digital finance environment and its economic growth: Pain or gain. Nigeria
Summary	Igoni et al. (2020) examined the influence of digital finance on the Nigerian gross domestic product. This research found no significant causality impact on the country's gross domestic product as a result of the adoption of digital finance. The authors assert that this finding could be as a result of "unpopularity of the digital financial environment" in Nigeria. Furthermore, the authors state that the spread of digital infrastructure is low in Nigeria, particularly in the rural regions. The participation rate in the digital economy is also low in the country.
Authors, year of publication	Arif, Aslam & Hwang, 2020
Title and country	Barriers in adoption of Internet banking: A structural equation modelling - neural network approach. Pakistan

Summary	The focus of this particular study was on the identification of barriers in the adoption of Internet banking in Pakistan. It was found that the country faces an unwillingness by customers to utilise Internet banking, regardless of its benefits. The authors are of the view that "there is a need to develop confidence in the minds of consumers towards the usage of Internet banking in Pakistan".
Authors, year of publication	Hossain, Bao, Hasan & Islam, 2020
Title and country	Perception and prediction of intention to use online banking systems: An empirical study using extended TAM. Bangladesh
Summary	One of the questions posed in this study was "How do online banking service customers adopt online banking services in Bangladesh?" This question stemmed from the fact that online banking is still in infancy in the country. Unsurprisingly, key findings of this study illustrate that the digital economy remains novel in Bangladesh. Most of the Internet users in the country are still not attuned to the use of online banking. Moreover, the digital infrastructure is underdeveloped in the country, which hinders the successful participation of households in the digital economy.
Authors, year of publication	Matita & Chauma, 2021
Title and country	Does financial literacy influence use of mobile financial services? Evidence from Malawi household survey data. Malawi
Summary	The influence of financial literacy on the financial behaviour of Malawians in relation to the adoption of

	digital finance was the focal point of this study. Matita and Chauma (2021) mention that there are continued efforts by the Malawian Reserve Bank and other stakeholders to improve the participation of the country's population in the digital economy. These efforts include financial education programmes that are aimed at promoting financial inclusion. However, this study found that the use of digital technologies to participate in mobile banking activities remains low in the country. The authors note that "biased agent distribution in rural areas was one of the bottlenecks to adoption and usage of mobile banking solutions".
Author, year of publication	Shihadeh, 2020
Title and country	Online payment services and individuals' behaviour: New evidence from the MENAP. Palestine
Summary	Shihadeh (2020) analysed the causal relationship between individuals' characteristics and the use of online payment services in the Middle East, North Africa, Afghanistan and Pakistan (MENAP). The author describes MENAP as a "low financial inclusion region". There is a call for the enhancement of digital infrastructure in this region to enhance the participation of individuals and businesses in the digital economy. The adoption of digital financial services remains very low in this region.

Source: Author's research

The reviewed literature corroborates the conclusion that the participation of marginalised societies, including peri-urban households, in the digital economy is still minimal. Therefore, the extent of the use of digital finance in this segment remains unknown.

2.6 Role of government and banks in promoting digital finance participation

It was noted in the previous section that the adoption of digital finance is not only beneficial to consumers, but also to service providers and government. Therefore, banks and government have a critical role to play in enhancing financial inclusion. The development of digital finance is gaining momentum globally and governments and banks around the world are framing solutions to make financial inclusion a reality. However, the heterogeneity analyses performed by Ye, Pu and Xiong (2022:11), He and Li (2020:296), and Mignamissi and Djijo (2021:1) show that the digital divide thwarts the digital financial inclusion agenda. The term 'digital divide' is defined by Mignamissi and Djijo (2021:1) as inequalities in ICTs. These inequalities are generally geographical, meaning that underdeveloped regions face limitations in accessing ICTs. It is for this reason that the participation rate in digital finance is still low in underdeveloped areas, including peri-urban communities (Ye et al., 2022:11). In order to address the digital imbalances that exist between different groups, governments and banks need to invest in digital infrastructure in rural and peri-urban areas (Kamath, 2018:386). Improving the digital infrastructure in alienated communities empowers the marginalised and enhances their participation in the digital economy (Igoni et al., 2020:2).

Kamath (2018:387) and Igoni et al. (2020:2) assert that governments and banks are key role players that need to lead in increasing digital finance awareness so as to improve receptivity to this technological innovation. Considering the low adoption rate of digital finance in rural and peri-urban communities, Prasad, Meghwal and Dayama (2018:29) call on governments and banks to channel digital finance awareness programmes to marginalised groups in order to ensure the realisation of financial inclusion. Ghosh and Chaudhury (2022:344) strongly argue that financial inclusion will remain a pipe dream unless sustained digital and financial awareness programmes are executed.

Participation in digital finance is enhanced by the availability and accessibility of easy-to-use banking applications (Prasad et al., 2018:29). Therefore, the development of

easily accessible and user-friendly banking applications increases the acceptance of digital finance. Liu, Liu and Zhou (2021:17) support this view, stating that the availability of technological applications for banking enables underdeveloped regions to benefit from financial services and products that are minimally offered by traditional finance. Li et al (2020:4) add that banking applications reduce transaction costs, improve residents' social security, and may even encourage participation in digital finance.

Banks enhance participation in the digital economy by providing digital financial education to their customers. For example, banking staff are trained to help customers migrate from traditional banking practices to self-service technologies. Self-service technologies "allow customers to do some work that would otherwise be handled by employees" (Shim, Han & Ha, 2020:1). Exposing customers to self-service options and educating them in the use of these facilities encourages their adoption of and participation in digital finance (Shim et al., 2020:7). Since self-service technologies provide remote self-services, peri-urban communities can easily be encouraged to participate in the digital economy through this innovation.

Governments promote digital finance by moving towards cashless economies. This is achieved by putting measures and policies in place to transition towards a cashless society (Ghosh & Chaudhury, 2022:345; Farook & Sudalaimuthu, 2017:1354). This move is important in encouraging citizens in emerging economies, particularly marginalised groups, to participate in the digital economy (Srouji, 2020:4). South Africa is among the developing economies that are making efforts towards transformation into a cashless society. However, according to Urhie et al. (2021:587), there are more cash-based transactions than cashless transactions in South Africa. This reveals a need for more programmes and initiatives by government and banks to encourage citizens to increase their engagement with digital financial technologies and thereby enhance their participation in digital finance.

While digital finance is beneficial to all levels of society, the literature provides strong evidence of many challenges associated with it. The most important of these challenges is cybercrime (Igoni et al., 2020:2; Van Niekerk & Phaladi, 2021:17; Ye et

al., 2022:13). Cybercrime discourages customers from participating in digital financial activities (Van Niekerk & Phaladi, 2021:13). Therefore, there is a need for banks and government to protect consumers by improving digital financial systems. Governments need to introduce regulations and policies that not only support digital finance but also protect customers from cybercrimes and other financial crimes (Van Niekerk & Phaladi, 2021:13; Ye et al., 2022:13; Aziz & Naima, 2021:5). For digital financial inclusion to occur, government and banks need to ensure "digital security to avoid the risk of fraudulent transaction and digital fraud" (Aziz & Naima, 2021:5).

2.7 Factors influencing participation in digital finance

As already discussed in the previous sections, participation in the digital economy is influenced by certain factors. The literature identifies these factors as either triggers or hindrances to the adoption of digital financial solutions. Attention has mostly been paid to factors that obstruct people from participating in the digital economy (Arif, Aslam & Hwang, 2020:1). The Technology Acceptance Model (TAM) has been used to identify key factors influencing the adoption of digital finance. Since the development of this model by Davis in 1985, a large number of studies have adopted it in examining factors influencing the adoption of technological innovations (Purnamasari et al., 2020:982). The TAM is perceived by Chau (1996:185) to be "one of the most influential research models in studies of the determinants of information systems/information technology (IS/IT) acceptance".

2.7.1 Factors enhancing participation in digital finance

The benefits of digital finance, including increased financial inclusion, are the main triggers and factors that motivate customers to participate in digital banking services (Shofawati, 2019:390; Chen, 2016:237: Li et al, 2020:7).

2.7.1.1 Perceived value

The main factor enhancing the adoption of digital finance is the perceived value that this innovation provides to customers (Arif et al., 2020:2). This relates to customer

perception of the advantages of utilising financial technology (Jain & Raman, 2022:3). For example, ease of use is a perception that customers have about digital financial solutions, which in turn motivates them to participate in this innovation (Igoni et al., 2020:2). Arif et al. (2020:2) further note that the concept of perceived value is "similar to the customers' perception of perceived usefulness". In other words, customers' intention to use digital financial services is also motivated by direct benefits that will accrue to them. Jain and Raman (2022:3) categorise perceived benefits into the four factors below.

2.7.1.1.1 Economic benefits

Participation in digital finance is enhanced only if it reduces transaction costs for customers (Rai & Sharma, 2019:601) while providing them with financial gains (He & Li, 2020:298; Jain & Raman, 2022:3). The economic benefits resulting from participating in the digital economy have been discussed in Section 2.4.1.

2.7.1.1.2 Seamless transactions

Seamless transactions are defined by Chishti (2016, as cited in Jain & Raman, 2022:4) as transactions that are conducted technologically in a swift and simple manner. Farook and Sudalaimuthu (2017:1354) assert that customers are motivated to participate in digital finance if technological banking operations are simple.

2.7.1.1.3 Convenience

Digital finance impacts household consumption by increasing the channels that can be explored to obtain financial solutions (Li et al., 2020:318). This convenience also serves as an enabler for customers to participate in digital finance. Matita and Chauma (2021:23) add that consumers' participation in the digital economy is driven by a "convenient platform for conducting financial transactions" which enables customers to access these services from the comfort of their homes.

2.7.1.1.4 Enjoyment

A convenient digital financial platform that is enjoyable creates value for customers (Shim et al., 2020:7). Enjoyment is provided by platforms that are fun to use and make customers feel good through their participation (Shim et al., 2020:7). Interactive digital platforms create an enjoyable experience for users (Roth & Koenitz, 2019:253) and thus improve technology adoption prospects.

2.7.1.2 System quality and trust

In the context of the TAM, which is adopted in this study, there is compelling literature that links the adoption of digital of financial services with system quality and trust (Chemingui & Ben Lallouna, 2013:579; Arif et al., 2020:2; Shofawati, 2019:390; Jain & Raman, 2022:3). The TAM, as will be discussed in great detail later, is commonly used to examine Internet technology usage by consumers (Purnamasari et al., 2020:983). According to Jain and Raman (2022:3), a transparent system improves the trust of customers in digital financial services. Chemingui and Ben Lallouna (2013:579) state that "the navigational structure and the visual appeal of the system determines the extent to which users place trust in financial technologies". Digital finance is reportedly transforming traditional banking operations, which in turn improves the quality of and trust in digital financial solutions (Li et al., 2020:321).

2.7.1.3 Service quality

As pointed out by Selase and Benedict (2021:117), the quality of digital finance service is measured by its ability to meet customers' expectations and needs. This could be through online banking, telephone banking, mobile banking, or ATMs (Selase & Benedict, 2021:117). This implies that if digital services are of sound quality, customers' intention to embrace and use the digital financial solutions is greatly increased. Liu et al. (2021:15) affirm this argument by stating that service providers are investing heavily in enhancing user-friendliness, features and functions in their digital channels with the aim of improving service quality. Such an investment is made by service providers in the hope of attracting new customers while retaining existing

ones (He & Li, 2021:311). As noted by Selase and Benedict (2021:115), most banks continually improve their digital financial services platforms to meet customer needs and to guarantee quality to their customers and users. The quality of digital financial service delivery is necessary for a financial services provider to remain competitive.

2.7.2 Factors inhibiting participation in digital finance

Several factors have been recognised in the literature as hindrances to the adoption of digital finance. Socio-economic factors dominate the financial inclusion research focusing on the adoption of digital financial technology (Salemink, Strijker & Bosworth, 2017:365; Matita & Chauma, 2021:29). These factors are identified and discussed below.

2.7.2.1   Infrastructure and geographical differences

The literature is consistent in showing that there are geographic inequalities in ICTs (Kamath, 2018:385; Mignamissi & Djijo, 2021:1; Ye et al., 2022:2). People residing in rural and peri-urban areas are easily excluded from participating in digital finance as compared to those in urban areas (Kamath, 2018:385: He & Li, 2020:311). Salemink et al. (2017:361) assert that rural areas and peri-urban communities are generally digitally underdeveloped, which increases the urban-rural digital divide. Rural and peri-urban areas are the most digitally fractured regions owing to a lack of infrastructure (Matita & Chauma, 2021:29). Hence, accessing and utilising financial technologies is still a challenge in these regions. Li et al. (2020) affirm that the level of participation in digital finance depends on the availability of digital infrastructure. Telecommunication infrastructure also affects participation in digital finance (Ndubuisi et al., 2021:2). This is supported by Aziz and Naima (2021:8), who assert that ICT and telecommunication infrastructures are key ingredients in facilitating inclusion in digital finance.

2.7.2.2   Financial and digital literacy

Participation in digital finance is influenced by financial and digital literacy (Igoni et al., 2020:5; Aziz & Naima, 2021:5). Prasad et al. (2018:23) define financial literacy as the

combination of skills and knowledge that allows individuals to make informed and effective financial decisions through their understanding of finance. Financial literacy provides users with knowledge and awareness of the digital financial services that are available (Ozili, 2018:333). Digital literacy, on the other hand, provides skills and knowledge of how to use a digital device (Sai & Pankajam, 2019:142). Users need to be familiar with the technical aspects of utilising digital resources to facilitate their participation in digital finance (Prasad et al., 2018:27).

2.7.2.3 Age

Age has been used in several studies to assess customers' intention to accept technological innovations. Arif et al. (2020:7) assert that digital innovations do not appeal to people in older age groups, and that people in older age groups are generally resistant to adopting digital financial services. A study conducted by Ghosh and Chaudhury (2022:344) also found that age "positively and significantly influences the adoption of digital innovations". Prasad et al. (2018:19) concur that the adoption of digital financial transactions is affected by the age structure of the population.

2.7.2.4 Gender

Arif et al. (2020:3-6) state that gender plays a dynamic role in the behavioural intention of participating in ICT. It has been found that females and males do not behave the same way in the decision-making process of adopting Internet banking (Arif et al., 2020:3). Several studies have found that higher numbers of females adopt technology than males. Males are perceived to be task-oriented and generally do not perceive the usefulness of technology (Arif et al., 2020:3), which serves as a barrier to their adoption of technology. Matita and Chauma (2021:37), however, argue that African males adopt Internet banking more than their female counterparts. This is supported by Mariscal et al. (2019:5) and Aziz and Naima (2021:8), who note that digital inequality is prominent in Africa and that there is male dominance in the adoption of Internet banking.

2.7.2.5   Employment and income

A study by Li et al. (2020) asserts that income inequality is an important factor affecting participation in the digital economy. In support of this finding, Mignamissi and Djijo (2021:1) affirm that income inequality is an unignorable critical factor that causes digital finance exclusion. Low-income earners, for example, find it difficult to afford digital devices such as smartphones, which, as already discussed, are pivotal in digital finance inclusion. Sai and Pankajam (2019:142) also associate low rates of participation in digital finance with low levels of income. Ghosh and Chaudhury (2022:353) also maintain that there is a relationship between individuals' level of income and their adoption of digital financial services. In addition, costs associated with digital financial services deter low-income earners from accessing these services. The low-income group is largely found in marginalised areas, which include peri-urban communities (Ye et al., 2022:5). Hence, participation in digital finance is low among peri-urban users.

The exclusion of the marginalised section of society, which includes unemployed people, from the benefits of digital finance is evidently prevalent in the literature. Cicchiello et al. (2021:10) assert that unemployment is one of the key economic factors that contribute to digital finance exclusion. Thus, an increase in the country's unemployment rate also increases financial exclusion. Ariansyah et al. (2021:10) concur that demographic factors such as unemployment and income correlate with digital finance adoption.

2.7.2.6   Education

Demographic traits of consumers, which include their level of education, influence their decision to adopt digital financial services (Cornelius & Kwon, 2018:15). Since various digital banking solutions have emerged, the general public needs to be acquainted with these solutions. Moreover, the general public needs knowledge and understanding of how to effectively use alternative technological banking solutions that are available to them. According to Urhie et al. (2021:586), high levels of education ameliorate the adoption of technological banking solutions by its users. Since low

levels of education are prevalent in marginalised communities, which include peri-urban households, people in these communities tend to have difficulty accepting any form of digital financial solution (Urhie et al., 2021:586). People in underdeveloped areas face the challenge of a lack of confidence in operating online banking platforms (Prasad et al., 2018:30). On the other hand, Ghosh and Chaudhury (2022:354) assert that level of education positively correlates with adoption of digital innovation. Shihadeh (2020:7) affirms that people with higher education levels are more likely to use digital finance platforms.

2.7.2.7 Risk barriers

Despite the convenience of digital finance services, trust is still a crucial component of rendering a service. Some people are doubtful about services offered digitally and are also concerned about security measures taken to protect their personal information (Selase & Benedict, 2021:118). The pervasiveness of and increase in cyber-attacks within the banking sector contributes to users avoiding the use of digital financial solutions (Rai & Sharma, 2019:602). For this reason, Farook and Sudalaimuthu (2017:1362) contend that risks associated with using Internet banking or online banking solutions deter some users.

2.8 Theoretical framework

A theoretical framework, as defined by Varpio et al. (2020:990), is "a logically developed and connected set of concepts and premises, developed from one or more theories, that a researcher creates to buttress a study". Sekaran and Bougie (2016:72) conceptualise a theoretical framework as an illustration of how the investigated concepts are connected to each other and a justification for the connectedness of the concepts under scrutiny. The reviewed literature has demonstrated the significance of digital finance in driving the financial inclusion agenda, particularly in marginalised localities. However, there is still a gap that exists in the body of knowledge regarding determinants of participation of peri-urban households in the digital economy (Ketterer, 2017:2). To examine and identify the determinants of participation of peri-urban households in digital finance, this study adopted the TAM and the Diffusion of

Innovation Theory (DIT). These models have been used in numerous studies that have investigated the adoption of innovations in technology by consumers (Sujatha & Sekkizhar, 2019:214). Min, So and Jeong (2018:772) contend that there is uncertainty that the TAM alone adequately explains the adoption of different types of technologies. Therefore, numerous studies recommend the integration of the TAM with other theories, particularly the DIT (Min et al., 2018:772; Goh & Sigala, 2020:157; Attié & Meyer-Waarden, 2022:2). This study integrates the TAM with the DIT to establish the determinants of participation of peri-urban households in digital finance.

2.8.1 Technology Acceptance Model

Marangunic and Granic (2015:85) argue that the TAM is an influential and commonly used theory in studies that investigate the adoption of various technologies. According to Min et al. (2018:772), the TAM is adopted in research for its ability to determine attitudes of users; it recognises the role of perceived ease of use and perceived usefulness in understanding user acceptance of information systems. The TAM was developed by Davis (1985) to "provide a valid theoretical explanation of what motivates people to use computer systems". This model was originally developed to obtain understanding of technology acceptance processes by users (Davis, 1985:7; Attié & Meyer-Waarden, 2022:2). In addition, the model was developed in order to "provide the theoretical basis for a practical user acceptance testing methodology that would enable system designers and implementors to evaluate proposed new systems prior to their implementation" (Davis, 1985:7). This model considers two variables that serve as user motivation for technology acceptance intention, namely, perceived usefulness and perceived ease of use (Davis, 1985:24; Yuen et al., 2020:2; Purnamasari et al., 2020:983). In Section 2.7.1 of this chapter, these variables are referred to as "perceived value", which is measured by economic benefit, seamless transaction, convenience, and enjoyment.

2.8.1.1 Perceived usefulness

Perceived usefulness is defined by Davis (1985) as the degree to which consumers find a technology to be useful. Purnamasari et al. (2020:983) conceptualise perceived

usefulness as the degree of users' belief that using a technology would be beneficial to them. Arif et al. (2020:2) assert that perceived usefulness is the main factor driving the adoption of new technology within the banking sector. This means that the absence of perceived comparative value to users may serve as a deterrent to the adoption of technological financial platforms.

2.8.1.2   Perceived ease of use

According to Nunkoo, Juwaheer and Rambhunjun (2013, as cited by Purnamasari et al., 2020:983), perceived usefulness refers to the degree to which consumers believe that utilising a technology would be easy and effortless. Jain and Raman (2022:4) assert that ease of use motivates users to adopt mobile banking. In the context of this study, this variable is largely measured by whether the adoption of new technology ensures effortless and seamless transactions (Purnamasari et al., 2020:983). Ease of use has been found in various studies to be the most important factor influencing users' decisions to adopt digital financial platforms (Marangunic & Granic, 2015:85; Gomber et al., 2017:568; Hossain et al., 2020:116).

2.8.2 Diffusion of Innovation Theory

Min et al. (2018:772) describe the DIT as a "social and psychological theory that aims to help predicting how people make decisions to adopt a new innovation by finding their adoption patterns and understanding its structure". The DIT is useful in explaining specific characteristics that encourage consumers to adopt an innovation (Min et al., 2018:772; Goh & Sigala, 2020:157). Attié and Meyer-Waarden (2022:5) add that the diffusion process depends on the perceptions of the new technology and on the characteristics of the target users. The TAM has a deterministic approach and fails to study individual user characteristics such as innovativeness (Attié & Meyer-Waarden, 2022:5). The DIT presents five innovation characteristics that are antecedents to any adoption (Min et al., 2018:773).

2.8.2.1 Relative advantage

In the context of this study, relative advantage relates to the perceived economic gains or convenience of using digital finance platforms as compared to traditional banking platforms. In other words, if customers perceive digital services to be more convenient and beneficial than visiting a branch of a financial services provider, they will be motivated to adopt the innovation (Ravikumar, 2019:3435).

2.8.2.2 Complexity

This innovation characteristic relates to the perceived ease or difficulty of use of an innovation. It was discussed in Section 2.6 that the availability of easy-to-use banking applications enhances participation in digital finance (Prasad et al., 2018:29). Hence, acceptance of digital finance is increased by the development of easily accessible and user-friendly banking applications.

2.8.2.3 Compatibility

When customers consider digital banking solutions to be consistent with their existing values, needs, and past experiences, their adoption of the innovation is enhanced (Selase & Benedict, 2021:115). For instance, customers who are acquainted with technology such as online shopping platforms are highly likely to be more receptive towards digital financial services.

2.8.2.4 Observability

Goh and Sigala (2020:161) note that if existing consumers are able to assess the implications of adopting a new technology, other consumers are more easily able to adopt it. Thus, if existing banking customers observe the reliability of digital financial solutions and a reduction in transaction costs, adoption by other customers is enhanced.

2.8.2.5 Trialability

The trialability of an innovation is described by Goh and Sigala (2020:161) as "the degree to which an innovation can be experimented with by the adopters and if trial and error can be perceived as free of risk or major/unaffordable costs and losses". This suggests that if customers are afforded an opportunity to experiment with new digital financial solutions, they will be more confident and comfortable with adopting these solutions.

2.8.3 Conceptual framework and proposed hypotheses

Stemming from the previously discussed theoretical framework is the conceptual framework that this study proposes. This conceptual framework is illustrated in Figure 2.1 below. This conceptual framework was developed to explain how the TAM and the DIT can be used to establish the determinants of participation of peri-urban households in the digital economy. In line with the literature review discussed earlier in this chapter, the following hypotheses were developed:

H1:   Awareness of digital financial services has a significant positive influence on customers' intention to participate in digital finance.

H2:   Digital infrastructure has a significant positive influence on customers' intention to participate in digital finance.

H3:   Digital literacy has a significant positive influence on customers' intention to participate in digital finance.

H4:   Support from the financial services provider has a significant positive influence on customers' intention to participate in digital finance.

H5:   Security concerns and costs have a significant positive influence on customers' intention to participate in digital finance.

H6:   Voluntary factors have a significant positive influence on customers' intention to participate in digital finance.

H7:   Gender has a significant positive influence on customers' intention to participate in digital finance.

H8:   Age has a significant positive influence on customers' intention to participate in digital finance.

H9:   Level of education has a significant positive influence on customers' intention to participate in digital finance.
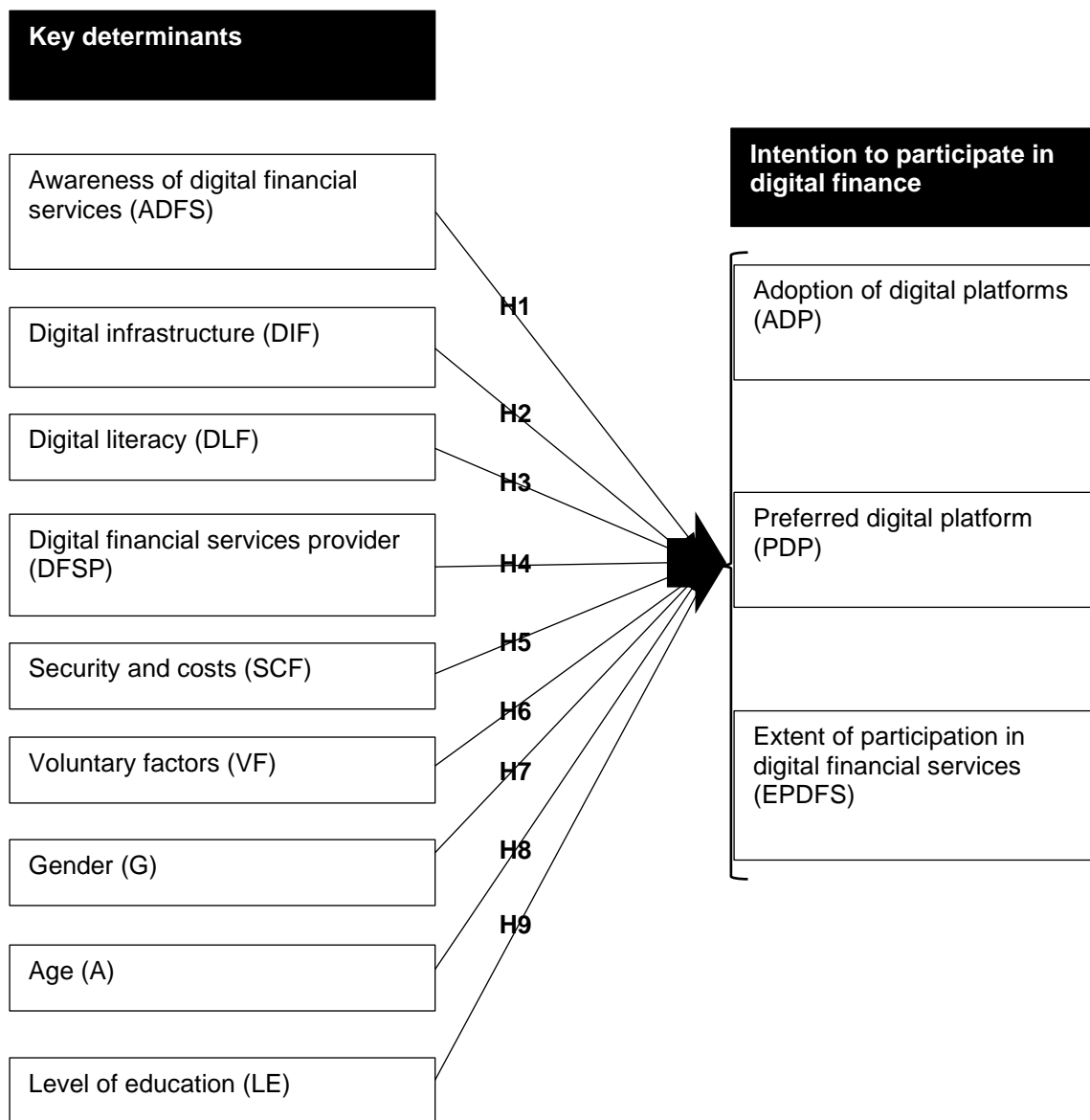
Figure 2.1: Conceptual framework

2.9   Chapter summary

This chapter has introduced the key concepts used in this study. The development of digital finance has been outlined, and the benefits of this innovation have been detailed. In addition, the participation of marginalised societies in digital finance has been discussed. A conclusion has been drawn that the participation rate of this segment in the digital economy is still low. This chapter has also discussed the role of government and financial institutions, particularly banks, in promoting digital finance participation. In addition, factors influencing participation in the digital economy have been unpacked. The theoretical and conceptual frameworks underpinning this study have been discussed, and a theoretical model has been proposed to empirically ascertain the achievement of this study's objectives.

The following chapter explains the research method that was employed in this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter laid the foundation that guided the empirical study. This chapter details the research method that was employed to examine and identify the determinants of participation of peri-urban households in the digital finance economy. The chapter begins by unpacking the research paradigm, research design and methodology that underpinned this study. In addition, this study's population, sampling strategy, sample size, collection of data, and analysis of data are discussed. The chapter concludes by explaining how the reliability and validity of this study were ensured.

3.2 Research paradigm

Park, Konge and Artino (2020:690) indicate that research paradigms are habitually considered in scientific research. This is largely because research paradigms are "philosophies of science" that shape scientific discoveries (Park et al., 2020:689; Kamal, 2019:1388). Fraser and Robinson (2004, as cited by Kamal, 2019:1388) assert that a paradigm is "a set of beliefs about the way in which particular problems exist and a set of agreements on how such problems can be investigated". It can then be argued that every researcher has a worldview that informs the meaning or interpretation of data (Khatri, 2020:1436). Thus, a research paradigm gives direction to the researcher concerning the steps to follow in an investigation, taking into consideration the research methodology.

It can be noted from the research questions and the literature review that this study is embedded in the positivism paradigm as the main philosophical stance. This approach is in line with other studies that have investigated the factors affecting the adoption of digital financial services (Hau, Nhung & Trang, 2021:87; Thathsarani & Jianguo, 2022:390). Several studies maintain that the positivist paradigm is associated with the

quantitative research approach (Kamal, 2019:1390: Saunders, Lewis & Thornhill, 2019:159; Thathsarani & Jianguo, 2022:390). Therefore, this study follows the quantitative research approach, which is explained in the next section.

One of the core elements of the positivism paradigm underpinning business and management research is ontology, which refers to assumptions about the nature of existence (Saunders et al., 2019:133; Khatri, 2020:1436). Consequently, knowledge about the existence of the digital finance economy and its significance in driving the financial inclusion agenda is considered to be the ontology for this study. Khatri (2020:1390) adds that ontology deals with the question "What is there that can be known?" In the context of this study, the determinants of participation of peri-urban households in digital finance economy are mainly unknown. The reviewed literature corroborates this view by maintaining that the participation of marginalised societies, including peri-urban households, in the digital finance economy is still minimal.

3.3   Research design

A suitable research design is required to ensure that research is carried out successfully (Asenahabi, 2019:76). According to Creswell and Creswell (2018:49), a research design is a strategy of enquiry. As already explained in Chapter One, this study is composed of a literature review and an empirical study. To reiterate, Stockemer (2019:18) describes sound research as beginning with a research question that is theoretically derived. To this end, the literature review provided an in-depth review of the participation of marginalised households in the digital finance economy. The review of the literature also guided the identification and explanation of the factors affecting the participation of peri-urban households in the digital finance economy. Thus, the historical review buttressed the empirical study and provided insight and understanding of the research problem.

3.3.1 Research methodology

A quantitative research approach was adopted to answer the research questions. The quantitative research approach is generally employed in the deductive process (Thathsarani & Jianguo, 2022:390). Thus, it is driven by theory (Stockemer, 2019:18). The research process that was followed in this study is illustrated in Figure 3.1 below.
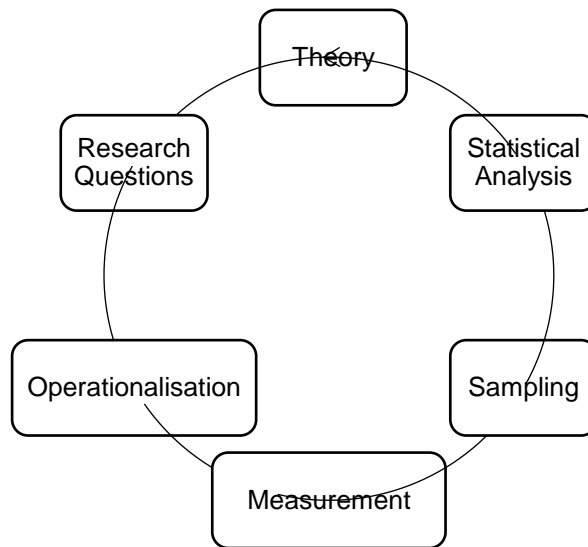
Figure 3.1: The adopted quantitative research process

Source: Adopted from Stockemer (2019:19)

Alasuutari, Bickman and Brannen (2008:4) assert that quantitative research is a systematic review of social research evidence that is measurable in scientific terms. In considering an appropriate research approach for this study, it was pivotal to ensure that the method of addressing the research questions was grounded in evidence-based and scientifically validated research (Alasuutari et al., 2008:11). Furthermore, this approach was adopted to ensure that this study utilised a rigorous systematic strategy for generating and refining knowledge to solve the research problem (Mohajan, 2020:53). Sekaran and Bougie (2016:2) state that a quantitative study is conducted by collecting numerical data, predominantly through structured questions. This method was found to be suitable for this study given that the research objectives can be best measured using a structured survey (Sekaran & Bougie, 2016:129).

3.3.2 Descriptive research

Based on the positivism stance, this study is descriptive in nature. Mohajan (2020:68) argues that descriptive research is used when little is known about a particular phenomenon. Shofawati (2019:400) describes a descriptive study as a "non-experimental research design" that uses a large amount of survey data collected from a representative sample. Shofawati (2019:400) further notes that "a descriptive research plan guarantees complete description of the situation, ensuring that there is minimum bias in the collection of data from the study population". Walliman (2011:8) states that this approach endeavours to assess situations with the aim of establishing the norm. This means that descriptive research ensures that the observations can be predicted to reoccur under the same circumstances. This research approach is consistent with several other studies which have investigated the adoption of technology-based banking (Farook & Sudalaimuthu, 2017:1355; Ghosh & Chaudhury, 2022:355; Shofawati, 2019:400; Urhie et al., 2021:588).

3.4   Target population

Population is commonly defined as the "complete set or entire group of individuals, events, or objects that exhibit the behaviours and/or possess the characteristics of interest to the researcher" (Berndt, 2020:221; Sekaran & Bougie, 2016:236). This study was conducted in the Msunduzi Local Municipality in the province of KwaZulu-Natal, South Africa. According to the housing sector plan of the Msunduzi Local Municipality (2019:2), the municipality has an estimated population of 679 039 people, the majority of whom reside in the Greater Edendale area. The Greater Edendale area "is peri-urban in character with tracts of agricultural land interspersed with settlement, some of which includes high density housing in areas with limited services" (Msunduzi Local Municipality, 2019:2). It consists of the Edendale and Imbali townships, which have a combined population size of over 43 800 households (Msunduzi Local Municipality, 2019:56). The target population of this study consisted of all peri-urban households located in the Greater Edendale area, which is the largest peri-urban area within the Msunduzi Local Municipality as explained above.

3.5　Sampling method

In most cases, it is uneconomical, impractical and illogical for a researcher to involve every member of the population in a study (Stockemer, 2019:57). For this reason, scholars suggest that a sample from the population be selected instead (Stockemer, 2019:58; Sekaran & Bougie, 2016:236; Walliman, 2011:93). According to Berndt (2020:224), the sampling method assists the researcher in selecting a representative sample. It also ensures that the appropriate sample size is determined to ensure the desirable degree of confidence from which conclusions and generalisability can be derived (Berndt, 2020:224). In determining the appropriate sampling strategy, this study considered three restrictions: time, cost, and the availability of an updated total population listing of peri-urban households located in the Greater Edendale area. These variables are fundamentally important in the sampling process as they dictate the sampling strategy that a study should employ (Sekaran & Bougie, 2016:241).

According to Sekaran and Bougie (2016:241) and Berndt (2020:225), a study of this nature should adopt a non-probability sampling strategy since a reliable updated listing of the population size is not available. Moreover, since this study sought to identify and examine the determinants of participation of peri-urban households in digital finance, using a random sampling strategy for the entire population would not have been appropriate. Therefore, purposive sampling, which is derived from non-probability sampling, was used in this study. Berndt (2020:221) describes purposive sampling as a technique that depends on the researcher's judgement for selecting the sample. In previous studies in this field, the sample has consisted of individuals who have bank accounts and mobile phones. This approach was also used in this study to ensure that valuable information from relevant participants was obtained in order to address the research questions (Stockemer, 2019:63).

3.6　Sample size

A sample is defined as small group or subset selected out of a large group or population (Walliman, 2011:93; Stockemer, 2019:58). Roscoe (1975, as quoted by Sekeran & Bougie, 2016:264), posits that "sample sizes larger than 30 and less than

500 are appropriate for most research". However, Etikan and Babtope (2019:51) and Omair (2014:142) argue that the sample size should be estimated by considering the four factors below.

3.6.1.1 Population size

It has already been established that the population size is approximated in this study.

3.6.1.2 Margin of error

The margin of error is a statistic expressing an amount by which a data set might be inaccurate (Etikan & Babtope, 2019:52). A margin of error of 5% (e = ±0.05) was adopted for this study as this is considered acceptable in social research (Taherdoost, 2017:237) and in management studies (Etikan & Babtope, 2019:51).

3.6.1.3 Confidence level

The confidence level refers to the desired degree of confidence for the research conclusions (Berndt, 2020:224). A confidence level of 95% was adopted for this study, which is in line with similar studies (Omair, 2014:143; Taherdoost, 2017:237). A 95% confidence level corresponds with a Z-score of 1.96 (Berndt, 2020:224; Omair, 2014:143).

3.6.1.4 Standard deviation

The standard deviation refers to the degree of variance expected in responses (Etikan & Babtope, 2019:52). The recommended standard deviation for an approximated population size, which is 50%, was adopted for this study (Omair, 2014:144; Etikan & Babtope, 2019:50). Thus, the p-value is 0.5.

Using the following formula and the values explained above, the acceptable sample size for this study was calculated as follows (Berndt, 2020:224; Omair, 2014:143):

$$n = \frac{z^2 p(1-p)}{e^2}$$

$$n = \frac{1.96^2 0.5(1-0.5)}{0.05^2}$$

$$n = 384$$

The sample size for this study was 384 peri-urban households. Questionnaires were evenly distributed between the Edendale and Imbali townships.

3.7   Data collection

The empirical data were collected by means of questionnaires which were personally administered in order to ensure a high response rate and to clarify any doubts that respondents might have had (Sekaran & Bougie, 2016:143). A well-structured questionnaire is recommended when adopting the positivism paradigm using a quantitative research approach (Thathsarani & Jianguo, 2022:389).

3.7.1 Questionnaire

The questionnaire was in English and was also translated into isiZulu in order to improve the study's participation rate. There is no consensus among scholars about a standardised translation process (Kalfoss, 2019:2; Lahdenperä et al., 2021:1920). In the absence of guidelines for an isiZulu translation process, the study used the forward translation process to translate the questionnaire from English into isiZulu. This translation protocol was developed by the World Health Organisation in an attempt to guarantee sound translation quality (Kalfoss, 2019:12). The researcher, whose native language is isiZulu, translated the questionnaire from English into isiZulu. The questionnaire was then reviewed by two isiZulu language experts who teach this language at the high school level and are also fluent in English. The expert panel discussed discrepancies between the original and forward translation. The reconciliation into one forward translation was completed when consensus was reached.

3.7.2 Questionnaire design

The questionnaire consisted of four sections. Section A of the questionnaire was used to collect the biographical data of participants. Section B of the questionnaire used the five-point point Likert scale to evaluate the participants' awareness and knowledge of digital financial services. Section C of the questionnaire was used to examine the extent of participation of peri-urban households in digital finance in the financial services sector. This was achieved using the Likert scale. The last part of the questionnaire, Section D (also in a Likert scale format), was used to determine factors influencing the participation of peri-urban households in the financial services sector.

3.7.3 Pilot test

Walliman (2011:98) asserts that it is essential that a pilot study is conducted as a pre-test process to ascertain if questionnaires can be utilised in earnest. A pilot test or study is conducted on a small scale by gathering information from a limited number of occurrences (Sekaran & Bougie, 2016:109). The purpose of a pilot test is to identify a range of potential problems with the questionnaire and to enable the researcher to address these problems before utilising the questionnaire in the actual study (Walliman, 2011:175). According to Schachtebeck, Groenewald and Nieuwenhuizen (2018:10), a specific pilot sample size is debatable. Several studies, however, recommend that 10 participants be considered in a pilot study (Schachtebeck et al., 2018:10; Hertzog, 2008:180). In this study, a pilot study was conducted with 10 households in France, a small peri-urban area within the Msunduzi Local Municipality. This peri-urban area was selected for its characteristics, which are similar to those of the main research site. It consists of tracts of agricultural land interspersed with settlement, some of which includes high density housing in areas with limited services. The goal of the pilot study was to improve the questionnaire so that it would be easier for participants to respond to the questions and for the data to be recorded. Most significantly, the pilot study was conducted to guarantee the validity and reliability of the data gathered.

3.8   Data analysis

The results from the collected questionnaires were analysed using the latest SPSS software, version 29. SPSS is statistical software that is widely used in scientific research, particularly in social sciences (Okagbue et al., 2021:1). It is used to carry out tasks such as "data transformation, regression analysis, analysis of variance, analysis of covariance, multivariate analysis of variance, analysis of covariance, t-tests, non-parametric tests, time series, design and analysis of experiments, spatial analysis, survival analysis, dimension reduction, reliability, factor analysis, correspondence analysis, neural network, correlation, and others" (Okagbue et al., 2021:3). In this study, the following tests and analyses were performed using SPSS to ascertain research rigour (reliability and validity) and to ensure the attainment of the research objectives: Cronbach's coefficient alpha, normality test, Spearman's rho test, Chi-square test, Mann-Whitney U Test and descriptive statistics analysis. Throughout the analysis, a significance level of 0.05 was applied.

3.8.1   Cronbach's coefficient alpha

Tavakol and Dennick (2011:453) note that Cronbach's coefficient alpha is frequently employed in scientific research to measure a test's internal consistency reliability. According to Lekhanya (2016:81), internal consistency checks are necessary to validate the accuracy and dependability of the measuring tool and the data collected. The alpha coefficient ranges from 0 to 1 and should be greater than 0.70 to indicate reliability (Tavakol & Dennick, 2011:453). The Cronbach's coefficient alpha reliability statistics are shown in Table 3.1 below. These confirm that the measuring tool was reliable.

Table 3.1: Cronbach's coefficient alpha reliability statistics

Objective	Number of items	Cronbach's alpha
Awareness and knowledge of digital financial services	8	,957
Extent of participation in digital financial services	6	,945
Factors influencing the participation of peri-urban households in the financial services sector	17	,886

3.8.2 Normality test

In research, statistical methods are applied judiciously, hence a need for normality tests (Das & Imon, 2016:5). In addition, the normalcy assumption must be verified for the inferential approaches, otherwise no relevant inferences can be drawn from the supplied data (Das & Imon, 2016:5; Mishra et al., 2019:67). The violation of normality is not a significant problem when the sample size is 100 or more observations (Knief & Forstmeier, 2021:2579). However, the assumption of normalcy should be followed for valid results (Mishra et al., 2019:67). In this study, the Kolmogorov-Smirnov test was used to test normality. This statistical technique is used for sample sizes greater than 50 (Mishra et al., 2019:67). The Kolmogorov-Smirnov test results for the variables in this study are presented in Table 3.2 below.

Table 3.2: Tests of normality

	Kolmogorov-Smirnov[a]		
	Statistic	Df	Sig.
ADP	,187	315	<,001
ADFS	,215	315	<,001
EPDF	,137	315	<,001
DIF	,121	315	<,001
DLF	,238	315	<,001
DFSP	,343	315	<,001
SCF	,099	315	<,001
VF	,256	315	<,001

a. Lilliefors Significance Correction

The results show a significant departure from normality for all the variables. Therefore, this study analysed data using non-parametric tests which are more appropriate for data that are not normally distributed (Mishra et al., 2019:70; Le Cessie, Goeman & Dekkers, 2020:1).

3.8.3 Spearman's rho test

Spearman's rank-order correlation, often known as Spearman's rho, can be employed when correlations are nonlinear, according to Gray (2004:315). Correlation may be defined as the strength of the relationship between two variables (Asuero, Sayago & González, 2006:41). In this study, Spearman's rho was employed to measure associations such as rank order correlation coefficient, coefficient of concordance, and agreement for variables recorded at the ordinal or interval levels (Walliman, 2011:126).

3.8.4 Chi-square tests

A chi-square (X^2) test is utilised to investigate whether a significant relationship between categorical variables exists (Waller & Johnson, 2013:1). In this study, variables were subjected to the chi-square test to ensure a thorough analysis since this study involves examining associations.

3.8.5 Mann-Whitney U Test

The Mann-Whitney U test is one of the most widely used non-parametric statistical tests in the field of behavioural sciences (Nachar, 2008:14; Şimşek, 2023:115). Compared to other approaches, the Mann-Whitney U test has more statistical power (Şimşek, 2023:119). This method examines the median difference between two groups and is believed to be more informative, which is one reason it may be a better option for evaluating Likert-type data (Nachar, 2008:20; Şimşek, 2023:122). The Mann-Whitney U test was used in this study to determine whether there were any significant demographic differences between the data.

3.8.6 Descriptive statistical analysis

According to Waller and Johnson (2013:1), descriptive statistics are numerical representations of data. Mohajan (2020:13) asserts that descriptive research accurately portrays the characteristics of individuals, events, or circumstances by way of descriptive statistics. For this reason, the main characteristics of the data gathered in this study were described and presented using descriptive statistics.

3.9 Validity

Validity is described by Sekaran and Bougie (2016:150) as the extent to which the research findings accurately reflect the phenomena under study. In this study, the data collection instrument was examined by the research supervisor, who is an expert in the field, and comments were adopted accordingly. Moreover, the questionnaire was piloted in order to address any potential limitations and pitfalls in the data collection instrument. These processes formed part of content and face validity. Face validity indicates that the test items that are intended to measure a concept do, on the face of it, look like they measure the concept (Sekaran & Bougie, 2016:220). Content validity is similar to face validity except that the researcher seeks the opinion of experts in the field to ensure that the measure includes an adequate and representative set of items that tap the concept (Walliman, 2011:104; Creswell & Creswell, 2018:215).

3.10 Reliability

According to Sekaran and Bougie (2016:223), "the reliability of a measure indicates the extent to which it is without bias (error free) and hence ensures consistent measurement across time and across the various items in the instrument". The Cronbach's alpha statistic was used to test the reliability of the research instrument. Cronbach's alpha is considered by many studies as an adequate and important measure of the reliability of the research instrument (Creswell & Creswell, 2018:215; Lekhanya, 2016:91).

3.11 Ethical considerations

This study adhered to Durban University of Technology's research ethics. This was achieved by providing the participants with a letter of information and a consent form. The letter of information and consent form indicated the following:

- Participation in this study is entirely voluntary and members may refuse or withdraw from the study if they wish to do so.
- Any information provided by participants in the study is confidential and there is no harm/risk associated with the participation.
- All information obtained will be used for research purposes only and participants will not be identified by their names in any report of the completed study.
- Data will be collected anonymously, and names will not be linked with any information.
- Consent will be required from participants to indicate their willingness to participate in this study.

3.12 Chapter summary

The research paradigm, research design, and methods that underlie this study have been discussed in this chapter. The target population, sampling method, and sample size have been outlined. The processes of data collection, data analysis, and ensuring validity and reliability have been explained in detail.

Chapter Four presents the analysis and interpretation of the results based on the data collected.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.1 Introduction

The previous chapter presented the philosophical posture of this study and detailed the research method that was employed to examine and identify the determinants of participation of peri-urban households in the digital finance economy. This chapter discusses the findings of this study based on the analysis of data. The analysis is descriptive in nature and is presented using frequencies, tables, figures, cross-tabulations and graphs. The analysis begins with a presentation of the biographical information of this study's participants. Thereafter, the data is analysed and discussed in terms of each of the objectives of this study.

4.2 Response rate

Out of 384 questionnaires administered, 329 were returned. However, only 315 were considered valid, which translates to a response rate of 82%. According to Lund (2023: 2), a typical research survey attracts between 136 and 374 respondents. Lund (2023: 4) further posits that a normal response rate has a median of 27.8% and varies from 16.5% to 50.0%. It is advised that the ideal sample size for SEM analysis be between 100 and 200 for it to be regarded as appropriate and suitable (Ooi, 2013:115). Therefore, this study's sample size and response rate were deemed germane and adequate.

4.3 Biographical profile of participants

Biographical information was collected to identify participants in terms of the township where they reside, their gender, their age group, and their level of education. Participants' personal data also included a statement about whether they had a bank account. The type of bank account, the name of the bank, and whether they had a

smartphone were also included. This biographical information is presented in Table 4.1 below.

Table 4.1: Biographical information of participants

Variables	Categories	N	Percentage (%)
Township	Imbali	160	50.8%
	Edendale	155	49,2%
Gender	Male	139	45,9%
	Female	164	54,1%
Age group	0-18	35	11,1%
	19-25	63	20,0%
	26-33	84	26,7%
	34-41	66	21,0%
	42-49	33	10,5%
	50 and above	34	10,8%
Level of education	No Matriculation	69	22,0%
	Matriculation	74	23,6%
	Diploma/Degree	104	33,1%
	Honours Degree	45	14,3%
	Master's Degree	12	3,8%
	PhD Degree	10	3,2%
Bank account	Yes	293	93,0%
	No	22	7,0%
Bank account type	Savings	257	82,1%
	Cheque	33	10,5%
	Other	23	7,3%
Bank name	ABSA	33	10,9%
	Capitec	139	45,7%
	FNB	39	12,8%
	Nedbank	38	12,5%
	Standard Bank	14	4,6%
	Other	41	13,5%
Owning a smart phone	Yes	249	79,0%
	No	66	21,0%

Table 4.1 above shows an almost even proportion of participants from the Imbali and Edendale townships (50.8% and 48.2% respectively). As indicated in the previous chapter, questionnaires were distributed evenly in these research sites. Table 4.1 shows that more females (54.1%) participated in this study than males (45.9%). This result is in line with Otufowora et al.'s (2021:19) argument that female participants are more likely to participate in research than males.

The biographical information indicates that participation in this study was dominated by the age group of 19 to 33 years (46.7%), followed by the age group of 34 to 41 years (21%). 11.1% of participants were 18 years or younger, while 10.5% were between the ages of 42 and 49 and 10.8% were 50 years or older. The majority of participants in this study (57.8%) were young people (0-33 years). Several studies, including those of Ghosh and Chaudhury (2022:354) and Matita and Chauma (2021:37), also found that younger age groups showed a more positive behavioural intention to adopt digital financial services than older age groups.

Table 4.1 also shows that the majority of participants in this study had post-school qualifications. Of the participants, 33.1% had a diploma or a bachelor's degree, 14.3% had an honours degree, 3.8% had a master's degree, and 3.2% had a doctoral degree. 22% of participants did not have a matriculation certificate, and 23.6% had only a matriculation certificate and no post-school qualification.

Participants were also asked to indicate whether or not they had a bank account. 93% of participants indicated that they had a bank account, while 7% responded that they did not have a bank account. Of those who had bank accounts, 82.1% indicated that they had a savings account, while 10.5% indicated that they had a cheque account. The remaining 7.3% indicated that they had another type of bank account that was not a savings or cheque account. The majority of participants indicated that they banked with Capitec Bank (45.7%), followed by First National Bank (FNB) (12.8%), followed by Nedbank (12.5%). Smaller numbers of participants indicated that they banked with ABSA (10.9%) or Standard Bank (4.6%). Some participants indicated that they did not bank with any of the large banks in South Africa but with other smaller banks.

Table 4.1 also shows that only 21% of participants indicated that they did not own a smartphone, while 79% indicated that they did.

The above discussion confirms that the biographical information gathered from the participants was relevant in answering this study's questions.

4.4   Data analysis as per research objectives

This section presents a detailed analysis of the results according to the objectives of this study. The questionnaire that was used to collect data included five-point Likert scale items which were analysed in the form of mean responses. Helsel (1987:180) argues that analysis using the mean for non-parametric data produces accurate results for large sample sizes (n > 30). This argument is supported by Le Cessie et al. (2020) and Knief and Forstmeier (2021:2583), who add that regardless of how the initial observations were distributed, the distribution of the mean will converge to the normal distribution as the sample size rises. The analysis of the means in this study is based on Pimentel's (2010) recommendation that mean scores between 1 and 1.8 should be interpreted as 'strongly disagree', while values between 1.81 and 2.60 should be interpreted as 'disagree'. Mean scores between 2.61 and 3.40 indicate neutrality, those between 3.41 and 4.20 indicate agreement, and those between 4.21 and 5 denote significant agreement.

4.4.1   Objective 1: Awareness and knowledge of digital financial services

This study's first objective was to assess the level of awareness and knowledge of digital financial services by peri-urban households within the selected areas. Section B of the questionnaire included eight items on a five-point Likert scale which were related to this objective. These items were assigned codes ADFS1 to ADFS8, as shown in Table 4.2 below.

Table 4.2: Awareness and knowledge of digital financial services

Items	N	Minimum	Maximum	Mean	Std. Deviation
ADFS1	315	1	5	3,69	1,186
ADFS2	315	1	5	3,90	1,197
ADFS3	312	1	5	3,38	1,327
ADFS4	314	1	5	3,66	1,333
ADFS5	309	1	5	3,97	1,224
ADFS6	313	1	5	3,98	1,272
ADFS7	312	1	5	3,78	1,326
ADFS8	315	1	5	3,88	1,343
ADFS	315	1,00	5,00	3,78	1,118

Note. 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, M = Mean, SD = Standard Deviation.

The Kruskal-Wallis test was used to establish whether there were any statistically significant demographic differences between the data sets. The Mann-Whitney U test was used to compare demographic differences between the data sets. The results are discussed as follows.

4.4.1.1 Item ADFS1

The purpose of this statement was to gauge the participants' familiarity with the financial services that are accessible through a computer or mobile device. Table 4.2 shows that the mean score for this statement was 3.69 (SD = 1.186), which means that most respondents agreed with the statement. While the literature maintains that familiarity with digital financial services is low in developing countries (Sarfo, Musshoff & Weber, 2023:2), this result demonstrates a positive outcome that may facilitate participation of peri-urban households in the digital economy.

4.4.1.2 Item ADFS2

This statement assessed whether the participants were aware of the financial services provided by banks that are accessible through an ATM. Table 4.2 shows that the mean score for this statement was 3.90 (SD = 1.197). Thus, the majority of participants were in agreement with the statement. This result resonates with Al-Smadi's (2023:469) finding that ATMs and Internet technologies have improved access to and utilisation of financial services.

4.4.1.3 Item ADFS3

Table 4.2 shows that the mean score for the statement "I know how to apply for an overdraft from my bank using the Internet (using my mobile phone or computer)" was 3.38 (SD = 1.327). Thus, the majority of participants expressed a neutral opinion regarding this statement. This finding indicates that most participants were unsure of their knowledge of how to apply for an overdraft online, which might be interpreted as having a negative attitude about the statement.

4.4.1.4   Item ADFS4

Participants were asked whether they were aware of how to change their overdraft limit online (on a computer or mobile device). Table 4.2 shows that the majority of participants agreed with this statement (M = 3.66, SD = 1.333). It is interesting to note that while most participants claimed to be aware of how to change their overdraft limit, most participants were neutral regarding their knowledge of how to apply for this facility online.

4.4.1.5   Item ADFS5

Table 4.2 shows a mean score of 3.97 (1.224) for the statement "I know how to pay my bills using an ATM". This indicates that the majority of respondents agreed that they knew how to pay their bills using an ATM. This conclusion is consistent with Matita and Chauma's (2021:29) finding that ATMs are beginning to be used more often by marginalised communities as digital payment systems.

4.4.1.6   Item ADFS6

Table 4.2 shows that the majority of participants agreed (M = 3.98, SD = 1.272) that they were familiar with using a speed point machine when making payments and purchases. This positive attitude, according to Urhie et al. (2021:587), is mostly a result of positive interactions that banking customers have with this technology.

4.4.1.7   Item ADFS7

Table 4.2 shows that the majority of participants were in agreement (M = 3.78, SD = 1.326) that they were able to pay their bills online (using a phone or computer). This finding demonstrates that most participants possess the digital literacy abilities necessary to take part in the digital economy (Sai & Pankajam, 2019:142; Prasad et al., 2018:27).

4.4.1.8   Item ADFS8

Table 4.2 shows that the majority of participants were in agreement (M = 3.88, SD = 1.343) with the statement "I know how to send money to someone who does not have a bank account using a cash send facility or e-wallet". This indicates that activities aimed at advancing digital finance through fostering cashless economies are beginning to have fruitful results, which is a positive development given that Urhie et al. (2021:587) found that more cash-based transactions than cashless transactions take place in South Africa.

4.4.1.9   Awareness and knowledge of digital financial services and Gender

This section provides an analysis of gender differences in participants' levels of awareness and knowledge of digital financial services. The results of a Kruskal-Wallis H test, as shown in Table 4.3 below, revealed that there was no statistically significant difference between genders (H (1) = 2.44, p = .119).

Table 4.3: Kruskal-Wallis H test – Awareness and Gender

Test Statistics[a,b]	
Kruskal-Wallis H	2,44
df	1
Asymp. Sig.	,119
a. Kruskal Wallis Test	
b. Grouping Variable: Gender	

The results of a Mann-Whitney U test, as shown in Table 4.4 below, also indicated that there was no statistically significant difference between genders (Z = -1.561, p = .119).

Table 4.4: Mann-Whitney U test – Awareness and Gender

Test Statistics[a]	
Mann-Whitney U	10216,500
Wilcoxon W	23746,500
Z	-1,561
Asymp. Sig. (2-tailed)	,119
a. Grouping Variable: Gender	

4.4.1.10 Awareness and knowledge of digital financial services and Age

This section examines the age variations in participants' awareness and knowledge of digital financial services. Table 4.5 below shows the results of a Kruskal-Wallis mean ranks test. The results showed, with a 95% significance level ($p < .005$), that the age group of 26 to 33 years had the highest level of agreement about awareness and knowledge of digital financial services, followed by the age groups of 34 to 41 years, 18 to 25 years, and 42 to 49 years. The age groups of 0 to 18 years and 50 years and above had the lowest levels of agreement.

Table 4.5: Kruskal-Wallis mean ranks test – Awareness and Age

Age	N	Mean Rank
0 - 18	35	73,63
18 - 25	63	162,95
26 - 33	84	205,64
34 - 41	66	181,10
42 - 49	33	158,53
50 or over	34	72,62
Total	315	

The results of a Kruskal-Wallis H test, as shown in Table 4.6 below, revealed a statistically significant difference between age groups (H (5) = 87.99, $p < .005$).

Table 4.6: Kruskal-Wallis H test – Awareness and Age

Test Statistics[a,b]	
Kruskal-Wallis H	87,99
df	5
Asymp. Sig.	<,001
a. Kruskal Wallis Test	
b. Grouping Variable: Age	

4.4.1.11 Awareness and knowledge of digital financial services and Education

This section provides an analysis of level of education differences in participants' levels of awareness and knowledge of digital financial services. Table 4.7 below shows the results of a Kruskal-Wallis mean ranks test. The results showed, with a 95% significance level ($p < .005$), that doctoral graduates had the highest level of agreement about awareness and knowledge of digital financial services, followed by honours degree graduates, master's degree graduates, diploma or bachelor's degree

graduates, and matriculants. Those without a matriculation certificate had the lowest level of agreement.

Table 4.7: Kruskal-Wallis mean ranks test – Awareness and Education

Education	N	Mean Rank
No matric certificate	69	63,25
Matric certificate	74	136,85
Diploma/Degree	104	193,29
Honours Degree	45	225,50
Master's Degree	12	197,21
PhD	10	234,70
Total	314	

The results of a Kruskal-Wallis H test, as shown in Table 4.8 below, revealed a statistically significant difference in education levels ($H(5) = 87.99$, $p < .005$).

Table 4.8: Kruskal-Wallis H test – Awareness and Education

Test Statistics[a,b]	
Kruskal-Wallis H	130,09
df	5
Asymp. Sig.	<,001
a. Kruskal Wallis Test	
b. Grouping Variable: Education	

4.4.1.12 Summary of findings for Objective 1

Table 4.2 shows an overall mean score of 3.775 (SD = 1.118) for the questionnaire items that sought to establish the level of awareness and knowledge of digital financial services in peri-urban households. To ascertain whether peri-urban households' knowledge and awareness of digital financial services has an influence on their adoption of digital platforms, a correlation analysis of the findings was conducted. The Spearman correlation analysis (r = .768, n = 315, $p < .001$) showed a strong and significant relationship between peri-urban households' knowledge and awareness of digital financial services and their usage of digital platforms. The public seems to be becoming more aware of the financial services provided by financial institutions, particularly interaction with speed point machines and ATMs. This is crucial in increasing marginalised populations' engagement in the digital economy.

4.4.2 Objective 2: The extent of participation of peri-urban households in digital finance

This study's second objective was to assess the extent of participation of peri-urban households in digital finance. Section C of the questionnaire included six items on a five-point Likert scale which were related to this objective, with 1 denoting 'never', 2 denoting 'rarely', 3 denoting 'sometimes', 4 denoting 'very often', and 5 denoting 'always'. Codes EPDFS1 to EPDFS8 were allocated to these items. The descriptive statistics are shown in Table 4.9 below. The analysis of the means is based on Pimentel's (2010) recommendation in which mean scores between 1 and 1.8 denote 'never', mean scores between 1.81 and 2.60 denote 'rarely', mean scores between 2.61 and 3.40 denote 'sometimes', mean scores between 3.41 and 4.20 denote 'very often', and mean scores between 4.21 and 5 denote 'always'.

Table 4.9: The extent of participation of peri-urban households in digital finance

	N	Minimum	Maximum	Mean	Std. Deviation
EPDFS1	312	1	5	3,44	1,316
EPDFS2	314	1	5	3,65	1,288
EPDFS3	313	1	5	3,32	1,461
EPDFS4	312	1	5	3,76	1,383
EPDFS5	313	1	5	3,36	1,428
EPDFS6	315	1	5	3,85	1,371
EPDF	315	1,00	5,00	3,56	1,215

Note. 1 = never, 2 = rarely, 3 = sometimes, 4 = very often, 5 = always, M = Mean, SD = Standard Deviation.

4.4.2.1 Item EPDFS1

Participants were asked how frequently they made mobile cash payments using digital financial services. According to Table 4.9 above, most participants (M = 3.44, SD = 1316) frequently utilised digital platforms for mobile cash payments. This indicates that efforts by the government and banking institutions to support a cashless society are having a positive impact.

4.4.2.2 Item EPDFS2

Participants were asked how frequently they used digital finance platforms to receive money. The mean score of 3.65 (SD = 1.288) indicates that the majority of participants

stated that they frequently used digital finance platforms to receive money. Ramli and Hamzah (2021:3) also note that mobile wallet innovations, which enable customers to perform transactions such as digital payments and receiving money, are becoming increasingly popular.

4.4.2.3   Item EPDFS3

For the question "How frequently do you use digital finance platforms to pay bills such as electricity, clothing accounts, school fees, etc.?", Table 4.9 displays a mean score of 3.32 (SD = 1.461). This suggests that participants occasionally paid their bills using online financial services.

4.4.2.4   Item EPDFS4

The majority of the participants indicated a much higher frequency rate (M = 3.76, SD = 1.383) in response to the question "How often do you use digital finance platforms to make purchases at your local retailers?" This suggests that local stores now have resources that encourage peri-urban households to engage in the digital economy.

4.4.2.5   Item EPDFS5

For the question "How often do you use digital finance platforms to buy airtime?", Table 4.9 shows that the majority of respondents (M = 3.36, SD = 1.428) only sometimes engaged with this innovation. Anene and Okeji (2021:21) assert that purchasing airtime and data bundles are two of the most popular mobile banking services. The study's conclusions show that few peri-urban families engage in this behaviour.

4.4.2.6   Item EPDFS6

According to the results in Table 4.9, the majority of participants frequently utilised online financial platforms to save money (M = 3.85, SD = 1.371). This finding runs counter to research that suggests that consumers utilise digital platforms to acquire

money but fail to use the same platforms for money-saving purposes (Prasad et al., 2018:28).

4.4.2.7   Extent of participation in digital finance and Gender

This section examines gender variations in peri-urban household participation in digital finance. The results of a Kruskal-Wallis H test, as shown in Table 4.10 below, indicated that there was no statistically significant variation in the extent of engagement in the digital finance market between genders (H (1) = 3.25, p = .071).

Table 4.10: Kruskal-Wallis H test – Extent of participation and Gender

Test Statistics[a,b]	
Kruskal-Wallis H	3,25
df	1
Asymp. Sig.	,071
a. Kruskal Wallis Test	
b. Grouping Variable: Gender	

The results of a Mann-Whitney U test, as shown in Table 4.11 below, also indicated that there was no statistically significant difference between genders (Z = -1.804, p = .071).

Table 4.11: Mann-Whitney U test – Extent of participation and Gender

Test Statistics[a]	
Mann-Whitney U	10032,500
Wilcoxon W	23562,500
Z	-1,804
Asymp. Sig. (2-tailed)	,071
a. Grouping Variable: Gender	

4.4.2.8   Extent of participation in digital finance and Age

Table 4.12 below shows the results of a Kruskal-Wallis mean ranks test. The results showed, with a 95% significance level (p < .005), that the age group of 26 to 33 years had the highest level of agreement about the extent of participation in digital finance, followed by the age groups of 34 to 41 years, 18 to 25 years, and 42 to 49 years. The age groups of 0 to 18 years and 50 years and above had the least agreement.

Table 4.12: Kruskal-Wallis mean ranks test – Extent of participation and Age

Age	N	Mean Rank
0 - 18	35	49,29
18 - 25	63	164,42
26 - 33	84	206,72
34 - 41	66	181,36
42 - 49	33	166,32
50 or over	34	84,22
Total	315	

The results of a Kruskal-Wallis H test, as shown in Table 4.13 below, revealed a statistically significant difference between age groups ($H(5) = 101.87$, $p < .005$).

Table 4.13: Kruskal Wallis H test – Extent of participation and Age

Test Statistics[a,b]	
Kruskal-Wallis H	101,87
df	5
Asymp. Sig.	<,001
a. Kruskal Wallis Test	
b. Grouping Variable: Age	

4.4.2.9 Extent of participation in digital finance and Education

This section examines peri-urban populations' participation in digital finance and level of education. Table 4.14 below shows the results of a Kruskal-Wallis mean ranks test. The results showed, with a 95% significance level ($p < .005$), that doctoral degree graduates indicated the highest level of participation in the digital financial market, followed by honours degree graduates, master's degree graduates, diploma or bachelor's degree graduates, and matriculants. Those without a matriculation certificate had the lowest level of agreement.

Table 4.14: Kruskal-Wallis mean ranks test – Extent of participation and Education

Education	N	Mean Rank
No matric certificate	69	66,70
Matric certificate	74	128,84
Diploma/Degree	104	201,04
Honours Degree	45	212,33
Master's Degree	12	205,00
PhD	10	239,55
Total	314	

The results of a Kruskal-Wallis H test, as shown in Table 4.15 below, revealed a statistically significant difference in education levels (H (5) = 129.08, $p <$ .005).

Table 4.15: Kruskal-Wallis H test – Extent of participation and Education

Test Statistics[a,b]	
Kruskal-Wallis H	129,08
df	5
Asymp. Sig.	<,001
a. Kruskal Wallis Test	
b. Grouping Variable: Education	

4.4.2.10 Summary of findings for Objective 2

Table 4.9 displays an overall mean score of 3.564 (SD = 1.215) for the questionnaire items that examined the extent of participation of peri-urban households in digital finance in the financial services sector. The general population in marginalised communities appears to engage regularly in digital finance in the financial services industry. A Spearman correlation analysis (r = .649, n = 315, $p <$ .001) revealed a significant positive association between the use of digital platforms by peri-urban households and their level of engagement in digital finance.

4.4.3 Objective 3: Factors influencing the participation of peri-urban households in the financial services sector

Section D of the questionnaire was used to identify factors influencing the participation of peri-urban households in the financial services sector. These factors are discussed below.

4.4.3.1 Digital infrastructure

This factor was evaluated by means of four items on a five-point Likert scale, as shown in Table 4.16 below. These questionnaire items were assigned codes DIF1 to DIF4.

Table 4.16: Digital infrastructure

	N	Minimum	Maximum	Mean	Std. Deviation
DIF1	315	1	5	2,70	1,317
DIF2	315	1	5	2,16	1,209
DIF3	311	1	5	2,93	1,338
DIF4	313	1	5	3,06	1,457
DIF	315	1	5	2.71	1.030

Note. 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, M = Mean, SD = Standard Deviation.

4.4.3.1.1 Item DIF1

Participants were asked whether access to digital financial services was difficult in their area due to Internet connectivity issues. As shown in Table 4.16, the majority of participants expressed a neutral response (M = 2.70, SD = 1.317); hence, there was no clear sign of agreement or disagreement. The Internet has become a generally acknowledged distribution medium for the banking industry (Shofawati, 2019:393). However, Van Niekerk and Phaladi (2021:11) assert that few households in marginalised communities have access to the Internet. The finding of this study neither supports nor refutes this assertion.

4.4.3.1.2 Item DIF2

According to Igoni et al. (2020:4), digital finance includes a wide range of new financial products, associated digital operating software, and innovative consumer communication methods. Participants were asked whether their mobile phones lacked an operating software system that supports access to digital financial services. Table 4.16 shows that the majority of participants (M = 2.16, SD = 2.209) disagreed with the statement. Therefore, this study cannot assert that residents in marginalised areas own mobile phones that lack an operating system that is able to provide access to digital financial services.

4.4.3.1.3 Item DIF3

Participants were asked whether the unavailability of ATMs in their area made it difficult to utilise digital financial services. Table 4.16 shows a mean score of 2.93 (SD = 1.338) for this statement. This indicates that the majority of participants expressed

a neutral opinion about the statement. Although there is a growing need for technology-driven financial systems (Igoni et al., 2020:9), the presence of ATMs in peri-urban areas does not represent a substantial digital finance channel. Anene and Ojeki (2021:8) note that mobile phone banking is more established than ATM services. This means that a customer can use the bank's services without going to an ATM.

4.4.3.1.4 Item DIF4

Participants were asked whether the lack of speed point machines at local businesses made it challenging to transact with a bank card. Table 4.16 shows a mean score of 3.06 (SD = 1.457) for this statement, which indicates that the majority of participants expressed a neutral opinion regarding this statement. Speed point or point of sale machines, like ATMs, do not represent a significant digital finance channel. This may be the reason for participants' neutrality regarding speed point machines as a digital techology that influences their engagement with digital banking.

4.4.3.2 Digital literacy

It has been documented in the literature that underdeveloped populations generally lack a considerable level of digital literacy, which inhibits their adoption of digital financial services (Ghosh & Chaudhury, 2022:347; Prasad et al., 2018:4). As shown in Table 4.17 below, digital literacy was evaluated by three questionnaire items on a five-point Likert scale. These items were assigned codes DLF1 to DLF3.

Table 4.17: Digital literacy

	N	Minimum	Maximum	Mean	Std. Deviation
DLF1	315	1	5	1,96	1,320
DLF2	314	1	5	1,97	1,330
DLF3	314	1	5	1,90	1,286
DLF	315	1	5	1,94	1,241

Note. 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, M = Mean, SD = Standard Deviation.

4.4.3.2.1 Item DLF1

Participants were asked whether they found it difficult to use digital financial services because they found it difficult to operate a smart phone. Table 4.17 shows a mean score of 1.96 (SD = 1.310) for this statement, which indicates that the majority of respondents did not agree with the statement. This finding contradicts Prasad et al. (2018:4), who argue that most people living in less developed areas fail to utilise their mobile phones to access digital financial services.

4.4.3.2.2 Item DLF2

Participants were asked to respond to the following statement: "I lack the ability to use a computer and this makes it difficult for me to have access to digital financial services that are offered by my bank." Table 4.17 shows that the majority of participants (M = 1.97, SD = 1.330) disagreed with this statement. This indicates that most participants believed that they possessed the digital abilities needed to engage in digital finance. This is despite the fact that Jain and Raman (2022:2), Aziz and Naima (2021:8), and Ndubuisi et al. (2021:7) contend that the majority of people in marginalised regions lack basic digital literacy skills, which accounts for their low participation rate in the digital financial economy.

4.4.3.2.3 Item DLF3

Participants were asked to respond to the following statement: "I am unable to use an ATM on my own and this makes it difficult for me to access digital financial services." Table 4.17 shows that the majority of participants disagreed with this statement. Therefore, inability to use ATMs was not identified in this study as a barrier to participation in the digital banking industry for peri-urban households.

4.4.3.3   Digital financial services provider

It has already been mentioned that the adoption of digital finance benefits service providers as well as consumers. For this reason, banks as financial services providers

globally are developing strategies to make financial inclusion a reality. This section covers the findings based on the three questionnaire items relating to digital financial service providers, which were assigned the codes DFSP1, DFSP2 and DFSP3.

Table 4.18: Digital financial services provider

	N	Minimum	Maximum	Mean	Std. Deviation
DFSP1	315	1	5	1,49	,872
DFSP2	314	1	5	1,51	,905
DFSP3	315	1	5	1,53	,918
DFSP	315	1	5	1,51	,858

Note. 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, M = Mean, SD = Standard Deviation.

4.4.3.3.1 Item DFSP1

Participants were asked to respond to the following statement: "My bank does not promote its digital financial services that I can access using my mobile device". Table 4.18 shows a mean score of 1.49 (SD = .872) for this statement, which indicates that the majority of participants strongly disagreed with the statement. According to Igoni et al. (2020:2), banks are important role players that must take the initiative to raise public awareness of digital finance in order to increase the acceptability of this technological advancement. The banking industry's campaigns to raise public awareness of digital financial solutions appear to be beginning to pay off.

4.4.3.3.2 Item DFSP2

Table 4.18 shows that the majority of participants (M = 1.51, SD = .905) strongly disagreed with the statement "My bank does not encourage me to use its mobile application to access its services". Again, this shows that the banking industry's attempts to persuade its clients to use mobile applications to access digital financial platforms are having a positive impact. According to Urhie et al. (2021:587), banks have launched programs and initiatives to encourage people to make more use of digital financial technologies, thereby increasing their involvement in the market.

4.4.3.3.3 Item DFSP3

The majority of participants strongly disagreed (M = 1.53, SD =.918) with the statement "My bank does not educate me on how to use their digital finance services", as shown in Table 4.18. Customers' acceptance of and engagement in digital finance are encouraged by introducing them to self-service alternatives and teaching them how to utilise these facilities (Shim et al., 2020:7). Prasad et al. (2018:29) corroborate this by stating that banks that offer their clients digital financial education are better able to engage with the digital economy.

4.4.3.4 Security concerns and costs

These factors were measured using five questionnaire items on a five-point Likert scale. These items were allocated codes SCF1 to SCF5, as shown in Table 4.19 below.

Table 4.19: Security and costs

	N	Minimum	Maximum	Mean	Std. Deviation
SCF1	315	1	5	2,83	1,497
SCF2	315	1	5	2,84	1,550
SCF3	315	1	5	2,55	1,556
SCF4	314	1	5	2,18	1,291
SCF5	306	1	5	2,11	1,304
SCF	315	1	5	2,50	1,104

Note. 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, M = Mean, SD = Standard Deviation.

4.4.3.4.1 Item SCF1

Table 4.19 shows that the majority of respondents expressed a neutral response (M = 2.83, SD = 1.497) regarding whether they found it unsafe to use ATMs in their area. This result might be explained by the finding that ATMs do not constitute a substantial digital finance channel, as discussed in Section 4.4.3.1.3 above. This indicates that the security of ATMs was regarded as irrelevant by the majority of the participants in this study, possibly because they rarely utilised them to access digital financial services.

4.4.3.4.2 Item SCF2

Table 4.19 shows that most participants expressed a neutral response (M = 2.84, SD = 1.550) regarding whether they found it unsafe to use their bank cards when shopping in their neighbourhood. This finding may be attributed to the results discussed in Section 4.4.3.1.4, where it was noted that speed points are not a significant platform used by banking customers to obtain digital financial services.

4.4.3.4.3 Item SCF3

Selase and Benedict (2021:118) assert that some consumers are doubtful about using digital services and are concerned about the security precautions implemented to safeguard their personal data. Aziz and Naima (2021:5) maintain that the government and banks must provide digital security in order to reduce the danger of fraudulent transactions and digital fraud. In light of these assertions, participants were asked whether they found it unsafe to use their mobile devices when accessing digital financial services. Table 4.19 shows that the majority of participants (M = 2.55, SD = 1.556) disagreed with the statement "I find it unsafe to use my mobile device when accessing digital financial services." This suggests that mobile phone manufacturers and banks are implementing security measures to protect their customers and end users.

4.4.3.4.4 Item SCF4

As already discussed, participation in digital finance is increased when it lowers clients' transaction costs (Rai & Sharma, 2019:601). In light of this, participants were asked whether they found it costly to use their mobile phone to access digital financial services. As shown in Table 4.19, the mean score of 2.18 (SD = 1.291) for the statement "I find it costly to use my phone to access digital financial services" indicates that the majority of participants disagreed with this statement. This suggests that financial institutions have attempted to reduce costs related to utilising digital financial services.

4.4.3.4.5 Item SCF5

Table 4.19 shows that the majority of participants disagreed (M = 2.11, SD = 1.304) that they found it expensive to transact using their computers or mobile phones. This finding is consistent with those of Moreno-Garcia et al. (2021:212), who identified decreased costs of access to financial services as an advantage of digital banking.

4.4.3.5   Voluntary factors

Ozili (2018:336) claims that exclusion from the digital finance market can be voluntary, largely due to superstition, religious, and cultural pressures. Li et al. (2020) confirm this claim, noting that cultural traditions and consumption patterns prevent participation in digital banking. Voluntary factors were measured by two questionnaire items on a five-point Likert scale. These items were allocated codes VF1 to VF2. The results for these items are shown in Table 4.20 below.

Table 4.20: Voluntary factors

	N	Minimum	Maximum	Mean	Std. Deviation
VF1	315	1	5	2,03	1,357
VF2	315	1	5	1,41	,978
VF	315	1	5	1,72	1,022

Note. 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, M = Mean, SD = Standard Deviation.

4.4.3.5.1 Item VF1

Wyman (2017:17) notes that financial inclusion in emerging and developing nations is negatively impacted by customers' lack of trust in digital finance channels, a problem that is worse in nations with weak consumer protection regimes and institutions. Contrary to the literature, the majority of participants in this study disagreed (M = 2.03, SD = 1.357) with the statement "Negativity surrounding online banking services discourages me from using this platform", as shown in Table 4.20.

4.4.3.5.2 Item VF2

Table 4.20 shows that the majority of participants strongly disagreed (M = 1.41, SD = .978) that their religious convictions prohibited them from using online banking solutions. Therefore, this study did not identify religious views as a factor influencing peri-urban household engagement in the digital finance economy.

4.4.3.6 Summary of findings for Objective 3

Table 4.16 shows that the questionnaire items used to determine whether digital infrastructure affects peri-urban households' engagement in digital finance in the financial services industry had an overall mean score of 2.71 (SD = 1.030). The general public appears to have a neutral opinion with regard to this. A Spearman correlation analysis found a statistically significant weak negative correlation between the usage of digital platforms by peri-urban households and the availability of digital infrastructure (r = -.269, n = 315, p < .001).

Table 4.17 shows that the questionnaire items used to determine whether digital literacy affects peri-urban households' engagement in digital finance in the financial services industry had an overall mean score of 1.94 (SD = 1.241). A Spearman correlation analysis found a significant negative association between peri-urban households' adoption of digital financial platforms and their digital literacy (r = -.524, n = 315, p < .001). This is despite the fact that Van Niekerk and Phaladi (2021:19) argue that in South Africa, the adoption of digital financial services is negatively affected by a lack of information and knowledge which is prevalent in marginalised communities.

According to the overall mean score of 1.51 (SD = .859) in Table 4.18, the majority of survey respondents strongly disagreed that financial services providers did not encourage the use of digital platforms to obtain or access their services. This suggests that financial service providers encourage customers to use mobile applications to obtain services. A Spearman correlation analysis found a significant negative correlation between the usage of digital platforms by peri-urban households and the influence of digital financial service providers (r = -.308, n = 315, p < .001).

The majority of participants disagreed that security concerns and costs had an impact on their participation in digital finance, as shown by the overall mean score of 2.50 (SD = 1.104) in Table 4.19. This is supported by the results of a Spearman correlation analysis, which showed a significant, negative relationship between peri-urban households' use of digital platforms and the impact of security concerns and costs (r = -.183, n = 315, p < .001).

As shown by the overall mean score of 1.72 (SD = 1.022) in Table 4.20, most participants strongly disagreed that voluntary factors such as religious beliefs and superstitions affected their involvement in the digital finance economy. Additionally, a Spearman correlation analysis found that peri-urban households' usage of digital platforms and the influence of voluntary factors were significantly negatively correlated (r = - .106, n = 315, p = .060).

4.5   Chapter summary

This chapter presented and discussed the results of the data analysis. The presentation of results began with the analysis of participants' biographical information. The data was then analysed in accordance with the study's objectives, which were to assess the level of awareness and knowledge of digital financial services by peri-urban households within the Msunduzi Local Municiality area, to examine the extent of participation of peri-urban households in digital finance in the financial services sector, and to establish factors influencing the participation of peri-urban households in digital finance in the financial services sector. This chapter focused on the outcomes of the analysis, using statistical methods, of the data that were collected via questionnaires.

The following chapter provides a summary of the research and its findings. As the concluding chapter, it contains the study's conclusions and recommendations.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1   Introduction

This study sought to investigate and identify the determinants of peri-urban households' participation in digital finance in order to enable the development of strategies intended at increasing peri-urban households' participation in the digital economy. This chapter is dedicated to summarising the findings of this study and drawing conclusions regarding the study's objectives. In addition, this chapter addresses this study's implications and limitations. Recommendations based on the findings of this study and recommendations for further research are presented at the end of this chapter.

5.2   Summary of key findings

This section provides a brief overview of the study's key results in relation to the study's objectives, which were formulated to address the study's main aim. The findings will be used to inform research questions, which will in turn lead to suggestions to achieve the goal of this study.

5.2.1 Objective 1: To assess the level of awareness and knowledge of digital financial services by peri-urban households within the Msunduzi Local Municipality area

The results of the questionnaire items that were designed to determine the level of awareness and knowledge of digital financial services held by peri-urban families were presented in Chapter Four. A correlation analysis of the data was carried out in order to determine whether or not the level of knowledge and awareness that peri-urban families have about digital financial services has an effect on the degree to which they use digital platforms. The Spearman correlation analysis found a strong and significant association between the knowledge and awareness of peri-urban families about digital

financial services and their utilisation of digital platforms (r = .768, n = 315, p < .001). The general public appears to be developing a greater awareness of the financial services that are made available by financial institutions, particularly the interactions that may take place using ATMs and speed point machines. This is absolutely necessary in order to boost the participation of underserved communities in the digital economy.

The results of a Kruskal-Wallis H test, as shown in Table 4.3, indicated that there was no statistically significant difference between genders. The results of a Mann-Whitney U test, as shown in Table 4.4, also indicated that there was no statistically significant difference between genders (Z = -1.561, p = .119).

The results of a Kruskal-Wallis mean ranks test, as shown in Table 4.5, indicated, with a 95% significance level (p < .005), that individuals in the age range of 26 to 33 years had the highest degree of agreement on their awareness and understanding of digital financial services, followed by the age groups 18 to 25 years, 42 to 49 years, and 34 to 41 years. The age groups of 0 to 18 years and 50 years and above had the lowest levels of agreement. In addition, the results of a Kruskal-Wallis H test, as shown in Table 4.6, revealed that there was a statistically significant difference between age groups (H (5) = 87.99, p < .005).

The results of a Kruskal-Wallis mean ranks test, as shown in Table 4.7, indicated, with a significance level of 95% (p < .005), that individuals who possessed a doctoral degree had the highest level of agreement on their awareness and understanding of digital financial services, followed by honours degree graduates, master's degree graduates, diploma or bachelor's degree graduates, and matriculants. Those who did not possess a matriculation certificate had the lowest level of agreement. In addition, the results of a Kruskal-Wallis H test, as shown in Table 4.8, demonstrated that there was a statistically significant difference in education levels.

5.2.2 Objective 2: To examine the extent of participation of peri-urban households in digital finance in the financial services sector

The results of this study indicate that the general public in economically disadvantaged communities participates in digital financial transactions on a regular basis in the financial services sector. A Spearman correlation analysis found a substantial positive link between the usage of digital platforms by peri-urban families and their degree of participation in digital finance. This association was shown to be statistically significant (r = .649, n = 315, $p < .001$). However, the results of a Mann-Whitney U test, as shown in Table 4.11, indicated that there was no statistically significant correlation between gender and involvement in digital finance ($Z = -1,804$, $p = .071$).

The results of a Kruskal-Wallis mean ranks test revealed, with a 95% significance level ($p < .005$), that the age group of 26 to 33 years had the highest degree of agreement regarding the extent of their participation in digital finance, followed by the age groups of 18 to 25, 42 to 49, and 34 to 41. The age groups of 0 to 18 and 50 and above had the lowest levels of agreement. In addition, as shown in Table 4.13, a Kruskal-Wallis H test demonstrated that there was a statistically significant difference between age groups ($H(5) = 101.87$, $p < .005$). Furthermore, the results of a Kruskal-Wallis means ranks test revealed, with a 95% significance level ($p < .005$), that doctoral graduates had the highest level of agreement regarding their level of engagement in the digital financial market, followed by honours degree graduates, master's degree graduates, diploma or bachelor's degree graduates, and matriculants. Those who did not possess a matriculation certificate had the lowest level of agreement. The results of a Kruskal-Wallis H test, as shown in Table 4.15, revealed that there was a statistically significant difference in education levels ($H(5) = 129.08$, $p < .005$).

5.2.3 Objective 3: To establish factors influencing the participation of peri-urban households in digital finance in the financial services sector

The literature review and empirical study were used to identify factors influencing the participation of peri-urban households in the financial services sector. A summary of the results is presented below.

5.2.3.1 Digital infrastructure

As shown in Table 4.16, the questionnaire items that were used to establish whether or not digital infrastructure influences the participation of peri-urban households in digital finance in the financial services industry had an overall mean score of 2.71 (SD = 1.030), which suggests that the general population has a neutral opinion with regard to this. A Spearman correlation analysis found a statistically significant weak negative association between the availability of digital infrastructure and the use of digital platforms by households located in peri-urban areas (r = -269, n = 315, $p < .001$).

5.2.3.2 Digital literacy

As shown in Table 4.17, the questionnaire items used to assess whether or not digital literacy influences peri-urban households' participation in digital finance in the financial services sector had a mean score of 1.94 (SD = 1.241). A Spearman correlation analysis found a strong negative link between peri-urban households' use of digital financial platforms and their level of digital literacy (r = -524, n = 315, $p < .001$).

5.2.3.3 Digital financial services provider

The overall mean score of 1.51 (SD = .859) in Table 4.18 indicates that the majority of respondents to the survey strongly disagreed with the statement that providers of financial services do not encourage the use of digital platforms in order to obtain or use their services. This suggests that the participants believed that suppliers of financial services encourage clients to make use of mobile applications in order to acquire services. A Spearman correlation analysis found a substantial negative correlation between the utilisation of digital platforms by peri-urban families and the impact of digital financial service providers (r = -308, n = 315, $p < .001$).

5.2.3.4 Security concerns and costs

As evidenced by the overall mean score of 2.50 and the standard deviation of 1.104 in Table 4.19, the majority of participants did not believe that concerns about digital

security and the associated expenses had an effect on how they participated in digital financial transactions. This is corroborated by a Spearman correlation analysis which revealed a strong negative association between the usage of digital platforms by peri-urban families and the effect of security concerns and expenses (r = -.183, n = 315, *p* < .001).

5.2.3.5   Voluntary factors

The majority of respondents strongly disagreed that voluntary elements such as religious beliefs and superstitions affected their participation in the digital financial industry, as indicated by the overall mean score of 1.72 (SD = 1.022) shown in Table 4.20. A Spearman correlation analysis found a substantial inverse association between the utilisation of digital platforms by peri-urban families and the effect of voluntary variables (r = -.106, n = 315, *p* = .060).

5.3   Conclusions about the hypotheses

In Chapter Two, a conceptual framework was developed to describe how the TAM and the DIT may be used to identify the determinants of the involvement of peri-urban households in the digital economy. The primary goal of this framework was to illuminate the factors that influence peri-urban households' participation in the digital economy. As a result of the examination of the relevant literature, hypotheses were formed. This section unpacks how these hypotheses were addressed.

5.3.1   H1: Awareness of digital financial services has a significant positive influence on customers' intention to participate in digital finance

A correlation analysis was undertaken to determine whether peri-urban households' awareness of digital financial services influences their adoption of digital platforms. The Spearman correlation analysis showed a strong and a significant relationship between peri-urban households' knowledge and awareness of digital financial services and their use of digital platforms (r = .768, n = 315, *p* < .001). Therefore, this hypothesis is accepted.

5.3.2 H2: Digital infrastructure has a significant positive influence on customers' intention to participate in digital finance

A Spearman correlation analysis found a statistically significant weak negative association between the use of digital platforms by peri-urban families and the availability of digital infrastructure ($r = -.269$, $n = 315$, $p < .001$). Therefore, this hypothesis is rejected.

5.3.3 H3: Digital literacy has a significant positive influence on customers' intention to participate in digital finance

A Spearman correlation analysis demonstrated a significant negative association between peri-urban households' usage of digital financial platforms and their digital literacy ($r = -.524$, $n = 315$, $p < .001$). Therefore, this hypothesis is rejected.

5.3.4 H4: Support from the financial services provider has a significant positive influence on customers' intention to participate in digital finance

A Spearman correlation analysis found that the usage of digital platforms by peri-urban households and the influence of digital financial service providers were significantly and negatively correlated ($r = -.308$, $n = 315$, $p < .001$). Therefore, this hypothesis is rejected.

5.3.5 H5: Security concerns and costs have a significant positive influence on customers' intention to participate in digital finance

A Spearman correlation analysis showed a significant negative relationship between peri-urban households' use of digital platforms and the impact of security concerns and costs ($r = -.183$, $n = 315$, $p < .001$). Therefore, this hypothesis is rejected.

5.3.6 H6: Voluntary factors have a significant positive influence on customers' intention to participate in digital finance

A Spearman correlation analysis found that peri-urban households' usage of digital platforms and the influence of voluntary factors were significantly negatively correlated (r = -.106, n = 315, p = .060). Therefore, this hypothesis is rejected.

5.3.7 H7: Gender has a significant positive influence on customers' intention to participate in digital finance

The results of the Kruskal-Wallis test, as shown in Table 4.10, demonstrated that there was no statistically significant variation in the extent of engagement in the digital finance market depending on gender (H (1) = 3.25, p = .071). The results of the Mann-Whitney U test, as shown in Table 4.11, also indicated that there was no statistically significant difference between genders regarding participation in digital finance (Z = -1.804, p = .071). Therefore, this hypothesis is rejected.

5.3.8 H8: Age has a significant positive influence on customers' intention to participate in digital finance

The results of the Kruskal-Wallis H test, as shown in Table 4.13, revealed a statistically significant difference between age groups (H (5) = 101.87, p < .005). Therefore, this hypothesis is accepted.

5.3.9 H9: Level of education has a significant positive influence on customers' intention to participate in digital finance.

The results of the Kruskal-Wallis H test, as shown in Table 4.15, revealed a statistically significant difference in education levels with regard to customers' intention to participate in digital finance (H (5) = 129.08, p < .005). Therefore, this hypothesis is accepted.

5.4   Implications of the study

This study demonstrated that a gap still exists in the literature concerning the determinants of participation of previously excluded consumers, which include peri-urban households. It can be argued that in order to enhance the involvement of marginalised households in digital finance, the financial services sector must cultivate a deep understanding of the pertinent theories and strategies that can be employed to bolster customer engagement within the digital economy. Therefore, the implications of this study are both theoretical and practical.

Theoretically, this study contributes to the existing body of knowledge by integrating the TAM and the DIT to illuminate the determinants of the participation of peri-urban households in the digital economy. This was achieved by the development of a conceptual framework that explained how the TAM and the DIT can be used to identify and explain the determinants of the participation of peri-urban households in the digital economy. Practically, this study was able to identify that awareness of digital financial services, age, and level of education are key factors influencing the participation of peri-urban households in the digital economy within the South African context. Therefore, it is necessary that financial institutions be proactive in driving awareness efforts in underserved regions of the country. In educating individuals about digital financial services, different age groups should be considered.

5.5   Limitations of the study

The following limitations were identified in this study:

- This study employed a quantitative methodology to answer research questions. While this research employed a rigorous systematic technique for creating and refining information to address the research problem, only structured questions were used to collect data. Consequently, the investigation emphasised quantitative information. This means that broad contextual understanding might be a challenge.

- The geographic focus of this study was another limiting factor. It focused only on the Imbali and Edendale townships. This may restrict the generalisability of this study's results to other urban areas.

- This study used a sample size of 384 units, which was calculated using a standard formula. This may not necessarily represent the entire population of peri-urban households. However, the preponderance of scholarly literature contends that the sample size utilised in this study is acceptable.

5.6   Recommendations

This section proposes recommendations based on the study's findings. These proposals are for the financial services sector, government, and future studies pertaining to inclusiveness in the digital finance economy.

5.6.1   Recommendations for the financial services sector

This study found that the majority of banks are continuously enhancing their digital financial services platforms to satisfy client demands and provide quality for their customers and users. In addition, this study found a strong and significant relationship between peri-urban households' knowledge and awareness of digital financial services and their usage of digital platforms. Therefore, to enhance the participation of peri-urban households in the digital economy, this study recommends the following:

5.6.1.1   Digital financial education

It is recommended that the financial services sector continue to offer their clients digital financial education to improve their ability to engage with the digital economy. This can be accomplished by training bank employees to assist consumers in transitioning from traditional banking processes to self-service technologies.

5.6.1.2   Public awareness campaigns

This study recommends that the financial services sector improve its efforts in raising public awareness of digital finance in order to increase participation. To ensure the success of financial inclusion, it is crucial that programmes raising awareness of digital finance reach marginalised communities, including peri-urban households.

5.6.1.3   Investment in digital infrastructure in rural and peri-urban areas

Investing in digital infrastructure in rural and peri-urban areas is necessary for the financial services sector to address digital inequalities between different demographics. To fully and effectively participate in the digital economy, digital infrastructure must be available. The marginalised should be given more agency and access to the digital economy through the improvement of digital infrastructure.

5.6.2   Recommendations for government

This study noted that digital finance expands the consumption demand of households and benefits governments. Therefore, the government should prioritise programmes that promote digital skills and financial literacy in order to expand access to digital financial services for all. In order to ensure that the urban-rural digital divide is closed, rural and peri-urban areas require government investment in digital infrastructure.

It was noted in Chapter Two that cash is still the preferred method of payment in South Africa. Therefore, the government of South Africa should encourage digital finance by pursuing a cashless economy. The government is encouraged to institute plans and policies that will facilitate the transition to a cashless society. This step is crucial in order to increase the participation of citizens, especially marginalised groups, in the digital economy.

5.6.3 Recommendations for future studies

For future research, this study recommends the following:

- It has already been stated that this study employed a quantitative research approach. A mixed-method approach is recommended in order to integrate quantitative and qualitative data with the aim of obtaining a more comprehensive understanding of the determinants of participation of peri-urban households in the digital economy.

- The geographical area in which this study was conducted was a limiting factor. Other peri-urban locations and other provinces could be included in a similar study. Such a study may shed light on the similarities and differences in peri-urban households' use of digital finance.

5.7 Conclusion

The public's awareness of financial services provided by financial institutions is evidently on the rise. This is a development of great significance as it paves the way for enhanced financial access. The pivotal role of such access in driving inclusive growth and mitigating poverty is widely recognised. This study uncovered a notable trend of active engagement with digital finance within peri-urban areas among the broader population. This trend holds critical importance for bolstering marginalised communities' participation in the digital economy. Given that digital finance serves as a catalyst for financial inclusion, it also serves as a cornerstone for a nation's economic growth and sustainable development. To amplify public involvement in digital finance, it is imperative for both the government and the financial services sector to take a leading role in educating the public about digital financial opportunities.

REFERENCES

Alasuutari, P., Bickman, L., & Brannen, J. (eds). 2008. *The SAGE handbook of social research methods*. London: SAGE Publications Ltd.

Al-Smadi, M.O. 2023. Examining the relationship between digital finance and financial inclusion: Evidence from MENA countries. *Borsa Istanbul Review*, *23*(2), 464-472.

Anene, A.I. & Okeji, C.C. 2021. Awareness, acceptance and usage of mobile banking services by academic librarians in Nigeria. *Library Philosophy and Practice,* 1-29.

Ariansyah, K., Sirait, E.R.E., Nugroho, B.A. & Suryanegara, M. 2021. Drivers of and barriers to e-commerce adoption in Indonesia: Individuals' perspectives and the implications. *Telecommunications Policy*, *45*(8), 1-15.

Arif, I., Aslam, W. & Hwang, Y. 2020. Barriers in adoption of Internet banking: A structural equation modelling - Neural network approach. *Technology in Society*, *61*, 1-8.

Arner, D.W., Barberis, J.N. & Buckley, R.P. 2016. The emergence of RegTech 2.0: From know your customer to know your data: From Know Your Customer to Know Your Data. *Journal of Financial Transformation*, 44, 79-86.

Arner, D.W., Barberis, J.N., Walker, J., Buckley, R.P., Dahdal, A.M. & Zetzsche, D.A. 2020. Digital finance & the COVID-19 crisis. *University of Hong Kong Faculty of Law Research Paper* No. 2020/017.

Asenahabi, B.M. 2019. Basics of research design: A guide to selecting appropriate research design. *International Journal of Contemporary Applied Researches*, *6*(5), 76-89.

Asuero, A.G., Sayago, A. & González, A.G. 2006. The correlation coefficient: An overview. *Critical Reviews in Analytical Chemistry*, *36*(1), 41-59.

Attié, E. & Meyer-Waarden, L. 2022. The acceptance and usage of smart connected objects according to adoption stages: An enhanced technology acceptance model integrating the diffusion of innovation, uses and gratification and privacy calculus theories. *Technological Forecasting and Social Change*, *176*, 1-15.

Aziz, A. & Naima, U. 2021. Rethinking digital financial inclusion: Evidence from Bangladesh. *Technology in Society*, *64*, 1-25.

Berndt, A.E. 2020. Sampling methods. *Journal of Human Lactation*, *36*(2), 224-226.

Capodaglio, A.G. 2017. Integrated, decentralized wastewater management for resource recovery in rural and peri-urban areas. *Resources*, *6*(2), 22-26.

Chau, P.Y. 1996. An empirical assessment of a modified technology acceptance model. *Journal of Management Information Systems, 13*(2), 185-204.

Chemingui, H. & Ben Lallouna, H. 2013. Resistance, motivations, trust and intention to use mobile financial services. *International Journal of Bank Marketing*, *31*(7), 574-592.

Chen, L. 2016. From fintech to finlife: The case of fintech development in China. *China Economic Journal*, *9*(3), 225-239.

Cicchiello, A.F., Kazemikhasragh, A., Monferrá, S. & Girón, A., 2021. Financial inclusion and development in the least developed countries in Asia and Africa. *Journal of Innovation and Entrepreneurship*, *10*(1),1-13.

Cornelius, K. & Kwon, Y. 2018. Digital finance revolution in E. Africa: Retail bank's adaption to a changing marketplace. In *22nd Biennial Conference of the International Telecommunications Society (ITS)*: Seoul, Korea, 24th-27th June 2018.

Creswell, J.W. & Creswell, J.D. 2018. *Research design: Qualitative, quantitative and mixed methods approaches.* 5th ed. London: Sage Publications Ltd.

Dadashpoor, H. & Ahani, S. 2019. Land tenure-related conflicts in peri-urban areas: A review. *Land Use Policy*, *85*, 218-229.

Das, K.R. & Imon, A.H.M.R. 2016. A brief review of tests for normality. *American Journal of Theoretical and Applied Statistics*, *5*(1), 5-12.

Davis, F.D., 1985. *A technology acceptance model for empirically testing new end-user information systems: Theory and results.* Doctoral dissertation, Massachusetts Institute of Technology.

Etikan, I. & Babtope, O. 2019. A basic approach in sampling methodology and sample size calculation. *Medlife Clinics*, *1*(2), 50-54.

Fairooz, H.M.M. & Wickramasinghe, C.N. 2019. Innovation and development of digital finance: A review on digital transformation in banking & financial sector of Sri Lanka. *Asian Journal of Economics, Finance and Management*, *1*(1), 69-78.

Farook, U.A. & Sudalaimuthu, S. 2017. Customer perception: Technology based banking and its impact on financial inclusion. *International Journal of Advance Research, Ideas and Innovations in Technology*, 3(6), 1354-1363.

Ghosh, C. & Chaudhury, R. 2022. Determinants of digital finance in India. *Innovation and Development*, *12*(3), 343-362.

Goh, E. & Sigala, M. 2020. Integrating Information & Communication Technologies (ICT) into classroom instruction: Teaching tips for hospitality educators from a diffusion of innovation approach. *Journal of Teaching in Travel and Tourism*, *20*(2), 156-165.

Gomber, P., Koch, J.-A. & Siering, M. 2017. Digital finance and FinTech: Current research and future research directions. *Journal of Business Economics*, *87*(5), 537-580.

Gray, D.E. 2004. *Doing research in the real world*. London: Sage Publications Ltd.

Hau, H.T., Nhung, D.T.H. & Trang, P.H. 2021. An empirical analysis of factors affecting the intention of using digital wallets in Vietnam. *Tạp chí Quản lý Kinh tế Quốc tế (Journal of International Economics and Management)*, *21*(1), 86-107.

He, J. & Li, Q. 2020. Can online social interaction improve the digital finance participation of rural households? *China Agricultural Economic Review*, *12*(2), 295-313.

Helsel, D.R. 1987. Advantages of nonparametric procedures for analysis of water quality data. *Hydrological Sciences Journal*, *32*(2), 179-190.

Hertzog, M.A., 2008. Considerations in determining sample size for pilot studies. *Research in Nursing & Health*, *31*(2), 180-191.

Hodson, D. 2021. The politics of FinTech: Technology, regulation, and disruption in UK and German retail banking. *Public Administration*, *99*(4), 859-872.

Hossain, S.A., Bao, Y., Hasan, N. & Islam, M.F. 2020. Perception and prediction of intention to use online banking systems: An empirical study using extended TAM. *International Journal of Research in Business and Social Science, 9*(1),112-126.

Igoni, S., Onwumere, J. & Ogiri, I.H. 2020. The Nigerian digital finance environment and its economic growth: Pain or gain. *Asian Journal of Economics, Finance and Management*, *2*(2), 1-10.

Jain, N. & Raman, T.V. 2022. A partial least squares approach to digital finance adoption. *Journal of Financial Services Marketing*, 1-14.

Kalfoss, M. 2019. Translation and adaption of questionnaires: A nursing challenge. *SAGE Open Nursing*, *5*, 1-13.

Kamal, S.S.L.B.A. 2019. Research paradigm and the philosophical foundations of a qualitative study. *PEOPLE: International Journal of Social Sciences*, *4*(3), 1386-1394.

Kamath, A. 2018. "Untouchable" cellphones? Old caste exclusions and new digital divides in peri-urban Bangalore. *Critical Asian Studies*, *50*(3), 375-394.

Kelly, G. 2014. *The digital revolution in banking*. Washington, DC: Group of Thirty.

Ketterer, J.A. 2017. Digital finance: New times, new challenges, new opportunities. *IDB-Inter American Development Bank*. 1-35. Available: https://publications.iadb.org/en/digital-finance-new-times-new-challenges-new-opportunities. (Accessed 16 October 2022).

Khatri, K.K. 2020. Research paradigm: A philosophy of educational research. *International Journal of English Literature and Social Sciences (IJELS)*, *5*(5), 1435-1440.

Knief, U. & Forstmeier, W. 2021. Violating the normality assumption may be the lesser of two evils. *Behavior Research Methods*, *53*(6), 2576-2590.

Kusimba, S. 2018. "It is easy for women to ask!": Gender and digital finance in Kenya. *Economic Anthropology*, *5*(2), 247-260.

Lahdenperä, N.I., Repo, J.P., Aartolahti, E., Tollow, P., Griffiths, C., Harcourt, D., Vuola, J. & Lindford, A. 2021. The CARe Burn Scale – Adult Form: Translation and linguistic validation into Finnish. *Burns*, *47*(8), 1922-1928.

Le Cessie, S., Goeman, J.J. & Dekkers, O.M. 2020. Who is afraid of non-normal data? Choosing between parametric and non-parametric tests. *European Journal of Endocrinology*, *182*(2), E1-E3.

Lekhanya, L.M., 2016. *Determinants of survival and growth of small and medium enterprises in rural KwaZulu–Natal.* PhD Thesis, University of the Western Cape.

Li, J., Wu, Y. & Xiao, J. 2020. The impact of digital finance on household consumption: Evidence from China. *Economic Modelling*, *86*, 317-326.

Liu, Y., Liu, C. & Zhou, M. 2021. Does digital inclusive finance promote agricultural production for rural households in China? Research based on the Chinese family database (CFD). *China Agricultural Economic Review*, *13*(2), 475-494.

Lund, B. 2023. Surveys in systems research: An overview of sample sizes, response rates, and statistical approaches utilized in studies. *VINE Journal of Information and Knowledge Management Systems*, *53*(1), 1-10.

Marangunić, N. & Granić, A. 2015. Technology acceptance model: A literature review from 1986 to 2013. *Universal Access in the Information Society*, *14*, 81-95.

Mariscal, J., Mayne, G., Aneja, U. & Sorgner, A. 2019. Bridging the gender digital gap. *Economics*, *13*(1), 1-13.

Matita, M.M. & Chauma, T. 2021. Does financial literacy influence use of mobile financial services? Evidence from Malawi household survey data. Malawi Journal of Economics, 2(1), 23-44.

Mia, M.A.H., Rahman, M.A. & Uddin, M.M. 2007. E-Banking: Evolution, status and prospect. *The Cost and Management*, *35*(1), 36-48.

Mignamissi, A. & Djijo, A.J.T. 2021. Digital divide and financial development in Africa. *Telecommunications Policy*, *45*(9), 1-18.

Min, S., So, K.K.F. & Jeong, M. 2018. Consumer adoption of the Uber mobile application: Insights from diffusion of innovation theory and technology acceptance model. *Journal of Travel & Tourism Marketing, 36*(7), 770–783.

Mishra, P., Pandey, C.M., Singh, U., Gupta, A., Sahu, C. & Keshri, A. 2019. Descriptive statistics and normality tests for statistical data. *Annals of Cardiac Anaesthesia*, *22*(1), 67–72.

Mohajan, H.K. 2020. Quantitative research: A successful investigation in natural and social sciences. *Journal of Economic Development, Environment and People*, *9*(4), 1-42.

Moreno-García, E., García-Santillán, A. & Campero, D.P. 2021. Students perception about digital financial services. *International Journal of Financial Research*, *12*(4), 212-224.

Morgan, P.J., Huang, B. & Trinh, L.Q. 2019. The need to promote digital financial literacy for the digital age. In *Realizing Education for All: In the Digital Age* (pp. 40-46). JICA and ADBI, Tokyo, Japan.

Mortoja, M. G., Yigitcanlar, T. & Mayere, S. 2020. What is the most suitable methodological approach to demarcate peri-urban areas? A systematic review of the literature. *Land Use Policy*, *95*, 1-13.

Msunduzi Local Municipality. 2019. Msunduzi Local Municipality's housing sector plan: A strategic plan for the development of sustainable human settlement. Available: http://www.msunduzi.gov.za/site/search/downloadencode/MSUNDUZI%20HSP%20DRAFT%204%20%28July%202019%29_1.pdf. (Accessed 29 October 2022).

Nachar, N., 2008. The Mann-Whitney U: A test for assessing whether two independent samples come from the same distribution. *Tutorials in Quantitative Methods for Psychology*, *4*(1), 13-20.

Ndubuisi, G., Otioma, C. & Tetteh, G.K. 2021. Digital infrastructure and employment in services: Evidence from Sub-Saharan African countries. *Telecommunications Policy*, *45*(8), 1-9.

Okagbue, H.I., Oguntunde, P.E., Obasi, E.C. & Akhmetshin, E.M. 2021. Trends and usage pattern of SPSS and Minitab software in scientific research. *Journal of Physics: Conference Series*, *1734*, 1-8.

Omair, A. 2014. Sample size estimation and sampling techniques for selecting a representative sample. *Journal of Health Specialties*, *2*(4), 1-142.

Ooi, K.B. 2013. *Total quality management and knowledge management in Malaysian manufacturing and service firms: A structural equation modeling approach.* Doctoral dissertation, University of Malaya.

Otufowora, A., Liu, Y., Young, H., Egan, K.L., Varma, D.S., Striley, C.W. & Cottler, L.B. 2021. Sex differences in willingness to participate in research based on study risk level among a community sample of African Americans in North Central Florida. *Journal of Immigrant and Minority Health*, *23*, 19-25.

Ozili, P.K. 2018. Impact of digital finance on financial inclusion and stability. *Borsa Istanbul Review*, *18*(4), 329-340.

Ozili, P.K. 2020. Comparing digital finance in the UK, US, India and Nigeria. *Financial Internet Quarterly*, *16*(4), 1-11.

Park, Y.S., Konge, L. & Artino, A.R., Jr., 2020. The positivism paradigm of research. *Academic Medicine*, *95*(5), 690-694.

Pimentel, J.L. 2010. A note on the usage of Likert scaling for research data analysis. *USM R&D Journal*, *18*(2), 109-112.

Prasad, H., Meghwal, D. & Dayama, V. 2018. Digital financial literacy: A study of households of Udaipur. *Journal of Business and Management*, *5*, 23-32.

Purnamasari, P., Pramono, I.P., Haryatiningsih, R., Ismail, S.A. & Shafie, R., 2020. Technology acceptance model of financial technology in micro, small, and medium

enterprises (MSME) in Indonesia. *The Journal of Asian Finance, Economics and Business (JAFEB)*, *7*(10), 981-988.

Rahi, S. 2017. Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. *International Journal of Economics & Management Sciences*, *6*(2), 1-5.

Rai, K. & Sharma, M., 2019. A study on awareness about digital financial services among students. *Proceedings of 10th International Conference on Digital Strategies for Organizational Success*, 600-607.

Ramli, F.A.A. & Hamzah, M.I. 2021. Mobile payment and e-wallet adoption in emerging economies: A systematic literature review. *Journal of Emerging Economies and Islamic Research*, *9*(2), 1-39.

Ravikumar, T. 2019. Digital financial inclusion: A payoff of financial technology and digital finance uprising in India. *International Journal of Scientific & Technology Research*, *8*(11), 3434-3438.

Roth, C. & Koenitz, H. 2019. Bandersnatch, yea or nay? Reception and user experience of an interactive digital narrative video. In *Proceedings of the 2019 ACM International Conference on Interactive Experiences for TV and Online Video*, 247-254.

Sai, P.J. & Pankajam, A. 2019. Digital India - A transformative technology in everyday life. *Management and Social Sciences (IJMSS)*, *8*(2.1), 1-164.

Salemink, K., Strijker, D. & Bosworth, G. 2017. Rural development in the digital age: A systematic literature review on unequal ICT availability, adoption, and use in rural areas. *Journal of Rural Studies*, *54*, 360-371.

Sarfo, Y., Musshoff, O. and Weber, R., 2023. Farmers' awareness of digital credit: Does financial literacy matter? *Journal of International Development*. 35, 2299-2317.

Saunders, M.N.K., Lewis, P. & Thornhill, A. 2019. *Research methods for business students*. 8th ed. London: Pearson Education Limited.

Schachtebeck, C., Groenewald, D. & Nieuwenhuizen, C. 2018. Pilot studies: Use and misuse in South African SME research. *Acta Universitatis Danubius. Œconomica*, *14*(1), 5-19.

Sekaran, U. & Bougie, R. 2016. *Research methods for business: A skill building approach*. 7th ed. West Sussex: Wiley.

Selase, A.M. & Benedict, A. 2021. An assessment of customer attitude towards Internet banking in Ghana. *International Journal of Economics, Business and Management Research*, *5*(7),113-136.

Shihadeh, F. 2020. Online payment services and individuals' behaviour: New evidence from the MENAP. *International Journal of Electronic Banking*, *2*(4), 275-282.

Shim, H.S., Han, S.L. & Ha, J. 2020. The effects of consumer readiness on the adoption of self-service technology: Moderating effects of consumer traits and situational factors. *Sustainability*, *13*(1), 1-17.

Shofawati, A. 2019. The role of digital finance to strengthen financial inclusion and the growth of SME in Indonesia. *KnE Social Sciences*, *3*(13), 389-407.

Şimşek, A.S. 2023. The power and type I error of Wilcoxon-Mann-Whitney, Welch's t, and student's t tests for likert-type data. *International Journal of Assessment Tools in Education*, *10*(1), 114-128.

Srouji, J. 2020. Digital payments, the cashless economy, and financial inclusion in the United Arab Emirates: Why is everyone still transacting in cash? *Journal of Risk and Financial Management*, *13*(11), 1-10.

Stockemer, D. 2019. *Quantitative methods for the social sciences: A practical introduction with examples in SPSS and Stata*. Cham, Switzerland: Springer.

Stratu-Strelet, D., Gil-Gómez, H., Oltra-Badenes, R. & Oltra-Gutierrez, J.V. 2021. Critical factors in the institutionalization of e-participation in e-government in Europe: Technology or leadership? *Technological Forecasting and Social Change*, *164*, 1-9.

Sujatha, R. & Sekkizhar, J., 2019. Determinants of m-commerce adoption in India using technology acceptance model infused with innovation diffusion theory. *Journal of Management Research, 19*(3), 193-204.

Taherdoost, H. 2017. Determining sample size: How to calculate survey sample size. *International Journal of Economics and Management Systems*, *2*, 237-239.

Tavakol, M. & Dennick, R. 2011. Post-examination analysis of objective tests. *Medical Teacher*, *33*(6), 447-458.

Thathsarani, U.S. & Jianguo, W. 2022. Do digital finance and the technology acceptance model strengthen financial inclusion and SME performance? *Information*, *13*(8), 390-407.

Urhie, E., Amonu, O.C., Mbah, C., Ewetan, O.O., Matthew, O.A., Adediran, O., Adesanya, O. & Adekeye, A. 2021. Banking technology and cashless economy in selected sub-Saharan African countries: Does education matter? *Journal of Money Laundering Control*, *24*(3), 584-595.

Van Niekerk, M.G. & Phaladi, N.H. 2021. Digital financial services: Prospects and challenges. *Potchefstroom Electronic Law Journal/Potchefstroomse Elektroniese Regsblad*, *24*(1), 1-25.

Varpio, L., Paradis, E., Uijtdehaage, S. & Young, M. 2020. The distinctions between theory, theoretical framework, and conceptual framework. *Academic Medicine*, *95*(7), 989-994.

Waller, J.L. & Johnson, M. 2013. Chi-square and T-tests using SAS: Performance and interpretation. Statistics and data analysis. SAS Global Forum, Georgia Regents University, Augusta, Georgia. Available: https://support.sas.com/resources/papers/proceedings13/430-2013.pdf. (Accessed 14 June 2023).

Walliman, N. 2011. *Research methods: The basics*. New York: Routledge.

Wandl, A. & Magoni, M. 2017. Sustainable planning of peri-urban areas: Introduction to the special issue. *Planning Practice & Research*, *32*(1), 1-3.

Wyman, O. 2017. Accelerating financial inclusion in South-East Asia with digital finance. *Asian Development Bank Reports*, 1-86.

Ye, Y., Pu, Y. & Xiong, A. 2022. The impact of digital finance on household participation in risky financial markets: Evidence-based study from China. *PLOS ONE*, *17*(4), 1-16.

Yin, Y. 2022. Digital finance development and manufacturing emission reduction: An empirical evidence from China. *Frontiers in Public Health*, *10*, 1-13.

Yuen, K.F., Huyen, D.T.K., Wang, X. & Qi, G. 2020. Factors influencing the adoption of shared autonomous vehicles. *International Journal of Environmental Research and Public Health*, *17*(13), 1-16.

APPENDIX A: ETHICAL CLEARANCE

DUT
DURBAN UNIVERSITY OF TECHNOLOGY
INYUVESI YASETHEKWINI YEZOBUCHWEPHESHE

FACULTY OF ACCOUNTING & INFORMATICS

Faculty Research Office
Durban University of Technology
Date: 31 May 2023

Student: Nelisiwe Fortunate Nyide
Student Number: 20900256
Degree: Master of Accounting: Management Accounting
Email: 20900256@dut4life.ac.za
Supervisor: Dr O.M. Olarewaju
Supervisor email: drmagolar@yahoo.com

Dear Mrs Nyide

I am pleased to inform you that the Faculty Research Ethics Committee (FREC) following feedback from two reviewers, has granted preliminary permission for you to conduct your research 'Determinants of participation of Msunduzi Local Municipality's peri-urban households in the digital finance economy'

When ethics approval is granted:
You are required to present the letter at your research site(s) for permission to gather data. Please also note that your research instruments must be accompanied by the letter of information and the letter of consent for each participant, as per your research proposal.

This ethics clearance is valid from the date of provisional approval on this letter for one year. A student must apply for recertification 3 months before the date of this expiry.

Recertification is required every year until after corrections are made, after **examination**, and the thesis is submitted to the Faculty Registrar.

A summary of your key research findings must be submitted to the FRC on completion of your studies.

Kindest regards.

Yours sincerely

APPENDIX B: LETTER OF INFORMATION

LETTER OF INFORMATION

Title of the Research Study: Determinants of participation of Msunduzi Local Municipality's peri-urban households in the digital finance economy

Principal Investigator/s/researcher: Nelisiwe Fortunate Nyide, B-Tech Cost and Management Accounting

Co-Investigator/s/supervisor/s: Dr O.M Olarewaju, PhD: Finance

Brief Introduction and Purpose of the Study: The aim of this study is to examine and identify the determinants of participation of peri-urban households in digital finance and provide strategies that will improve their participation in the financial services sector in Msunduzi Local Municipality in the province of KwaZulu-Natal, South Africa.

Greeting: How are you?

Introduce yourself to the participant: I am a student at Durban University of Technology doing research for my Masters degree in Management Accounting.

Invitation to the potential participant: I would like to invite you to participate in the research

What is Research: Research is a systematic search or enquiry for generalized new knowledge.

Outline of the Procedures: You are kindly requested to answer all the questions in the questionnaire. It
should take approximately 20-30 minutes to complete.

Risks or Discomforts to the Participant: There is no expected risk or discomfort when participating in
this study.
Explain to the participant the reasons he/she may be withdraw from the Study: You can withdraw from the study at any time if you wish to do so. There will be no penalty for withdrawal from the study.

Benefits: This research will benefit the participants directly since the findings of this study will provide digital finance education that will enhance peri-urban household inclusion.

Remuneration: There are no financial rewards or benefits from participating in this study.

Costs of the Study: There are no cost implications for the respondents for participating in the study.

Confidentiality: Names of respondents will not be used on questionnaires. The consent form with your name
will be kept separately from the questionnaires by the researcher.

Results: The researcher will disseminate the results of the research to any interested respondents by providing a link of DUT Open scholar to search the topic that was researched.

Research-related Injury: The nature of the study does not pose any risk of injury to the respondents.

Storage of all electronic and hard copies including tape recordings: The primary data will be stored in
the department in which the project is based. The intention of this is to ensure safety and integrity of the data
set. Electronic data sets will be adequate arrangements for back up.

Persons to contact in the Event of Any Problems or Queries: Please contact the researcher (tel no. 083 950 5746), my supervisor (email: drmagolar@yahoo.com) or the Institutional Research Ethics Administrator on 031 373 2375. Complaints can be reported to the Acting Director: Research and Postgraduate Support Prof K Motaung on TtiDirector@dut.ac.za

APPENDIX C: CONSENT FORM

CONSENT

Full Title of the Study: Determinants of participation of Msunduzi Local Municipality's peri-urban households in the digital finance economy

Names of Researcher/s: Nelisiwe Fortunate Nyide

Statement of Agreement to Participate in the Research Study:

I hereby confirm that I have been informed by the researcher, _Nelisiwe Fortunate Nyide, about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: _____,

- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

_____   _____   _____   _____

Full Name of Participant   Date   Time   Signature/Right Thumbprint

I, _Nelisiwe Nyide_ herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

_____   _____   _____
Full Name of Researcher   **Date**   **Signature**

_____   _____   _____
Full Name of Witness (If applicable)   **Date**   **Signature**

_____   _____   _____
Full Name of Legal Guardian (If applicable) Date   **Signature**

APPENDIX D: QUESTIONNAIRE (ENGLISH)

Please only cross out one answer (X)

1. Please select the township at which you reside

Imbali	Edendale
1	2

2. Please select your gender

Male	Female
1	2

3. Please indicate your age group

0 –18	18 – 25	26 – 33	34 – 41	42 – 49	50 or over
1	2	3	4	5	6

4. Please indicate your highest level of education

No Matric Certificate	Matric Certificate	Diploma	Honour's Degree	Master's Degree	PhD Degree
1	2	3	4	5	6

5. Please indicate if you have a bank account

Yes	No
1	2

6. Please indicate the type of your account

Savings	Cheque	Other (Please state which one)
1	2	3

7. Please indicate the bank you are currently using (you may tick more than 1 bank if you have accounts with several banks)

ABSA	CAPITEC	FNB	NEDBANK	STANDARD BANK	Other (Please state which one)
1	2	3	4	5	6

8. Please indicate if you own a smart phone

Yes	No
1	2

SECTION B – AWARENESS AND KNOWLEDGE OF DIGITAL FINANCIAL SERVICES

Definition of digital finance: These are financial services delivered through mobile phones, personal computers, the internet or cards linked to reliable digital payment system. Digital finance involves an

environment of technological infrastructure that enables individuals and companies to have access to payments, savings and credit facilities via the internet (online) without the need to visit a bank branch or without dealing directly with the financial services providers.

Please answer the following questions by placing a cross (X) to reflect your level of agreement to the statements.

Adoption of Digital Platforms (ADP)	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
I adopt the following platforms to access digital financial services					
ADP1. Mobile banking	1	2	3	4	5
ADP2. Internet banking	1	2	3	4	5
ADP3. Mobile money (cash send/e-wallet)	1	2	3	4	5
ADP4. ATM (money transfers and bill payments)	1	2	3	4	5
ADP5. Speed point machine	1	2	3	4	5

Awareness of Digital Financial Services (ADFS)		Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
ADFS1	I am familiar with the financial services that I can access using my mobile phone or computer	1	2	3	4	5
ADFS2	I am aware of the financial services offered by my bank that I can access using the ATM	1	2	3	4	5
ADFS3	I know how to apply for an overdraft from my bank using the internet (using my mobile phone or computer)	1	2	3	4	5
ADFS4	I know how to increase or decrease my overdraft limit using the internet (using my phone or computer).	1	2	3	4	5
ADFS5	I know how to pay my bills using an ATM	1	2	3	4	5
ADFS6	I am familiar with using a speed point machine when making payments and purchases	1	2	3	4	5
ADFS7	I know how to pay my bills using the online platforms (using my phone or computer)	1	2	3	4	5
ADFS8	I know how to send money to someone who does not have a bank account using a cash send facility or e-wallet	1	2	3	4	5

SECTION C – THE EXTENT OF PARTICIPATION OF PERI-URBAN HOUSEHOLDS IN DIGITAL FINANCE IN THE FINANCIAL SERVICES SECTOR

9. Please indicate the digital platform that is more convenient for you to participate in.

	Preferred Digital Platform (PDP)	Tick
1.	Internet banking using a personal computer	
2.	Mobile app using a cell phone	
3.	ATM	
4.	Bank card when buying at the local retailers	
5.	Telephone banking	

	Other (Indicate the platform)	
6.		

10. Please indicate the number of years you have been participating in digital finance platforms.

	Digital Platform Usage (DPU)	Tick
1.	Never been used	
2.	Less than 2 years	
3.	2-5 years	
4.	More than 5 years	

Please answer the following questions by placing a cross (X) to reflect the response that is more relevant to you. NB: Please refer to question 19 for clarity on the digital platforms that are under investigation.

1 = Never   2 = Rarely   3 = Sometimes   4 = Very often   5 = Always

Extent of Participation in Digital Financial Services (EPDFS)	Never	Rarely	Sometimes	Very often	Always
	1	2	3	4	5
EPDFS 1. How frequently do you use digital finance platforms to make mobile cash payments?	1	2	3	4	5
EPDFS 2. How frequently do you use digital finance platforms to receive money?	1	2	3	4	5
EPDFS 3. How frequently do you use digital finance platforms to pay bills such as electricity, clothing accounts, school fees, etc?	1	2	3	4	5
EPDFS 4. How often do you use digital finance platforms to make purchases at your local retailers?	1	2	3	4	5
EPDFS 5. How frequently do you use digital finance platforms to buy airtime?	1	2	3	4	5
EPDFS 6. How frequently do you use digital finance platforms to make savings?	1	2	3	4	5

SECTION D – FACTORS INFLUENCING THE PARTICIPATION OF PERI-URBAN HOUSEHOLDS IN IN THE FINANCIAL SERVICES SECTOR

Please answer the following questions by placing a cross (X) to reflect your level of agreement to the statements.

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

Digital infrastructure (DIF)					
11. The internet connectivity issues in my area make it difficult to access digital financial services.					
12. My mobile phone does not have the operating software system that supports access to digital financial services.					
13. The unavailability of ATMs in my area makes it difficult to utilise digital financial services.					
14. Shops in my area are not equipped with speed point machines and this makes it difficult to transect using a bank card					
Digital literacy (DLF)					
15. I find it challenging to operate a smart phone and this makes it difficult for me to access digital financial services					
16. I lack the ability to use a computer and this makes it difficult for me to have access to digital financial services that are offered by my bank					
17. I am unable to use an ATM on my own and this makes it difficult for me to access digital financial services					
Digital financial services provider (DFSP)					
18. My bank does not promote its digital financial services that I can access using my mobile device					
19. My bank does not encourage me to use its mobile application to access its services.					
20. My bank does not educate me on how to use their digital finance services.					
Security and costs (SCF)					
21. I find it unsafe to use ATMs in my area					
22. I find it unsafe to use the bank card when shopping in my neighbourhood					
23. I find it unsafe to use my mobile device when accessing digital financial services					
24. I find it costly to use my phone to access digital financial services					
25. I find it expensive to transact using my phone or computer.					
Voluntary factors (VF)					
26. Negativity surrounding online banking services discourages me from using this platform					
27. My religious convictions prohibit me from using online banking solutions					

APPENDIX E: QUESTIONNAIRE (ISIZULU)

UHLU LWEMIBUZO YOCWANINGO

Khetha impendulo eyodwa (X)

1. Khetha indawo ohlala kuyo kulezi

Imbali	Edendale
1	2

2. Sicela ukhethe ubulili

Owesilisa	Owesifazane
1	2

3. Sicela ukhethe ingxenye efaka iminyaka yakho yobudala kwelandelayo

0-18	18-25	26-33	34-41	42-49	50 kuya phezulu
1	2	3	4	5	6

4. Veza izinga lakho lemfundo

Awunawo uMatikuletsheni	Unesitifiketi sikaMatikuletsheni	Une Diploma	Iziqu ze Honours	Iziqu ze Masters	Iziqu zobu Dokotela
1	2	3	4	5	6

5. Kungabe unayo imininingwane (akhawunti) yasebhange?

Yebo	Cha
1	2

6. Chaza uhlobo lwemininingwane (akhawunti) yasebhange onayo

Uhlelo lokonga oluphansi	Uhlelo lokonga olusezingeni	Olunye (Luchaze)
1	2	3

7. Yisho ibhange olisebenzisayo kulawa alandelayo. Ungawakhetha wonke uma engaphezu kweyodwa

ABSA	CAPITEC	FNB	NEDBANK	STANDARD BANK	Olunye uhlelo uma lungekho kulawa abaliwe
1	2	3	4	5	6

8. Umakhalekhukhwini owusebenzisayo kungabe unazo ezobuchwepheshe? *(smartphone)*

Yebo	Cha
1	2

Incazelo yohlelo lwezezimali olusebenza ngezobuchwepheshe: Lezi izinhlelo zezimali ezisebenza ngomakhalekhukhwini ,amakhomputha, i-inthanethi noma amakhadi asebhange axhunywe ezinhlelweni zokukhokha ezisemthethweni. Lezi zingqalasizinda zobuchwepheshe zilekelela abantu noma izinkhampani zikwazi ukuthola izinhlelo zokukhokha nokukhokheleka, ukugcina imali, nemali mbholeko ngokusebenzisa i-inthanethi, ngaphandle kakuziyela mathupha ebhange noma ukuxhumana nezikhungo zezimali.

Sicela ukhethe okukodwa kokulandelayo uma sewuphendula kule ngxenye.

	Angivumelani Kakhulu	Angivumelani	Ngiphakathi nendawo	Ngiyavuma	Ngivumelana ngokweqile
	1	2	3	4	5
9.Ngisebenzisa le nkundla ukuze ngifinyelele kusevisi yezimali					
9.1 Ukubhanga ngomakhalekhukhwini					
9.2 Ukubhanga nge inthanethi					
9.3 Ukuthumela imali ngomakhalekhukhwini					
9.4 Ukuthumela imali nokukhokhela izindlelo zenyanga ngomshini wasebhange (ATM)					
9.5 Umshini wokukhokha ngokushesha (Speed point)					

	Angivumelani kakhulu	Angivumelani	Ngiphakathi nendawo	Ngiyavumelana	Ngiyavumelana ngokwequile
	1	2	3	4	5
10. Ngiyazazi izinkundla zezimali engingakwazi ukufinyelela kuzo ngisebenzisa iselula yami Noma ikhompuyutha					
11. Ngiyazi ngezinhlelo (services) zezimali ezihlinzekwa yibhange lami engingakwazi ukufinyelela kuzo ngisebenzisa i ATM.					
12. Ngiyazi ukuthi ngingasifaka kanjani isicelo sensizakalo yesikweletu njenge					

(ovadraft, imali-mboleko yomuntu siqu kanye nekhadi lesikweletu ebhange lami ngisebenzisa umakhalekhukhwini wami noma ikhompuyutha.					
13. Ngiyazi ukuthi ngingenza kanjani ukunyusa noma ukunciphisa umkhawulo wemali lapho ngisebenzisa iselula yami noma i- inthanethi.					
14. Ngiyakwazi ukukhokha izikweletu zami ngisebenzisa i- ATM.					
15. Ngijwayele ukusebenzisa umshini ophuthumayo lapho ngikhokha noma ngithenga.					
16. Ngiyakwazi ukukhokha izikweletu zami ngokusebenzisa izinhlelo eziku- inthanethi ngisebenzisa iselula yami noma ikhompuyutha.					
17. Ngiyakwazi ukuthumela imali kumuntu ongenayo i-akhawunti yasebange ngokusebenzisa indlela yokuthumela ukheshi esheshayo kumakhalekhukhwini.					

INGXENYE C – IZINGA LOKUBAMBA IQHAZA KWEMINDENI ESEDUZE NEDOLOBHA KWEZEZIMALI NGOKUSEBENZISA EZOBUCHWEPHESHE EMKHAKHENI WEZINSIZAKALO ZEZEZIMALI

18. Sicela ukhombise inkundla yezobuchwepheshe ekulungele kangcono ukuthi ubambe iqhaza.

	Inkundla yezobuchwepheshe	**Maka**
1.	Ukubhanga nge-inthanethi usebenzise ikhompuyutha yakho ngqo.	
2.	Uhlelo lokubhanga usebenzisa umakhalekhukhwini	
3.	I-ATM	
4.	Ikhadi lasebhange lapho uthenga ezitolo zendawo.	
5.	Ukubhanga ngocingo	
6.	Ingxoxo yasebhange	
7.	Olunye uhlobo olusebenzisayo (*luchaze*)	

19. Sicela uveze inani leminyaka ubambe iqhaza ezinkundleni zezimali zobuchwepheshe (*dijithali).*

	Izinkundla zobuchwepheshe/(dijithali)	**Maka**
1.	Angikaze ngiyisebenzise	
2.	Ngaphansi kweminyaka emibili	

3.	Iminyaka emibili kuya kwemihlanu	
4.	Kungaphezu keminyaka emihlanu	

**Sicela uphendule ngokufaka isiphambano ukukhombisa impendulo ehambisana ngqo nawe.
Okusemqoka: Sicela ubuke umbuzo 19 ukuze uqondisise ngalezo zinkundla zobuchwepheshe
(dijithal) okuphenywa ngazo.**

1 = Angikaze   2 = Akuvamile   3 = Ngezinye Izikhathi   4 = Ngokujwayelekile   5 = Njalo

	Angikaze	Akuvamile	Ngezinye Izikahthi	Ngokujwayelekile	Njalo
	1	**2**	**3**	**4**	**5**
20. Uzisebenzisa kangakanani izinkundla zobuchwepheshe zezimali(dijithali) ukukhokha ngeselula noma ukuthumela imali?					
21. Uzisebenzisa kangakanani izinkundla zobuchwepheshe zezimali ukwamukela imali?					
22. Uzisebenzisa kangakanani izinkudla zobuchwepheshe zezimali ukukhokhela izindleko kanye nezikweletu zakho zanyanga zonke njengokukhokhela izitolo zezingubo kanye nemali yesikole?					
23. Uzisebenzisa kangakanani izinkundla zobuchwepheshe zezimali ukuthenga ezitolo zasendaweni yangakini?					
24. Uzisebenzisa kangakanani izinkundla zobuchwepheshe zezimali ukuthenga i-ethayimi?					
25. Uzisebenzisa kangakanani izinkundla zobuchwepheshe zeziimali ohlelweni lokonga imali yakho?					

**INGXENYE D – IZIMO EZINOMTHELELA EKUBAMBENI IQHAZA KWEMINDENI EHLALA
EDUZE NEDOLOBHA EMKHAKHENI WEZINSIZAKALO ZEZEZIMALI**

**Sicela uphendule le mibuzo elandayo ngokufaka isiphambano lapho uvumelana khona
nesitatimende.**

	Angibumelani kakhulu	Angivumelani	Ngiphakathi nendwo	Ngiyavumelana	Ngiyavumelana ngokweqile
	1	**2**	**3**	**4**	**5**
INGQALASIZINDA YEZOBUCHWEPHESHE (DIGITAL)					
26. Ukungadonsi kahle kwe-inthanethi endaweni engihlala kuyo kwenza kube nzima ukusebenzisa uhlelo lwezobuchwepheshe lezimali.					
27. Umakhalekhukhwini wami awunazo ezobuchwepheshe obulungele ukusebenzisa lezi zinhlelo.					
28. Ukungabikhona kwemishini yokukhipha imali endaweni yangakithi kwenza kube nzima ukusebenzisa lezi zinhlelo zobuchwepheshe.					
29. Izitolo zasendaweni yangakithi azinayo imishini yemali kanye nezinhlelo zokusebenzisa amakhadi asemabhange.					
UKUFUNDISEKA/ULWAZI LWEZOBUCHWEPHESHE (DIJITHALI)					
30. Ngikuthola kunzima ukusebenzisa iselula yesimanjemanje ukungena ezinhlelweni zobuchwepheshe bezimali.					
31. Anginalo ulwazi olwanele lokusebenzisa ikhompuyutha, lokho kwenza ngingakwazi ukufinyelela ezinkundleni zobuchwepheshe bezezimali ezinikezwa yibhange lami.					
32. Angikwazi ukusebenzisa umshini wemali (ATM) ngaphandle kosizo. Lokhu kwenza kube nzima ukufinyelela kwezobuchwepheshe bezimali.					
UMHLINZEKI WEZINSIZAKALO ZEZEZIMALI ZOBUCHWEPHESHE (DIJITHALI)					
33. Ibhange lami alikhuthazi izinhlelo zalo zezezimali zobuchwepheshe engingakwazi ukufinyelela ngisebenzisa uhlelo lwami lweselula.					
34. Ibhange lami alingikhuthazi ukuthi ngisebenzise uhlelo lwayo lweselula ukuze					

ngifinyelele izinsiza zalo.	111				
35. Ibhange lami alingifundisi ukuthi ngingasebenzisa kanjani izinsiza zabo zezimalo zobuchwepheshe (dijithali).					
UKUPHEPHA KANYE NEZINDLEKO.					
36. Ngikuthola kungaphephile ukusebenzisa umshini wemali (ATM) endaweni yangakithi,					
37. Ngikuthola kungaphephile ukusebenzisa ikhadi lami lasebhange ezitolo zangakithi.					
38. Ngikuthola kungaphephile ukusebenzisa iselula yami lapho ngifinyelela kwizinsiza zobuchwepheshe zezimali.					
39. Ngikuthola kubiza ukusebenzisaiselula yami noma ikhompuyutha ukufinyelela kwizinhlelo zobuchwepheshe bezezimali.					
40. Ngikuthola kubiza ukwenza izinhlelo zokubhanga ngisebenzisa iselula noma ikhompuyutha yami.					
IMIGOMO YOKUZITHANDELA/ UKUZIKHETHELA					
41. Ukusabalala kwezindaba ezingezinhle ngokubhanga ngohlelo lwezobuchwepheshe ziyangidikibalisa ekusebenziseni le nkundla.					
42. Inqubo yeNkolo yami iyangivimbela ekusebenziseni izinhlelo zokubhanga nge-inthanethi.					

APPENDIX F: DECLARATION OF PROFESSIONAL EDITING

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6 December 2023

DECLARATION OF PROFESSIONAL EDITING

This is to certify that the dissertation written by **Nelisiwe Nyide** and entitled:

DETERMINANTS OF PARTICIPATION OF MSUNDUZI LOCAL MUNICIPALITY'S PERI-URBAN HOUSEHOLDS IN THE DIGITAL FINANCE ECONOMY

was copy edited for:

- Layout
- Pagination
- Formatting and numbering of headings, tables and figures
- Spelling, punctuation and grammar
- Language usage, style and consistency

A reconciliation of citations and the accompanying reference list was undertaken.

The author of the dissertation was provided with suggested corrections/amendments which required action.

The author is responsible for implementing the suggested corrections/amendments in the final copy submitted for examination purposes.

John Goodier
Copy Editor

APPENDIX G: TURNITIN REPORT

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