



Business & Social Science  
IJRBS

## Research in Business & Social Science

IJRBS VOL 14 NO 2 (2025) ISSN: 2147-4478

Available online at [www.ssbfn.net](http://www.ssbfn.net)

Journal homepage: <https://www.ssbfn.net/ojs/index.php/ijrbs>

# Influence of demographics on drivers of, and preference for, digital personal banking in South Africa



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### ARTICLE INFO

#### Article history:

Received 12 Dec 2024

Received in rev. form 20 Jan 2025

Accepted 05 Feb 2025

#### Keywords:

Digital banking; e-banking; online banking; personal banking; adoption; demographics; age; gender; education; income; consumer perceptions; South Africa.

#### JEL Classification:

G21, L86, M31, O33

### ABSTRACT

*This paper evaluates how the perceptions of consumers from different demographic backgrounds influence their adoption and use of digital personal banking, and suggests marketing activities required to increase digital banking by these different demographic target groups. The method involved an online survey of a sample of 400 respondents with bank accounts in the iLembe district of KwaZulu-Natal, South Africa, focusing on the demographic dimensions of age, gender, education and income. The study found that high digital banking users were older (24+), with higher education and a higher income, while low digital banking users were younger (18-23), with a lower level of education and a lower income. No differences according to gender were found. The convenience of digital banking and a good online banking experience were the factors that most encouraged digital banking use by high users, while perceptions of high cost and having low control over their online banking activities were factors that discouraged low users from more digital banking use. These findings confirmed the previous research about the influence of age and education on digital banking use, but contributed new knowledge about the influence of income, and the lack of influence of gender, on digital banking adoption and use. Comprehensive recommendations for banks, policy makers and other stakeholders are provided.*

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## Introduction

In the battle for market share in the personal banking market, traditional commercial banks face competition from financial technology (fintech) companies who have not traditionally been in the personal banking business. Harchekar (2018) and Matlala (2024) maintain that until recently banks did not envision the shifts in consumer behaviour that arose as a result of the millennial generation, who have a greater tendency to adopt financial technology (Faridi et al., 2024; Hosen et al., 2023) and are now the largest consumers of financial products. These “millennials” (also known as Generation Y) tend to use more advanced technology than prior generations (Garcia et al., 2018; Kotz, 2016; Mgiba and Shulka, 2024; Pyoria et al., 2017) and are considered to be ‘early adopters’ (Benckendorff et al., 2014; Femenia-Serra et al., 2018; Rizwa and Prayogi, 2023). Companies such as banks adopt newer technologies (such as digital banking) to improve competitiveness (Dwivedi et al., 2021; Yongjie, 2023), marketing them to these ‘early adopters’, with the new technology eventually spreading to the entire population.

In South Africa, the banking sector is moving towards a “marketplace without boundaries” (Camarate and Maritz, 2018: 1). Banks such as TymeBank (a wholly digital bank owned by an investment company) and Discovery Bank (a wholly digital bank owned by Discovery which operates primarily in the medical aid/insurance market) are offering traditional banking-related activities like cheque and savings accounts, cashless payments, lending, deposits, debit and credit cards (Nel and Boshoff, 2021). To combat this

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competition, traditional banks have begun investing in their own fintech projects, allowing for a renewal of banking systems that has seen improvements in online payments, e-banking, e-commerce, financing and increased focus on online safety.

Digital banking (also known as mobile banking, e-commerce, self-service banking) has created opportunities for attracting new business from both new and existing customers, from wider geographic markets, and from new target segments (Ali, 2023; Zamir, 2019). Designing specific products and services for identifiable groups of clients is key to modern bank marketing (Aghaei, 2021; Bach et al., 2013; Kabuoh, 2017). Segmenting the market and identifying specific groups of clients requires an understanding of the client demographics. This is especially true for the digital banking market as age clearly plays a role – the younger generations are more attracted to the use of digital technology (Beaven, 2014; Linnes and Metcalf, 2017; Venter, 2017; Yalcin-Incik and Incik, 2022), while elderly people are less comfortable with the use of digital technology (Gertze and Petersen, 2024; Msweli and Mawela, 2020). Another example is education, which, according to Gertze and Petersen (2024) and Sheeba and Goathi (2020), has a significant influence on the adoption of digital banking, while Ameme (2015) maintains that marketing should be targeted towards the educated, as the less educated, or those with no education, may not be able to operate computers and technology confidently. Furthermore, Gertze and Petersen (2024) suggest that low income should be considered as a factor in the lack of adoption of digital banking due to trust and accessibility factors, while Nel and Boschhoff (2023) maintain that gender plays a key role in perceptions about service levels, especially in banking.

Generally, the literature makes mention of demographic factors in relation to digital banking adoption only as incidental issues, with insufficient attention being given to the potential major role of demographics. In other words, the effect of demographics and demographic inequalities on such adoption has not been adequately identified, other than the obvious point that older customers are more nervous in the use of technology and thus are more reluctant to adopt digital banking (Ramsundra and Mason, 2023). Thus, there is a significant gap in the knowledge about the role of demographics on the adoption of digital banking, which this study attempts to address.

Therefore, this study attempted to close this knowledge gap by effectively evaluating how the perceptions of consumers from different demographic backgrounds directly impact their use of digital personal banking, and to identify what is required to market digital banking to these different demographic groups.

Previous international studies, such as by Harchekar (2018), Thorkelsson (2017), and Murrar et al. (2023), have identified reasons behind the growth and use of digital personal banking in robust and thriving economies. These reasons include the increasing use of smartphones, initiatives to encourage the opening of bank accounts for previously un-banked individuals, increased automation and capacity of key banking services, and a focus on customer value creation. However, despite the growth of digital banking in South Africa, there is still little literature on the adoption and use of digital banking in South Africa (Ajigini and Chinamasa, 2023; de Jager et al., 2023; Gertze and Petersen, 2024). Understanding this adoption and use is critical for bank marketers in a growing, but unstable, economy like South Africa's, which despite recent improvements still consists of significant demographic inequalities (StatsSA, 2024). How these demographic differences affect the use of digital personal banking has not been fully addressed in extant literature (Ramsundra and Mason, 2024) despite the importance of demographic factors in understanding digital banking behaviour (Ayikwa et al., 2022). Because of calls for more demographic research from many researchers (for example, Nel and Boschhoff (2014) a decade ago, and more recently from Nguyen et al. (2020)), this study has attempted to resolve this research problem by evaluating how the perceptions of consumers from different demographic backgrounds impact their acceptance and use of digital personal banking, and to identify what is required to market digital banking most effectively to these different demographic groups.

To guide the research into this problem, three objectives were developed:

- i. To identify the target segment, defined according to demographics, which has the highest, and which target segment has the lowest, preference for digital banking
- ii. To identify the factors that influence preference for digital banking for each of the target segments
- iii. To make recommendations for bank marketing practitioners as to the actions needed for those clients with a low preference for digital banking to start to use it, or to use it more, and to encourage those clients with a current high preference for digital banking to use it more frequently and more intensively.

## Literature Review

### Digital banking

The development of the digital world via the Internet and mobile technology is one of the most important drivers of the fourth industrial revolution (Lee et al., 2018; Nesindande et al., 2024). In the banking world these advancements have enabled businesses, via e-commerce, to expand market reach, improve relationships and offer more products and services, thereby improving customer service. e-Commerce can be business-to-business, business-to-customer or customer-to-customer (Azeem et al., 2015; Jiang and Murmann, 2022). Banks tend to focus on business-to-consumer, which incorporates e-banking, which, in addition to Automatic Teller Machines (ATMs), Electronic Funds Transfer (EFT) and direct deposits, incorporates digital banking (Azeem et al., 2015; Paun et al., 2024). Advancements in technology have positively impacted digital banking (Fatonah et al., 2018; Havasi et al., 2013;

Nesindande et al., 2024) resulting in considerable growth in the 2010's decade. Furthermore, the 21st century has seen the use of mobile devices increase dramatically (Adamczewska-Chmiel et al., 2022; Carbonell et al., 2013), and the resulting use of smartphones and the Internet have significantly influenced banking behaviour. New ideas and methods of banking have allowed banks to seamlessly offer new products and services, many of which comprise the 'digitization of banking' (Ajibade and Mutula, 2020; Lauren, 2022; Ohene-Afoakwa and Nyanhongo, 2017). Although South Africa is considered a developing country, its banks have exceeded many European countries in the development and implementation of digital banking (Romagny, 2024) and have received international awards for their banking technology and innovation (De Jager et al., 2023). Based on this understanding of digital banking, for the purposes of this paper, we accept the definition of Nguyen et al. (2020, p. 681), namely "a technology-based operating model for exchanging information and carrying out transactions between banks and customers. Instead of generating transactions in the traditional way (i.e., face-to-face transactions), customers and banks can interact with each other by electronic devices such as smartphones, tablets and Internet web applications."

### **Constructs influencing adoption of digital banking**

Previous studies have provided reasons behind the growth and use of digital banking mostly in developed and thriving economies (see for example Acosta-Prado et al., 2024; Harchekar, 2018; Torkelsson, 2017). Such reasons have been found to include the growth in use of smartphones, initiatives to promote and open bank accounts for previously un-banked individuals, growth in automation and capacity of banking services, and the focus on value creation. Most of these identified factors tend to be internal to the banking corporations rather than to the consumers (Ajigini and Chinamasa, 2023). Furthermore, studies in more unstable, developing, but growing, economies have been minimal. Many developing economies, such as South Africa's, have significant demographic inequalities (StatsSA, 2016; StatsSA, 2022) that have not been researched with regard to how digital banking is contributing to consumer perceptions of, and satisfaction with (or a lack thereof), banking services, nor how these demographic inequalities are affecting the use of digitized personal banking. Recent research by Ramsundra and Mason (2023) and Ramsundra and Mason (2024) have identified the main factors driving the preference for, and use of, digital banking in South Africa via a regression model that explains nearly a third of the variance in the 'usage of digital banking' ( $r^2 = 0.29$ ). Extant literature covering these factors are now discussed briefly.

#### **Convenience**

Convenience is a core feature of digital banking (Chitungo and Munongo, 2013; Dhanalakshmi, 2019; Kornitasari et al., 2024), which provides a nearly full line of services without having to visit a bank branch. This saves travel time and cost and the inconvenience of queues and lengthy paperwork in the branch (Chigada and Hirschfelder, 2017; Mosteanu et al., 2020). It also enables consumers to bank outside of normal office hours and to conduct some business without extra charges, which was confirmed for South Africa by Cele and Mlitwa (2024) for both urban and rural areas. Gertze and Petersen (2024) found digital banking in South Africa to be convenient, which contributed to the use of digital banking. Since most banks offer the same basic digital banking services, i.e., payments, checking balances or transferring funds, all banks also have other unique services or products to differentiate their offerings from their competitors. According to Revathi (2019), in such monopolistic competitive environments digital banking is beneficial to clients as they are easily able to change banks for more perceived convenience. Convenience was found by Ramsundra and Mason (2024) to be an important factor encouraging use of digital banking in South Africa but was only ranked fifth among the eight factors considered.

#### **Practical quality**

The practical ability to use internet banking is not easily achieved as consumers need to internalize new perceptions and feelings about their banking activities (Durmaz and Efendioglu, 2016; Kornitasari et al., 2024). Users need time to familiarize themselves with the computer applications before deciding to adopt digital banking. This means that banks need to understand the process and difficulties that their clients go through when trying to access digital banking. Cele and Mlitwa (2024) confirmed this for South African digital banking, while Geetze and Petersen (2024) found that digital banking in South Africa was clear, easy to use and straightforward. Although Ramsundra and Mason (2024) found practical quality to have a positive effect on digital banking, it was low and only the fourth most important influencing factor.

#### **Branch service quality**

Consumer-to-employee interaction has decreased with the growth of automated banking (starting with ATMs), which provides a core service at a lesser cost. Such impersonal service lacks the human and social interaction that many customers seek when shopping, and especially when banking. Uddin et al. (2014) suggests that clients seek companies whose staff are attentive and friendly, thus developing positive perceptions about the service quality received. Johnston and Kong (2011) and Levy (2022) maintain that service encounters enable companies to build emotional connections with customers. Trust is critical in digital banking because such emotional connections are more difficult to build digitally than with staff in the branch (Bigne and Blesa, 2003; Lee and Turban, 2001; Mbama and Ezepeue, 2018). Personal interaction helps to build trust, which suggests the importance of branch service quality. Ramsundra and Mason (2024) found that branch service quality was the most important factor, having a negative correlation with digital banking use, i.e., if branch service quality is poor, consumers will be encouraged to migrate to digital banking. In this sense, branch service quality can be a critical driver of digital banking use

### Usability

Since the time-consuming nature of having to be physically present in the bank is one of the disadvantages of traditional banking (Pankomera and Greunen, 2018), ease of use has a positive effect on intention to use digital banking (Khrais, 2017; Martínez-Navalón et al., 2023; Selvanathan et al., 2016). Furthermore, Bidarra et al. (2013), Harahap (2023) and Pankomera and Greunen (2018) found that perceived usefulness or intention to use correlates with the actual usage of online banking. Cele and Mlitwa (2024) found that facilitating conditions which simplify use are key to adoption of digital banking, especially due to the developing nature of the South African economy. Ramsundra and Mason (2024) found that useability is the third most important factors driving digital banking in South Africa,

### Safety

Withdrawing, depositing or carrying cash can be dangerous to consumers, with cashless societies experiencing a reduction of robberies and theft at cash machines and other public spaces (Khando et al., 2022; Ordu and Anyanwakoro, 2016; Parmar, 2018). Lakshmi and Kavitha (2020) stress that safety is a significant factor influencing positive perceptions about digital banking. However, there are disadvantages to cashless transactions. For example, identity theft is higher in cashless transactions (Deora, 2018), as is cybercrime where people's bank accounts, savings, and credit cards are used without their consent (Abbas, 2017; Kirobo et al., 2022). Cashless transactions are also inconvenient for the informal economy, which mostly depends on cash transactions. Furthermore, people in countries with high unemployment and inequality (such as South Africa) tend to rather use physical cash (Jumba and Wepukhulu, 2019). The findings of Ramsundra and Mason (2024) showed safety to be the least important factor influencing digital banking use, suggesting that customers may not fully understand the safety issues. This obviously places more responsibility on the banks to ensure safe banking procedures.

### Online service quality

Satisfaction with online banking services is influenced by the experience a consumer has with each banking e-service (Raza et al., 2020). In South Africa, Gertze and Petersen (2024) found some dissatisfaction with online customer service, which they also found to be influential in digital banking use. The service characteristics of intangibility, heterogeneity, inseparability, and perishability (Moeller, 2010) are critical to the digital banking experience. Even though quick, innovative and technologically advanced online banking is an intangible service that cannot be examined or used before purchase (Moon and Lee, 2015) - online banking cannot be 'tried' without committing to purchase it. Services, like banking, which require higher rates of personal face-to-face interactions show more relational advantages to clients than services that require less face-to-face interactions (Srihadi and Setiawan, 2015). This is a further disadvantage of digital banking. Service production and consumption are usually inseparable as they happen simultaneously (Hoffman and Bateson, 2011). A long known advantage of digital banking is that banks can decrease the degree of inseparability by making much of the procedure 'self-service' by the clients themselves (Jaw et al., 2010), but then the bank must also provide excellent technical and non-technical support (Abeka et al., 2012; Probojakti, 2025). The perishability of services is minimized by digital banking by not having to be conducted at a specific time or place and thus eliminating the waiting time often prevalent at a bank branch (Lovelock and Wirtz, 2011). Perishability is a critical service issue (Bhasin, 2017) that is thus avoided by digital banking. Ramsundra and Mason (2024) identified online service quality as the second most important factor influencing digital banking experience. Furthermore, it is the most important positive influencing factor, after the negative relationship of branch service quality, confirming its importance as a key driver of digital banking use.

### Risk

Breach of privacy can impact digital banking and thus clients' intention to adopt digital banking. Such breaches include fraud and hacking, the sharing of private and confidential information with third parties, and the inappropriate recording of details like mobile phone numbers and addresses (Menon, 2019). Bigne and Blesa (2003), Lee and Turban (2001) and Mbama and Ezepue (2018) highlight the risks involved in digital banking and the importance of trust because of the differing natures of digital versus in-person transactions. For instance, in traditional branch banking, client documents are confidential and are not accessible by third parties. With online banking, a client may need to submit confidential documents through an online channel (such as email), which could, through cyber hacking, breach a client's privacy. Both Cele and Mlitwa (2024) and Gertze and Petersen (2024) found that perceived risk and trust were influential in the use of digital banking in South Africa. A low correlation and a low non-significant relationship with digital banking use was found by Ramsundra and Mason (2024), indicating that perceived risk has the lowest influence of digital banking use. This disconnect between the findings of Ramsundra and Mason (2024) and those of most of the previous research is possibly because few studies have considered the growth and use of advanced security features available on today's smartphones and on today's online banking channels, which probably make clients more confident about their security.

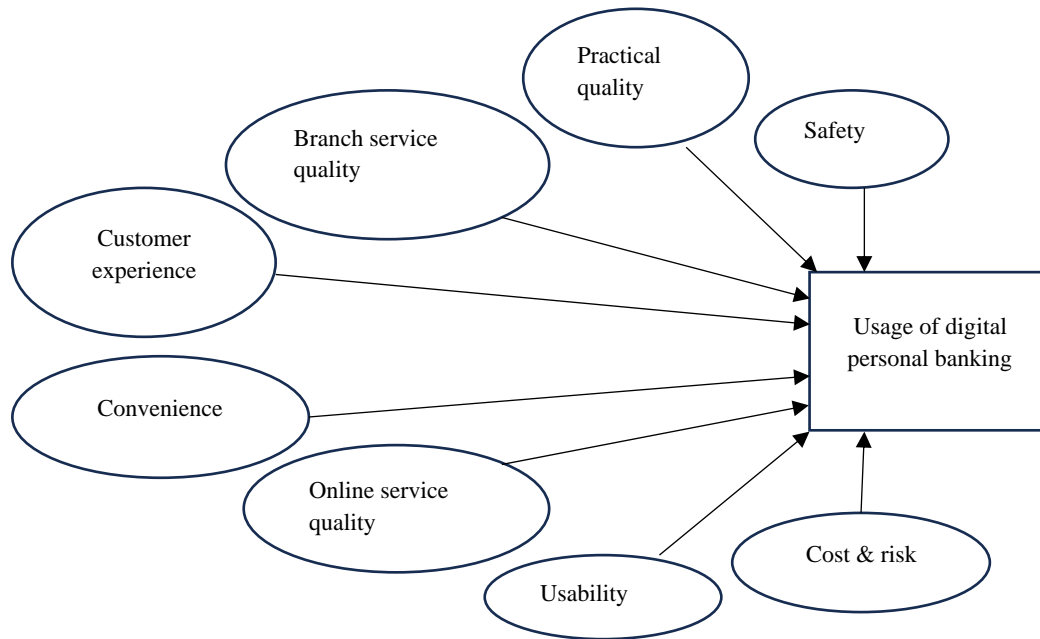
### Consumer experience

Customers today expect a positive purchase experience. They are more aware of products and services, often due to online searches, and are more financially cautious. Thus, they expect not only excellent service but also excellent value, which combine with other factors to provide a positive experience. In providing a service encounter the bank engages in emotional connections (Johnston and Kong, 2011; Levy and Hino, 2016), and thus builds relationships with customers. If banks wish to encourage more clients to bank digitally, they must ensure positive experiences from every online banking visit. Walls et al. (2011) maintain that customers seek

consumption experiences to create memorable moments. Such experiences deliver additional advantages to the bank, such as increased customer satisfaction, brand loyalty, repurchase, and positive word-of-mouth about the service used (McColl et al., 2015). Since it is banks, not the clients, who are driving the technology-based, cost-efficient, digital banking service by pushing clients towards digital banking (Reddy and Reinartz, 2017), it is essential that they provide an excellent digital experience. Ramsundra and Mason (2024) found a relatively high correlation between customer experience and digital banking use. This construct was the third most important driver of the preference for digital banking.

### Summary

The literature reviewed above confirms the varying importance of the identified constructs (Ramsundra and Mason, 2024), which are summarized in the research framework in Figure 1. These influencing constructs are therefore considered as the possible factors that may influence preference for digital banking for each of the target segments in order to meet Objective 2.



**Figure 1:** Summary of research constructs influencing digital banking use; *Source:* Ramsundra and Mason, 2024.

### Demographics and digital banking

As mentioned in the introduction to this paper, demographics are believed to play an important role in the adoption and use of digital banking – for example, Sharma et al. (2015) and Guerra-Leal (2023) found that demographics were a predictor of digital banking adoption. Although various demographic categories are mentioned in the literature (for example, marital status and occupation), from our study of the literature, age, gender, education and income appear to be the most relevant to digital banking in South Africa and so only these are included in our study.

#### Age

Research via hierarchical regression in India has shown that age has a significant influence on adoption of digital banking, with those over 24 years of age being likely to adopt digital banking (Ali, 2023), with age also being found to be a predictor in Oman via a combined neural network and regression model (Sharma et al. (2015). Research in Nepal showed that age influences awareness levels of internet banking, with those older being less aware of internet banking services (Ranabhat et al., 2023). However, an East African study of corporate customers found that older users with more general banking experience were more confident and required less technical support (Jagero and Abeka, 2011). In Nigeria, Otei et al. (2024) also found that younger customers are more inclined towards internet banking, but that age does not influence adoption. However, their findings were not statistically significant. Thus, regarding developing countries globally, it appears that age can be said to have an influence on adoption and use of digital banking.

Research in South Africa has similarly found that attitudes to, and use of, digital banking differs according to age. For example, Aguidissou et al. (2017) identified positive relationships with internet banking adoption and Mujinga (2024) found that younger users are more critical of online systems, demanding a higher level of useability. Ayikwa et al. (2022) found a significant difference in intention to use, and propensity to adopt, e-banking between Generations Y and Z, while Garekwe et al. (2024) found younger clients to be more optimistic about technological innovations like digital banking. More specifically, Ramlall et al. (2020) also found age to

be important, with older customers (Baby Boomers) having higher levels of trust and perceived usefulness, secureness and control in digital banking intention.

Thus, from both international and local findings, it is confirmed that age is a potentially important variable for our study.

#### Gender

Research on the influence of gender on digital banking appears to have provided mixed results internationally. A literature review on research into e-banking in Finland, Brazil, India, Malaysia, Taiwan and New Zealand by Goswami and Dutta (2015) found that half the studies showed that gender had a significant influence on use of mobile or Internet banking, with males more likely to adopt digital banking. Statistically significant findings from a study into East African corporate customers show that female customers found that internet banking was easy to use and that technical support from the bank was very important but found the opposite for men (Jagero and Abeka, 2011). However, the remainder of the studies showed either no significant relationship between gender and digital banking use or only showed an influence on certain digital banking constructs, e.g., perceived privacy and performance expectancy. This uncertainly is supported by another study in India that found no statistical significance for the effect of gender on mobile banking adoption (Tamilselvi and Balaji, 2019). However, a more recent study in India using hierarchical regression found to the contrary, namely that gender is a strong predictor of adoption of digital banking with a positive and significant influence, indicating that males are one-and-a-half times more likely to adopt digital banking than females (Ali, 2023).

Regarding research into adoption of digital banking in South Africa, most authors have found positive correlations amongst demographics. Aguidissou et al. (2017) found a positive relationship between gender and (internet banking adoption, while Ramlall et al. (2020) found that the gender of older clients (Baby boomers) had a significant influence on trust and perceived usefulness, secureness and control of digital banking, Ayikwe et al. (2022) found a statistically significant difference for gender in intention to use, and adoption of, e-banking. Their research showed that males used e-banking more for money transfer, savings accounts and deposits, and to top up digital money more than females, who were more affected by social influence and subjective norms regarding use of digital banking. Mujinga (2024) found a significant different between male and female ratings of digital banking authentication systems, while Nel and Boshoff (2022) found that gender influences adoption of digital banking through the influence of satisfaction with existing bank, which they found to be greater with males. As with the international literature, there was an indication of contrary findings; for example, with no correlation being shown for the effect of gender on customers' preparedness to use artificial intelligence in digital banking.

#### Education

Internationally, the literature indicates that education plays a significant role in predicting the adoption and use of digital banking. Ali (2023), in India, found a positive, significant correlation between digital banking and a higher education level. Furthermore, regression analysis showed that those with secondary education or higher were 1.23 times more likely to adopt digital banking. Although not statistically significant, the findings of Otei et al. (2024) in Nigeria and Jagero and Abeka (2011) in East Africa were indicative of more highly educated clients being more likely to adopt e-banking services. Ranabhat et al. (2023), however, did find significant results in their research in Nepal. They found that level of education influences the following factors relevant to adoption of digital banking: awareness levels, access to the Internet, attitudes toward digital banking cost-savings, and perceptions of ease of use and assistance from the bank. Overall, they found education to be a major influencer in the adoption of digital banking.

Most South African literature supports the international findings, although Garekwe et al. (2024) did not find a statistically significant correlation between education and customers readiness to adopt artificial intelligence in digital banking. This might currently be a step too far for many customers, who might be satisfied with standard digital banking. Both Aguidissou et al. (2017) and Mabuza (2023), for example, found that education was a key predictive factor in influencing clients to adopt and use digital banking, as did Ayikwa et al. (2022), who found a significant difference between education levels regarding what e-banking is used for (e.g., transferring money) and adoption attributes (e.g., social influence). They also found that medium educated clients were more likely to adopt digital banking, while higher educated clients were more hesitant as they tended to worry more about security and trust. A worrying factor is that, considering that Schmidt et al. (2017) found that entrepreneurs and small business owners/managers generally had poor financial literacy, it is likely that banks' personal customers are even more poorly financially educated.

#### Income

Income has been shown to be a significant predictor of adoption of Internet banking in some international literature. For example, Ali (2023) found positive, significant correlations between digital banking use and households in the two highest income quartiles, with regression analysis indicating that individuals with household income at the middle and higher levels are nearly twice as likely to use digital banking services. This finding was supported by Ranabhat et al. (2023) who found that monthly family income was a major factor affecting perceptions toward the use of Internet banking. Furthermore, they also found that such economic levels affected awareness levels, attitudes toward the cost-saving, and the perception of ease of use, of digital banking.

The South African literature seems to be consistent in showing a positive relationship between socio-economic status, measured in our study as household income, and digital banking. For example, Aguidissou et al. (2017) identified a positive relationship of income with Internet banking adoption and Mabuza (2023) found that low disposable income significantly affects the adoption of digital

banking services. Garekwe et al. (2024) showed that an increase in income level is associated with an increase in technological readiness, which is required for digital banking adoption. This implies that higher-earning customers are more receptive to, and thus more likely to adopt and use, digital banking.

### Summary of demographics and digital banking

This brief discussion of extant literature, both international and South African, indicates that, although there is some disagreement, there is sufficient evidence to warrant a deeper investigation into the influence of certain demographic factors (gender, age, education, income) on the constructs that encourage, or discourage adoption and use of digital banking. The literature is mostly focussed on these factors, with very little on other demographic factors such as occupation, marital status, urban/rural location, household size or family status. Therefore, the study focuses on the influence of those four main demographic factors to achieve Objective 1. The framework of possible relationships, identified from the literature, and upon which Objectives 1 and 2 are focused, is illustrated in Figure 2. Note that Objective 3 is addressed in the ‘Identification of target groups for marketing activities’, the ‘Identification of factors influencing the identified target groups’ and the ‘Recommendations’ parts of this paper and requires the prior achievement of Objectives 1 and 2.

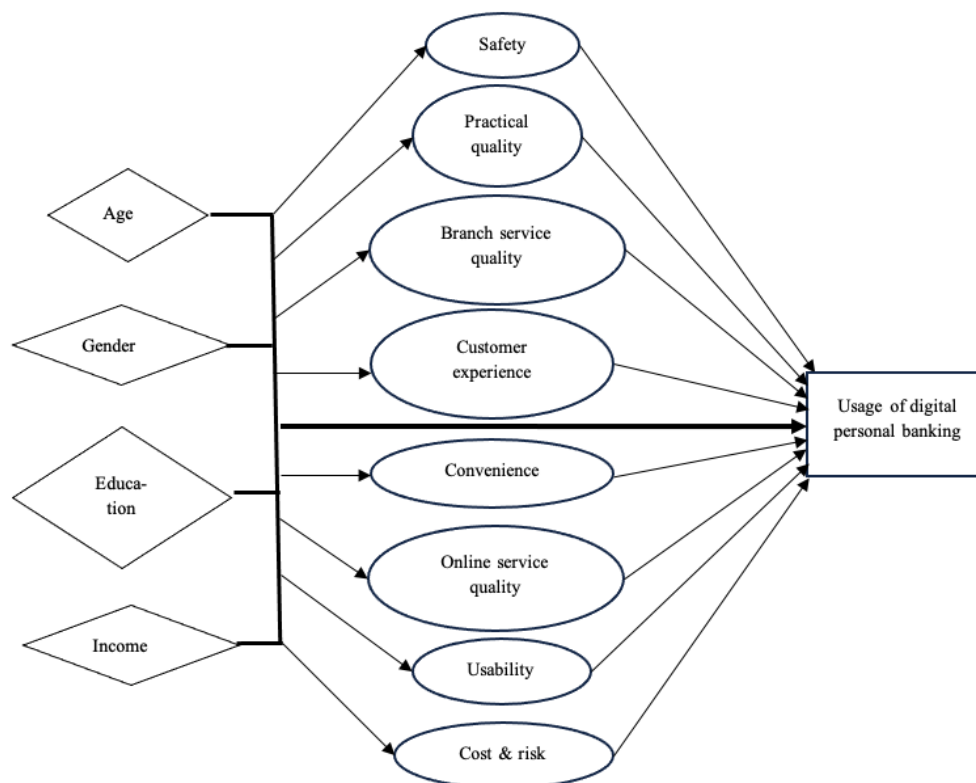


Figure 2: Framework - demographics, influencing constructs and digital banking

## Research and Methodology

### Research design

This paper reports on a follow up analysis of collected data not discussed in previous papers (Ramsundra and Mason, 2023; 2024), which identified the constructs influencing digital personal banking. Therefore, the methods used in the two papers are similar. The study used an inductive approach (Msosa, 2017), via a cross sectional quantitative survey of the opinions of a sample from the iLembe district in KwaZulu-Natal, South Africa. Due to the paucity of research on the role of the various demographic factors on digital banking, the study is essentially exploratory and descriptive.

Ethics approval was obtained from the Durban University of Technology’s Faculty Research Ethics Committee. Respondents were informed that participation was voluntary, they could withdraw at any point without having to give reasons, and that all information collected was confidential and that participation was anonymous.

### Respondents

The location of the study, the iLembe District of KwaZulu-Natal, South Africa, was selected as it represents the fastest growing population in KwaZulu-Natal between 2007 and 2016 (South Africa, 2020), has a large population (iLembe District Municipality, 2016) with a diverse demographic profile (iLembe District Municipality, 2020) and, since collection was during the COVID-19

pandemic, allowed for safe, convenient and quick data collection. Furthermore, iLembe has a 'young' population, with 41% classified as 'youth' (iLembe District Municipality, 2024), which means it has a large population of 'millennials' (Generation Y) and Generation Z, in addition to Generation X and the 'baby boomer' generation. iLembe also has a roughly equal gender spread (48% male 52% female) (iLembe District Municipality, 2024), a mix of employed (30.9% of economically active population) and unemployed (and thus considerable poverty and a spread of incomes), and 32.4% have a matriculation school leaving certificate or higher level of education (iLembe District Municipality, 2020). Thus, the iLembe population is suitable to cover the demographic characteristics being studied. The target population from this region included all salaried citizens who could access digital personal banking, including active users, new adopters and non-users. Non-salaried users and those without bank accounts are likely to know less about digital banking and so were excluded from the target population. Since a sample frame of users who were the focus of the study was not available, we targeted all people with access to digital banking, and thus had to rely on non-probability sampling, namely a form of quota sampling, to provide as representative sample as possible (Sekaran and Bougie, 2016).

The location of the study (iLembe) was chosen via non-probability, judgmental sampling (Wisniowski et al., 2020), with respondents with banking accounts being selected as the target population. Since those targeted chose whether to participate or not, this was a self-selected sample, making it effectively a convenience sample. The inherent potential bias of convenience sampling was minimised by collecting responses until we had reasonably large quotas of samples of more than 100 in each demographic category breakdown (see Table 1), as specified by Diamantopoulos and Schlegelmilch (1997). With a population of 657 612, an assumed standard deviation of 1, an allowed error of 0,1 and a significance level of 95%, the required sample size for the iLembe target population was 384 (Ogubazghi and Muturi, 2014; Sekaran and Bougie, 2016). To cater for unusable or incomplete responses, a sample size of 400 was aimed for.

## Data collection

### Data collection instrument

The derivation of the data collection instrument was literature driven, as illustrated in the Appendix. The questionnaire, developed on Google forms, comprised 38 questions, namely seven screening questions to eliminate ineligible participants (as explained in Section 3.3.2), five demographic questions, and 26 questions about the constructs that are the focus of this research. The constructs identified from the literature review are *preference for digital banking* (dependent variable), and eight independent variable constructs, namely *digital banking convenience*, *practical quality*, *branch service quality*, *usability*, *safety*, *online service quality*, *cost and risk*, and *consumer experience*. The questions measuring these constructs and their source literature are shown in the Appendix.

Closed-ended response categories with symmetric, 5-point Likert-type response scales (Joshi et al., 2015) were used. The questionnaire was structured for each section to be completed sequentially, i.e. screening → main study questions → demographics, with progression only possible after completion of the previous question. A subject matter expert and a statistician pilot tested the questionnaire. Pre-testing with 20 people matching the population criteria, and who were excluded from the later, main sample, identified a few problems with the wording of the education questions and the directionality of some questions. Appropriate adjustments were made to correct these issues and to simplify understanding. The pre-test questionnaire results were tested for reliability via Cronbach's alpha - all constructs scored above the required alpha of 0.7 (Taber, 2018), namely between 0.717 and 0.959, except for the *cost and risk* construct (0.495). Since various authors consider such values as acceptable (0.45–0.98) or sufficient (0.45–0.96) (Taber, 2018) we considered the questionnaire as adequate for data collection.

### Data instrument administration

The data instrument was administered online, through Google Forms, due to the restrictions imposed on personal gatherings and social distancing during the COVID-19 pandemic. The main potential bias of this form of collection, namely potential respondents not being accessible by, or comfortable using, computer technology, was less important for our target population (Bless et al., 2013). Those with bank accounts (a main inclusion criteria) tend to be employed and younger, as discussed earlier, and thus access the Internet either via computer or smart phone. Furthermore, the use of multiple distribution lists, such as iLembe Facebook and the banks' mailing lists, minimised the exclusion of potential respondents.

A link to the questionnaire on the iLembe District Public Matters and News group Facebook page was used to distribute the questionnaire, plus the questionnaire was also emailed to potential respondents using various email lists provided by the local banks. An accompanying letter requested only current iLembe residents to complete the questionnaire. Furthermore, any respondents who selected the "other" answer to the screening question listing the four iLembe municipalities were excluded. Any respondents who did not confirm having an active bank account or earning a salary were excluded. A final exclusion criterion was relocated residents who were no longer permanent iLembe residents. An isiZulu-translated (and back-translated) questionnaire was available for respondents who wished to answer in isiZulu. Data collection was slow, due to the COVID 19 pandemic, taking place from 15th February 2021 to 14th January 2022. Multiple mailings were necessary, with each mailing receiving between 45 and 50 responses. Data cleaning ensured no duplicate responses were included.

**Data analysis**

Analysis was conducted using SPSS version 25. Univariate analyses in the form of means and standard deviations, with chi-square tests or Pearson’s independent samples t-tests to assess significance, were used to compare the various constructs and demographic dimensions. ANOVA and multiple regression analyses were used to investigate the relationships between the dependent variable (preference for digital banking) and the various constructs, for each of the demographic dimensions. Durban-Watson tests and Variance Inflation Factor (VIF) and Tolerance tests were used to check for multicollinearity and autocorrelation. Cohen’s d test was used to assess effect size. Cross-tabulations were used to identify the potential differentiating roles of the four demographic dimensions between high and low users of digital banking, with Pearson Chi Square being used to assess the statistical significance of the findings.

**Results and discussion**

In this section we first present the profile of the sample of respondents obtained, followed by the statistics confirming the reliability and validity of the data collection instrument and the data collected, and then present the findings related to the research objectives in the form of descriptive statistics, multiple regression analyses and cross-tabulations.

**Profile of respondents**

Each dimension (age, gender, education, and monthly gross income) of the respondent sample obtained was grouped into a dichotomy of response categories. Table 1 reflects the study dimensions, the dichotomized response categories, the frequency of answers, their percentage of the dimension’s total responses and a comparison against the approximate equivalent statistics for the South African population.

**Table 1:** Demographic profile of sample

Dimension	Category	Sample		SA population
		n	%	%
Age	18-23 (approx. Generation Z)	159	39.8	17.1
	24+ (Boomers, Generation X, Millennials)	241	60.2	82.9
Gender	Male	171	42.8	48.5
	Female	229	57.3	51.5
Education	Up to post high school diploma/certificate	134	33.5	+ 87
	Bachelor degree and above	266	66.5	+ 13
Gross income	0 – R8000 (lower income)	206	51.5	62.3
	R8 001 + (higher income)	194	48.5	37.7
<b>Total</b>		<b>400</b>	<b>100.0</b>	<b>100.0</b>

The age category 18 to 23 (approximately Generation Z) had the highest concentration of respondents, more than the approximate Millennial, Generation X and Boomer categories, which were grouped into one category for analysis. Although higher than the SA population proportion for this age cohort (StatsSA, 2023), this was expected, as Generation Z are frequent users of digital banking as they probably have the highest level of digital literacy, as indicated by the literature (Ameme, 2015; Linnes and Metcalf, 2017; Venter, 2017). Overall, the ratio of males to females (42.8%:57.3%) is close to the South African gender proportions (StatsSA, 2022) and is also consistent with the population profile for the iLembe District (iLembe district Municipality, 2020). A high proportion of the respondents in this study had a post school qualification, higher than the SA population (StatsSA, 2023), which was expected since the iLembe region has a high proportion of citizens who place considerable importance on education. It was, furthermore, expected as the more educated would probably have bank accounts and be more digitally savvy. This indicates that the sample was an informed (learned) source, but also indicates that there may exist a digital literacy barrier. The income results reflect a generally higher income for the sample than for the South African population (Standard Bank, 2016), but more closely match the 2016 Community Survey by Statistics South Africa in iLembe, which indicated that the majority earn below R4 800 (iLembe District Municipality, 2016). This indicates that low-income earners may not have the financial means to access digital banking through the use of smartphones and because of internet costs.

Based on these comparative results, it can be generally concluded that the sample is a reasonable representation of the study population.

**Reliability analysis**

Cronbach’s coefficient alpha is frequently used to assess reliability, with coefficients of 0.60 or higher being acceptable for newly developed constructs (Daud et al., 2018). The Cronbach’s alpha scores for the study’s constructs are provided in Table 2.

**Table 2:** Reliability statistics

Construct	No. of questions	Cronbach's Alpha
Digital banking convenience	3	0.943
Practical quality	2	0.889
Branch service quality	4	0.816
Usability	3	0.767
Safety	3	0.841
Online service quality	3	0.896
Cost and risk	3	0.629
Consumer experience	4	0.913

Cronbach’s alpha values of 0.7 or more were achieved for all the constructs, other than *cost and risk*. Daud et al. (2018) maintains that coefficients of 0.60 are acceptable, especially for a newly designed instrument. The coefficient alpha of 0.629, plus the fact that the factor analysis shows a clear allocation for this construct, which is a well-established scale that has been validated in previous banking research, prompted us to keep the construct *cost and risk* in the model.

**Exploratory factor analysis**

To check that the constructs and questions in the data collection instrument were valid and accurate representations of the issues being examined, an exploratory factor analysis was conducted. The extraction method was principal component analysis, using varimax rotation with Kaiser normalization. The suitability of the data for checking the construct structures for factor analysis was assessed via Kaiser-Meyer-Olkin (KMO) and Bartlett’s tests, whereby the KMO value should be more than 0.500 and the Bartlett’s test of sphericity significance value should be smaller than 0.05. Table 3 shows that all these conditions were met (Shrestha, 2020).

**Table 3:** KMO and Bartlett’s test

Construct	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	Bartlett's Test of Sphericity		
		Approx. Chi-Square	df	Sig.
Digital banking convenience	0.756	1133.179	3	0.000
Practical quality	0.508	410.782	3	0.000
Branch service quality	0.783	538.624	6	0.000
Usability	0.618	447.251	3	0.000
Safety	0.710	508.212	3	0.000
Online service quality	0.730	747.526	3	0.000
Cost and risk	0.585	211.838	3	0.000
Consumer experience	0.836	1434.384	6	0.000

Table 4 provides the rotated component matrix for the study constructs, showing that all questions loaded perfectly along single constructs. Thus, the statements comprising the constructs exactly measured what they were intended to measure.

**Table 4:** Rotated component matrix

Constructs/Questions	Components	
D - Digital banking convenience	1	
D1 Online banking is more convenient than visiting a branch	0.943	
D2 Online banking is faster	0.962	
D3 I can use online banking at any hour	0.939	
E - Practical quality	2	
E1 I understand how to use online banking	0.940	
E2 The online information offered by my bank is clear and easy to understand	0.942	
E3 I prefer to visit a bank for new information or for more complicated queries	0.433	
F - Branch service quality	3	
F1 There are more services available when going to a branch than are offered online	0.756	
F2 I visit my bank to fix issues such as a lost or stolen card	0.803	
F3 I get to ask about new products/services when I visit the bank	0.836	
F4 Human interaction (speaking to consultants/ tellers) is important for my banking relationship	0.816	
G - Usability	4	
G1 I use online banking regularly	0.906	
G2 I prefer a more personalised online banking experience	0.689	
G3 My smartphone banking application covers all my basic banking requirements	0.893	
H - Safety	5	
H1 Internet banking is safer in terms of online fraud and theft	0.846	
H2 When paying physically, I prefer paying with my card	0.868	
H3 I am happy with the safety regulations from my bank	0.903	
J - Online service quality	6	
J1 I have had positive experiences using online banking	0.903	
J2 Online banking is clear and easy to use	0.936	
J3 Online banking has sufficient services	0.893	
K - Cost and risk	7	
K1 Online banking saves banking fees and is cost efficient	0.843	
K2 I have more control of my banking when I bank online	0.851	
K3 Branch banking charges are reasonable	0.592	
L - Consumer experience	8	
L1 Online banking saves time	0.944	
L2 I prefer to not travel to a bank for simple transactions	0.929	
L3 Online banking is more convenient due to 24/7 operation	0.946	
L4 Online banking has no delays in processing	0.760	
Extraction Method: Principal Component Analysis. a. 1 components extracted		

### Findings related to 'age' demographic dimension

#### Descriptive statistics analysis

The age dimension was analysed as a dichotomous variable, namely 18 - 23 years old (Generation Z) and 24 years and older (Boomer, X and Millennial generations), with Table 5 showing a clear picture. Other than the *branch service quality*, the older generations rated all the constructs as highly significantly better than the younger (Generation Z) cohort did. *Branch service quality* was judged slightly better, but not statistically significantly better, by Generation Z.

The biggest observed difference between the two cohorts was for the *usability* of digital banking (0,33 difference with 95% confidence interval of 0.159 - 0,507). Although it had the strongest effect, this was still only medium according to Cohen's d (0,411). This large difference in perception of *useability* of digital banking might be because younger users probably do more of their banking actions via smartphone than the older generation who probably are more comfortable doing their digital banking on laptops or desk top computers on which the banking apps are clearer and easier to use.

The second and third biggest differences between the cohorts was for the *safety* of digital banking (Cohen's d = 0,348; difference 0,30 with 95% confidence interval 0,128 - 0,479) and *online service quality* (Cohen's d = 0,338, difference 0,28 with 0,95: 0,114 - 0,447). This could be explained by the younger cohort being more experienced with smartphones and more digitally aware, and thus being more knowledgeable about the risks of digital dangers and having greater expectations and demands of digital transactions. The older cohort may still trust banks to be 'solid, reliable and trustworthy' and so rated *safety* and *online service quality* more highly.

The overall preference for online banking (the dependent variable) shows the fourth biggest difference with a small to medium effect (Cohen's d = 0,333). The older cohort shows a highly significant higher preference for online banking ( $p < 0.001$ , difference 0,25 with 95% confidence interval 0,108 - 0,437). In addition to the possible reasons given above (the use of laptops or desktops, greater trust in banks and lower expectations), people 24 and over may have been using digital banking for a longer time, have more experience of it and so may be more confident with it. This finding was supported by a cross-tabulation between age and use of internet banking and a chi square test. It showed that the 24+ cohort uses digital banking more often than the generation Z cohort, i.e., more than 5 times a month - 24+ = 59,8% and Generation Z = 45,3% ( $p < 0,003$ ).

**Table 5:** Age demographics and regression analysis

Demographic	N	Statistic	DV: Preference for DB	IV: DB convenience	IV: Practical quality (DB)	IV: Branch Service Quality	IV: Usability (DB)	IV: Safety (DB)	IV: Online service quality	IV: Cost and risk (DB)	IV: Consumer Experience (DB)	
Age – descriptive stats	18 - 23 (Gen Z)	Mean	3,93	4,1971	3,83438	3,4308	3,9119	3,7945	3,9769	3,5409	4,1431	
		SD	0,872	1,00995	0,853449	0,90398	0,96014	0,95157	0,91949	0,83243	0,94779	
	24 +	Mean	4,20	4,4509	4,04564	3,3600	4,2448	4,0982	4,2573	3,7414	4,3880	
		SD	0,783	0,83195	0,685998	1,04025	0,69155	0,81652	0,76450	0,75826	0,72916	
	Total	Mean	4,10	4,3500	3,96167	3,3881	4,1125	3,9775	4,1458	3,6617	4,2906	
		SD	0,829	0,91417	0,763026	0,98778	0,82421	0,88415	0,83977	0,79365	0,83061	
	Differ.: 24+ minus 18-23			0,27	0,25	0,21	-0,07	0,33	0,30	0,28	0,20	0,24
	Significance (2 sided p)			0,001	0,006	0,009	0,471	<0,001	<0,001	0,001	0,013	0,004
	95% conf interval			0,11 - 0,44				0,16 - 0,51	0,13 - 0,48	0,12 - 0,45		
	Strength of effect (Cohen's d)			0,333	0,28	0,279	-0,072	0,411	0,348	0,338	0,254	0,298
			sml to med	small	small	not sig	medium	sml to med	sml to med	small	small	
Age – regress analysis	18 - 23 (Gen Z)	std beta		0,130	-0,140	-0,236	0,210	0,045	0,523	-0,131	-0,100	
		sig.		0,339	0,277	0,005	0,093	0,718	0,001	0,178	0,485	
		95% conf		-0,12 - 0,34	-0,40 - 0,12	-0,39 - -0,07	-0,03 - 0,41	-0,18 - 0,27	0,20 - 0,79	-0,34 - 0,06	-0,35 - 0,17	
	24 +	std beta		0,043	-0,121	-0,339	0,173	-0,033	0,108	0,045	0,176	
		sig.		0,615	0,143	0,000	0,049	0,726	0,314	0,572	0,094	
		95% conf		-0,12 - 0,20	-0,32 - 0,05	-0,36 - -0,15	0,00 - 0,39	-0,21 - 0,15	-0,11 - 0,33	-0,12 - 0,21	-0,03 - 0,41	
	Total	std beta		0,069	-0,100	-0,298	0,226	0,004	0,280	-0,038	0,050	
		sig.		0,344	0,152	0,000	0,002	0,955	0,002	0,533	0,552	
		95% conf		-0,07 - 0,19	-0,26 - 0,04	-0,34 - -0,16	0,08 - 0,37	-0,14 - 0,14	0,11 - 0,45	-0,16 - 0,09	-0,12 - 0,22	
	18 - 23 Gen Z			Adjusted r <sup>2</sup> 0,279, Durban Watson 1,723, Anova highly significant p<0,001, VIF 0,1476 - 0,429, Tolerance 0,233 - 0,677								
24+			Adjusted r <sup>2</sup> 0,250, Durban Watson 1,544, Anova highly significant p<0,001, VIF 1,5240 - 3,654, Tolerance 0,274 - 0,656									
Total			Adjusted r <sup>2</sup> 0,275, Durban Watson 1,522, Anova highly significant p<0,001, VIF 0,1476 - 0,429, Tolerance 0,233 - 0,677									

**DB = Digital or online banking; R = South African Rand**

### Regression analysis

Ramsundra and Mason (2024) found that *online service quality, usability, and consumer experience* had the greatest influence on online banking preference. In this study we set out to identify the extent to which these influences differ between age groups. The bivariate comparison between the Generation Z and the 24+ cohorts, discussed in the Age descriptive statistics analysis section above, showed that there are significant differences in the preferences towards online banking, as well as differences regarding the factors that might influence this preference.

A multiple regression analysis (MRA) further analysed these differences, with the outcome being illustrated in Table 5. The checks of the requirements for MRA showed no violation of multicollinearity, with only the VIF value for *online service quality* for the Generation Z cohort (0,5335) being a little problematic. Durban-Watson was between 1.5 and 2.5 for all regressions, indicating no autocorrelation. The plots show normally distributed residuals and no indication of heteroscedasticity. The adjusted r squares are satisfactory, with 27,5% for the total population, 27,9% for the Generation Z cohort and 25,0% for the 24+ cohort, indicating that the study constructs explain about a quarter of the variance in the preference for digital banking.

For the total population *branch service quality* has the strongest (std beta -0,298,  $p < 0.000$ ), but negative, influence on the *preference for online banking*, which indicates that the better the service quality in the branch, the lower the online banking preference. This is plausible, but it is surprising that *online banking preference* is mainly driven by a negative experience with an outside criterion, i.e., service quality in the branches, and not by a positive experience, for example from the *online service quality* itself. *Online service quality* is the second strongest, highly significant (std beta 0,280,  $p < 0.000$ ) driver within the total population, followed by the *usability* of digital banking (std beta 0,226,  $p < 0.002$ )

Considering the two age cohorts, *branch service quality* had a significant influence on both the younger as well as the older generations. For the older cohort, bad *branch service quality* pushes them more strongly towards online banking (std beta -0.339,  $p < 0.000$ ). However, the 95% confidence interval for the difference between the two samples' means (-0.07) is not significant for the total population ( $p = 0.471$ ). As for the total population, the older cohort (24 +) was most strongly influenced (std beta -0.339,  $p < 0.000$ ) by negative *branch service quality*, with *usability* being the second strongest, significant influence (std beta 0.173,  $p < 0.049$ ). It is interesting to note that, for the older cohort, *online service quality* had no significant influence on *digital banking preference* (std beta 0.108,  $p = 0.314$ ). Regarding the younger, Generation Z, cohort, *online service quality* had the strongest, highly significant influence (std beta 0.523,  $p < 0.001$ ), but *useability* was not significantly influential (std beta 0.210,  $p = 0.093$ ).

These findings indicate that *online service quality* is the most important driver towards digital banking for the younger, Generation Z cohort, and so banks should promote high online service quality, especially compared to branches, if they want to encourage Generation Z to use their digital banking services more frequently. However, for the older generations they should put the focus on *usability*, since bad *branch service quality* obviously cannot be mentioned in advertising as a reason to adopt digital banking.

### Findings related to the 'gender' demographic dimension

#### Descriptive statistics analysis

Based on the sample means, females showed a slightly higher *preference for online banking* than males (+0,07), while males evaluated all the constructs slightly higher than females (differences in means between 0,04 - 0,18). But all these differences, as shown in Table 6, were very small and not statistically significant. The only exception is the *usability* of digital banking ( $p < 0,029$  with 95% confidence interval 0.018 - 0.344) with a small effect (Cohen's  $d = 0,221$ ). Therefore, it is concluded that gender is not influential on perceptions about digital banking and it's influencing constructs, and so banks do not need to consider gender-based activities in their marketing for digital banking.

#### Regression analysis

The requirements for the gender regression were fulfilled, with only the Durban Watson tests showing marginal, but acceptable, indications of autocorrelation (male: 1,444, female 1,485)

As far as the influence of *branch service quality* and the *usability* of digital banking as drivers for the *preference for online banking* are concerned, male and female show no differences. Both of these factors were significant, but there were no significant differences between the genders regarding the strength of these factors, as shown in Table 6. The only relevant difference was for *online service quality* as a driving factor for males. It is the strongest influencing factor for males (std beta 0.395,  $p = 0.004$ ), but not for females.

Overall, as shown in Table 6, the high similarities in the evaluation of the factors, plus only one difference in the driving factors for *digital banking preference*, indicates that gender-based marketing activities would not be justified.

**Table 6:** Gender demographics and regression analysis

Demographic	N	Statistic	DV: Preference for DB	IV: DB convenience	IV: Practical quality (DB)	IV: Branch Service Quality	IV: Usability (DB)	IV: Safety (DB)	IV: Online service quality	IV: Cost and risk (DB)	IV: Consumer Experience (DB)	
Gender – descriptive stats	Male	Mean	4,05	4,3723	4,00585	3,4430	4,2164	4,0741	4,1715	3,6959	4,3216	
		SD	0,870	0,85009	0,775839	1,06448	0,76907	0,85542	0,81357	0,79281	0,77102	
	Female	Mean	4,13	4,3333	3,92868	3,3472	4,0349	3,9054	4,1266	3,6361	4,2675	
		SD	0,798	0,96073	0,753328	0,92664	0,85654	0,90012	0,86008	0,79505	0,87341	
	Total	Mean	4,10	4,3500	3,96167	3,3881	4,1125	3,9775	4,1458	3,6617	4,2906	
		SD	0,829	0,91417	0,763026	0,98778	0,82421	0,88415	0,83977	0,79365	0,83061	
	Differ.: 24+ minus 18-23		-0,07	0,04	0,08	0,10	0,18	0,17	0,04	0,06	0,05	
	Significance (2 sided p)		not sig	not sig	not sig	not sig	0,029	not sig	not sig	not sig	not sig	
	95% conf interval						0,02 - 0,34					
	Strength of effect (Cohen's d)						0,221					
						small						
Gender – regress analysis	Male	std beta		-0,046	-0,093	-0,283	0,302	-0,017	0,395	-0,104	-0,025	
		sig.		0,658	0,387	0,001	0,013	0,884	0,004	0,283	0,845	
		95% conf		-0,26 - 0,16	-0,34 - 0,13	-0,36 - -0,10	0,07 - 0,61	-0,26 - 0,22	0,14 - 0,71	-0,32 - 0,09	-0,32 - 0,26	
	Female	std beta		0,180	-0,110	-0,296	0,191	0,043	0,130	0,031	0,093	
		sig.		0,081	0,244	0,000	0,046	0,664	0,275	0,702	0,421	
		95% conf		-0,02 - 0,32	-0,31 - 0,08	-0,37 - -0,14	0,00 - 0,35	-0,14 - 0,21	-0,10 - 0,34	-0,13 - 0,19	-0,12 - 0,29	
	Total	std beta		0,069	-0,100	-0,298	0,226	0,004	0,280	-0,038	0,050	
		sig.		0,344	0,152	0,000	0,002	0,955	0,002	0,533	0,552	
		95% conf		-0,07 - 0,19	-0,26 - 0,04	-0,34 - -0,16	0,08 - 0,37	-0,14 - 0,14	0,11 - 0,45	-0,16 - 0,09	-0,12 - 0,22	
	Male		Adjusted r <sup>2</sup> 0.281, Durban Watson 1.444, Anova highly significant p<0,001, VIF 1.572 – 4.292, Tolerance 0.233 – 0.636									
	Female		Adjusted r <sup>2</sup> 0.271, Durban Watson 1.485, Anova highly significant p<0,001, VIF 1.441 – 4.455, Tolerance 0.241 – 0.694									
	Total		Adjusted r <sup>2</sup> 0.275, Durban Watson 1.522, Anova highly significant p<0,001, VIF 0.148 - 0,429, Tolerance 0.233 – 0.677									

DB = Digital or online banking; R = South African Rand

## Findings related to the 'education' demographic dimension

### Descriptive statistics analysis

As shown in Table 7, education reflects significant differences for six of the nine analysed constructs. The biggest, highly significant and strongest difference (Cohen's  $d = 0,311$ ) was found for the dependent variable, namely *preference for online banking*. People with higher education showed a higher *online banking preference* (difference of 0,26 with 95% confidence interval 0,084 - 0,426). For all six significant differences, people in the higher education cohort evaluated the digital banking constructs higher than those in the lower education cohort did.

Regarding the influencing independent variables, the highest significant differences were found for *digital banking convenience* (difference of 0,23 with 95% confidence interval 0,0377 - 0,4163), *online banking experience* (difference of 0,23 with 95% confidence interval 0,04456 - 0,41428) and *usability* of digital banking (difference of 0,22 with 95% confidence interval 0,0473 - 0,3883). But according to Cohen's  $d$  (0,25, 0,278, 0,266 respectively) all of these effects are 'small.'

It is interesting to note that, although not significant, the lower education cohort rated *branch service quality* slightly higher than those with higher education. This might be because people with a higher education might be more computer literate and more comfortable and confident with online technology, whereas the lower educated may have more experience of actual branch service for help and advice.

### Regression analysis

With the relatively large differences between people in the two education cohorts, a multiple regression analysis (MRA) identified differences in the factors that drive the two groups' online banking preferences, are shown in Table 7. The quality statistics for the education regression were satisfactory, with only the VIF value for consumer experience (5,88) in the lower education group being slightly problematic, i.e., above 5. The regression for the lower education group shows a much higher adjusted  $r$  square (31,2%) than that for the higher education group (24,0%).

The lower education group reflects high similarity to the overall population finding. *Branch service quality* (std beta -0,368) has the highest significant (negative) influence on *online banking preference* and *usability* of digital banking the lowest significant influence (std beta 0,319). Digital banking *convenience* (std beta 0,352) also has a significant influence on *digital banking preference* for the lower education group. The high rating of *convenience* and *branch service quality* might be explained by the probability that people with lower education are less computer literate, might feel overwhelmed more quickly when attempting online banking and so lose confidence more than people with a higher education.

Responses from the higher education cohort showed that *branch service quality* (std beta -0,244) and *online service quality* (0,382) were the only factors with a significant influence on *online banking preference* (similar to the younger (Generation Z) cohort). Thus, banks should promote *high online service quality* to encourage the more educated to use their digital banking services more frequently. They should also improve the *convenience* and *useability* of their digital banking apps, and then promote these factors to encourage the less educated to adopt digital banking.

**Table 7:** Education demographics and regression analysis

Demographic	N	Statistic	DV: Preference for DB	IV: DB convenience	IV: Practical quality (DB)	IV: Branch Service Quality	IV: Usability (DB)	IV: Safety (DB)	IV: Online service quality	IV: Cost and risk (DB)	IV: Consumer Experience (DB)	
Education – descriptives	→Post matric dipl	Mean	3,93	4,1990	3,87065	3,5037	3,9677	3,8856	4,0075	3,5473	4,1381	
		SD	0,915	0,96394	0,807143	0,99481	0,88037	0,89097	0,90434	0,84308	0,94320	
	Bachelor degree →	Mean	4,18	4,4261	4,00752	3,3299	4,1855	4,0238	4,2155	3,7193	4,3675	
		SD	0,771	0,88011	0,737116	0,98093	0,78606	0,87874	0,79800	0,76270	0,75802	
	Total	Mean	4,10	4,3500	3,96167	3,3881	4,1125	3,9775	4,1458	3,6617	4,2906	
		SD	0,829	0,91417	0,763026	0,98778	0,82421	0,88415	0,83977	0,79365	0,83061	
	Diff.: Bach+ minus →Matric			0,26	0,23	0,14	-0,17	0,22	0,14	0,21	0,17	0,23
	Significance (2 sided p)			0,004	0,019	0,09	0,097	0,012	0,14	0,019	0,041	0,015
	95% confidence interval			0,08 - 0,43	0,04 - 0,42			0,05 - 0,39		0,03 - 0,39	0,00 - 0,34	0,045 - 0,42
	Strength of effect (Cohen's d)			0,311	0,25			0,266		0,249	0,218	0,278
			sml - med	small			small		small	small	small	
Education – regress analysis	→Post matric dipl	std beta		0,352	-0,241	-0,368	0,319	-0,107	0,114	0,044	0,001	
		sig.		0,024	0,051	0,000	0,008	0,484	0,475	0,709	0,996	
		95% conf		0,05 - 0,62	-0,55 - 0,00	-0,5 - -0,18	0,09 - 0,57	-0,42 - 0,2	-0,20 - 0,43	-0,21 - 0,30	-0,36 - 0,36	
	Bachelor degree →	std beta		-0,012	-0,059	-0,244	0,117	0,046	0,382	-0,066	0,068	
		sig.		0,887	0,500	0,000	0,229	0,600	0,001	0,358	0,469	
		95% conf		-0,15 - 0,13	-0,24 - 0,12	-0,29 - -0,09	-0,07 - 0,30	-0,11 - 0,19	0,16 - 0,58	-0,21 - 0,08	-0,12 - 0,26	
	Total	std beta		0,069	-0,100	-0,298	0,226	0,004	0,280	-0,038	0,050	
		sig.		0,344	0,152	0,000	0,002	0,955	0,002	0,533	0,552	
		95% conf		-0,07 - 0,19	-0,26 - 0,04	-0,34 - -0,16	0,08 - 0,37	-0,14 - 0,14	0,11 - 0,45	-0,16 - 0,09	-0,12 - 0,22	
	→ Post matric diploma			Adjusted r <sup>2</sup> 0.312, Durban Watson 1.530, Anova highly significant p<0,001, VIF 2.701 – 5.880, Tolerance 0.145 – 0.637								
Bachelor degree →			Adjusted r <sup>2</sup> 0.240, Durban Watson 1.870, Anova highly significant p<0,001, VIF 1.778 – 4.114, Tolerance 0.234 – 0.667									
Total			Adjusted r <sup>2</sup> 0.275, Durban Watson 1.522, Anova highly significant p<0,001, VIF 0.148 - 0,429, Tolerance 0.233 – 0.677									

**DB = Digital or online banking; R = South African Rand**

## Findings related to the 'income' demographic dimension

### Descriptive statistics analysis

From the findings presented in Table 8, income is the best discriminating demographic variable. The differences between the two income groups for the constructs are greater than for any of the other demographic dimensions. The dependent variable, *online banking preferences*, shows a highly significant difference of 0,41 (95% confidence interval 0,248 - 0,564) with a Cohen's d of 0,5 reflecting a medium strength - respondents with a higher income have a higher preference for online banking. This finding is similar to the results for education and age - the lower education and age groups valued *branch service quality* more highly than online banking.

The second biggest difference is for the *usability* of digital banking with a highly significant difference in the mean for the higher income group (0,39 with 95% confidence interval 0,2322 - 0,54533) and a medium effect (Cohen's d 0,485).

All factors, except for *branch service quality*, were rated higher by the higher income group. A possible reason for this could be that the lower income group may have a lower level of digital literacy because they are less exposed to computers and software in their jobs and therefore probably value and use branch services more, but this can only be indicative as this finding was not significant ( $p=0.141$ ).

### Regression analysis

An MRA was conducted to identify differences in the factors (independent variables) that most influence *preference for online banking* by the two income groups. The quality criteria for the high- and low-income regression were good, with only the VIF for *online service quality* (5,101) being marginal, but acceptable. The adjusted r squares were satisfactory, with 27,5% for the total population, 31.1% for the lower income cohort and 24.7% for the higher income cohort. This indicates that the study constructs explain about a quarter of the variance in the *preference for digital banking*.

The lower income group showed exactly the same drivers as the total population, with only the ranking being different. *Online service quality* has the highest impact (std beta 0,434), followed by the *usability* of digital banking (std beta 0,314) and then *branch service quality* with a negative influence (std beta -0,281). This suggests that, for the lower income group, the positive influence of *online banking service* drives their usage more than the negative influence of inadequate *branch service quality*.

The high-income group shows a different picture - none of the characteristics of digital banking drive them to use it, except maybe *consumer experience* (std beta 0.221,  $p=0.047$ ). As for the other dimensions, *branch service quality* also has a significant negative influence (-0.31,  $p<0.000$ ) on *preference for digital banking*, meaning that poor branch service drives customers away from visiting branches, and towards the use of digital banking.

**Table 8:** Income demographics and regression analysis

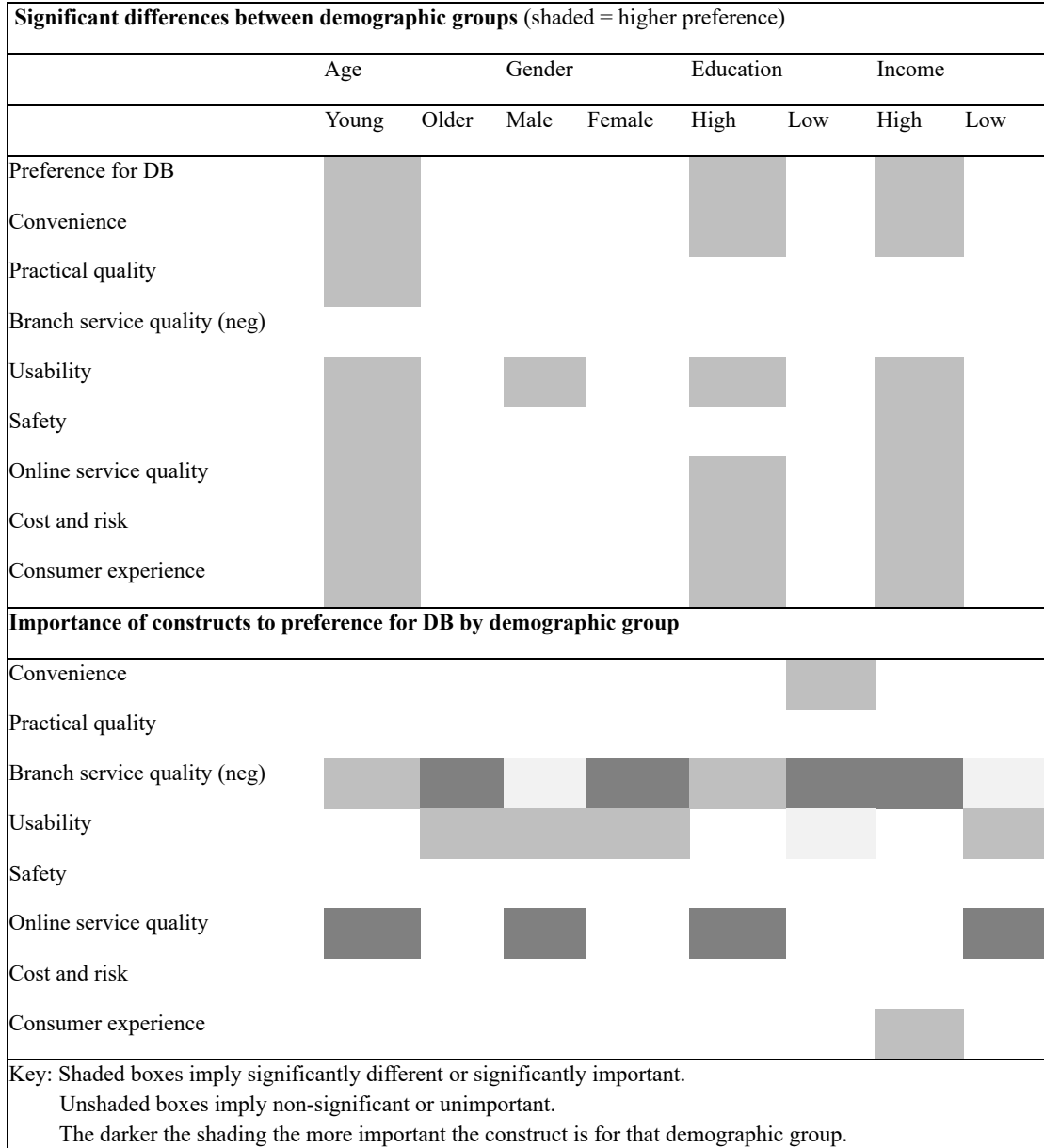
Demographic	N	Statistic	DV: Preference for DB	IV: DB convenience	IV: Practical quality (DB)	IV: Branch Service Quality	IV: Usability (DB)	IV: Safety (DB)	IV: Online service quality	IV: Cost and risk (DB)	IV: Consumer Experience (DB)	
Income – descriptive stats	<= R8000	Mean	3,90	4,2298	3,89320	3,4587	3,9239	3,8204	4,0016	3,5307	4,1626	
		SD	0,880	0,98831	0,816780	0,85118	0,89330	0,91752	0,88743	0,80100	0,91612	
	> R8000	Mean	4,30	4,4777	4,03436	3,3131	4,3127	4,1443	4,2990	3,8007	4,4265	
		SD	0,716	0,81141	0,696210	1,11203	0,69178	0,81707	0,75873	0,76353	0,70625	
	Total	Mean	4,10	4,3500	3,96167	3,3881	4,1125	3,9775	4,1458	3,6617	4,2906	
		SD	0,829	0,91417	0,763026	0,98778	0,82421	0,88415	0,83977	0,79365	0,83061	
	Differ.: Hi inc minus lo inc			0,41	0,25	0,14	-0,15	0,39	0,32	0,30	0,27	0,26
	Significance (2 sided p)			<0,001	0,006	0,063	0,141	<0,001	<0,001	<0,001	<0,001	<0,001
	95% conf interval			0,25 - 0,56	0,07 - 0,42			0,23 - 0,55	0,15 - 0,5	0,13 - 0,46	0,12 - 0,42	0,10 - 0,42
	Strength of effect (Cohen's d)			0,5 medium	0,273 small			0,485 med	0,372 sml - med	0,359 sml - med	0,345 sml - med	0,321 sml-med
Income – regress analysis	<= R8000	std beta		0,102	-0,138	-0,281	0,314	-0,013	0,434	-0,109	-0,080	
		sig.		0,369	0,191	0,000	0,004	0,910	0,001	0,200	0,540	
		95% conf		-0,11 - 0,29	-0,37 - 0,08	-0,44 - -0,14	0,10 - 0,52	-0,22 - 0,2	0,17 - 0,69	-0,30 - 0,06	-0,32 - 0,17	
	> R8000	std beta		0,061	-0,105	-0,310	0,012	-0,003	0,136	0,057	0,221	
		sig.		0,521	0,276	0,000	0,905	0,975	0,251	0,526	0,047	
		95% conf		-0,11 - 0,22	-0,30 - 0,09	-0,30 - -0,10	-0,19 - 0,21	-0,18 - 0,18	-0,09 - 0,35	-0,11 - 0,22	0,00 - 0,45	
	Total	std beta		0,069	-0,100	-0,298	0,226	0,004	0,280	-0,038	0,050	
		sig.		0,344	0,152	0,000	0,002	0,955	0,002	0,533	0,552	
		95% conf		-0,07 - 0,19	-0,26 - 0,04	-0,34 - -0,16	0,08 - 0,37	-0,14 - 0,14	0,11 - 0,45	-0,16 - 0,09	-0,12 - 0,22	
	<= R8000			Adjusted r <sup>2</sup> 0.311, Durban Watson 1.501, Anova highly significant p<0,001, VIF 1.437 – 5.101, Tolerance 0.196 – 0.679								
> R8000			Adjusted r <sup>2</sup> 0.247, Durban Watson 1.489, Anova highly significant p<0,001, VIF 1.991 – 3.408, Tolerance 0.208 – 0.679									
Total			Adjusted r <sup>2</sup> 0.275, Durban Watson 1.522, Anova highly significant p<0,001, VIF 0.148 - 0,429, Tolerance 0.233 – 0.677									

**DB = Digital or online banking; R = South African Rand**

The significant findings discussed in the previous sections are summarised and illustrated in Figure 3. The first half of the figure clearly shows the importance of the younger, better educated and higher earning group for digital banking and the potential available from the older, lower educated and lower earning group.

The lower half of the figure clearly illustrates the importance of three constructs, namely online service quality, usability and the negative influence of branch service quality, which suggests the direction for banks marketing activities.

**Figure 3:** Graphical illustration of key findings



**Identification of target groups for marketing activities**

This analysis was intended to identify which potential demographic target group has the highest, and which the lowest, preference for digital banking. To create “high” and “low” user preference groups, we grouped the respondents as follows: those who said that they go “only” and “mostly” to branches were grouped with those who use branch and digital banking (DB) equally, resulting in a group with 75 respondents, which we labelled “low DB” users. Those who “only” use digital banking created the high preference group, with 123 respondents, which we labelled “high DB” users. The “mostly” use internet banking respondents were excluded from this analysis to ensure adequate differentiation between the responses – this effectively resulted in a maximum variation sample, which enables common patterns to “emerge out of heterogeneity” (Patton, 1987, p. 53).

As shown in Table 9, the “high DB” users are significantly ( $p < 0.000$ ) older than the “low DB” users - 67,9% of “high DB” users are 24+, whereas in the “low DB” user group only 42,7% are 24+. Of the younger, 18-23 group, 57,3% were “low DB” users, with only 32.1% being “high DB” users.

Overall, 41.1% of total users are younger, but in the group “low DB users” 57,3% are younger, whereas in the “high DB users” only 32,1% are younger. Regarding the older group, who comprised 58.9% of the total sample, this picture is reversed - within the “low DB user” group 42,7% are older and in the “high DB user” group 67,9% are older. Thus, we conclude that “high DB users” tend to be older and “low DB users” tend to be younger.

As far as gender is concerned, there are no significant differences in relation to digital banking usage. In the total sample there are 56% female – of all “high DB” users, females accounted for 58,5%, while of the “low DB” users, 52.0% were female. This difference was not statistically significant ( $p=0.386$ ).

For the education demographic, there is a statistically significant relationship ( $p=0.014$ ). “High DB” users have a higher level of education (73.9% bachelor’s degree or higher) than those respondents in the “low DB” user group (only 57,3% with bachelor’s degree or higher).

Regarding income, this was also a significant differentiator between the two digital banking preference groups ( $p<0.000$ ), with 61,9% of “high DB” users falling in the high-income group but only 26,7% of the “low DB” users reporting in the higher income category.

Summarizing the above findings, the typical “high DB” user is older (24+), has a higher education (bachelor’s degree or higher) and a higher income (more than 8000 Rand per month), while the “low DB” user is younger (18-23), has a lower level of education (maximum of a post school diploma), and has a lower income (less than 8000 Rand a month). Having identified a profile of “high DB” and “low DB” users, it would be appropriate to provide recommendations for bank marketing practitioners about what they need to do for the “low DB” user group to start to use digital banking or to use it more, and also to encourage the “high DB” user group to use digital banking more intensively

**Table 9:** Demographics according to user preference for digital banking

Dim	Demographic	Low DB users		High DB users		Total		Sig
		N	%	N	%	N	%	
Age	18 - 23 (Gen Z)	43	57,3	43	32,1	86	41,1	0.000
	24 +	32	42,7	91	67,9	123	58,9	
	Total	75	100,0	134	100,0	209	100,0	
Gender	Male	36	48,0	56	41,8	92	44,0	0.386
	Female	39	52,0	78	58,2	117	56,0	
	Total	75	100,0	134	100,0	209	100,0	
Education	Up to post school diploma	32	42,7	35	26,1	67	32,1	0.014
	Bachelor degree or higher	43	57,3	99	73,9	142	67,9	
	Total	75	100,0	134	100,0	209	100,0	
Income	<= R8000	55	73,3	51	38,1	106	50,7	0.000
	> R8000	20	26,7	83	61,9	103	49,3	
	Total	75	100,0	134	100,0	209	100,0	

**DB = Digital or online banking; R = South African Rand**

**Identification of factors influencing the identified target groups**

Ideally, we would have used regression analysis to identify the influence of high or low user group membership of preference for digital banking, but, since both are defined via the same variable, making the dependent variable a constant, regression was not possible. Instead, we look at which of the eight constructs were influential in the differences between the two preference for digital banking groups. This analysis showed that the differences between the “high DB” and the “low DB” user groups were considerably more influenced by the eight constructs than by any of the demographic factors.

The biggest differences, with very large effects, were found for *online service quality* (0,92 with 95% confidence interval 0,673 - 1,179, Cohen’s d 1,15), *online banking consumer experience* (0,811 with 95% confidence interval 0,546 - 1,076, Cohen’s d 0,978), *digital banking convenience* (0,786 with 95% confidence interval 0,5441 - 1,032; Cohen’s d 0,912) and *usability* of digital banking (0,7495 with 95% confidence interval 0,4838 - 1,015, Cohen’s d 0,908).

Considering which constructs “high DB” users value the most, Table 10 shows that *convenience* (mean = 4.599) and a good *online banking experience* (mean = 4.511) were most valued. Therefore, banks should ensure that they keep these aspects at a high level and include them in their marketing activities to encourage the “high DB” user group to keep using digital banking or to use it more intensively.

This then raises the question of what could be done to encourage the non-users and the “low DB” users to use digital banking, or if already using, how to encourage greater use? The lowest mean values and thus the highest concerns are the perceived high *cost and risk* potential when involved in online banking activities (mean = 3,33), followed by the perceived low level of *safety* (mean = 3.50) and poor *online service quality* (mean = 3.51). Therefore, these are issues that banks must address to convince more clients to use digital banking, or for those who use it to some extent to increase their use.

**Table 10:** Construct differences according to high versus low/medium preferences

Constructs	Low DB users		High DB users		Total		Difference: Hi DB minus Lo DB users	sig (2-sided p)	95% conf interval	Effect strength (Cohen's d)
	Mean	SD	Mean	SD	Mean	SD				
Convenience (DB)	3,81	1,071	4,60	0,719	4,32	0,939	0,7862	< 0,001	0,544 - 1,032	0,912
Practical quality (DB)	3,78	0,889	3,99	0,698	3,91	0,777	0,2123	not sig		
Branch service quality	3,70	1,029	3,00	1,033	3,25	1,083	-0,7037	< 0,001	0,410- 0,997	0,682
Usability (DB)	3,57	1,047	4,32	0,671	4,05	0,899	0,7495	< 0,001	0,484 - 1,015	0,908
Safety (DB)	3,50	1,124	4,21	0,763	3,95	0,968	0,7087	< 0,001	0,420 - 0,997	0,78
Online service quality (DB)	3,51	0,981	4,43	0,685	4,10	0,917	0,9262	< 0,001	0,673 - 1,179	1,153
Cost and risk (DB)	3,33	0,888	3,84	0,767	3,66	0,843	0,5119	< 0,001	0,282 - 0,742	0,634
Consumer experience (DB)	3,70	1,039	4,51	0,686	4,22	0,915	0,8112	< 0,001	0,546 - 1,076	0,978

DB = Digital or online banking

## Discussion

The above results have provided new knowledge about banking customers' attitudes towards digital banking and about the demographic characteristics of those customers who prefer and use digital banking and those who do not use it very much and continue to use branch banking. These results are now summarized according to the study's research objectives.

### Objective 1: identification of target segments according to demographics

Through the cross-tabulation analysis of the findings, two potential target segments were identified. First, the high digital banking users, who only use digital banking, were identified as older (24+), with higher education (bachelor's degree or higher) and higher income (more than 8000 Rand per month), but with no difference according to gender.

The second potential target segment was the lower digital banking users, i.e., those who only, mostly or equally use branch banking, which implies a considerable opportunity for banks to increase digital bank use. This target segment was defined, from the study results, as younger (18-23), with a lower level of education (maximum of a post school diploma), and with a lower income (less than 8000 Rand a month) – again there was no difference between the genders.

Thus, objective one has been satisfied, providing two potential target segments that are clearly defined and differentiated according to age, education and income. Also of interest is that gender plays no role in preference for digital banking, nor a role in preferring to continue supporting branch banking.

### Objective 2: factors to increase digital banking by target segment

Having identified these two target segments, objective 2 required the identification of the digital banking factors that have the most significant influence on each target segment. According to the cross-tabulation analysis, the high digital banking users value *convenience* and a good online banking *experience* as the first and second most important constructs. *Usability* and *safety* also scored highly.

For those who either do not use digital banking, or use it less frequently, *convenience* and *practical quality* scored most highly, although considerably lower than for the high digital banking users. What is more useful from a bank marketing point of view is the identification of the weakest factors, as it is likely that consumers' attitudes to these factors discourage digital banking use. The lowest values, and thus the greatest concern for the lower digital bank users, were perceived high *cost and risk* in using online banking activities, followed by perceived lack of *safety* and poor *online service quality*.

Thus, objective 2 has been satisfied, identifying those factors that encourage the high user segment to maximize their digital banking, and also identifying those factors that discourage the low user segment from adopting digital banking more intensively.

### Objective 3: recommendations to increase digital banking use

Based on the findings under objective 2, recommendations can be made to assist digital bank marketers to develop marketing strategies to encourage high users to use digital banking more intensively, or possibly to use more of the available facilities, and to improve the low users' perceptions and experiences of digital banking so as to increase their use of digital banking facilities.

To encourage high users to use digital banking more intensively, digital banks must ensure that their banking apps are very convenient, e.g., always available with minimal downtime and the avoidance of long webpage opening, or download, times. Overall, the banking app must provide an excellent experience, easy and quick to use, no problems with issues like logging in or recognition of passwords, and minimal 'clicks' to get to the required page. Promotion and advertising of their digital banking services should focus on this convenience and the excellent online service, possibly with references from satisfied users who match the target segment demographics.

Regarding the low digital banking users, it should be considered that these are often less experienced online banking users and so any issues relating to reduced convenience and practical quality of the online banking apps should be addressed - for example, ease and speed of use, and the ability to get assistance at any time of the day or night. These users also tend to have the lowest financial literacy and so it could be helpful if banks could provide simple, easy-to-access, online training in day-to-day banking and financial matters. The more financially and banking "savvy" a consumer is, the more likely they will feel confident to conduct their own banking activities online. Since the biggest fears of this segment are cost, risk and safety, clarity on how these are addressed should be built into the banking app, so that users' fears are addressed when they are experienced. Promotional and advertising activities should be clear and simple, explaining to the low users, and potential users, how the bank, and especially the app, addresses these issues to maximise the convenience and practical quality of the online banking experience. Furthermore, promotional activities should focus on, and provide evidence of, how the bank and the online app reduce risk and ensure that the customer has total control over their banking activities and how their banking, both in terms of funds and personal information, is kept safe by the security measures built into the online banking app.

It should be noted that it is not implied that the implementation of the above recommendations would be easy. Jenkin and Naude (2019) identified numerous challenges that may stand in the way of this type of wide spread implementation. Such challenges might be the lack of knowledgeable and skilled human resources to implement the recommendations in all the banks, resistance to change by older customers who may be perfectly happy with, and prefer, in-person branch banking and thus resist changing to digital banking. Lack of digital coverage, and thus access to the Internet, in large tracts of the country, expense of internet connection and use, and the cost of data, might preclude many of the lower income customers from making easy and regular use of digital banking, whereas access to branch banking is easy and 'free' if you walk!

Most of these challenges apply equally to all banks and the financial sector in general and will require numerous policy decisions and actions, regarding, for example, job losses and upskilling needs, effect on the nature of work, need for skills other than technical, new training and education needs, transition to digital is just for all including women and the poverty stricken, and telecommunications infrastructure and data cost. Therefore, addressing these challenges and implementation of the above recommendations require more than the actions of individual banks. Therefore, a cross banking solution should be sought. It is recommended that organisations such as The Banking Association South Africa (BASA - see <https://www.banking.org.za/about-us/>), The Banking Sector Education and Training Authority (BankSETA see <https://bankseta.org.za/>), the South African Society of Bank Officials (SASBO – see <https://sasbo.org.za/>) should be approached to participate in addressing these and any other similar challenges.

## Conclusion

The study first defined the high digital banking users as those older (24+), with higher education (bachelor's degree or higher) and a higher income (more than 8000 Rand per month) and the low digital banking users as younger (18-23), with a lower level of education (maximum of a post school diploma), and with a lower income (less than 8000 Rand per month). In both cases gender played no differentiating role.

Next, the study identified *convenience* and a good online banking *experience* as the factors that most encouraged digital banking use by the high users, followed by *usability* and *safety*. *Convenience* and *practical quality* factors encouraged the lower users, but at a much lower rate than that of the high users. Of greater interest is that perceived high *cost and risk* of their online banking activities were factors that probably discourage low users from using digital banking. Lack of *safety* and poor *online service quality* were also discouraging factors.

The study has contributed to knowledge about what encourages and what discourages bank customers from using digital banking, specifically in terms of the customers' demographics. As expected the study confirmed that age is a significant differentiating factor, confirming the findings of Beaven (2014), Linnes and Metcalf (2017), Msweli and Mawela (2020), Venter (2017) and Yalcin-Incik and Incik (2022). Education was also found to be a significant differentiating factor, confirming the work of Ameme (2015) and Sheeba and Goathi (2020). The literature says little about gender or income, and so our findings that income is a differentiating factor, while gender plays no differentiating role, have provided new knowledge about the role of demographic factors in influencing the adoption and use of digital banking.

Since the study was conducted in a limited geographic area, there was a risk of coverage bias, which could also have arisen due to the data collection being done electronically via the Internet. Unfortunately, this was unavoidable due to the limitations placed on data collection by the restrictions caused by the COVID-19 pandemic. The similarity of the sample profile to the population demographics indicates that this was probably not a major limitation, but extrapolating these results to other geographic areas should

be avoided. This potential limitation could be overcome by conducting a survey with a much larger sample from across the whole of South Africa, thus providing more generalizable results.

Convenience sampling is always a potential limitation. This risk was minimized by collecting the data via a public social media Internet platform. This meant that the respondents were unknown to the researchers and thus selection bias was avoided. Despite the practical difficulties, this limitation could be minimized with a much larger sample selected via stratified or cluster sampling, or at least quota sampling, to provide a more clearly defined representative sample.

A final limitation of the study was that demographic criteria were restricted to age, gender, education and income. It is possible that other demographic characteristics could be influential on attitudes towards the adoption and use of digital banking. Further research could include demographic dimensions such as marital status, ethnic origin, employment status, occupation, homeownership, urban/rural location and home language. Furthermore, to delve deeper into the research problem, psychographics could be used to define and describe high versus low digital banking users more clearly. For example, criteria such as personality traits, lifecycle stage, interests/activities/hobbies and attitudes or beliefs could be studied using classification systems such as the VALS (values and lifestyles) framework (Sharma, 2021), Living Standards Measure (LSM) (Lappeman et al., 2021) or the ES Socio-Economic Measures (SEM) (Reidon, 2018). Such psychographic research could provide a different, deeper understanding of digital banking adoption and use.

## Acknowledgement

We would like to express our appreciation to all the research participants who devoted their time to responding to our questions, as well as to the reviewers whose comments and suggestions have improved this paper. We also thank Durban University of Technology for the funding to conduct this research.

All authors have read and agreed to the published version of the manuscript.

**Author Contributions:** Conceptualization, A.R., R.M.; methodology, A.R., R.M.; literature review, A.R.; data collection, A.R.; software developing, analysis, validation, and interpretation, T.D.; visualization, R.M.; writing - original draft, A.R., R.M.; writing - review and editing, R.M., T.D.; project administration, R.M.

**Funding:** Research was funded by Durban University of Technology, South Africa.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data presented in this study are available on request from the corresponding author. The data are not publicly available due to restrictions.

**Conflicts of Interest:** The authors declare no conflict of interest.

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Appendix – Derivation of questionnaire

Constructs	Question	Sources	
Preference for digital banking	Do you use internet banking?	Own	
	My preference towards banking is...		
	How often do you use the following in a month?		
	Which online banking services do you use?		
Digital banking convenience	D1: Online banking is more convenient than visiting a branch	Chigada and Hirschfelder, 2017; COEFS Fintech Report, 2018	
	D2: Online banking is faster		Kinsman, 2019; Al-Jabri and Sohail Sadiq, 2012; COEFS Fintech Report, 2018
	D3: I can use online banking at any hour		
Practical quality	E1: I understand how to use online banking	Ramavhona and Mokwena, 2016; Fairouz and Wickramasinghe, 2019	
	E2: Online information and content offered by my bank is clear and easy to understand		Nkoyi et al., 2019; Schoombee, 2004
	E3: I prefer to visit a bank for any information I am unaware of		
Branch service quality	F1: There are more services available when going to a branch than offered online	Uddin et al., 2014	
	F2: I visit my bank to fix issues such as replacing a lost or stolen card		Dalvi, 2018; Revathi, 2019
	F3: I get to ask about new products & services when I visit a bank		
	F4: Human interaction (speaking to tellers/sales consultants) is important for banking relationship		Uddin et al., 2014; Coetzee, 2018
Usability	G1: I use online banking regularly	Saini, 2011; Saidi and Scacciavillani, 2008	
	G2: I would prefer a more personalised online banking experience		
	G3: My smartphone banking app covers all my basic banking requirements		
Safety	H1: Internet banking is safer in terms of online fraud and theft	Maduku et al., 2016; Redelinghuis and Rensleigh, 2010; Harchekar, 2018; Nel and Boshoff, 2014	
	H2: When paying physically, I prefer paying with my bank card		Dalvi, 2018; Serrao and Jansen Van Vuuren, 2019
	H3: I am happy with safety regulations of my bank		
Online service quality	J1: I had positive experiences using online banking	Rootman, et al., 2007; Schoombee, 2004	
	J2: Online banking is clear and easy to use		
	J3: Online banking has sufficient services		Mbama and Ezepue, 2018
Cost and risk	K1: Online banking saves on banking fees and is cost efficient	Schoombee, 2004; Serrao and Jansen Van Vuuren, 2019	
	K2: I have more control of my banking when I bank online		Chaturvedi, 2019
	K3: Branch Banking charges are reasonable		
Consumer experience	L1: Online banking saves time	Kinsman, 2019; Al-Jabri and Sohail Sadiq, 2012; COEFS Fintech Report, 2018	
	L2: I prefer to not travel to a bank to process simple transactions		The World Bank, 2017
	L3: Online banking is more convenient due to its 24/7 operation	Nkoyi et al., 2019; Ramavhona and Mokwena, 2016	
	L4: Online banking has no delays in processing		Mohana Sujana, 2018

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