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Re-configuring customer value co-creation in the internet banking dyad: examining service quality, digital efficacy, flow experience and E-satisfaction

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ABSTRACT

Substantial literature has addressed firm-level competencies that drive online customer satisfaction. This study examines the role of customer digital efficacy on the link between service quality, flow experience and customer satisfaction in internet banking. Data from 412 customers estimated the model through Structural Equation Modelling (SEM) in AMOS. The findings from SEM revealed the positive and significant influence of e-banking service quality on customer satisfaction, e-banking service quality on flow experience, customer digital efficacy on both flow experience and e-customer satisfaction, and flow experience on e-customer satisfaction. The mediation effect of flow experience on e-banking service quality and e-customer satisfaction was confirmed. However, the moderating effect of customer digital efficacy on e-service quality and e-satisfaction was insignificant. To enhance e-customer satisfaction, banks should leverage internet banking infrastructure that drives optimal flow experiences. Banks should continuously invest in revamping the digital banking features that customers prioritise in e-banking. Enhancing customer digital knowledge and skills through education and training could promote digital encounters that foster better value co-creation. The paper addresses the largely overlooked role of customers in enhancing their online experience and satisfaction by highlighting the interaction of user digital self-efficacy with service quality, flow experience and e-satisfaction in internet banking.

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1. Introduction

The advent of advanced banking technologies has culminated in an exponential growth in internet banking globally. In the recent decade and post COVID-19 era, most financial service providers have leveraged hi-tech investments in a multi-channel model to enhance customer experience, satisfaction and loyalty (Dangaiso et al., 2024; Mwiya et al., 2022). Internet banking is defined as facilitation of banking or financial transactions using the web and web-supported applications (Klapper et al., 2025). The World Bank Global Findex Database for 2025 shows that banks in pre-emerging economies have transitioned service delivery to online channels, with 79% of adults now having a digitally enabled account globally, an increase of 28% since 2011. In addition, internet banking is expected to expand; 82% of adults with accounts have received or made a digital payment in 2024 (Klapper et al., 2025). Notwithstanding, the banking industry has embraced rapid technological advancements to bolster their overall value proposition to customers, creating competitive advantage through better service quality, customer experience and user satisfaction (Mwiya et al., 2022). Internet banking has seen exponential growth, with banks now adopting a multi-channel approach that seeks to drive superior customer experiences across digital and physical touch points (Gazi et al., 2025).

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While banks have directed significant investment towards revamping digital banking infrastructure in developing economies such as Zimbabwe in the post COVID-19 period, significant scores of customers are still queuing in banking malls (Dangaiso et al., 2024; IOBZ, 2024). This raises a key question in this context - Is internet banking enjoyable? While the social aspects of physical shopping interactions have been identified as culturally attractive experiences (Dangaiso et al., 2026; Laudon & Traver, 2020), does this also extend to customer encounters in banking? This suggests that more empirical research could explore if seamless (flow) experiences in internet banking could enhance the link between online banking service quality and e-customer satisfaction in pre-emerging economies. Flow experience has been conceptualised as a moment of deep emotional capture, immersion and connection by a user to a computer mediated service or one delivered through the internet (Xin Ding et al., 2010). Most studies have examined the role of flow in contexts that lock in digital consumers for prolonged service experiences such as e-learning (Nguyen et al., 2025; Zheng & Xiao, 2023), virtual reality (Issock et al., 2024), e-shopping (Mohammadi & Dickson, 2024), and live streaming e-commerce (Yu et al., 2025). However, the concept of flow embodies a form of holistic human focus, control, concentration and security, while self-serving a digitally mediated service (Heutte et al., 2016; Priyanka & Karthik, 2025). Given that flow resonates with internet banking quality attributes such as speed, site aesthetics (organisation), reliability, efficiency, responsiveness, and privacy, we formulated the following main research questions:

R1: What is the link between flow experience and customer satisfaction with internet banking?

R2: Does flow experience interact with effect of e-banking service quality and customer satisfaction?

Furthermore, our paper proposes that customer digital efficacy improves flow experience and user satisfaction with internet banking. Many scholars have demonstrated how diverse dimensions of internet banking quality relate to online customer (e-customer) satisfaction (Amin, 2016; Dangaiso et al., 2024; Gazi et al., 2024). While significant research focuses on the role of the firm in enhancing online customer experiences (Dangaiso et al., 2024; Harmat et al., 2016), there is limited research on how the customer, as a value co-creator, shapes their satisfaction and perceptions of service performance. Most researchers have examined the role of firm level competencies as creators of competitive advantage in the banking industry. Examples of such researchers include Mwiya et al. (2022), Kim and Yang (2025), and van Beuningen et al. (2011). The role of the customer has been largely marginalised from research linking service quality and customer satisfaction.

Extensive services marketing literature has also focused on provider-initiated service failures (Dangaiso et al., 2026; Osborne & Ballantyne, 2012; Robertson et al., 2023), overlooking the role of the customer in the value co-creation dyad, despite long-standing suggestions that one third of service failures are triggered by customers themselves (Zeithaml & Bitner, 2003). Extant literature confirms the key role of the customer as a co-producer and consumer on the service encounter (Grönroos, 2000; Lovelock & Witz, 2012). Being value co-creators in servicescapes, the role of customers in enhancing their own satisfaction cannot be overlooked. Despite ample research evidence showing that considerable customer dissatisfaction in online environments is attributed to customers failing to follow instructions on how to use the service (Dangaiso & Mukucha, 2024; Robertson et al., 2023), there is limited empirical evidence exploring how customers' knowledge and technical skills could impact their experiences and subsequent satisfaction. Most studies have focused on the technological attributes that influence technology use, service quality, customer experience and satisfaction (Issock et al., 2024; Kim & Yang, 2025; Nanta et al., 2025; Zheng & Xiao, 2023). The role of the customer in co-creating seamless service experiences has been largely overlooked by most researchers. This theoretical gap underscores the need for studies examining how individual customer digital competences interact with e-service quality perceptions, flow and e-satisfaction. This study attempts to answer the following main research questions:

R3: How does customer digital efficacy affect flow experience across internet banking touch points?

R4: What is the nexus between customer digital efficacy and customer satisfaction with internet banking?

In terms of contribution, this study demonstrates how banks can harness internet banking infrastructure, customer learning, knowledge building and skills to enhance e-service satisfaction. Further, customers can bolster their understanding of the critical roles in value co-production on service encounters,

enhancing compatibility and co-operation, experiences and future usage intentions. This paper demonstrates how digitally savvy customers could be a springboard for enhancing customer satisfaction with internet banking. The study shows how customers can leverage their own digital competencies to enhance their user experiences and satisfaction. In addition, we situate customer digital efficacy to present even richer pathways for banks to receive more accurate and reliable user perceptions about the quality level of their services. Furthermore, the study also advances literature on the service quality and customer satisfaction dyad, reflecting key theoretical integration insights between e-service quality, technology usage, customer experience and user satisfaction. This paper highlights potential e-service quality (*technology-task fit*), customer digital efficacy (*tech-knowledge-task fit*), flow experience and e-customer satisfaction (*stimulus-response linkages*) theoretical loop in internet banking. Thus, the multi-factorial determinants of customer satisfaction underscore the imperative to integrate explanatory constructs from diverse originating frameworks. The subsequent sections of this paper address literature review, methods, results, discussion and conclusions.

2. Literature review

2.1. Theoretical perspectives

The relationships proposed in this study are grounded in several theories from extant literature. First, the Expectation-Confirmation Theory (ECT) (Oliver, 1980) underpins the link between internet banking service quality and e-customer satisfaction. According to the ECT, customers make post consumption evaluations on goods and services they use. This follows a comparison between prior expectations and the perceived performance. Thus, they confirm or disconfirm their prior expectations. Positive disconfirmation implies that the customer has been satisfied and in this scenario, the service performance is greater or matches prior expectations (Oliver, 1980). When performance falls below expected standards, that amounts to negative disconfirmation and the customer is dissatisfied. Thus, the ECT theoretically grounds the proposed linkage between internet banking service quality and online customer satisfaction in the context of Zimbabwean banks.

Second, this study borrows a theoretical lens from the Technology Adoption Model (TAM) (Davis, 1989). The TAM is used in this context to theorise the role of user digital efficacy on flow experience and e-customer satisfaction with e-banking. According to the TAM, perceived usefulness and perceived ease of use determines usage intention, which predicts adoption of new technology. With the growth of internet banking in pre-emerging markets such as Zimbabwe, users' adoption and satisfaction with the advanced electronic banking interface strongly depends on their digital knowledge, skills and individual conviction that they are able to perform the intended transactions online. Thus, this proposition draws in the 'perceived ease of use' dimension of the TAM into this research. If e-banking is perceived to be effortless by the end user, this implies their possession of the necessary user digital attributes that elicit positive user experiences such as flow and user satisfaction.

Third, the study also uses the Social Cognitive Theory (SCT) (Bandura, 1986) to theorise the role of perceived user digital efficacy on catalysing customer experience with internet banking. According to the SCT, individual factors and environmental variables, shape individual and group behaviours. More importantly, the SCT emphasises the role of individual self-efficacy in executing desired behaviours. Self-efficacy is defined as the conviction that one has in possessing the requisite ability, knowledge, resources and skills needed to perform an intended action (Bandura, 1986). In this study, we propose that customer digital efficacy (knowledge, skills, and resources) with internet banking technologies and user interface has a positive effect on flow experience and the subsequent satisfaction with e-banking. Thus, the SCT also contributes to the theoretical framework of the present study.

Lastly, the flow theory underpins the role of a desirable digital stimulus on enhancing customer experience with internet banking and the subsequent e-customer satisfaction. According to Csikszentmihalyi (1990), flow is a state of deep immersion and seamless enjoyment in an intended activity or task. Accordingly, flow experience subsequently boosts customer satisfaction by creating heightened positive feelings of delight (hedonic motivation) and user perceived usefulness of the technology (utilitarian value) (Nakamura & Csikszentmihalyi, 2009). Digital efficacy is the individual's ability and confidence in

that ability to use digital tools, technologies and platforms to achieve their goals, improve performance and learning in digital environments (Harmat et al., 2016). The present study proposes that customer digital efficacy leads to flow experience in internet banking, subsequently influencing customer satisfaction with e-banking. Given that scenario, the flow theory provides an essential lens with which to view the leveraging role of immersive digital experiences on seamless internet banking navigation and customer satisfaction.

2.2. Hypotheses and conceptual framework

2.2.1. Internet banking service quality, flow experience and e-customer satisfaction

Rapid technological developments in the financial services industry have seen banks resorting to a multi-channel system to expedite service delivery. Internet banking is defined as financial services that are mediated through digital servicescapes mainly through applications and the web (Amin, 2016). Due to ubiquity and convenience, customers enjoy transacting from the comfort of their homes and work spaces (Dangaiso et al., 2024). Most studies reveal that internet banking service quality consists of key dimensions such as system availability, site organisation, efficiency, speed, ease of navigation, responsiveness, privacy, and security (Amin, 2016; Gazi et al., 2025). Most e-banking frameworks significantly borrow from the E-S-QUAL model (Parasuraman et al., 2005), adding context-specific attributes necessary in the banking sector. Customer satisfaction is defined as an emotional and subjective state of pleasure as a result of product or service performance that meets or surpasses customer expectations (Anderson & Sullivan, 1993; Oliver, 1980). According to Kim and Yang (2025), customer satisfaction is an emotion evoked by a response to customer experience and interaction experience related to a service. Abundant research has shown that e-banking service quality has a positive effect on e-customer satisfaction e.g. Dangaiso et al. (2024), Amin (2016), Mwiya et al. (2022), Gazi et al. (2024) and Gazi et al. (2025). Although the Zimbabwean banking industry has previously been marred by limited technological infrastructure amid bank closures, hyperinflation, and corporate governance failures, among other challenges, (Dangaiso et al., 2024), there is a new wave of confidence in the growth and viability of the financial sector. Incremental investments in new banking technology has led to growing competition and improved service delivery. Given the foregoing, this study proposed that:

H1: Internet banking service quality positively and significantly influences e-customer satisfaction.

The advancement of banking infrastructure and technology has provided serendipitous avenues for enhancing online customer experience. Banks have largely benefited from immersive technologies and the internet that keep customers locked in, enjoying a seamless state of flow while they complete their financial transactions. According to van Beuningen et al. (2011), self-efficacy increase is determined by a firm's strategic choice to help customers learn, a firm's tactic to provide quality information and customers' level of cognitive effort. This underscores the impact of bank technology infrastructure and service quality on customer experience. The concept of flow was coined by Csikszentmihalyi (1990) and has explained significant customer experience in diverse settings, especially in tech-intensive service industries. Flow resembles a state of pleasure and fulfillment while immersed in a task or activity (Nakamura & Csikszentmihalyi, 2009).

Banks that offer better digital banking interface with online aesthetics, ease of navigation, better site organisation, privacy, security, and responsiveness, have a higher propensity to have better customer experience and user satisfaction (Dangaiso et al., 2024; Gazi et al., 2025; Mwiya et al., 2022). In this context, we query whether Zimbabwean banks can earn competitive advantage by making online banking an enjoyable experience. Given that scenario, we infer that internet banking service quality leads to better customer experience through role of flow, error free and seamless e-banking experience. Empirical evidence also shows that flow experience has a positive effect on customer satisfaction with most internet mediated services such as e-learning (Nguyen et al., 2025; Zheng & Xiao, 2023), online banking (Pham & Pham, 2024; Priyanka & Karthik, 2025), virtual reality (Issock et al., 2024), e-shopping (Mohammadi & Dickson, 2024), and live streaming e-commerce (Yu et al., 2025). Grounded in the empirical bases above, this study hypothesised that:

H2: Internet banking service quality positively and significantly affects customer flow experience.

H3: Flow experience mediates the relationship between internet banking service quality and e-customer satisfaction.

2.2.2. Customer digital efficacy, flow experience and e-customer satisfaction

The main proposition of this study is anchored on the pivotal role of customers on the internet banking value co-creation dyad. Extant services marketing literature confirms that both the provider and the consumer play critical roles in the concurrent production and consumption of a service (Grönroos, 2000; Lovelock & Witz, 2012). While the technological investments by providers enable production of the service, the consumer needs incremental investments in new knowledge, resources and human skills that facilitate performance or consumption of the service. Thus, if customers have requisite digital banking knowledge, resources and skills, they are more inclined to enhance their e-banking experiences. Digital efficacy impacts how users adopt new technology, interact on digital touch points, intentionally execute tasks and troubleshoot challenges (Nanta et al., 2025). Although there is limited empirical evidence to support this hypothesis, substantial literature demonstrates how most service failures are attributed to customer failures (Dangaiso & Mukucha, 2024; Osborne & Ballantyne, 2012; Robertson et al., 2023; Zeithaml & Bitner, 2003). Thus, individual customer efficacy with e-banking has a greater propensity to enhance the customer's own service experience through both hedonic and utilitarian value fulfillment with internet banking.

Previous studies also show that flow experience has a positive influence on user satisfaction, for example, in e-learning (Getenet et al., 2024; Zheng & Xiao, 2023), artificial intelligence use (Wang & Chuang, 2024), virtual reality (Issock et al., 2024), and online shopping (Mohammadi & Dickson, 2024). The impact of flow on e-banking is relatively under-researched, with a few studies such as, Xin Ding et al. (2010), Pham and Pham (2024) and Priyanka and Karthik (2025) showing its under-explored impact. Furthermore, according to Nanta et al. (2025), digital touch points that prioritise user engagement and human characteristics have huge customer satisfaction prospects. Studies in different countries show that digital self-efficacy improved business success among micro entrepreneurs (Arifin et al., 2023), student experiences and behavioural outcomes in e-learning (Zheng & Xiao, 2023), and financial literacy of online stock traders (van Beuningen et al., 2011). In this study, user digital efficacy is positioned as a strong antecedent factor of flow experience in internet banking. Furthermore, stronger user digital efficacy is also expected to strengthen the positive effects of online banking service quality on online customer satisfaction. By buttressing better customer digital efficacy, banks have an opportunity to improve customer e-banking experiences and subsequent satisfaction with service. The current study therefore proposes that better digital self-efficacy has a pivotal role in determining the level of service usage, service performance, user perceived experience and post-experience outcomes in the banking sector. Drawing from the foregoing, this study predicted that:

H4: Customer digital efficacy has a positive and significant influence on flow experience in internet banking.

H5: Customer digital efficacy positively moderates (strengthens) the relationship between internet banking service quality and e-customer satisfaction.

H6: Customer digital efficacy positively and significantly influences e-customer satisfaction with internet banking.

The role of flow experience has been emphasised by scholars regarding its importance in catalysing customer experiences in online servicescapes (Harmat et al., 2016). Studies show that flow experience provides comfort, immersion and enjoyment as customers navigate through online service encounters (Nakamura & Csikszentmihalyi, 2009). In other words, flow experience refers to the degree of a customer's emotional captivation and submersion in an activity as they consume services mediated through the internet (Bolton et al., 2018; Heutte et al., 2016). Abundant research confirms that flow experience has a positive impact on customer satisfaction in online environments such as e-commerce, e-gaming, and e-learning (Becker & Jaakkola, 2020; Bolton et al., 2018; Jain et al., 2017; McColl-Kennedy et al., 2017; Nguyen et al., 2025). In online banking, flow experience has positively influenced user satisfaction in the

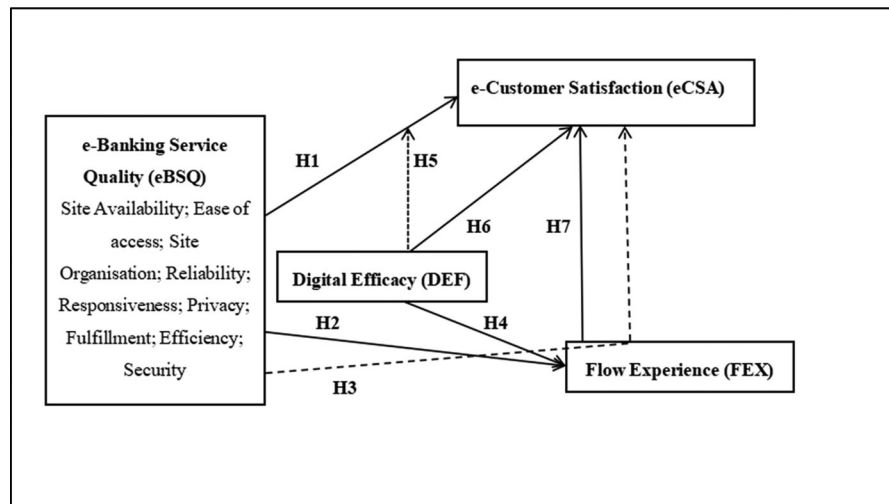


Figure 1. Conceptual framework. *Notes:* e-banking service quality (eBSQ) is internet banking service quality; digital efficacy (DEF) is customer digital efficacy.

studies of Pham and Pham (2024), Priyanka and Karthik (2025) and Xin Ding et al. (2010). This study proposes that, in addition to internet banking service quality through the role of the existing technology infrastructure, user digital readiness is a key driver of flow experience. In the light of the foregoing, the present study hypothesised that:

H7: Flow experience has a positive and significant effect on e-customer satisfaction with internet banking.

Figure 1 illustrates the conceptual framework.

3. Methodology

3.1. Research design and sampling

The purpose of this research was to examine causal links between e-banking service quality, customer digital efficacy, flow experience, and e-customer satisfaction, in a pre-emerging market context. Given that scenario, the study adopted the positivism research philosophy, aligned with the quantitative research approach and an explanatory research design (Saunders et al., 2018). The study targeted internet banking customers in Harare, Bindura, and Chinhoyi. Harare is the capital city of Zimbabwe while Chinhoyi and Bindura are provincial capitals, providing a generalisable banking populace for the study. Without a reliable sampling frame for internet banking customers (Saunders et al., 2018), probability sampling methods were not feasible. Therefore convenience sampling was used. Convenience sampling allows researchers to collect quantitative data where probabilistic methods are impractical. According to Nunkoo (2018), convenience sampling ensures sample representativeness and reduces respondents' bias for high and low response rates. A sample of 430 customers was selected based on Cochran (1963), resulting in 412 valid responses. This sample size aligned with the data analysis methods (SEM), sizes used in related studies, and generalisability considerations (Hair et al., 2019).

3.2. Measurement instrument

The measurement items that were employed in this study were extracted from previous studies (Table 1). These validated scales were extracted from literature. These were internet banking service quality (6 items) from Amin (2016), customer digital efficacy (4 items) adopted and contextualised from Arifin et al. (2023), Compeau and Higgins (1995) and van Beuningen et al. (2011), flow experience (4 items) adapted from Issock et al. (2024) and e-customer satisfaction (3 items) that were extracted from Amin (2016). These measurement items were measured using a seven-point Likert scale ranging from strongly

Table 1. Psychometric properties of the measurement model.

Constructs and observed items	SFL	SMC	Mean	SD
Internet Banking Service Quality (EBSQ)				
EBSQ1: The online system completes my transactions error free	0.835	0.698	5.654	0.812
EBSQ2: The internet banking service is always available (24/7)	0.810	0.656	5.842	0.725
EBSQ3: My personal data are secure with online banking	0.793	0.629	5.923	0.932
EBSQ4: My enquiries on internet banking channels are processed swiftly	0.877	0.770	5.981	0.824
EBSQ5: The online banking website is well organised	0.757	0.573	6.142	0.743
EBSQ6: The internet banking system is always up to date	0.800	0.641	5.810	0.895
Flow Experience (FEX)				
FEX1: Using internet banking is a pleasurable experience for me	0.870	0.756	6.018	0.768
FEX2: I feel in control when navigating internet banking services	0.837	0.701	5.864	0.640
FEX3: Using internet banking makes me fully engaged in the activity	0.900	0.809	5.927	0.785
FEX4: Using internet banking makes me lose track of time	0.898	0.807	5.685	0.854
Digital Efficacy (DEF)				
DEF1: I have essential knowledge and skills to use internet banking	0.868	0.754	5.706	0.821
DEF2: My own performance using internet banking is optimal	0.896	0.802	5.920	0.795
DEF3: I am certain to successfully do internet banking to the levels I like	0.834	0.696	6.064	0.880
DEF4: I understand the internet banking procedures without any challenges	0.768	0.590	6.220	0.762
e-Customer Satisfaction (eCAS)				
eCSA1: I am happy with using my internet banking platforms	0.859	0.738	6.001	0.562
eCSA2: Choosing my e-financial service provider was one of my best decisions	0.820	0.672	5.982	0.580
eCSA3: The internet banking service meets all my needs	0.847	0.717	5.833	0.876

SMC: Squared Multiple Correlation; SFL: Standardised Factor Loading; SD: Standard deviation.

Source: SPSS AMOS (2026).

disagree (1) to strongly agree (7). To procedurally mitigate common methods bias, the items were randomised on the survey instrument during the design stage.

3.3. Data collection procedure and ethics

The study was approved by the Ethics Committee of Chinhoyi University of Technology (CUT), Reg. no. CUT/SEBS/10/08/2025-013, dated 10 August 2025. In addition, the study fully complied with the provisions of the Declaration of Helsinki. This study obtained written informed consent from all the participants. No minors, cognitively impaired or other persons needing parental or guardian consent were used as respondents. In addition, participant rights such as full disclosure of study purpose, freedom from harm, unconditional withdrawal, voluntary participation, privacy and confidentiality, were observed before, during and post fieldwork. The study did not collect any financially or personally sensitive data from the respondents. All the survey questions were guided by the established research objectives. Data were collected through a person-administered questionnaire from 6 to 23 October 2025. The study did not adopt an online survey due concerns about relatively lower response rates and the unavailability of a reliable sampling frame.

3.4. Data analysis methods

The study employed Structural Equation Modelling (SEM) in SPSS AMOS (Version 23) to evaluate the proposed effects. This followed a two-step analysis procedure - measurement model assessment through Confirmatory Factor Analysis (CFA) and structural model estimation in SEM (Anderson & Gerbin, 1988). We employed Average Variance Extracted (AVE) to assess convergent validity whilst discriminant validity was examined by comparing construct correlations against the square roots of AVE (Hair et al., 2019). The Heterotrait Monotrait (HTMT) ratio of correlations also further evaluated discriminant validity (Henseler et al., 2015). Furthermore, construct reliability was assessed using Cronbach alpha and composite reliability (Nunnally & Bernstein, 1994). This study used both absolute and incremental fit indices to assess the suitability of the models. These were the normed chi square (χ^2/df), Goodness of Fit Index (GFI), Standardised Root Mean Residual (SRMR), Root Mean Square Error of Approximation (RMSEA), Incremental Fit Index (IFI), Tucker-Lewis Index (TLI) and the Comparative Fit Index (CFI). Further, the Harman's single factor test and the common latent factor methods were used to examine any incidences of common methods variance (CMV) (Podsakoff et al., 2012).

Table 2. Demographic profile of respondents.

Variable	Category	Frequency	Percentage (%)
Gender	Male	201	48.79
	Female	211	51.21
Age (years)	1–6–25	88	21.36
	26–35	100	24.28
	36–45	85	20.63
	46–55	78	18.93
	56+	61	14.80
Income (\$)	0–500	80	19.42
	501–1000	193	46.84
	1001–1500	53	12.86
	1501–2000	45	10.92
	2001+	41	9.96
Source of Income	Formally employed	236	57.28
	Self-employed	107	25.97
	Investment	51	12.38
	Other	18	4.37
Education	No formal education	6	1.46
	Ordinary Level	68	16.50
	Advanced Level	76	18.45
	Diploma	66	16.02
	Bachelor's degree	124	30.10
	Master's degree	59	14.32
	Doctoral degree	13	3.15

Source: Primary data (2026).

4. Data analysis and results

4.1. Sample characterisation

The demographic profile of the participants who took part in this study was analysed. The results from SPSS show that there were marginally more female (211: 51.21%) than male (201: 48.79%) participants. In addition, our data shows that the 26–35 years cohort had more participants (100: 24.28%) than any other age group while the 56+ segment had the lowest number of participants (61: 14.8%). In terms of income, there were 193 (46.84%) participants in the \$501–1000 category, followed by the \$0–500 with 80 (19.42%) while the \$2001+ category had the fewest respondents with 41 (9.96%). Furthermore, data on income sources revealed that the majority of the participants were formally employed (236: 57.28%) while the self-employed represented 107 (25.97%) responses. The last demographic variable examined in the study was the education level of respondents. There were 124 (30.1%) bachelor's degree holders, 76 (18.45%) Advanced level graduates, while only 6 (1.46%) had no formal education. The full participants' socio-demographic profile is illustrated in [Table 2](#).

4.2. Assessment of the measurement model

This study followed a two-step analysis procedure recommended by Anderson and Gerbin (1988) for models evaluating structural relations between constructs. First, the data were subjected to a Confirmatory Factor Analysis (CFA) procedure to establish validity and reliability of the measurement models. Second, Structural Equation Modelling (SEM) in AMOS estimated proposed causal paths between the constructs in the proposed model. Using Maximum Likelihood for estimation, the factor loadings of the CFA model were all greater than the recommended threshold of 0.7 (Kline, 2023), except FEX5 (0.580) which was subsequently dropped from further analysis. The retained factor loadings were statistically significant, ranging from 0.757 to 0.900, confirming significant explained variance between the observed items and the latent constructs (see [Table 1](#)). To examine convergent validity of each construct, the Average Variance Extracted (AVE) was employed. [Table 3](#) shows that the AVEs were greater than 0.5, confirming that at least 50% variance in each observed item was explained by the construct (Fornell & Larcker, 1981; Hair et al., 2019).

Furthermore, the presence of discriminant validity was assessed using the Fornell-Larcker criterion, where the square root of the AVE was compared against the correlations between the constructs in the model. Accordingly, all square roots of the AVE values were greater than the correlations, confirming that the squared extracted variances were greater than the shared variances, establishing distinct constructs

Table 3. Construct validity and reliability.

	CR	AVE	MSV	MaxR(H)	EBSQ	FEX	DEF	eCSA
EBSQ	0.921	0.661	0.521	0.925	0.813			
FEX	0.930	0.768	0.643	0.933	0.531***	0.877		
DEF	0.907	0.710	0.674	0.916	0.576***	0.802***	0.843	
eCSA	0.880	0.709	0.674	0.881	0.721***	0.725***	0.821***	0.842

Notes: AVEs are shown on the diagonal; bivariate correlations are below the diagonal.

Table 4. HTMT ratios for discriminant validity.

	EBSQ	FEX	DEF	eCSA
EBSQ	1.000			
FEX	0.515	1.000		
DEF	0.587	0.833	1.000	
eCSA	0.723	0.731	0.829	1.000

Notes: HTMT ratios are below the diagonal.

Source: Henseler et al. (2015) Online HTMT Calculator.

(Fornell & Larcker, 1981). In addition, the Maximum Shared Variance (MSV) values were less than the AVE values, providing evidence of discriminant validity (Hair et al., 2019). Lastly, the Heterotrait-Monotrait (HTMT) criterion (Henseler et al., 2015) also confirmed that the ratio of related to unrelated correlations was lower than 0.85 (see Table 4). Accordingly, this supported the presence of discriminant validity in this study. Composite reliability scores were greater than 0.7, confirming that the measurements were reliable (see Table 3). The maximum reliability MaxR(H) ranged from 0.881 to 0.933, indicating good reliability for all the variables. Using Harman's single factor test, no single factor accounted for close to 50% of total variance in EFA. Further, the single factor marker model had a very bad model fit and did not correlate with the four-factor CFA model. Table 1 shows the results of the confirmatory factor analysis (CFA).

Table 3 illustrates the validity and reliability statistics of the CFA model.

4.3. Structural Equation Modelling and hypothesis testing

SPSS AMOS version 23 estimated model parameters in the proposed structural model. The structural model was evaluated on three criteria: the statistical significance of path estimates, the coefficient of determination (model squared/ R^2) and the model fit (Hair et al., 2019). The structural model obtained a very good fitting model (GFI = 0.930; CFI = 0.960; TLI = 0.958; χ^2/df = 3.1, RMSEA = 0.07; SRMR = 0.04). According to Hu and Bentler (1999) and Joreskog and Sorbhom (1993) in Byrne (2016), Hair et al. (2019) and Kline (2023), this model had a very good fit.

The causal path between internet banking service quality and e-customer satisfaction was positive and statistically significant (β = 0.348, t = 6.194, p < 0.001). Given this scenario, H1 was accepted. The second hypothesis (H2) predicted that e-banking service quality leads to flow experience. This path was also positive and significant (β = 0.372, t = 6.670, p < 0.001), influencing support for H2. This study also predicted the mediation effect of flow experience on the link between e-banking service quality and e-customer satisfaction. Based on the support of H1 (EBSQ $\rightarrow$ eCSA), the results confirmed a partial mediation effect (β = 0.311, t = 6.453, p < 0.001), subsequently supporting H3. Furthermore, the study also proposed that customer digital efficacy would positively influence flow experience in H4. Interestingly, this path was positive and significant (β = 0.743, t = 11.528, p < 0.001). The effect was the strongest in the estimated structural model and H4 was also confirmed. In addition, e-banking service quality and flow experience explained 65.1% of the variability in flow experience in internet banking (R^2 = 0.651). Furthermore, H5 proposed that customer digital efficacy positively moderated the influence of e-banking service quality and e-customer satisfaction. Against our expectations, this interaction effect was not statistically significant (β = -0.033, t = -0.815, p = 0.416), rejecting H5. In addition, the effect of customer digital efficacy on e-customer satisfaction with e-banking was positive and significant (β = 0.533, t = 9.403, p < 0.001). Based on the results, H6 was supported. The ultimate hypothesis predicted the positive effect of flow experience on e-customer satisfaction with e-banking (H7). This relationship was confirmed (β = 0.133, t = 3.165, p < 0.01) and we subsequently accepted H7. Overall, the model managed to account

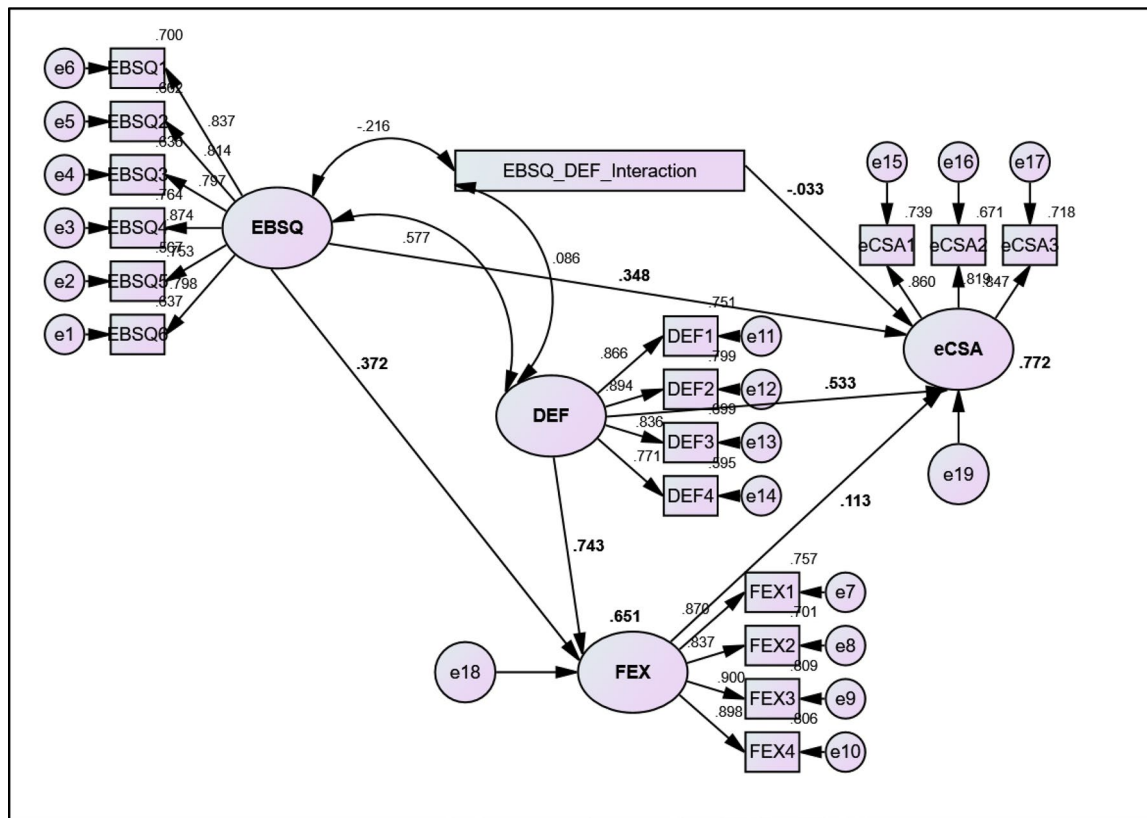


Figure 2. Structural model.

Table 5. Outcomes of hypothesis testing.

Hypothesis and causal path	Estimate	t-value	p-value	Decision
H1: EBSQ→eCSA	0.348	6.194	***	Supported
H2: EBSQ→FEX	0.372	6.670	***	Supported
H3: EBSQ→FEX→eCSA (mediation)	0.311	6.453	***	Supported
H4: DEF→FEX	0.743	11.528	***	Supported
H5: EBSQ*DEF→eCSA (moderation)	−0.033	−0.815	0.416	Not supported
H6: DEF→eCSA	0.533	9.403	***	Supported
H7: FEX→eCSA	0.133	3.165	**	Supported

Notes: *** = $p < 0.001$; ** = $p < 0.01$.

Source: SPSS AMOS (2026).

for 77.2% of the variability in e-customer satisfaction ($R^2 = 0.772$). The results of the SEM estimation for this study are in Figure 2 and the outcomes of hypothesis testing are shown in Table 5.

Figure 2 illustrates the estimated structural model.

5. Discussion

The purpose of the study was to examine the relationships between internet banking service quality, customer digital efficacy, flow experience and e-customer satisfaction. Survey data from 412 e-banking customers in Zimbabwe was used to evaluate the structural model in SPSS AMOS. The findings of the study show that e-banking service quality positively influenced e-customer satisfaction ($\beta = 0.348$, $t = 6.194$, $p < 0.001$). These results influenced support for H1, aligning with previous studies such as Dangaiso et al. (2024), Gazi et al. (2024), Gazi et al. (2025) and Mwiya et al. (2022). The findings imply that banks need to ensure that the available technology infrastructure enhances aspects such as responsiveness, privacy, reliability, security, efficiency, site organisation and user fulfillment. The findings support existing theoretical frameworks such as the disconfirmation paradigm (Oliver, 1980) that underscores the importance of

service quality on customer satisfaction, especially in online environments where the provider and the customer co-create value in remote locations.

Secondly, H2 had predicted that service quality positively and significantly influences flow experience in internet banking. This hypothesis was supported ($\beta=0.372$, $t=6.670$, $p<0.001$). Echoing the findings of Pham and Pham (2024) as well as Priyanka and Karthik (2025) in Vietnam and India, respectively, the results confirm that advanced internet banking technology that offers highly responsive speeds, error free digital banking, reliability, and security, enhances the user immersion and customers' emotional connection with e-banking. In computer mediated servicescapes, internet privacy and security provide an additional layer of user experience that reinforces safety, confidence and seamless user experience. Given that situation, banks should invest in technology infrastructure that fosters customer experience. The flow theory supports the perspective that emotional connection, submersion and control in an online activity, reinforces perceived enjoyment and satisfaction. Thus current findings establish the pivotal role of e-banking service quality as an antecedent factor of user flow during internet banking navigation experiences.

Building on the previous findings, the study also proposed that flow experience mediates the relationship between e-banking service quality and e-customer satisfaction. SEM estimation supported this claim ($\beta=0.311$, $t=6.453$, $p<0.001$), denoting partial mediation, and thus supporting H3. The findings resonate with previous claims by Ertemel et al. (2021) and Hsu et al. (2012) in B2C online shopping contexts from Turkey and Taiwan, respectively. The findings show that the mediating role of flow experience is still undermined in e-banking as more studies examining flow experiences focused on more digitally pronounced services such as e-learning (Zheng & Xiao, 2023), artificial intelligence use (Wang & Chuang, 2024), virtual reality (Issock et al., 2024), and online shopping (Mohammadi & Dickson, 2024). The study shows that although a direct effect of internet banking service quality was evident, this study demonstrates that this effect is also catalysed through the role of enjoyable flow experience between the pages, tags and meta tags that build online user experience.

Furthermore, H4 predicted that customer digital efficacy leads to flow experiences in e-banking. This proposition situates the novelty of our proposed model, empirically validating the nexus between the constructs, influencing support for H4 ($\beta=0.743$, $t=11.528$, $p<0.001$). User efficacy in computerised and internet mediated service experiences plays a key role in driving both task flow and user satisfaction. The role of digital self-efficacy has been shown in other contexts such as micro entrepreneurial success (Arifin et al., 2023), entrepreneurship intention (Kivuyo et al., 2025), e-learning outcomes (Zheng & Xiao, 2023), online stock trader financial literacy (van Beuningen et al., 2011) and industry 4.0 digital creativity (Ren et al., 2025). In this context, we further demonstrate that digital knowledge skills to navigate effortlessly and troubleshoot minor technical glitches on the user interface are critical elements for internet banking success. Current literature supports the view that most customer dissatisfaction in online environments is attributed to their apparent lack of digital skills, experience and failure to follow site instructions or steps (Dangaiso et al., 2024; Robertson et al., 2023). Given that situation, the present study provides implications for bank managers through continuous customer education and skills training, using multi-channel banking and investing in easy-to-use technology systems. Increasing digital efficacy can yield better customer experiences in internet banking. Theoretically, the results demonstrate the interplay between service quality theory, social cognitive perspective and flow theory, connecting the necessity of e-banking infrastructure and user technological readiness in enhancing seamless online banking experiences.

In line with our digital readiness concept, we further proposed that customer digital efficacy would moderate (strengthen) the positive influence of internet banking service quality on e-customer satisfaction (H5). In terms of the direct effect of e-banking service quality on e-customer satisfaction, contrary to our expectations, we found that the influence of the resultant interaction term was not significant ($\beta = -0.033$, $t = -0.815$, $p=0.416$), therefore we reject H5. We did not find any prior empirical support for the current results. However, our study demonstrates that customer efficacy with digital banking positively impacts both their user satisfaction (H6) and flow experience (H4) with internet banking. Regarding the effect of digital efficacy on e-customer satisfaction ($\beta=0.533$, $t=9.403$, $p<0.001$), the study underscores the need for continuous customer training on multichannel platforms to reinforce their e-banking knowledge and skill-set. Although this area remains under-researched in e-banking, the findings lean

towards Nanta et al. (2025) and Arifin et al. (2023), who pinpointed the role of digital self-efficacy in Indonesian broadband application (IndiHome) users and Malaysian entrepreneurs, respectively. In terms of theory, we demonstrate the integration of social cognitive insights and TAM on the nexus of user digital readiness, user experience and user satisfaction. While the SCT highlights how self-efficacy shapes individual behaviours, the TAM reflects on user's readiness to adapt e-banking technology based on the 'perceived ease of use.' This paper also highlights the theoretical potential to explain how users' digital efficacy in online servicescapes could influence perceived service quality in future research, as user perception of e-service quality would largely be attributed to their own understanding of how and if they fit in the e-banking value co-creation dyad.

The last hypothesis predicted that flow experience positively and significantly influence e-customer satisfaction with internet banking. This relationship was positive and significant ($\beta=0.133$, $t=3.165$, $p<0.01$), leading to empirical support for H7. Previous studies confirm that user flow experience has a positive impact on customer satisfaction in computer environments, for example, in e-banking (Pham & Pham, 2024; Priyanka & Karthik, 2025), e-learning (Getenet et al., 2024), virtual reality (Issock et al., 2024), and e-commerce (Mohammadi & Dickson, 2024). Given that position, banks should ensure that they configure e-banking infrastructure that creates immersive experiences, leading to satisfied customers. Second, leaning on previous hypotheses, banks should consider customer development initiatives to improve user digital efficacy with internet banking. Theoretically, the results confirm the role of task enjoyment on e-customer satisfaction with internet banking. This links the flow and expectancy-disconfirmation theoretical perspectives, demonstrating how user flow, immersion and perceived enjoyment affects customer satisfaction in internet mediated service experiences.

Despite the validity of the findings discussed, the study also had limitations. First, we present a limitation regarding the use of convenience sampling. This limits the generalisability of our findings. Due to non-availability of a sampling frame, the study could not use probability sampling techniques. However, Nunkoo (2018) supports the use of convenience sampling in surveys seeking to generalise findings to wider populations. Second, the use of mono-quantitative research methodology limits access to detailed user perspectives on e-banking service quality, customer digital efficacy, flow experiences and e-customer satisfaction. Future studies may use triangulation to overcome the weaknesses of each methodological approach, integrating in-depth interviews and focus group discussions. Lastly, the study was cross-sectional, collecting data once off. Although this has been validated as an approach for research over time, more longitudinal and meta-analytic studies may be needed to strengthen the validity of our findings.

6. Implications

This study has implications for both theory and practise in the contemporary digital services context.

6.1. Theoretical implications

The present findings support existing frameworks, such as the disconfirmation paradigm (Oliver, 1980), that underscore the role of service quality on customer satisfaction especially in online environments where the provider and the customer co-create value in remote locations. In addition, the present findings build upon the flow theory, reinforcing the notion that emotional connection, submersion and control in digital servicescapes fosters perceived enjoyment and satisfaction. Thus current findings establish the pivotal role of e-banking service quality as an antecedent of flow experience in internet banking. Extant literature indicates that most customer dissatisfaction in electronic environments is linked to their apparent lack of digital knowledge, navigation skills, limited experience and failure to follow service site instructions (Dangaiso et al., 2024; Robertson et al., 2023). Our results show that online customer satisfaction significantly improves when users' digital efficacy is strong. The present findings also confirm the importance of task enjoyment on e-customer satisfaction with internet banking. This links the flow and expectancy-disconfirmation theory, showing how flow, deep immersion and user enjoyment affect customer satisfaction with e-banking service experiences. The findings also epitomise the theoretical alignment between e-banking service quality, social cognitive and flow theories, and demonstrating synergies between e-banking infrastructural

configuration, customer technological readiness and experiential outcomes in optimising online banking. While the SCT emphasises how individual self-efficacy shapes individual behaviours, the TAM reflects on user's readiness to adapt e-banking technology based on the perceived ease of use. This study shows that the customer's perception of their own digital efficacy is a key factor that determines their perception of experience quality and satisfaction. These findings also highlight the theoretical potential to explain how users' digital self-efficacy in online services could explain perceived service quality in future studies. We position user perception of e-service quality as an outcome largely attributed to their own conception of their critical role in enhancing value co-creation on the e-banking dyad.

6.2. Practical implications

The paper shows bank managers the key factors that drive customer satisfaction in the context of internet banking. While abundant literature has emphasised on a provider's digital infrastructure as the mirror image of its e-service quality and customers' experiential outcomes, this study adds digital self-efficacy as a key aspect that drives experience quality and satisfaction with e-banking. Although the results imply that online banks should ensure that the technology infrastructure enhances aspects such responsiveness, privacy, reliability, security, efficiency, site organisation and user fulfillment, reinforcing user efficacy in navigating online banking emerges as a critical factor for better flow experience and customer satisfaction. The findings imply that banks should configure internet banking technology that enhances user flow and immersion, leading to better perceived enjoyment and customer satisfaction. The findings also show that using high-end internet banking technology that is highly responsive, error free, reliable, and secure, enhances the user's experience quality and emotional connection with service providers. In internet mediated services, security and privacy present an additional layer of user experience that builds user confidence, safety perception, low-risk exposure and seamless transacting. Given that scenario, bank managers should adopt technology infrastructure that fosters these attributes for better online banking experience. Moreover, the present findings provides key implications for bank managers through continuous user education and skills training, highlighting the need to employ multi-channel banking and adopting easy-to-follow steps that make e-banking simple, effective, enjoyable and memorable. Banks managers should adopt customer development programs that strengthen user digital efficacy with internet-based servicescapes. Enhancing user digital self-efficacy can yield better experience quality and customer satisfaction with internet banking.

7. Conclusions

Most previous studies that examined the service quality and customer satisfaction nexus have focused on firm-level competences that drive customer experience and perceptions of service performance. The present study integrates the customer role in influencing their own digital banking experiences and user satisfaction in the internet banking value co-creation dyad. The findings demonstrate that in addition to service quality, customer digital efficacy and flow experience positively impact e-customer satisfaction in the context of internet banking. These findings underscore the importance of having digitally savvy customers who augment their user experiences through internet banking knowledge and skills that catalyse their flow experiences in online service platforms. The main contribution of this study is situated on its ability to demonstrate how service quality augmentation with digital efficacy and flow experience creates seamless customer experiences in e-banking. Thus, in addition to revamping e-banking technology infrastructure, banks that develop customer digital experiences through easy-to-use customer interface, simpler instructions and steps, and customer training and education programs, have higher propensity to leverage customer digital acumen for e-customer satisfaction. Customer satisfaction has a pivotal role in determining future service patronage intentions and behaviours, thus reinforcing the main antecedents of user satisfaction may provide better competitive advantage for the banks. However, the model validated in this study was based on survey data from a developing market context, thus, more context specific studies are needed to reach more accurate generalisations on the role of online customers on augmenting their own user experiences through better digital knowledge and skills in e-servicescapes.

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Author contributions

CRedit: **Phillip Dangaiso**: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Writing – original draft, Writing – review & editing; **Masimba Elvis Manyangara**: Investigation, Methodology, Project administration, Resources, Writing – review & editing; **Paul Mukucha**: Investigation, Resources, Validation, Writing – review & editing; **Brighton Nyagadza**: Formal analysis, Resources, Validation, Writing – review & editing; **Regis Misheal Muchowe**: Investigation, Resources, Validation, Writing – review & editing; **Tendai Towo**: Investigation, Resources, Validation, Writing – review & editing.

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Data availability statement

The data that supports the conclusions of this study will be availed by the corresponding author on reasonable request.

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