INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN ACCOUNTING, FINANCE AND MANAGEMENT SCIENCES

OPEN ACCESS JOURNAL

Vol 16, Issue 4, (2026) E-ISSN: 2225-8329

Beyond Green Awareness: Financial Literacy and Sustainable Digital Banking Intentions among Generation Z in Malaysia

[1]Jaludin Janteng, [1]Alesia Sigang Gugkang, [2]Puspita Wulansari, [3]Hazairi Hassan

[1]Labuan Faculty of International Finance, Universiti Malaysia Sabah Labuan International Campus (UMSKAL), Jalan Sungai Pagar, 87000, Malaysia, [2]School of Economics and Business, Telkom University, Jl Telekomunikasi 1, Bandung 40257, West Java, Indonesia, [3]Maybank International Labuan Branch, Financial Park Complex, 87000 FT Labuan, Malaysia

Corresponding Author Email: jaludin@ums.edu.my

DOI Link: http://dx.doi.org/10.6007/IJARAFMS/v16-i4/29324

Published Online: 17 November 2026

Abstract

As digital transformation reshapes the financial sector, sustainable digital banking has become increasingly important in supporting responsible financial behaviour. However, sustainability awareness may not necessarily translate into behavioural intention, reflecting the broader attitude–behaviour gap widely recognised in sustainable consumption research. This study examines the effects of Green Banking Awareness (GBA), Environmental, Social and Governance (ESG) Awareness, Digital Banking Service Quality (DBSQ), and Financial Literacy (FL) on behavioural intention towards sustainable digital banking among Generation Z consumers in Malaysia. Using a quantitative cross-sectional design and purposive sampling, data were collected from 300 Generation Z digital banking users and analysed using Partial Least Squares Structural Equation Modeling (PLS-SEM) and PLSpredict. The measurement model demonstrated satisfactory reliability, convergent validity, and discriminant validity, while the structural model explained 69.4% of the variance in behavioural intention (R^2 = 0.694). Financial Literacy emerged as the strongest predictor ($\beta = 0.467$, $p < 0.001$), followed by ESG Awareness ($\beta = 0.250$, $p = 0.010$) and DBSQ ($\beta = 0.227$, $p = 0.002$), whereas GBA was not significant ($\beta = -0.026$, $p = 0.676$). PLSpredict further indicated meaningful predictive relevance. The findings suggest that green awareness alone may be insufficient to strengthen sustainable digital banking intention; instead, financial capability, broader ESG understanding, and effective digital service experiences play more important roles. The study extends the attitude–behaviour gap discussion to sustainable digital banking and highlights the need to move beyond green awareness toward capability-enabled sustainable financial decision-making.

keywords: Sustainable Digital Banking, Financial Literacy, Green Banking Awareness, ESG Awareness, Behavioural Intention, Generation Z.

Introduction

The rapid digitalisation of financial services is creating new opportunities for banks to embed sustainability into consumers' everyday financial activities. Green banking and sustainable FinTech increasingly connect digital financial services with environmental, social and governance (ESG) objectives, making consumer adoption an important component of the transition towards sustainable finance. This issue is particularly relevant to Generation Z, whose familiarity with digital financial services makes them an important segment for the diffusion of sustainable banking practices. In Malaysia, evidence from Millennials and Generation Z indicates that ethical banking behaviour is associated with factors including awareness, service quality, convenience, information and behavioural intention, highlighting the importance of understanding younger consumers' responsible banking decisions (Zahari et al., 2024). Internationally, green banking awareness has also been shown to influence green FinTech adoption (Sharma et al., 2025), while emerging evidence among Generation Z suggests that financial literacy, sustainability literacy and trust are relevant to green banking intention. However, these findings raise an important question: does awareness of sustainable banking necessarily translate into intention to adopt sustainable digital banking?

The question is particularly important because a persistent awareness–behaviour gap has been identified across sustainable consumption research. Consumers may express environmental concern and favourable sustainability attitudes without consistently translating these orientations into behavioural action. A systematic review of 64 studies by Munro et al. (2023) demonstrates that sustainable attitudes frequently fail to translate into corresponding behaviour because individual and contextual factors can intervene between attitudes, intentions and actions. Similarly, Syed et al. (2024) conclude that sustainable consumption requires multidimensional explanations incorporating psychological, social and contextual factors rather than relying solely on environmental awareness. In sustainable banking, this gap may be particularly consequential because consumers can recognise the environmental value of green banking while simultaneously prioritising financial capability, institutional credibility, convenience, reliability and digital service quality. Although existing research reports a positive relationship between green banking awareness and green FinTech adoption (Sharma et al., 2025), limited evidence has examined whether this relationship remains influential when Financial Literacy (FL), ESG Awareness and Digital Banking Service Quality (DBSQ) are considered simultaneously, particularly among Generation Z consumers in Malaysia. This gap motivates an examination of whether green banking awareness retains an independent association with sustainable digital banking intention when financial literacy, ESG awareness, and digital service quality are considered jointly.

Accordingly, this study examines the effects of Green Banking Awareness (GBA), ESG Awareness, Digital Banking Service Quality (DBSQ), and Financial Literacy (FL) on behavioural intention towards sustainable digital banking among Generation Z consumers in Malaysia. By integrating sustainability awareness, financial capability, and digital service experience within a single framework, the study addresses an important gap in the sustainable banking literature. In particular, it examines whether Green Banking Awareness remains influential when broader ESG understanding, financial literacy, and digital service quality are considered simultaneously. The study therefore contributes to the broader awareness–behaviour literature by examining the potential disconnect between environmental awareness and behavioural intention in the sustainable digital banking context.

Literature Review

Sustainable Digital Banking

Sustainable digital banking refers to the integration of sustainability considerations into digitally delivered financial services. Unlike conventional digital banking, sustainable digital banking combines functional service benefits with environmental, social, and governance considerations. Consumer behavioural intention is important because the success of sustainable financial innovation depends on consumers' willingness to consider and use such services. Previous studies indicate that sustainability awareness, financial capability, trust, and digital service experience may influence sustainable financial decisions (Sharma et al., 2025; Rahayu & Hidayat, 2026). Therefore, sustainable digital banking intention can be viewed as a multidimensional decision involving both sustainability considerations and practical consumer capabilities.

Green Banking Awareness and Behavioural Intention

Green Banking Awareness (GBA) refers to consumers' knowledge and recognition of banking practices that reduce environmental impacts or support environmentally responsible economic activities, including paperless banking, green financing, sustainable investment and environmentally responsible lending. Awareness can represent an important antecedent of sustainable financial behaviour because consumers are more likely to evaluate sustainable alternatives when they understand their environmental implications.

Empirical evidence supports a positive relationship between green banking awareness and sustainable financial technology adoption. Sharma et al. (2025) found that GBA significantly influences green FinTech adoption, suggesting that awareness can encourage consumers to incorporate environmental considerations into financial decisions. This relationship is consistent with sustainable-consumption research showing that knowledge and awareness can contribute to pro-environmental intentions. However, awareness does not necessarily translate directly into behavioural action. Munro et al. (2023) demonstrate that the attitude–behaviour gap remains a persistent challenge in sustainable consumption, indicating that awareness may require complementary individual and contextual conditions to produce behavioural outcomes.

In the context of sustainable digital banking, this distinction is particularly important because consumers may recognise the environmental value of green banking while simultaneously considering financial capability, trust, convenience and service quality. Thus, the effect of GBA may not be sufficient on its own to explain sustainable banking intention. Nevertheless, based on prior empirical evidence, greater awareness of green banking practices is expected to increase consumers' propensity to consider sustainable digital banking alternatives. Accordingly, the following hypothesis is proposed:

H1: Green Banking Awareness has a significant positive effect on behavioural intention towards sustainable digital banking.

ESG Awareness and Behavioural Intention

Environmental, Social and Governance (ESG) considerations provide a broader sustainability perspective than environmental awareness alone. ESG Awareness refers to consumers' understanding of how financial institutions address environmental responsibility, social

outcomes and governance practices, including responsible financing, transparency, ethical governance and sustainable investment. Such awareness can influence consumers' evaluation of whether financial institutions demonstrate credible sustainability practices, with recent research highlighting the growing relevance of ESG considerations to consumer behaviour (Tan et al., 2025).

ESG awareness may strengthen behavioural intention by helping consumers distinguish responsible financial institutions from conventional providers. It may also reduce information asymmetry because consumers cannot directly observe how banks allocate funds or manage environmental and social risks. ESG-related information can therefore act as a signal through which consumers evaluate an institution's sustainability orientation and credibility. This mechanism is particularly relevant in digital banking, where interactions are largely technology-mediated and consumers depend on information communicated through digital channels. Recent evidence among Generation Z indicates that ESG awareness can positively influence Green FinTech adoption, further supporting the relevance of ESG knowledge in digitally oriented sustainable-finance decisions (Alnsour, 2026).

Despite increasing interest in ESG and sustainable finance, limited research has examined ESG Awareness as a distinct multidimensional determinant of sustainable digital banking behavioural intention, particularly alongside environmental awareness, financial capability and digital service quality. This distinction is important because GBA primarily captures awareness of environmental aspects of banking, whereas ESG Awareness encompasses broader environmental, social and governance considerations. Accordingly, consumers with greater ESG awareness are expected to demonstrate stronger behavioural intention towards sustainable digital banking adoption.

H2: ESG Awareness has a significant positive effect on behavioural intention towards sustainable digital banking.

Digital Banking Service Quality and Behavioural Intention

Digital Banking Service Quality (DBSQ) refers to consumers' evaluation of the quality of services delivered through digital banking channels, including reliability, responsiveness, efficiency, security, ease of use and accessibility. Service quality is particularly important because sustainable digital banking must satisfy consumers' fundamental expectations for convenient, reliable and secure financial services. A sustainability-oriented service is unlikely to generate adoption if its digital experience fails to meet these functional expectations.

The relationship between service quality and behavioural intention can be understood through consumers' evaluation of service performance. When digital banking services are perceived as reliable, convenient and secure, consumers are more likely to develop favourable evaluations and stronger intentions to use such services. Empirical evidence supports this relationship, with e-banking service quality found to influence perceived usefulness, perceived ease of use and intention to use digital banking services (Ahmad et al., 2020). Recent evidence further demonstrates that mobile-banking service quality is relevant to customers' continuance intention (Pokhrel et al., 2026).

In sustainable digital banking, DBSQ may therefore represent an important experiential mechanism through which sustainability preferences are converted into behavioural intention. Consumers may recognise the environmental and social value of sustainable banking but remain reluctant to adopt services that are inconvenient, unreliable or insecure. This suggests that sustainability attributes and digital service performance should operate together rather than independently. Accordingly, higher perceived digital banking service quality is expected to strengthen consumers' behavioural intention towards sustainable digital banking adoption.

H3: Digital Banking Service Quality has a significant positive effect on behavioural intention towards sustainable digital banking.

Financial Literacy and Behavioural Intention

Financial Literacy (FL) refers to an individual's knowledge, understanding and capability to make informed financial decisions. It enables consumers to evaluate financial products, assess costs and risks, compare alternatives and make decisions consistent with their financial objectives. In sustainable digital banking, financial literacy is particularly relevant because consumers must evaluate both the financial implications and sustainability claims associated with digital financial services. Prior research links financial literacy with more sustainable financial consumption, indicating that financial capability can influence consumers' engagement with sustainable financial products (Muñoz-Céspedes et al., 2021).

Financial literacy may provide a capability mechanism that bridges awareness and behaviour. Consumers may recognise the importance of sustainable banking but lack the knowledge required to evaluate financial products, assess risks or determine whether a service provides genuine financial and sustainability value. Financially literate consumers are better positioned to interpret financial information and assess product suitability. Recent evidence among Generation Z demonstrates that financial literacy positively influences green banking adoption, while trust further contributes to the translation of financial capability into green banking intention (Rahayu & Hidayat, 2026).

This capability is particularly relevant in digital financial environments. Digital access can expand consumers' exposure to financial products while increasing the need to evaluate information, risks and product suitability. Evidence from Malaysia further indicates that digital financial literacy plays an important role in the actual use of AI-enabled FinTech applications, highlighting the importance of financial capability in increasingly technology-mediated financial decisions (Jahanzeb et al., 2026). Accordingly, higher financial literacy is expected to strengthen consumers' ability and willingness to make informed sustainable financial decisions, leading to stronger behavioural intention towards sustainable digital banking adoption.

H4: Financial Literacy has a significant positive effect on behavioural intention towards sustainable digital banking.

Theoretical Synthesis and Research Model

The literature suggests that sustainable digital banking intention cannot be explained by environmental awareness alone. GBA represents consumers' recognition of environmentally

responsible banking, ESG Awareness reflects a broader understanding of responsible financial practices, FL represents consumers' capability to evaluate financial choices, and DBSQ reflects the quality of digital service delivery. However, limited research has examined these factors simultaneously among Generation Z consumers, particularly in Malaysia. This study therefore proposes an integrated framework to examine whether sustainability awareness, financial capability, and digital service experience contribute differently to behavioural intention. In particular, the framework allows the study to determine whether Green Banking Awareness remains influential when ESG Awareness, Financial Literacy, and Digital Banking Service Quality are considered simultaneously. Figure 1 presents the proposed research model. The framework is an integrative, prediction-oriented model rather than a formal test of a single adoption theory; the four predictors are assessed as parallel antecedents, not as mediators or moderators.

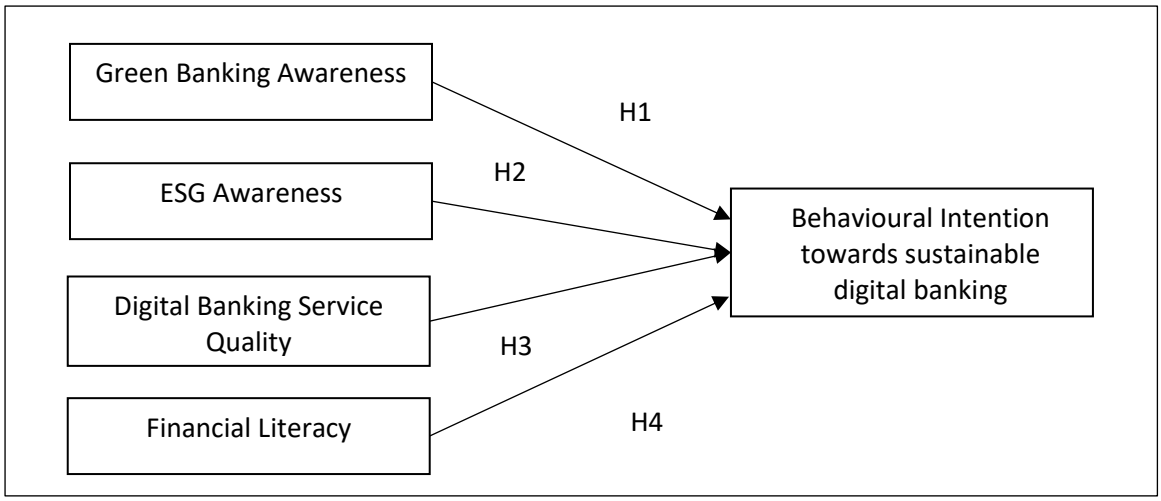


Figure 1: Research Model

Methodology

Research Design

This study employed a quantitative cross-sectional research design to examine the determinants of behavioural intention towards sustainable digital banking among Generation Z consumers in Malaysia. A structured questionnaire was used to measure Green Banking Awareness (GBA), ESG Awareness, Digital Banking Service Quality (DBSQ), Financial Literacy (FL), and Behavioural Intention (BI), reflecting the widespread use of survey-based approaches in Malaysian digital and ethical banking research (Zahari et al., 2024). The hypothesised relationships were analysed using Partial Least Squares Structural Equation Modeling (PLS-SEM) because the study aims to explain and predict behavioural intention through multiple latent constructs while accommodating prediction-oriented research objectives (Hair et al., 2022). To strengthen the predictive assessment, PLSpredict was employed to evaluate the model's out-of-sample predictive capability, consistent with recommendations that PLS-SEM models should be assessed not only for explanatory power but also for their ability to generate accurate predictions for new observations (Shmueli et al., 2019).

Population and Sampling

The target population comprised Generation Z consumers in Malaysia who actively use digital banking services. Purposive sampling was employed because respondents were required to

meet specific eligibility criteria related to age and digital banking experience. The final sample consisted mainly of university-associated Generation Z consumers and should therefore not be interpreted as fully representative of the Malaysian Generation Z population. An a priori power analysis using G*Power 3.1 was conducted with four predictors, a medium effect size ($f^2 = 0.15$), $\alpha = 0.05$, and statistical power of 0.80. The analysis indicated a minimum sample size of approximately 85 respondents. The final sample substantially exceeded this requirement, providing adequate statistical power for testing the proposed relationships (Cohen, 1988; Kock & Hadaya, 2018).

Research Instrument

Data were collected using a structured self-administered questionnaire consisting of demographic questions and measurement items for GBA, ESG Awareness, DBSQ, FL, and BI. The measurement items were adapted or contextualised based on relevant established literature and modified to suit the sustainable digital banking context. GBA was informed by green banking and green FinTech research (Sharma et al., 2025), ESG Awareness by ESG and responsible banking literature (Chow & Ho, 2024; Tan et al., 2025), DBSQ by electronic and digital banking service-quality studies (Raviadaran et al., 2019; Ahmad et al., 2020), FL by established financial-literacy literature (Lusardi & Mitchell, 2014; Morgan & Trinh, 2019), and BI by digital and sustainable banking adoption research (Hoo et al., 2024; Rahayu & Hidayat, 2026). All construct items were measured using a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The questionnaire was reviewed for clarity and relevance before the main data collection. The measurement constructs and their supporting sources are presented in Table 1.

Table 1
Measurement Constructs and Supporting Sources

Construct	Code	No. of items	Measurement focus	Key supporting source(s)
Green Banking Awareness (GBA)	GBA1–GBA5	5	Consumers' awareness and knowledge of environmentally responsible banking practices, including green banking and sustainable financial services	Sharma et al. (2025)
ESG Awareness	ESG1–ESG5	5	Consumers' understanding of environmental, social and governance practices associated with responsible banking	Chow & Ho (2024)
Digital Banking Service Quality (DBSQ)	SQ1–SQ5	5	Reliability, accessibility, security, responsiveness and overall quality of digital banking services	Raviadaran et al. (2019); Ahmad et al. (2020)
Financial Literacy (FL)	FL1–FL5	5	Consumers' knowledge and capability to understand, evaluate and make informed financial decisions	Rahayu & Hidayat (2026); Jahanzeb et al. (2026)
Behavioural Intention (BI)	BI1–BI5	5	Consumers' intention to adopt/use sustainable banking services	Taneja et al. (2025)

Data Collection Procedure

Data were collected through an online structured questionnaire distributed to eligible Generation Z consumers in Malaysia with prior digital-banking experience. Participation was voluntary, and respondents were informed of the study purpose, while anonymity and confidentiality were maintained and no personally identifiable information was collected. Screening questions were used to verify the inclusion criteria, and incomplete or ineligible responses were removed before analysis, resulting in 300 usable responses. As the study collected all constructs from the same respondents using a single instrument, potential common method bias (CMB) was addressed through procedural remedies, including respondent anonymity, clear instructions, reduced evaluation apprehension, and careful separation of construct descriptions, following the recommendations of Podsakoff et al. (2003). These procedures are consistent with established survey-based research practices in digital banking and financial technology studies, including research conducted in Malaysia (Raviadaran et al., 2019; Ahmad et al., 2020).

Data Analysis

Data were analysed using SmartPLS 4 following the recommended two-stage PLS-SEM procedure comprising measurement-model and structural-model assessment (Hair et al., 2022). The measurement model was evaluated for indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. Indicator reliability was assessed using outer loadings, while internal consistency was evaluated using Cronbach's alpha and composite reliability. Convergent validity was assessed using the Average Variance Extracted (AVE), with values of ≥0.50 indicating adequate convergence. Discriminant validity was examined to confirm that the constructs were empirically distinct, using the Heterotrait–Monotrait (HTMT) ratio as the primary criterion (Henseler et al., 2015). This analytical procedure is widely applied in digital banking and FinTech adoption research, including studies conducted in Malaysia (Ahmad et al., 2020; Raviadaran et al., 2019), and provides a rigorous basis for subsequent structural-model and predictive assessment.

Structural Model Assessment

Following confirmation of the measurement model, the structural model was assessed using predictor collinearity, path coefficients (β), coefficient of determination (R^2), effect sizes (f^2), and statistical significance. Predictor collinearity was evaluated using inner VIF values, while the significance of the hypothesised relationships was assessed through bootstrapping in SmartPLS 4. A significance level of $p < 0.05$ was used for hypothesis testing. The model's predictive performance was subsequently assessed using PLSpredict (Hair et al., 2019; Shmueli et al., 2019).

Predictive Assessment Using PLSpredict

To strengthen the predictive assessment, PLSpredict was employed to evaluate the model's out-of-sample predictive performance beyond conventional PLS-SEM explanatory measures. Following Shmueli et al. (2019), PLSpredict distinguishes explanatory power from predictive capability by assessing how well the estimated model predicts observations not used for model estimation. The assessment considered Q^2predict values and prediction errors (RMSE and MAE) for the endogenous construct, with positive Q^2predict values indicating predictive relevance. The PLS-SEM prediction errors were further compared with those of a linear-model (LM) benchmark to determine the model's relative predictive performance. This

approach provides a more comprehensive evaluation of model usefulness and strengthens the predictive contribution of the proposed sustainable digital banking model (Shmueli et al., 2019; Hair et al., 2022).

Findings

Sample Profile

The demographic profile of the 300 respondents is presented as follows. In terms of gender, 168 respondents (56.0%) were female and 132 (44.0%) were male. Regarding age, the majority were aged 21–23 years (214 respondents; 71.3%), followed by those aged 18–20 years (58; 19.3%) and 24–27 years (28; 9.3%). In terms of educational background, 245 respondents (81.7%) were undergraduate students, while 55 (18.3%) were postgraduate students. With respect to monthly income or allowance, 176 respondents (58.7%) reported less than RM1,000, followed by 82 (27.3%) between RM1,001 and RM2,000, and 42 (14.0%) above RM2,000. Regarding digital banking usage, 187 respondents (62.3%) used digital banking services several times per week, while 113 (37.7%) reported daily use. Overall, the profile indicates that the sample was dominated by young, digitally active Generation Z consumers, making it appropriate for examining sustainable digital banking behavioural intention in the Malaysian context.

Measurement Model Assessment

The measurement model was evaluated prior to structural-model assessment following established PLS-SEM guidelines (Hair et al., 2022). As reported in Table 2, all indicator loadings ranged from 0.778 to 0.916, exceeding the recommended threshold of 0.70 and demonstrating satisfactory indicator reliability. Internal consistency was also established, with Cronbach's alpha ranging from 0.884 to 0.936, composite reliability (rho_C) from 0.915 to 0.951. Convergent validity was confirmed as the AVE values ranged from 0.682 to 0.796, exceeding the 0.50 criterion. The lowest indicator loading, GBA1 (0.778), remained above the recommended threshold and was therefore retained. Overall, the results demonstrate that all five constructs: GBA, ESG Awareness, DBSQ, FL, and BI possess satisfactory reliability and convergent validity, providing an adequate measurement foundation for subsequent structural-model assessment.

Table 2
Measurement Model Assessment

Construct	Indicator	Outer Loading	Cronbach's α	Composite Reliability (rho_C)	AVE
Behavioural Intention (BI)	BI1	0.848	0.936	0.951	0.796
	BI2	0.910			
	BI3	0.915			
	BI4	0.916			
	BI5	0.870			
ESG Awareness (ESG)	ESG1	0.857	0.932	0.948	0.785
	ESG2	0.908			
	ESG3	0.909			
	ESG4	0.889			
	ESG5	0.867			

Financial Literacy (FL)	FL1	0.836	0.914	0.936	0.744
	FL2	0.873			
	FL3	0.889			
	FL4	0.879			
	FL5	0.834			
Green Banking Awareness (GBA)	GBA1	0.778	0.884	0.915	0.682
	GBA2	0.866			
	GBA3	0.878			
	GBA4	0.796			
	GBA5	0.808			
Digital Banking Service Quality (DBSQ)	SQ1	0.808	0.915	0.937	0.747
	SQ2	0.885			
	SQ3	0.900			
	SQ4	0.885			
	SQ5	0.840			

Note: Outer loadings > 0.70 indicate satisfactory indicator reliability; Cronbach's alpha and composite reliability (rho_C) > 0.70 indicate satisfactory internal consistency; AVE > 0.50 indicates adequate convergent validity.

Discriminant validity was assessed using the heterotrait–monotrait ratio (HTMT), following the recommendation of Henseler et al. (2015). As shown in Table 3, HTMT values ranged from 0.588 to 0.873, with the highest value observed between Financial Literacy and Service Quality (HTMT = 0.873). All values were below the commonly applied threshold of 0.90, indicating adequate discriminant validity and empirical distinctiveness among GBA, ESG Awareness, DBSQ, FL, and BI. These findings confirm that the constructs capture sufficiently distinct concepts and provide support for proceeding with structural-model assessment. The use of HTMT is particularly appropriate in variance-based SEM because it has been demonstrated to provide a more sensitive assessment of discriminant validity than traditional criteria such as the Fornell–Larcker criterion (Henseler et al., 2015).

Table 3
Discriminant Validity Using HTMT

Construct	Behavioural Intention	ESG Awareness	Financial Literacy	Green Banking Awareness	Service Quality
Behavioural Intention					
ESG Awareness	0.725				
Financial Literacy	0.859	0.709			
Green Banking Awareness	0.605	0.840	0.650		
Service Quality	0.800	0.683	0.873	0.588	

Overall, the measurement model demonstrated satisfactory reliability, convergent validity, and discriminant validity. These results provide sufficient evidence that the measurement model is suitable for subsequent structural-model evaluation.

Collinearity Assessment

Predictor collinearity was assessed using the inner variance inflation factor (VIF) before evaluating the structural relationships. The inner VIF values ranged from 2.535 to 3.178, with Digital Banking Service Quality (VIF = 2.957), ESG Awareness (VIF = 2.971), Financial Literacy (VIF = 3.178), and Green Banking Awareness (VIF = 2.535). All values were below the recommended threshold of 5.00, indicating that critical collinearity was not evident among the predictors of Behavioural Intention (Hair et al., 2022). Therefore, the structural model was considered suitable for subsequent hypothesis testing.

Structural Model Assessment

The structural model was analyzed to test the hypothesized relationships between the constructs. This involved examining the path coefficients (β), their significance levels (p-values), and the R^2 values, along with the effect sizes (F2) and predictive relevance (Q2). The result of the analysis is shown in Figure 2.

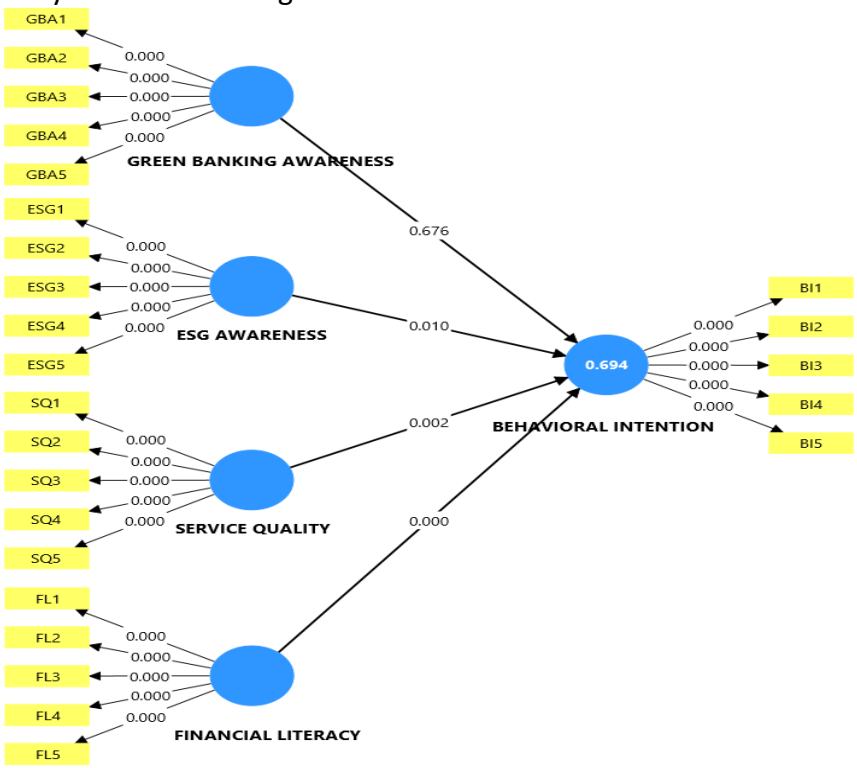


Figure 2: Path coefficient and p-value of the structural model analysis.

Following confirmation of the measurement model, the structural model was assessed to examine the hypothesised relationships between GBA, ESG Awareness, FL, DBSQ, and BI. Bootstrapping was used to determine the statistical significance of the path coefficients. The results are presented in Table 4.

Table 4
Structural Model and Hypothesis Testing

Hypothesis	Relationship	β	t-value	p-value	Decision
H1	GBA → BI	-0.026	0.417	0.676	Not supported
H2	ESG → BI	0.250	2.569	0.010	Supported
H3	DBSQ → BI	0.227	3.058	0.002	Supported
H4	FL → BI	0.467	5.847	<0.001	Supported

The results reveal three statistically significant positive relationships and one non-significant relationship. First, Financial Literacy was the strongest predictor of behavioural intention (β = 0.467, t = 5.847, p < 0.001). This result provides evidence of a positive association between financial literacy and behavioural intention towards sustainable digital banking. The magnitude of the coefficient also indicates that FL represents the most influential predictor among the four variables examined.

Second, ESG Awareness significantly and positively influenced behavioural intention (β = 0.250, t = 2.569, p = 0.010). This finding indicates that broader awareness of environmental, social, and governance considerations contributes to consumers' intention to adopt sustainable digital banking. The result provides empirical support for the argument that consumers' understanding of responsible banking practices extends beyond environmental awareness alone.

Third, Service Quality had a significant positive effect on behavioural intention (β = 0.227, t = 3.058, p = 0.002). The finding demonstrates that sustainable banking propositions must also provide satisfactory digital service experiences. Consumers may value sustainability, but the quality, reliability, and functionality of the digital banking service remain important considerations in adoption decisions.

In contrast, Green Banking Awareness did not significantly influence behavioural intention (β = −0.026, t = 0.417, p = 0.676). The coefficient was small and negative, while the p-value was substantially above the 0.05 significance threshold. Therefore, H1 was not supported. This is a particularly important finding because it challenges the assumption that environmental awareness alone is sufficient to stimulate sustainable digital banking adoption intention.

Explanatory Power and Effect Sizes

The structural model demonstrated substantial explanatory power. The coefficient of determination for behavioural intention was $R^2 = 0.694$, indicating that GBA, ESG Awareness, FL, and DBSQ collectively explained 69.4% of the variance in behavioural intention. The remaining 30.6% of variance was not explained by the predictors included in the model. The R^2 indicates substantial in-sample explanatory power of behavioural intention within the study context.

Effect-size analysis further demonstrated differences in the substantive contribution of individual predictors. Financial Literacy produced the largest effect size ($f^2 = 0.224$), followed by ESG Awareness ($f^2 = 0.069$) and Service Quality ($f^2 = 0.057$). Green Banking Awareness produced a negligible effect ($f^2 = 0.001$). These results reinforce the path-coefficient findings and provide a more nuanced interpretation of the predictors. Although ESG Awareness and Service Quality were statistically significant, their individual contributions were considerably smaller than that of Financial Literacy. Conversely, the negligible effect of GBA is consistent with its non-significant path coefficient. The effect size assessments are presented in Table 5.

Table 5
Effect Size Assessment

Predictor	β	f^2	Interpretation
Financial Literacy	0.467	0.224	Strongest predictor; moderate substantive effect
ESG Awareness	0.250	0.069	Significant but relatively small effect
Service Quality	0.227	0.057	Significant but relatively small effect
Green Banking Awareness	-0.026	0.001	Negligible effect

The combined results indicate that financial capability is substantially more influential than green awareness in explaining sustainable digital banking behavioural intention among the respondents. This finding is consistent with the proposition that sustainability awareness alone may be insufficient to explain behavioural intention when financial capability, ESG awareness, and service quality are considered simultaneously; it does not establish a causal conversion mechanism.

Predictive Assessment Using PLSpredict

PLSpredict was used to assess the model's out-of-sample predictive performance. All behavioural intention indicators recorded positive Q^2_predict values ranging from 0.477 to 0.596, indicating predictive relevance. Comparison with the linear-model benchmark showed that PLS-SEM produced lower RMSE values for most BI indicators, although the linear model performed slightly better for selected indicators. Overall, the results provide meaningful but mixed evidence of predictive performance, indicating that the model has predictive relevance beyond its in-sample explanatory power (Shmueli et al., 2019). The PLSpredict results are presented in Table 6.

Table 6
PLSpredict Assessment

Indicator	Q^2_predict	PLS-SEM RMSE	LM RMSE	PLS-SEM MAE	LM MAE
BI1	0.477	0.732	0.739	0.479	0.501
BI2	0.516	0.689	0.731	0.460	0.496
BI3	0.566	0.640	0.656	0.433	0.446
BI4	0.596	0.657	0.683	0.448	0.437
BI5	0.511	0.750	0.728	0.488	0.473

Discussion

The findings provide important insights into sustainable digital banking behavioural intention among Generation Z consumers in Malaysia. The model explained 69.4% of the variance in behavioural intention, indicating strong explanatory power. Financial Literacy was the strongest predictor, followed by ESG Awareness and Digital Banking Service Quality, while Green Banking Awareness was not significant. These findings suggest that environmental awareness alone may not be sufficient to strengthen sustainable banking intention. Instead, consumers may also require financial capability, broader ESG understanding, and positive digital banking experiences to make sustainable financial decisions.

Financial Literacy as the Strongest Driver of Sustainable Digital Banking Intention

Financial Literacy was the strongest predictor of behavioural intention ($\beta = 0.467$, $t = 5.847$, $p < 0.001$, $f^2 = 0.224$), indicating that financially literate Generation Z consumers are more likely to intend to adopt sustainable digital banking services. This finding suggests that

financial literacy helps consumers evaluate the costs, benefits, risks, and value of sustainable financial products and make informed financial decisions. The result is consistent with previous studies highlighting the importance of financial literacy in financial decision-making and sustainable banking intention (Lusardi & Mitchell, 2014; Rahayu & Hidayat, 2026; Jahanzeb et al., 2026). Although Generation Z is generally familiar with digital financial services, digital familiarity does not necessarily indicate strong financial capability. Therefore, financial institutions and policymakers should strengthen financial education and provide clear information on sustainable financial products to support informed and sustainable financial decisions.

ESG Awareness Positively Influences Behavioural Intention

ESG Awareness had a significant positive effect on behavioural intention ($\beta = 0.250$, $t = 2.569$, $p = 0.010$), indicating that Generation Z consumers with greater ESG awareness are more likely to develop sustainable digital banking intentions. Unlike Green Banking Awareness, ESG Awareness reflects a broader understanding of environmental responsibility, social impact, and good governance, which may strengthen consumers' perceptions of responsible banking. This finding is consistent with previous research showing that ESG practices can influence customer perceptions and behavioural outcomes (Chow & Ho, 2024). However, its effect was smaller than that of Financial Literacy ($\beta = 0.467$), suggesting that financial capability remains more influential than sustainability awareness alone. Therefore, financial institutions should communicate their ESG practices clearly and transparently to help consumers make informed sustainable banking decisions.

Service Quality Remains Important in Sustainable Digital Banking

Digital Banking Service Quality (DBSQ) had a significant positive effect on behavioural intention ($\beta = 0.227$, $t = 3.058$, $p = 0.002$), indicating that Generation Z consumers value reliable, convenient, secure, and user-friendly digital banking services. This finding is consistent with previous studies showing that service quality influences consumers' behavioural responses in digital banking (Raviadaran et al., 2019; Ahmad et al., 2020). It also suggests that sustainability benefits alone may not be sufficient if the digital banking experience is poor. Although the effect size was relatively small ($f^2 = 0.057$), DBSQ remained a significant predictor. Therefore, financial institutions should integrate sustainability with high-quality digital service delivery to encourage sustainable digital banking intention.

Green Banking Awareness and the Awareness-Intention Gap

Green Banking Awareness (GBA) had no significant effect on behavioural intention ($\beta = -0.026$, $t = 0.417$, $p = 0.676$, $f^2 = 0.001$), suggesting that environmental awareness alone may not be sufficient to strengthen sustainable digital banking intention. This finding is consistent with previous research showing that environmental awareness does not always translate into behavioural outcomes (Kollmuss & Agyeman, 2002; Munro et al., 2023). Generation Z consumers may understand the importance of green banking but still prioritise practical factors such as financial capability, convenience, security, and service quality. The finding therefore suggests an awareness–intention gap in sustainable digital banking and contributes to the broader awareness–behaviour gap literature. Financial institutions should consequently move beyond awareness campaigns and provide clear, credible, and practical sustainable banking options.

Financial Literacy as a Potential Capability Mechanism

Financial Literacy showed the strongest relationship with behavioural intention, while Green Banking Awareness had a negligible effect. This contrast suggests that financial capability may help explain why sustainability awareness does not necessarily translate into sustainable banking intention. Previous studies show that financial literacy improves consumers' ability to evaluate financial products, understand risks, and make informed choices (Lusardi & Mitchell, 2014; Morgan & Trinh, 2019). However, the present study did not test Financial Literacy as a mediator between Green Banking Awareness and behavioural intention. Therefore, Financial Literacy should be interpreted as a potential capability mechanism rather than an established mediating mechanism. Future research could directly test whether financial literacy helps convert sustainability awareness into sustainable financial behaviour.

Theoretical Implications

The findings contribute to the sustainable digital banking literature in three ways. First, the non-significant effect of Green Banking Awareness suggests that environmental awareness alone may not be sufficient to strengthen behavioural intention. Second, Financial Literacy was more influential than Green Banking Awareness, highlighting the importance of financial capability in sustainable banking decisions. Third, the findings support a multidimensional view of sustainable digital banking intention involving financial capability, ESG awareness, and digital service experience. Overall, the study suggests that sustainable digital banking intention depends not only on what consumers know about environmental sustainability, but also on their ability to evaluate financial choices, understand responsible banking practices, and experience effective digital services.

Practical Implications

The findings provide practical implications for financial institutions, policymakers, and universities. First, banks should move beyond green-awareness campaigns by integrating financial literacy into sustainable banking initiatives and providing clear information about product benefits, costs, risks, and environmental impacts. Second, financial institutions should communicate ESG practices clearly and transparently to strengthen consumers' understanding of responsible banking. Third, sustainable banking products should be supported by reliable, secure, convenient, and user-friendly digital services. Finally, policymakers and universities should combine financial literacy and sustainability education to help young consumers evaluate and use sustainable financial products. Overall, these efforts can help translate sustainability awareness into informed and practical financial decisions.

Conclusion, Limitations and Future Research

Conclusion

This study examined the factors influencing sustainable digital banking behavioural intention among Generation Z consumers in Malaysia. The model explained 69.4% of the variance in behavioural intention ($R^2 = 0.694$) and demonstrated meaningful predictive relevance. Financial Literacy was the strongest predictor ($\beta = 0.467$, $p < 0.001$), followed by ESG Awareness ($\beta = 0.250$, $p = 0.010$) and Digital Banking Service Quality ($\beta = 0.227$, $p = 0.002$). In contrast, Green Banking Awareness was not significant ($\beta = -0.026$, $p = 0.676$), suggesting that environmental awareness alone may not be sufficient to strengthen sustainable digital

banking intention. Instead, consumers may also require financial capability, broader ESG understanding, and positive digital banking experiences. Therefore, financial institutions should combine sustainability initiatives with financial education, transparent ESG communication, and high-quality digital services. Overall, the study highlights the importance of moving beyond green awareness towards informed and practical sustainable financial decision-making.

Theoretical and Contextual Contributions

This study contributes to the sustainable digital banking literature by integrating green banking awareness, ESG awareness, digital banking service quality, and financial literacy as parallel predictors of behavioural intention in a single empirical model. Theoretically, the findings clarify the distinct roles of sustainability-related knowledge, financial capability, and digital service experience: financial literacy showed the strongest positive association with intention ($\beta = 0.467$, $p < 0.001$), followed by ESG awareness ($\beta = 0.250$, $p = 0.010$) and digital banking service quality ($\beta = 0.227$, $p = 0.002$), whereas green banking awareness had no significant independent association ($\beta = -0.026$, $p = 0.676$). This contrast adds nuance to discussions of the awareness–intention gap by showing that green awareness is not necessarily associated with stronger intention once other relevant factors are considered. The findings do not establish a causal mechanism or demonstrate actual adoption. Contextually, the study provides evidence from 300 Generation Z digital banking users in Malaysia, predominantly university-associated respondents, in a setting where sustainable finance and digital service delivery increasingly intersect. Its results can inform Malaysian banks seeking to combine clear ESG communication with reliable, accessible digital services, and can guide universities and policymakers in developing financial literacy initiatives that help younger consumers evaluate sustainable financial options. These implications are relevant to the study population and warrant further testing in more representative samples.

Limitations

Several limitations should be acknowledged. First, the cross-sectional design captures respondents' perceptions at a single point in time and does not establish causal relationships. Second, the use of purposive sampling among Generation Z digital banking users associated with Malaysian universities may limit the generalisability of the findings to other populations and contexts. Third, the study examined behavioural intention rather than actual sustainable banking behaviour. Future studies could address these limitations through longitudinal designs, more diverse samples, and the examination of actual banking behaviour.

Future Research

Future research could extend this study in several directions. First, longitudinal studies could examine whether sustainability awareness and behavioural intention lead to actual sustainable banking behaviour over time. Second, future studies could test mediation and moderation effects, particularly the roles of Financial Literacy, trust, financial self-efficacy, and perceived behavioural control. Third, comparisons across generations and countries, particularly within ASEAN, could determine whether the findings vary across consumer and institutional contexts. Future models could also include green trust, perceived greenwashing, ESG credibility, and transparency to better explain the weak effect of Green Banking Awareness. Finally, future research could examine whether financial education and ESG-

related digital interventions can help translate sustainability awareness into actual financial behaviour.

References

Ahmad, S., Bhatti, S. H., & Hwang, Y. (2020). E-service quality and actual use of e-banking: Explanation through the technology acceptance model. Information Development, 36(4), 503–519. https://doi.org/10.1177/0266666919871611

Alnsour, Y. (2026). The role of ESG awareness in green FinTech adoption among Generation Z: Evidence from Saudi Arabia. Sustainability, 18(10), Article 5189. https://doi.org/10.3390/su18105189

Chow, M. Y. C., & Ho, S. P. S. (2024). Investigating the effect of ESG on retail banks' customer equity. Journal of Financial Services Marketing, 29(4), 1330–1344. https://doi.org/10.1057/s41264-024-00271-x

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Lawrence Erlbaum Associates.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A primer on partial least squares structural equation modeling (PLS-SEM) (3rd ed.). SAGE Publications.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43, 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hoo, W. C., Marthyna, A., Wolor, C. W., Tan, G. P. L., & Prompanyo, M. (2024). Factors influencing intention to accept digital banks among Generation Z in Malaysia. Journal of Lifestyle and SDGs Review, 4(3), Article e01815. https://doi.org/10.47172/2965-730X.SDGsReview.v4.n03.pe01815

Jahanzeb, A., Xin, T. Y., & Ali, H. (2026). Beyond intention: The critical role of digital financial literacy in the actual usage of AI-enabled fintech applications in Malaysia. Future Business Journal, 12, Article 108. https://doi.org/10.1186/s43093-026-00818-5

Kock, N., & Hadaya, P. (2018). Minimum sample size estimation in PLS-SEM: The inverse square root and gamma-exponential methods. Information Systems Journal, 28(1), 227–261. https://doi.org/10.1111/isj.12131

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? Environmental Education Research, 8(3), 239–260. https://doi.org/10.1080/13504620220145401

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. Journal of Economic Literature, 52(1), 5–44. https://doi.org/10.1257/jel.52.1.5

Morgan, P. J., & Trinh, L. Q. (2019). Determinants and impacts of financial literacy in Cambodia and Viet Nam. Journal of Risk and Financial Management, 12(1), Article 19. https://doi.org/10.3390/jrfm12010019

Muñoz-Céspedes, E., Ibar-Alonso, R., & de Lorenzo Ros, S. (2021). Financial literacy and sustainable consumer behavior. Sustainability, 13(16), Article 9145. https://doi.org/10.3390/su13169145

Munro, P., Kapitan, S., & Wooliscroft, B. (2023). The sustainable attitude-behaviour gap dynamic when shopping at the supermarket: A systematic literature review and

framework for future research. Journal of Cleaner Production, 426, Article 138740. https://doi.org/10.1016/j.jclepro.2023.138740

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. Journal of Applied Psychology, 88(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Pokhrel, L., K C, A., & Shrestha, B. K. (2026). Does mobile banking service quality matter? A two-staged structural equation modeling-artificial neural network approach. Journal of Marketing Analytics, 14(2), 474–486. https://doi.org/10.1057/s41270-024-00363-6

Rahayu, N. S., & Hidayat, A. R. (2026). Gen-Z and green banking adoption in Yogyakarta, Indonesia: Evidence from a PLS-SEM survey. The Economics and Finance Letters, 13(1), 151–161. https://doi.org/10.18488/29.v13i1.4823

Raviadaran, H., Dastane, O., Ma'arif, M. Y., & Mohd Satar, N. S. (2019). Impact of service quality dimensions on internet banking adoption, satisfaction and patronage. International Journal of Management, Accounting and Economics, 6(10), 709–730.

Sharma, R., Vasishta, P., & Singla, A. (2025). Impact of green banking awareness on green FinTech adoption: A way towards profitable and sustainable practices. Managerial Finance, 51(3), 377–394. https://doi.org/10.1108/MF-04-2024-0272

Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.-H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. European Journal of Marketing, 53(11), 2322–2347. https://doi.org/10.1108/EJM-02-2019-0189

Syed, S., Acquaye, A., Khalfan, M. M., Obuobisa-Darko, T., & Yamoah, F. A. (2024). Decoding sustainable consumption behavior: A systematic review of theories and models and provision of a guidance framework. Resources, Conservation & Recycling Advances, 23, Article 200232. https://doi.org/10.1016/j.rcradv.2024.200232

Tan, Q. L., Hashim, S., Abdullah, N. L., Zaki, H. O., & Zheng, Z. (2025). Environmental social governance (ESG) and consumer behavior: A systematic review and research agenda. International Journal of Consumer Studies, 49(5), Article e70105. https://doi.org/10.1111/ijcs.70105

Taneja, S., Siraj, A., Mathiyazhagan, K., & Khorana, S. (2025). From demand to impact: Can sustainable banking services advance UN Sustainable Development Goals? Business Strategy and the Environment, 34(3), 3425–3445. https://doi.org/10.1002/bse.4142

Zahari, S. A., Shahimi, S., Alma'amun, S., & Arshad, M. M. (2024). Ethical banking behavior among millennials and Gen-Z in Malaysia. International Journal of Islamic and Middle Eastern Finance and Management, 17(2), 252–273. https://doi.org/10.1108/IMEFM-04-2023-0152