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Digital Financial Literacy and Financial Well-Being: Unpacking the Roles of Financial Behavior and Financial Stress

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ABSTRACT

Purpose—This study aims to analyze the effect of Digital Financial Literacy on Financial Behavior, Financial Stress, and Financial Well-being among students of Islamic universities in Medan. This study also examines the mediating role of Financial Behavior and Financial Stress in the relationship between Digital Financial Literacy and Financial Well-being.
Methodology— The target population of this study consisted of students who had previously taken financial management courses. The sampling technique used was accidental sampling, in which respondents were selected based on their availability and willingness to participate at the time of data collection. This study employed a non-probability sampling method, using an online questionnaire distributed through Google Forms to collect data from 385 students at private universities in Medan. The collected data were then analyzed using the SmartPLS program with the SEM-PLS approach.
Findings – The results showed that Digital Financial Literacy has a significantly positive effect on financial behavior and Financial Well-being. Additionally, it was found that digital financial literacy has a significant negative impact on financial well-being, contributing to financial stress. Financial behavior is shown to have a significant positive effect on financial well-being. In contrast, financial stress negatively impacts financial well-being but also positively influences financial behavior.
Originality/Novelty – This research model includes four variables and utilizes the notion of mediation by using SEM-PLS to evaluate each relationship in the model.
Implications—This study implies that improving digital financial literacy can significantly promote individual financial well-being directly and indirectly through positive financial behavior and reduced financial stress.

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INTRODUCTION

The integration of digital technology into the financial sector has reshaped the way people interact with monetary systems and make financial decisions. The emergence of various technological innovations in finance has brought forward new instruments such as online payment solutions, cryptocurrency, crowd-based lending, and algorithm-driven advisory services (Isaia & Oggero, 2022; Zavolokina et al., 2017). These transformations have shifted the responsibility of navigating financial services onto the individual, who must now operate autonomously within digital environments. As face-to-face transactions become increasingly obsolete, users are expected to develop advanced digital capabilities to manage their finances wisely (Lyons & Kass-Hanna, 2021). In this new reality, the ability to mitigate financial uncertainty and attain personal financial goals is closely tied to one's digital and financial proficiency (Morgan et al., 2019). Hence, modern financial well-being is influenced not solely by income or wealth but also by the capacity to utilize digital finance systems securely and competently (Morgan et al., 2019).

Traditionally, financial knowledge has been regarded as a key prerequisite for making responsible economic choices. Research by Lusardi and Mitchell (2014) underscores that individuals with inadequate financial understanding often face difficulties in saving, investing, and managing risk. The proliferation of technology, however, has challenged the conventional interpretation of financial literacy and prompted scholars to reconsider its relevance in today's digitalized context (Lyons & Kass-Hanna, 2022). The term digital financial literacy has thus evolved to capture a more complex set of competencies. Rather than being confined to understanding financial concepts, digital financial literacy incorporates the ability to operate digital tools, maintain cyber safety, and evaluate risks in virtual financial settings (Mir & Bushra, 2024). In Lyons and Kass-Hanna (2021), digital financial literacy is characterized by skill in accessing financial content, safeguarding personal data, utilizing financial applications, and responding thoughtfully to potential online threats. This broader lens reflects a shift from static financial knowledge to a dynamic and context-sensitive skillset required in an increasingly digitized world. Various studies have been conducted to examine how digital financial literacy shapes individual behavior and encourages the adoption of technology-based financial solutions (Koskelainen et al., 2023; Lyons & Kass-Hanna, 2021; Ravikumar et al., 2022). For example, (Lo Prete, 2022) observed that those with strong digital financial literacy are more likely to benefit from fintech platforms without falling into harmful consumption patterns.

Although previous studies have highlighted the relevance of digital financial literacy in enhancing financial well-being, the exact pathways through which this influence occurs are not yet fully understood. Specifically, the potential mediating roles of financial behavior and financial stress have often been overlooked. For instance (Jhonson et al., 2023) and (Rahayu, et al., 2022) confirm the importance of digital financial competence in shaping financial outcomes, yet they do not investigate how financial actions or emotional stress might mediate that relationship. Meanwhile, (Kass-Hanna et al., 2022) reported that individuals with higher digital skills tend to exhibit more disciplined behavior, such as maintaining savings and managing debt effectively. On the other hand, (Panos & Wilson, 2020) caution that easy access to digital

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financial services might increase the likelihood of impulsive spending. Supporting this concern, (Yue et al., 2022) observed that uncritical use of online credit facilities may lead to higher debt exposure among users who lack proper digital understanding.

Financial well-being is a complex concept involving both measurable aspects such as income and assets, and personal perceptions related to control, security, and confidence in managing financial matters. Diener and Biswas-Diener (2002) emphasize that one's confidence in handling daily financial decisions can be a stronger indicator of well-being than income alone. This perspective is also adopted by the Consumer Financial Protection Bureau, which proposes that financial well-being depends on perceived control, informed decision-making, and the ability to cope with economic challenges (Mir & Bushra, 2024). Netemeyer et al. (2018) further argue that these subjective perceptions offer a more reliable predictor of overall life satisfaction compared to net worth. Thus, in a digital context, assessing financial well-being must also involve an individual's ability to safely and effectively navigate digital tools used for financial management.

For university students, financial well-being holds considerable relevance due to their unique economic vulnerabilities. Many students contend with limited financial resources while bearing the burden of academic and living expenses simultaneously (Fan & Henager, 2022). According to Burke et al. (2020), those with stronger financial literacy generally report better financial well-being. Nonetheless, the specific role of digital competence in this relationship has not been widely explored. Collins and Urban (2020) recommend the integration of digital and financial instruction in higher education, suggesting that such combined approaches may help alleviate students' financial stress. Given their regular engagement with digital financial platforms, students present an ideal population for evaluating the effect of digital financial literacy on well-being, particularly since many may not fully grasp the complexities of the tools they use.

From a psychological perspective, financial well-being is not only determined by resources but also shaped by stress and behavior related to money management. Financial stress, defined as the emotional distress resulting from difficulties in meeting financial obligations (Norvilitis et al., 2006), has been shown to harm students' mental health, academic progress, and overall life satisfaction (Serido et al., 2010). In contrast, sound financial practices, such as budgeting, saving regularly, and controlling expenditures play a key role in translating financial knowledge into improved well-being (Sajid et al., 2024). Hence, it is important to explore whether digital financial literacy affects well-being directly or through these mediating factors, with special attention to students attending private universities in Indonesia.

Indonesia presents a distinctive environment for this investigation. Although the use of financial technology has expanded rapidly, including widespread adoption of digital wallets, a substantial segment of the student population remains ill-equipped in terms of both digital competence and financial understanding (Rahayu et al., 2022). Inadequate literacy in these areas can lead to unwise decisions when using financial technology. Findings by (Jhonson et al., 2023) reveal that students in emerging economies often demonstrate a gap between their fintech usage and their grasp of associated risks. This highlights the need for contextually relevant research that

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examines the influence of digital financial literacy in Indonesian universities to guide appropriate educational and regulatory responses.

Building on these considerations and addressing gaps in existing literature, this study investigates the extent to which digital financial literacy influences financial well-being through the dual pathways of behavior and stress. Applying the mediation pathway framework, it is assumed that digital competence encourages responsible financial actions (Houston, 2010) while also reducing the psychological strain related to financial challenges. The proposed model aims to enrich the academic understanding of these relationships while offering practical insights to enhance financial literacy initiatives targeting Indonesian university students.

Hypothesis Development

The Effect of Digital Financial Literacy on Financial Behavior

Digital financial literacy describes an individual's ability to understand, apply, and confidently navigate digital platforms when handling both personal and business-related financial matters. This capability has become critically important in shaping financial behavior: individuals who are more proficient in digital finance are more likely to engage in responsible financial practices such as disciplined budgeting and regular saving. For instance, Gosal & Nainggolan (2022) found that micro, small, and medium enterprises (MSMEs) in Indonesia with higher levels of digital financial proficiency were more likely to adopt digital tools, which fostered more consistent and structured financial habits. In parallel, Respati et al. (2023), demonstrated that students with higher digital financial literacy tended to manage their finances more prudently, including regularly saving and avoiding nonessential borrowing. Furthermore, Nurkholik (2024) emphasized that enhanced competence in digital finance improves self-regulatory behavior, helping individuals resist impulsive financial decisions. These empirical patterns resonate strongly with the Theory of Planned Behavior (TPB). According to TPB, behavioral intentions are shaped by one's attitudes toward the behavior and perceived behavioral control. In the context of financial behavior, digital financial literacy bolsters both: it strengthens positive attitudes by increasing confidence in using digital financial services, and it enhances perceived control by equipping individuals with the skills and knowledge to navigate complex financial platforms. Consequently, digital financial literacy not only informs intention but also empowers individuals to act responsibly through improved self-regulation.

Adding to this evidence, recent studies in the international literature offer further support. For example, Choung et al. (2023) found that digital financial literacy significantly influences financial well-being, and this relationship is mediated by financial behavior. Moreover, Başar et al. (2025) conducted a cross-country study across 12 nations and revealed that digital financial literacy, along with fintech access, strongly predicts saving behavior by reducing impulsive financial habits. Based on both theory and empirical findings, we posit the following hypothesis:
H1: Digital financial literacy affects financial behavior.

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The Effect of Digital Financial Literacy on Financial Stress

Proficiency in digital financial literacy significantly contributes to alleviating financial stress by enhancing individuals' ability to manage their finances in an increasingly digital landscape. Those who possess advanced digital capabilities tend to feel more in control when engaging with online financial systems, fostering a sense of security and reducing emotional strain. Mastery of digital financial tools allows users to interpret complex financial data, recognize potential risks, and make well-informed decisions in areas such as virtual lending or investment activities. Zhang & Chatterjee (2023) observed that individuals with adequate digital literacy are better equipped to cope with financial uncertainty, leading to diminished anxiety and more composed financial behavior. In line with this, Balatif et al. (2024) argue that structured digital financial learning plays a crucial role in easing stress, especially when individuals are faced with the demands of navigating digital finance systems. From the perspective of Coping Theory, digital literacy can be regarded as an active coping resource, empowering individuals to reduce stress by fostering autonomy, improving decision-making capacity, and enhancing access to critical financial information in complex economic environments. In this framework, digital financial literacy not only mitigates the adverse emotional impact of financial uncertainty but also builds resilience by helping individuals proactively manage their financial lives.

Empirical support for this idea is bolstered by recent research in behavioral finance and consumer well-being. For example, Chhillar et al. (2025) found that greater digital financial literacy is significantly associated with lower levels of financial stress and higher financial self-efficacy in their sample. Likewise, Koskelainen et al. (2023) emphasize that digital financial literacy enables individuals to engage in more deliberate financial behaviors, reducing impulsivity and, as a result, lowering stress related to risky or emotionally fraught financial decisions. Taken together, these findings offer a strong theoretical and empirical foundation for the hypothesis:

H2: Digital financial literacy affects financial stress.

The Effect of Financial Behavior on Financial Well-Being

Responsible financial behavior, such as regularly saving, adhering to a budget, and effectively managing debt, is a key contributor to financial well-being. Individuals who consistently engage in these behaviors tend to develop greater financial stability and higher satisfaction with their economic situation, thereby improving their overall well-being. Rahman et al. (2021) documented a significant positive relationship between disciplined financial conduct and higher levels of well-being, particularly among low-income individuals. Lone & Bhat (2024) further revealed that financial self-efficacy mediates this relationship, suggesting that individuals who believe in their own financial capabilities more strongly translate their behaviors into well-being gains. Similarly, Respati et al. (2023), found that university students who maintained structured financial routines reported greater confidence and contentment regarding their financial conditions.

These empirical results resonate with the *Subjective Well-being* framework, which posits that positive behaviors and internal experiences contribute to psychological wellness and life

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satisfaction. Through this lens, responsible financial behavior is not just an external action but also a source of inner security and perceived competence. People who save, budget, and manage debt are likely to feel more in control of their lives, a sense of mastery that supports both emotional and financial well-being. van Raaij et al. (2023) demonstrated that self-control and a future time perspective have both direct and indirect beneficial effects on financial well-being, pointing to the importance of long-term planning and disciplined behavior. Another study by Kaur et al. (2023) identified several individual-level determinants of financial well-being, including self-efficacy and financial self-control, which help explain how responsible financial behavior translates into greater life satisfaction and reduced financial stress. Taken together, these theoretical and empirical foundations support the hypothesis:
H3: Financial behavior affects financial well-being.

The Effect of Financial Stress on Financial Behavior

Financial stress is widely acknowledged as a critical factor that can negatively alter an individual's approach to managing money. When stress levels rise, people often exhibit reduced self-control, which may lead to impulsive financial decisions, an unwillingness to plan ahead, and the development of harmful habits such as excessive borrowing or speculative spending. Zhang & Chatterjee (2023) observed that individuals under high financial stress are less likely to engage in healthy financial behaviors, such as saving or investing. Similar results were reported by Rahman et al. (2021), who found that stress undermines one's ability to maintain financial discipline, thereby degrading the quality of decision-making. Moreover, Balatif et al. (2024) noted that elevated financial stress tends to shift individuals toward emotionally driven decisions, raising the risk of adverse financial outcomes.

These empirical observations align with the Behavioral Life-Cycle Hypothesis, which posits that emotional distress can impair rational financial reasoning by weakening self-control and fostering mental accounting. As a result, individuals may treat different "accounts" of money (e.g., income, assets, future earnings) as separate, making them more susceptible to impulsive spending of current income when under stress. A study by de Almeida et al., 2024) demonstrated that financial scarcity, a proxy for financial stress, impairs cognitive functions, particularly executive control, which compromises self-regulation in financial decision-making. In addition, Wake & O'Donnell (2024) tracked emerging adults over time and found that persistent financial stress predicts worsening inhibitory control and self-regulatory capacity, leading to deteriorating financial behaviors. Taken together, these lines of evidence, from behavioral theory, empirical finance, and neuroscience, provide a strong foundation for the hypothesis:
H4: Financial stress affects financial behavior.

The Effect of Financial Stress on Financial Well-Being

Financial stress constitutes a significant psychological factor that negatively impacts an individual's sense of financial well-being. People who experience persistent financial strain often report reduced financial satisfaction, even when their objective income may not be inadequate. According to Zhang & Chatterjee (2023), financial stress diminishes well-being by triggering

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psychological distress, including excessive worry, a weakened sense of control, and heightened uncertainty about future financial security. This observation is consistent with the findings of Rahman et al. (2021), who argue that financial stress is a strong negative determinant of well-being, particularly among vulnerable and economically disadvantaged groups. In addition, Balatif et al., (2024) report that overwhelming debt and limited financial knowledge further exacerbate feelings of insecurity and instability, deepening the negative impact on an individual's well-being.

These empirical patterns align closely with Stress Process Theory, which posits that chronic exposure to stressors such as financial hardship gradually erodes coping resources and impairs psychological functioning, ultimately diminishing overall quality of life. Reinforcing this perspective, Sorgente et al. (2023) demonstrate through an intensive longitudinal study that financial stress and financial well-being are distinct yet interconnected constructs, with financial stress exerting a substantial negative influence on well-being independently. Furthermore, Simonse et al. (2024) demonstrate that economic pressures, such as income volatility and rising debt, significantly heighten financial stress, which in turn translates into reduced psychological and financial well-being. Together, these findings provide robust theoretical and empirical support for the proposed hypothesis:

H5: Financial stress affects financial well-being.

The Effect of Digital Financial Literacy on Financial Well-Being Through Financial Behavior

The connection between digital financial literacy and financial well-being is primarily facilitated through individuals' financial behavior. Individuals with higher competence in navigating digital financial tools are more likely to exhibit sound financial habits, which subsequently contribute to improved well-being. For example, Respati et al. (2023) observed that university students with strong digital financial skills tend to manage budgets effectively and avoid irresponsible borrowing, resulting in more stable financial conditions. Similarly, Gosal & Nainggolan (2022) noted that MSME actors with advanced digital financial literacy display agile and resilient financial behavior, which supports their long-term economic sustainability. Moreover, Lone & Bhat (2024) highlighted that regular investment practices and proactive financial planning act as behavioral pathways through which digital competence fosters greater well-being.

These insights align well with the Theory of Reasoned Action (TRA), which suggests that knowledge-based literacy influences individuals' intentions and behavior patterns, ultimately shaping long-term financial outcomes such as well-being. In this framework, digital financial literacy strengthens behavioral intentions by enhancing both perceived benefits and confidence in using digital financial services, which then translates into responsible financial behavior and sustained financial satisfaction. Furthermore, empirical evidence from the international literature supports this argument. Choung et al. (2023) demonstrated in their study that digital financial literacy is significantly associated with financial well-being, and this relationship is largely mediated by financial behavior such as saving and investing. Another study by Muat et al. (2024)

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found that individuals' financial competence (which includes digital literacy) has a strong direct effect on their financial well-being, and that financial behavior significantly mediates this relationship. Taken together, these theoretical and empirical insights provide a solid foundation for the following hypothesis:
H6: Digital financial literacy affects financial well-being through financial behavior.

The Effect of Digital Financial Literacy on Financial Well-Being Through Financial Stress

Beyond shaping financial behavior, digital financial literacy also plays a critical role in improving financial well-being by alleviating financial stress. Individuals who are proficient in using digital financial tools are better equipped to gather, interpret, and utilize financial information online, which helps reduce feelings of uncertainty and financial anxiety. Lone and Bhat (2024) noted that individuals with higher levels of digital financial literacy tend to feel more in control and assured when navigating financial decisions, which contributes to lower stress levels. Similarly, Balatif et al. (2024) demonstrated that the use of digital tools, such as financial planning apps, empowers users to organize their finances more systematically, easing the burden of unexpected costs and debt-related concerns. Nurkholik (2024) also highlighted that stress reduction serves as a key channel through which digital financial literacy enhances overall financial well-being in increasingly digitized environments. These outcomes align with the Health Belief Model, which posits that individuals who perceive themselves as capable of managing risks tend to experience higher psychological security and improved well-being.

Beyond shaping financial behavior, digital financial literacy also plays a critical role in enhancing financial well-being by reducing financial stress. Individuals who are proficient in using digital financial tools are better able to gather, interpret, and apply financial information online, which helps diminish feelings of uncertainty and financial anxiety. Lone & Bhat (2024) noted that individuals with higher digital financial literacy tend to feel more confident and in control when making financial decisions, ultimately resulting in lower stress levels. Similarly, Balatif et al. (2024) demonstrated that the use of digital financial tools, such as budgeting applications and financial planning platforms, enables users to manage their finances more systematically, reducing the burden associated with unexpected expenses and debt-related obligations. Nurkholik (2024) further emphasized that reducing financial stress acts as a central pathway through which digital financial literacy contributes to improved financial well-being within an increasingly digital society.

Chhillar et al. (2025) found that digital financial literacy significantly alleviates financial stress among working adults by increasing emotional resilience and strengthening their capability to navigate financial tasks effectively. Likewise, Al-Afeef & Alsmadi (2025) revealed that individuals with higher levels of digital literacy experience stronger digital empowerment, as manifested through mastery of online banking, secure digital payments, and financial applications, which subsequently reduces financial distress and enhances overall well-being. These findings align with the Health Belief Model, which posits that individuals who perceive themselves as capable of anticipating and managing risks tend to experience greater psychological security and improved well-being. Within this framework, digital financial literacy

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serves not only as a cognitive asset but also as an emotional buffer, helping individuals manage financial stress more effectively. Based on this theoretical and empirical evidence, the following hypothesis is proposed:
H7: Digital financial literacy affects financial well-being through financial stress.

Based on the introductory explanation and theoretical review, it is evident that the roles of digital financial literacy, financial behavior, and financial stress have not been comprehensively examined within an integrated framework. The novelty of this study lies in analyzing two simultaneous mediation mechanisms, financial behavior and financial stress, which remain underexplored, particularly among students in developing countries. This research aims to investigate how digital financial literacy affects financial well-being, both directly and indirectly through behavioral changes and stress reduction. Thus, the study offers a more comprehensive understanding of financial dynamics in the digital era and enhances insights for educational and financial interventions. This research explores how digital financial literacy independently affects financial well-being. The following conceptual model outlines the theoretical foundation underpinning the study's analytical approach.

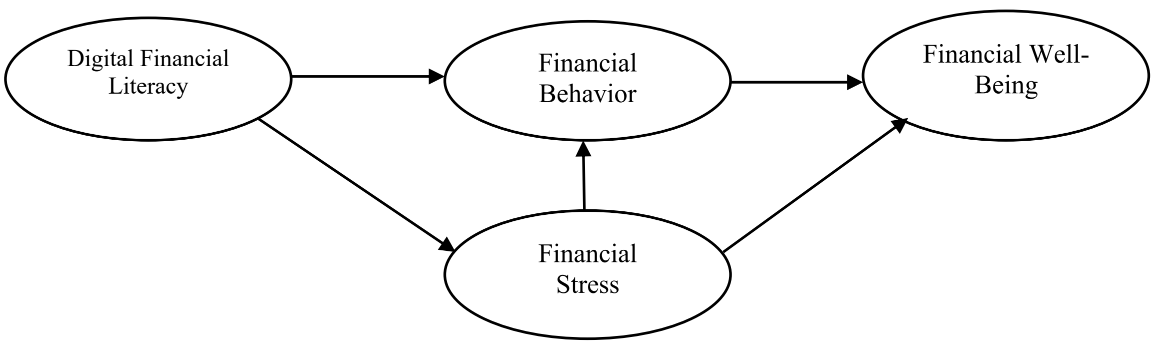

Figure 1. Research Model

METHODS

Research Design. This study employs a quantitative methodology, emphasizing a methodical and organized process to examine measurable data. By relying on numerical analysis, the approach facilitates the exploration of variable interactions through statistical testing and model-based interpretation. It enables the researcher to detect trends, test theoretical assumptions, and uncover potential associations or causal dynamics among the study's core variables (Apuke, 2017).

Research Location, Population and Sample. This research was carried out in Medan, focusing specifically on students attending private universities. The city was chosen intentionally due to its

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dense concentration of private higher education institutions. The target population consisted of students who had previously undertaken financial management courses. However, given the absence of complete and accessible enrollment records, the exact number of eligible participants could not be precisely determined. Consequently, the sample size was estimated using the Lemeshow formula, a statistical method commonly applied when the total population is unknown. This formula relied on the model established by Lwanga and Lemeshow (Ogston et al., 1991) to calculate the appropriate sample size for proportion-based studies.

$$n = \frac{Z_{1-a/2}^{2} * p * (1-p)}{d^{2}}$$

Where *n* represents the required sample size, *Z* is the Z-score corresponding to the desired confidence level $(1 - \alpha/2)$, *p* is the estimated proportion, and *d* is the acceptable margin of error or level of precision. In this study, the researcher set $Z = 1.96$, $p = 0.5$, and $d = 0.05$. Substituting these values into the formula yields: $n = (1.96^2 \times 0.5 \times 0.5) / 0.05^2 = 384.16$. Therefore, the minimum required sample size was rounded up to 385 students from private universities in Medan. The sampling technique applied in this study was accidental sampling, in which participants were selected based on their availability and willingness to participate at the time of data collection.

Data collection technique. To obtain research data, the study adopted a combination of direct interaction and self-administered methods. One technique involved conducting guided interviews, where participants were posed a consistent set of questions tailored to the study's core themes. Complementing this, a structured questionnaire was distributed, incorporating a Likert scale format to measure participants' opinions and judgments across various statements. This integrative strategy enabled the collection of both narrative explanations and quantifiable responses, enhancing the depth and reliability of the dataset.

Data analysis technique. This study utilized a quantitative approach to explore the relationships between variables in a structured and empirical manner. The analysis was guided by deductive reasoning, where hypotheses derived from theoretical foundations were tested using real-world observations. To ensure robustness in the results, Partial Least Squares Structural Equation Modeling (PLS SEM) was employed, which allowed the simultaneous assessment of both measurement and structural components of the model (Hair et al., 2021). This technique was chosen due to its suitability for evaluating complex constructs within studies that involve limited sample sizes and heterogeneous data scales. The statistical procedures were conducted using SmartPLS version 3 for Windows (Hair et al., 2021).

Instrument Validity and Reliability Test. The evaluation of the instrument's quality was conducted in two phases. Initially, expert judgment and item-total correlation were used to verify that each item properly reflected its respective construct. In the next phase, the analysis proceeded with PLS SEM to test convergent validity by ensuring that all outer loading values surpassed 0.70 and that AVE exceeded 0.50. Reliability was assessed through both composite

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reliability and Cronbach's alpha, with values above 0.70 considered acceptable. Discriminant validity was verified using the Fornell Larcker criterion and by comparing cross-loadings. All test outcomes confirmed that the indicators fulfilled the validity and reliability benchmarks, indicating the instrument's suitability for analyzing the structural model.

RESULTS AND DISCUSSION

Outer Model Analysis

The evaluation of the measurement model involves analyzing several core aspects, including indicator reliability, consistency across items, AVE, and discriminant validity. The first three factors form the basis for assessing convergent validity, which determines how well a group of items represents a specific latent construct. Convergent validity is typically assessed through three indicators: individual item loadings, overall composite reliability, and the AVE score. Strong convergent validity suggests that the indicators effectively capture the underlying concept they are intended to measure.

Item reliability, commonly referred to as indicator validity, is examined by reviewing the standardized loading values, which show the degree of correlation between each item and the construct it measures. A loading above 0.70 indicates a strong relationship and is generally viewed as optimal, while values above 0.50 are still acceptable. Indicators with loadings below 0.50 are generally excluded to maintain model quality (Chin, 1998). In this study, all item loadings are reported in the standardized loading table, illustrating the strength of association between each observed variable and its construct.

Table 1. Outer Loading Results

Variable	Indicator	Outer Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Digital Financial Literacy	DFL_1	0.794	0.926	0.938	0.628
	DFL_2	0.818			
	DFL_3	0.756			
	DFL_4	0.787			
	DFL_5	0.777			
	DFL_6	0.804			
	DFL_7	0.796			
	DFL_8	0.794			
	DFL_9	0.802			
Financial Behavior	FB_1	0.834	0.922	0.936	0.647
	FB_2	0.822			
	FB_3	0.857			
	FB_4	0.810			
	FB_5	0.783			
	FB_6	0.814			
	FB_7	0.801			
	FB_8	0.707			
Financial	FS_1	0.870	0.936	0.934	0.588
	FS_10	0.710			

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Variable	Indicator	Outer Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Stress	FS_2	0.867			
	FS_3	0.797			
	FS_4	0.710			
	FS_5	0.707			
	FS_6	0.721			
	FS_7	0.729			
	FS_8	0.804			
	FS_9	0.728			
Financial Well-Being	FWB_1	0.718	0.942	0.949	0.662
	FWB_10	0.871			
	FWB_2	0.783			
	FWB_3	0.702			
	FWB_4	0.854			
	FWB_5	0.859			
	FWB_6	0.756			
	FWB_7	0.853			
	FWB_8	0.869			
	FWB_9	0.849			

The table 1, demonstrates that all constructs in the measurement model meet the required standards for reliability and validity. The outer loadings for every indicator exceed 0.70, showing that each item strongly represents its respective variable. Cronbach's Alpha and Composite Reliability values for all constructs,Digital Financial Literacy, Financial Behavior, Financial Stress, and Financial Well-Being, are above 0.90, indicating excellent internal consistency. Additionally, the AVE values for each construct range from 0.588 to 0.662, surpassing the minimum threshold of 0.50, which confirms adequate convergent validity. These results collectively indicate that the indicators used to measure each variable are statistically sound, reliable, and capable of capturing the intended constructs effectively. Therefore, the measurement model is appropriate and robust for further analysis using Structural Equation Modeling.

Table 2. Discriminant Validity

	Digital Financial Literacy	Financial Behavior	Financial Stress	Financial Well-Being
DFL_1	0.794	0.561	0.215	0.376
DFL_2	0.818	0.593	0.209	0.430
DFL_3	0.756	0.530	0.243	0.377
DFL_4	0.787	0.546	0.240	0.451
DFL_5	0.777	0.576	0.285	0.449
DFL_6	0.804	0.683	0.281	0.598
DFL_7	0.796	0.705	0.278	0.621
DFL_8	0.794	0.669	0.299	0.594
DFL_9	0.802	0.693	0.289	0.561

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FB_1	0.609	0.834	0.433	0.634
FB_2	0.598	0.822	0.407	0.637
FB_3	0.636	0.857	0.332	0.629
FB_4	0.618	0.810	0.278	0.568
FB_5	0.589	0.783	0.336	0.539
FB_6	0.713	0.814	0.337	0.634
FB_7	0.675	0.801	0.289	0.579
FB_8	0.622	0.707	0.218	0.477
FS_1	0.367	0.513	0.870	0.367
FS_10	0.179	0.160	0.710	0.084
FS_2	0.378	0.528	0.867	0.389
FS_3	0.188	0.188	0.797	0.076
FS_4	0.110	0.083	0.710	0.006
FS_5	0.159	0.133	0.707	0.015
FS_6	0.122	0.089	0.721	-0.008
FS_7	0.125	0.104	0.729	-0.027
FS_8	0.227	0.246	0.804	0.107
FS_9	0.160	0.145	0.728	0.071
FWB_1	0.414	0.468	0.111	0.718
FWB_10	0.531	0.631	0.213	0.871
FWB_2	0.435	0.535	0.145	0.783
FWB_3	0.507	0.546	0.162	0.702
FWB_4	0.554	0.642	0.238	0.854
FWB_5	0.569	0.642	0.219	0.859
FWB_6	0.555	0.573	0.283	0.756
FWB_7	0.530	0.634	0.250	0.853
FWB_8	0.553	0.642	0.228	0.869
FWB_9	0.508	0.617	0.226	0.849

Table 3 presents evidence supporting discriminant validity, showing that each construct correlates more strongly with its own indicators than with those of other constructs. This finding affirms that the indicators align appropriately with their respective latent variables, thereby confirming the model's measurement accuracy. Additionally, each indicator demonstrates a higher loading on its designated construct than on any alternative construct, confirming that the items are properly aligned and effectively capture the dimensions they are intended to measure.

Table 3. Fornell-Larcker Criterion

	Digital Financial Literacy	Financial Behavior	Financial Stress	Financial Well-Being
Digital Financial Literacy	0.792			
Financial Behavior	0.787	0.805		
Financial Stress	0.331	0.411	0.767	
Financial Well-Being	0.636	0.733	0.258	0.814

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Table 5 presents evidence that each construct exhibits a stronger correlation with its own latent variable than with any other variable in the model, as evaluated using the Fornell and Larcker criterion. This confirms that the measurement model successfully satisfies the requirements for discriminant validity. Furthermore, the indicators load most heavily on their respective constructs, reinforcing the appropriateness of their assignment and the robustness of the model's construct validity.

In addition, the model's explanatory power is assessed through the coefficient of determination, or R-square, which quantifies how much variance in the dependent variable is explained by the predictors in the model. This coefficient serves as a measure of the model's ability to predict outcomes. An R-square value of 0.75 indicates strong explanatory capability, 0.50 suggests a moderate level of prediction, while a value around 0.25 reflects a relatively weak explanatory strength. These thresholds provide insight into the model's overall effectiveness in capturing relationships among variables (Juliandi, 2018).

Inner Model Test

The analysis conducted using SmartPLS 3.0 generated R-square values, which reflect the model's predictive accuracy. These coefficients provide critical information regarding the extent to which the independent variables account for the variance observed in the dependent variables. To aid interpretation and enable a thorough assessment of the model's explanatory capability, the resulting values are illustrated through the following figures and tables.

Table 4. R-Square Test Results

	R Square	R Square Adjusted
Financial Behavior	0.644	0.643
Financial Stress	0.110	0.107
Financial Well-Being	0.539	0.536

Table 6 shows that financial behavior and financial stress jointly explain 53.9% of the variance in financial well-being, indicating moderate explanatory power, while the remaining 46.1% is influenced by other factors. Digital financial literacy and financial stress account for 64.4% of the variance in financial behavior, reflecting a strong predictive relationship, with 35.6% of the variance explained by additional variables. In contrast, digital financial literacy explains only 11% of the variance in financial stress, suggesting a weak influence, while the remaining 89% is shaped by other determinants not included in the model. Overall, the results highlight varying predictive strengths among the variables.

Hypothesis Testing

This study evaluated the structural model by analyzing path coefficients to determine the strength and direction of relationships. Using SmartPLS 3.0, both direct and indirect effects were assessed. Results are presented in two sections, supported by a visual diagram that clarifies path estimates and enhances interpretation of the model's explanatory power.

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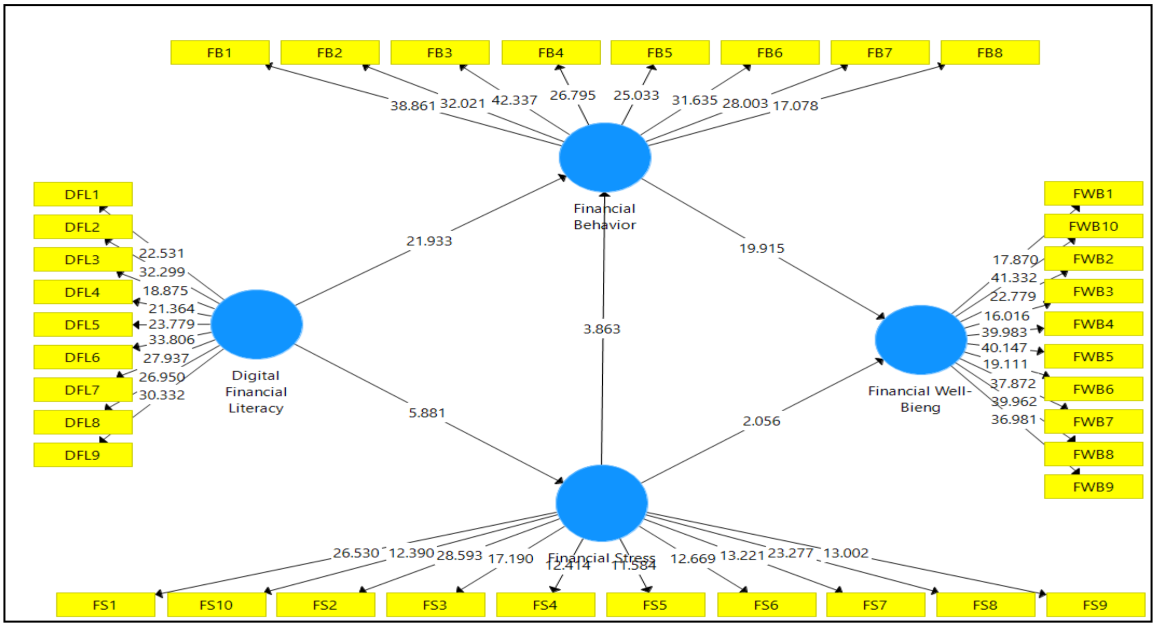

Figure 2. Path Coefficient

The findings from the direct effect hypothesis testing are presented in the path coefficient table below, which outlines the strength and significance of each direct and indirect relationship within the structural model.

Table 5. Direct and Indirect Effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Digital Financial Literacy → Financial Behavior	0.731	0.729	0.033	21.933	0.000
Digital Financial Literacy → Financial Stress	0.331	0.341	0.056	5.881	0.000
Financial Behavior → inancial Well-Being	0.754	0.754	0.038	19.915	0.000
Financial Stress → Financial Behavior	0.169	0.171	0.044	3.863	0.000
Financial Stress → Financial Well-Being	-0.051	-0.051	0.025	2.056	0.040
Digital Financial Literacy → Financial Behavior → Financial Well-Being	0.551	0.551	0.045	12.305	0.000
Digital Financial Literacy → Financial Stress → Financial Well-Being	-0.017	-0.018	0.010	1.979	0.046

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DISCUSSION

The Effect of Digital Financial Literacy on Financial Behavior.

The analysis of this study reveals that digital financial literacy has a strong and significant influence on financial behavior, as indicated by a path coefficient of 0.731 with p = 0.000. This high coefficient value indicates that the better an individual's ability to understand and utilize digital financial services, the more likely they are to demonstrate healthy financial behaviors such as controlled spending, consistent saving, and more prudent financial decision-making. These findings align with the *Theory of Planned Behavior*, which emphasizes that behavior is shaped by knowledge, attitudes, and perceived control over behavior. When compared to previous studies, these findings demonstrate a stronger influence. Abdallah et al. (2025), reported a positive relationship between digital literacy and financial behavior, while Rahayu et al. (2022) found that digital literacy fosters more structured financial behavior among Indonesian women. These results are further supported by Muat et al. (2024), who demonstrated that digital financial literacy enhances financial behavior by improving financial skills. In addition, Kusumawardhani et al. (2025) confirmed that digital literacy significantly contributes to saving habits and planned spending among the millennial generation, while Prameswary & Muslimin (2025) demonstrated that digital financial literacy and locus of control significantly affect MSME financial management through the mediating role of financial behavior. The strong effect observed in this study is likely attributable to the characteristics of the population, most likely students who are highly accustomed to using digital financial technologies, creating greater sensitivity in translating digital literacy into real financial actions. Therefore, the findings not only reinforce previous empirical evidence but also affirm that digital financial literacy is a key factor enabling adaptive financial behavior in the digital era.

The Effect of Digital Financial Literacy on Financial Stress.

The analysis reveals a statistically significant and positive relationship between digital financial literacy and financial stress ($\beta = 0.331$, $p < 0.001$). This finding suggests that individuals with higher levels of digital financial literacy tend to experience increased financial stress, indicating that digital competence may not automatically alleviate psychological tension. Instead, greater familiarity with digital financial platforms often heightens awareness of financial risks, fraud possibilities, and economic volatility, factors that can intensify perceived insecurity. This tendency is consistent with Lyons and Kass-Hanna (2021), who reported that although enhanced digital literacy in South Korea improved fraud prevention behaviors, it simultaneously increased individuals' sensitivity to financial threats. Similarly, Rahayu, et al. (2022) found that among Indonesian users, digital financial literacy improved financial well-being but also fostered a greater recognition of personal financial vulnerability, contributing to increased anxiety. Nurlaily et al. (2021) also observed that during the COVID-19 pandemic, increased digital financial understanding made individuals more attentive to risk, unintentionally elevating stress levels.

These findings align with the Theory of Planned Behavior, which argues that knowledge shapes perceptions, attitudes, and internal responses; thus, heightened awareness of risk may

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trigger emotional strain even when individuals behave more rationally. International evidence strengthens this interpretation. Zhang & Chatterjee (2023) reported that higher financial literacy increased users' detection of threats, which correlated with certain stress indicators. Sorgente et al. (2023) emphasized that financial stress and financial well-being are distinct constructs that may move in opposite directions. A meta-analysis by de Almeida et al. (2024) further showed that financial scarcity and uncertainty impair cognitive control, amplifying stress responses. Therefore, the findings of this study add to a growing body of evidence suggesting that digital financial literacy has a dual effect: it enhances financial capability but may also intensify financial stress through increased risk awareness. Consequently, literacy programs should incorporate psychological coping strategies to mitigate stress while strengthening financial competence.

The Effect of Financial Behavior on Financial Well-Being

The results indicate a strong and statistically significant positive effect of responsible financial behavior on students' financial well-being ($\beta = 0.754$, $p < 0.001$), suggesting that disciplined spending, regular saving, and informed investment decisions meaningfully enhance perceived financial stability and satisfaction. This finding is consistent with Selvia et al. (2021), who documented similar positive effects in Sumatra, and with Gunawan et al. (2025), who reported improved financial satisfaction associated with effective financial practices. A broader evidence base supports this pathway: Hwang & Park (2023), meta-analysis demonstrated that financial behavior is a stable predictor of financial well-being across diverse populations, reinforcing the robustness of our result. Compared to prior studies, the magnitude of the current coefficient (0.754) is relatively large, which may reflect sample characteristics, students at Islamic universities in Medan, who might adopt prudent financial habits due to cultural, educational, or institutional norms that emphasize resource stewardship. Complementary international studies help explain the mechanisms underlying this link. Sabri et al. (2024) found that among young adults in Malaysia, the effect of financial behavior on well-being is moderated by gender and contextual stressors, suggesting that demographic and situational factors either amplify or attenuate the behavioral benefits. Kumar et al. (2023) demonstrated that financial capability and autonomy interact with digital financial literacy to enhance decision-making and well-being, suggesting that behavior is effective when supported by capability and access to relevant tools. van Raaij et al. (2023) further demonstrated that psychological traits (self-control, future time perspective) exert both direct and indirect effects on well-being through financial behavior, suggesting that behavior mediates broader personal characteristics. Together, these comparisons suggest that while responsible financial behavior consistently predicts financial well-being, the effect sizes vary according to context, capability, and psychological resources. Practically, interventions aiming to improve student well-being should combine behavior training (budgeting, saving) with capability building (financial skills, autonomy) and psychological supports (self-control, future orientation) to maximize impact.

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The Effect of Financial Stress on Financial Well-Being

The significant negative relationship between financial stress and financial well-being (p = 0.040; path coefficient = – 0.051) among students at Islamic universities in Medan shows that increased financial pressure reduces students' perceptions of financial stability and satisfaction. While the negative coefficient is relatively small, it suggests even minor increases in financial strain can, over time, erode students' financial well-being. This diminishes their ability to manage daily needs and short-term financial plans (Bashir & Qureshi, 2023). This pattern is consistent with previous findings: Moore et al., (2021) reported that financial stress negatively impacts students' mental health, academic engagement, and social functioning; Rahman et al., (2021) identified financial stress as a strong predictor of poor financial well-being among low-income groups. Further, Mawadah & Sumiati (2024) describe financial health as a mediator, reinforcing that financial stress not only causes direct pressure but also disrupts healthy financial practices. Similarly, Sobrejuanite et al. (2024) found that financial stress impairs work performance, highlighting broader implications for students as they transition to the workforce. According to the stress–well-being model, ongoing stress disrupts emotional regulation and cognitive function, undermining perceived financial adequacy. Therefore, universities should consider expanding support mechanisms, such as emergency financial aid, financial counseling, and literacy training to address financial burdens that, though statistically modest, can have significant, lasting impacts on student well-being and persistence (Moore et al., 2021; Rahman et al., 2021; Silva & Dias, 2023).

The Effect of Financial Stress on Financial Behavior

The finding of a strong positive relationship between financial stress and financial behavior (p = 0.000; path coefficient = 0.169) among students in Islamic universities in Medan is quite intriguing, as it suggests that, contrary to intuitive expectations, stress may actually spur more proactive financial behavior. Rather than discouraging financial discipline, increased stress appears to motivate students to engage in deliberate financial strategies, such as increased budgeting, cutting nonessential spending, or seeking supplemental income, as a way to reassert control over their economic circumstances. This aligns with a stress-and-coping framework: when stress is perceived as manageable, it can trigger problem-focused coping, prompting individuals to adopt adaptive financial behaviors to reduce perceived threats (Lee & Dustin (2021) Similarly, Magwegwe et al. (2023) emphasized that psychological resources, such as resilience and coping mechanisms, moderate how individuals respond behaviorally to financial strain, reinforcing the idea that stress does not always lead to maladaptive behavior.

Further supporting this interpretation, Fan and Ryu (2023) found that debt burden undermines subjective well-being, which in turn spurs adaptive decision-making. People under stress may become more cautious, strategic, and disciplined in their financial choices. In this way, financial stress may serve not only as a risk factor but also as a catalyst for positive financial behavior when individuals effectively harness coping strategies. This perspective is also consistent with recent research showing that financial behaviors can shape mental health: for instance, Carton et al. (2024) demonstrated that financial resilience and behavior are deeply

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intertwined, such that positive financial behaviors foster stronger coping strategies and lower psychological distress.

On the other hand, the pathway from stress to behavior may not always be fully positive: Rahman et al. (2021) demonstrated that for low-income groups, financial stress still undermines well-being even when behavioral responses are positive, highlighting that coping behavior may mitigate but not eliminate the negative impact of stress. Thus, while our finding suggests a potentially adaptive response among students, universities should still offer targeted support (financial education, counseling, peer support) to help students channel stress into constructive behavior rather than harmful coping. This nuanced role of stress, as both a motivator and a burden, is theoretically consistent with the conservation of resources framework. Empirical studies have applied this theory to show that when individuals perceive a threat to or actual loss of valued resources (e.g., financial, social, health), they experience elevated stress, but may also restructure their behavior to prevent further loss and even rebuild resources (Egozi Farkash et al., 2022).

The Effect of Digital Financial Literacy on Financial Well-Being Through Financial Behavior

The strong indirect positive effect of digital financial literacy (DFL) on financial well-being, mediated by financial behavior ($p = 0.000$; path = 0.551), highlights the crucial functional role of behavior as a mediating mechanism. This finding suggests that students with higher digital financial literacy do not merely possess digital financial knowledge; they also translate this knowledge into practical actions, such as budgeting, monitoring expenses, comparing digital financial products, and utilizing digital tools to make informed financial decisions. These behavioral responses ultimately elevate their financial well-being. This interpretation aligns closely with Choung et al. (2023), who reported that digital financial literacy enhances well-being more effectively than traditional financial literacy by improving individuals' ability to navigate digital risks and make informed choices in online financial ecosystems. Furthermore, Permadi et al. (2022) emphasized that confidence in digital financial tools and active technological engagement strengthen the pathways from DFL to behavior and well-being, suggesting that psychological readiness is integral to leveraging digital literacy benefits. Muat et al. (2024) similarly argued that digital financial skills exert a cascading effect, shaping responsible behavior that directly contributes to both subjective and objective financial outcomes.

These results are also theoretically consistent with the Theory of Planned Behavior (TPB), which posits that intention and perceived behavioral control are central predictors of action. Viewed through this lens, digital financial literacy heightens perceived capability and self-efficacy, encouraging intentional and systematic behaviors that promote financial stability. Recent research reinforces this perspective: Islam & Khan (2024) emonstrated that financial literacy, digital literacy, and financial self-efficacy significantly influence the adoption of FinTech services, with self-efficacy having the greatest impact among these variables. In addition, Muat et al. (2024) found that digital financial literacy affects financial behaviour and financial skills, which in turn contribute to financial well-being. Sumartin et al. (2024) also

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reported that digital financial literacy enhances individuals' self-efficacy, which subsequently strengthens their intention to use digital banking. Collectively, these patterns affirm that digital financial literacy not only helps individuals understand digital finance but also empowers them to act effectively and responsibly within it.

The Effect of Digital Financial Literacy on Financial Well-Being Through Financial Stress

The significant indirect negative effect of digital financial literacy (DFL) on financial well-being via financial stress ($p = 0.046$; path = −0.017) suggests a nuanced mechanism: greater DFL can simultaneously protect (by improving fraud awareness and decision competence) and burden learners (by increasing sensitivity to digital risks), producing a small but meaningful stress-mediated decline in perceived well-being. This interpretation accords with Choung et al., (2023), who show digital financial literacy raises fraud-prevention skills even as it exposes users to more complex risk information. Kumar et al. (2023) and Muat et al. (2024) similarly report that higher literacy can amplify perceived vulnerability, which amplifies stress reactions and thus weakens well-being. Complementary evidence indicates the pathway is context-dependent: Bai (2023) finds that financial knowledge, budgeting and self-control normally improve financial outcomes but operate through behavioral mediators, implying that knowledge alone does not guarantee better subjective welfare. Ryu and Fan (2023) document a strong association between financial worries and psychological distress in large adult samples, showing that increased awareness of financial problems frequently maps onto greater distress, a pattern consistent with our mediation result. Finally, Du & Chen (2023) demonstrate a non-linear (U-shaped) relationship between financial literacy and fraud victimization, suggesting that beyond a point, more knowledge can change risk perception and behaviour in ways that paradoxically increase stress before longer-term benefits appear. Practically, these studies collectively recommend that digital financial literacy programs be paired with stress-management, realistic risk framing, and behavioural skills (budgeting, self-efficacy training) so students convert knowledge into adaptive actions without an immediate increase in psychological burden.

CONCLUSION

This study highlights the central role of digital financial literacy in shaping students' financial outcomes. Among students at Islamic universities in Medan, higher digital financial literacy significantly improves financial behavior (path coefficient = 0.731) and indirectly enhances financial well-being via positive behavioral changes (0.551) and slight reductions via increased financial stress (−0.017). Strong financial behavior emerges as the most influential factor on financial well-being (0.754), while financial stress negatively impacts well-being (−0.051) but paradoxically encourages more prudent financial behavior (0.169), likely as a coping mechanism.

These findings suggest the need for universities to go beyond teaching technical skills related to digital finance. Programs should also integrate stress management and emotional resilience training to help students respond wisely to financial pressures. Providing financial counseling and mental health support would further assist students in navigating financial

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challenges without compromising well-being. A balanced strategy that merges digital literacy with emotional support is essential to fostering financially capable and mentally resilient individuals in today's digital financial landscape.

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