The Fintech Paradox: Assessing Digital Financial Literacy and Behavioral Outcomes Among Tertiary Students in Ghana - Evidence From Umat Tarkwa

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ABSTRACT

The rapid expansion of financial technology (Fintech) has transformed the way individuals' access and manage financial services, particularly among young adults in emerging economies. In Ghana, mobile-based financial platforms such as mobile money have become widely used among tertiary students for receiving funds, making payments, and conducting daily financial transactions. While this transformation has improved financial inclusion and convenience, concerns remain about whether students possess the necessary digital financial literacy to manage these tools responsibly. The objective of this study is to examine the relationship between Fintech adoption, digital financial literacy, and financial behaviour among students of the University of Mines and Technology (UMaT), Ghana.

The study adopted a descriptive and correlational cross-sectional research design. Data were collected through a structured digital questionnaire administered to 440 students selected using a stratified random sampling technique. The collected data were analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to summarize fintech usage patterns and financial behaviour, while Pearson correlation and multiple linear regression were applied to examine the relationships among fintech adoption, digital financial literacy, impulse spending behaviour, and financial distress.

The findings reveal a very high level of fintech adoption, with 91.8% of respondents reporting active use of mobile money as their primary digital financial tool. However, digital financial literacy among students was found to be moderate, particularly regarding transaction cost awareness, digital security practices, and the use of budgeting or savings-control mechanisms. The results further indicate that 41.4% of students reported that the ease of digital payments encourages spending beyond their planned budget, while 50.7% experienced end-of-month financial shortfalls. Regression analysis shows that impulse spending linked to the convenience of digital payments significantly predicts financial distress among students.

The study concludes that fintech adoption among students has progressed faster than the development of financial competence, creating behavioural risks associated with digital convenience. The findings suggest the need for universities to integrate structured digital financial literacy education into student support programmes and for fintech providers to incorporate behavioural tools that promote responsible financial decision-making among young users.

Keywords: Fintech adoption, digital financial literacy, mobile money, impulse spending, tertiary students.

INTRODUCTION / BACKGROUND TO THE STUDY

Financial literacy has become an important component of personal financial management, particularly among young adults and university students. Financial literacy refers to the ability to understand financial concepts and apply this knowledge in managing personal finances and making informed financial decisions (Mensah, 2018). Studies have shown that students often begin managing their finances independently during their tertiary education, yet many lack the necessary financial knowledge to make sound financial decisions. Evidence from Ghana indicates that the level of financial literacy among tertiary students is moderate, highlighting the need for greater financial education and awareness among students (Mensah, 2018).

Over the past decade, Ghana has experienced rapid growth in digital financial services, particularly Mobile Money (MoMo) and related Fintech innovations. Within tertiary institutions such as the University of Mines and Technology (UMaT), digital platforms have increasingly become the dominant medium for receiving allowances, paying fees, transferring funds, and managing daily expenses. As a result, many students now rely heavily on digital financial platforms to conduct routine financial transactions.

Although this transition has expanded financial access and transactional efficiency, improved access does not automatically translate into improved financial well-being. Digital financial systems are designed for speed and convenience. While these features enhance usability, they may also reduce the psychological restraint traditionally associated with cash transactions. Reduced transaction friction, instant transfers, and easy access to digital micro-credit may unintentionally influence spending discipline and budgeting behaviour among students.

The current financial environment is therefore characterized by increasingly frictionless transactions that minimize the “pain of paying,” while simultaneously expanding access to financial products such as digital loans and online investment platforms. For tertiary students, particularly those at the University of Mines and Technology (UMaT), digital wallets and mobile money services have gradually replaced physical cash as the primary medium for managing personal finances.

This study therefore examines the relationship between Fintech adoption, digital financial literacy, transaction frictionlessness, and financial outcomes among students of the University of Mines and Technology.

Problem Statement

Despite near-universal access to digital financial platforms, concerns remain regarding the depth of students’ digital financial literacy. The core issue addressed in this study is the Adoption–Literacy Gap: the possibility that technology adoption has progressed faster than financial competence.

Preliminary observations at UMaT indicate that while students express positive attitudes toward budgeting and saving, a substantial proportion report recurring liquidity shortfalls before the end of the budgeting period. The convenience of digital payments may weaken spending restraint, particularly in environments where transactions are instantaneous and highly accessible.

In addition, moderate levels of security and cost awareness suggest that technical proficiency in app usage does not necessarily equate to informed financial decision-making. Without structured intervention, the same technologies designed to promote financial inclusion may contribute to increased financial vulnerability among students.

The core problem this study addresses is the "Adoption-Literacy Gap." While technological infrastructure in Ghana has made financial services accessible to 95.8% of the student population, there is evidence that their financial literacy has not evolved at the same pace.

Current empirical data from UMaT suggests a behavioral paradox: while students express a strong desire to save and follow budgets, 46.3% still report frequently running out of money. The "ease of use" of Fintech products appears to be a double-edged sword; 38% of students admit that the the frictionless architecture of digital

payment systems mitigates the psychological 'pain of paying,' thereby exacerbating the propensity for unplanned expenditures

Furthermore, a significant security gap exists, with only 44.3% of students feeling confident in identifying digital fraud. Without a clear intervention, the very tools intended to promote financial inclusion may instead lead to a cycle of digital debt and financial distress among the youth.

Research Objectives

The primary aim of this study is to evaluate the relationship between Fintech adoption and financial behavior at UMaT. The specific objectives are:

1. To analyze the extent of Fintech adoption (Mobile Money, Digital Loans, and Cryptocurrency) among UMaT students.

2. To examine the level of digital financial literacy regarding transaction costs, security protocols, and interest rates.

3. To examine how the frictionless nature of digital payment systems influences impulse spending behaviour and budget adherence among UMaT students.

4. To evaluate the correlation between digital financial knowledge and the frequency of financial distress.

Research Questions

The study seeks to answer the following research questions:

1. To what extent have UMaT students adopted fintech services such as Mobile Money, digital loans, and cryptocurrency in their financial activities?

2. What is the level of digital financial literacy among UMaT students with respect to transaction costs, security protocols, and interest rate awareness?

3. How does the frictionless nature of digital payment systems influence impulse spending behaviour and budget adherence among UMaT students?

4. What is the relationship between digital financial literacy and the frequency of financial distress (such as running out of money before the end of the month) among UMaT students?

Research Hypotheses

- H_1: There is a significant positive relationship between the ease of digital payments and impulse buying among UMaT students.
- H_2: There is a significant positive relationship between impulse buying behaviour and running out of money before the end of the month.
- H_3: Students who report stronger budgeting attitudes still experience financial distress in a digital payment environment.
- H_4: Digital security awareness does not significantly influence students' likelihood of running out of money.

Significance of the Study

This study holds substantial value for several stakeholders:

For Educational Institutions: The findings provide empirical justification for UMaT to integrate "Digital Financial Literacy" into its curriculum, addressing the 70% of students who requested a mandatory personal finance course.

For Fintech Providers & Banks: It highlights the need for "Behavioral Guardrails" in app design, such as spending alerts or educational nudges, to protect younger, vulnerable users.

For Policy Makers: It provides the Bank of Ghana and the Ministry of Finance with data on the "real-world" impact of digital payment systems on the youth, aiding in the development of consumer protection regulations.

For Academic Literature: It contributes to the growing body of knowledge on the "Fintech Paradox" in developing economies, shifting the focus from mere *access* to financial services to the *quality* of financial outcomes.

Limitations of the Study

This study has some limitations that should be acknowledged. The research relied on self-reported questionnaire data, which may be subject to response bias. In addition, the cross-sectional design captures financial behaviour at a single point in time and therefore does not establish causal relationships. The study was also conducted within a single institution, which may limit generalization to other tertiary institutions in Ghana. Despite these limitations, the study provides useful insights into fintech adoption and financial behaviour among university students.

LITERATURE REVIEW

Theoretical Framework

Financial literacy has become an important component of personal financial management, particularly among young adults and university students. Financial literacy refers to the ability of individuals to understand financial concepts and apply such knowledge in managing personal finances, making informed financial decisions, and planning for long-term financial wellbeing (Mensah, 2018). Financial literacy plays an important role in enabling individuals to manage their finances effectively, improve saving and investment behaviour, and avoid poor financial decisions that may lead to financial distress (Mensah, 2018).

Financial literacy is particularly important among university students because many students begin managing their personal finances independently during their tertiary education, often without adequate financial knowledge or experience. Evidence from Ghana indicates that the level of financial literacy among tertiary students is moderate, suggesting that many students possess basic financial knowledge but may still face challenges in applying financial concepts effectively in real-life financial decisions (Mensah, 2018). Improving financial literacy among tertiary students is therefore important because it equips them with the knowledge and skills necessary to make sound financial decisions regarding saving, borrowing, and investment (Mensah, 2018).

Within the context of rapidly expanding digital financial services, particularly mobile money and other fintech platforms, financial knowledge alone may not be sufficient. Students must also possess the ability to navigate digital financial systems and make responsible financial decisions within an increasingly technology-driven financial environment. To examine the relationship between Fintech adoption and Digital Financial Literacy (DFL) among students of the University of Mines and Technology (UMaT), this study is anchored in three complementary theoretical perspectives. These theories collectively explain the technological, cognitive, and behavioural factors influencing financial decision-making within a digital environment.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), explains how individuals come to accept and use new technologies. The model posits that technology adoption is primarily determined by two cognitive factors: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU).

- **Perceived Usefulness (PU):** The degree to which an individual believes that using a particular system enhances performance or efficiency.
- **Perceived Ease of Use (PEOU):** The degree to which an individual believes that using a system requires minimal effort.

TAM has been extensively applied in studies of mobile banking, digital payments, and broader financial technologies. Empirical research consistently shows that when digital financial platforms are perceived as efficient, accessible, and user-friendly, adoption likelihood increases. Among young adults and university students, convenience, transaction speed, and simplicity of interface are particularly influential determinants of usage behavior.

Relevance to Objective 1

This model provides a theoretical basis for analyzing the extent of Fintech adoption, including Mobile Money, Digital Loans, and Cryptocurrency, among UMaT students. Adoption can be examined through perceived usefulness, such as transaction convenience and accessibility, and perceived ease of use, such as clarity of transaction processes and platform simplicity. TAM therefore offers a structured framework for understanding the drivers of technology uptake in a university setting.

Mental Accounting Theory and Payment Friction

Mental Accounting Theory, introduced by Thaler (1985), explains how individuals cognitively organize, evaluate, and track financial activities. Rather than treating money as perfectly fungible, individuals mentally allocate funds into separate "accounts" based on source, purpose, or context. These mental categorizations influence spending decisions, saving behavior, and overall financial discipline.

An important extension of this theory in digital finance research is the concept of **payment friction**. Payment friction refers to the psychological and procedural barriers associated with completing a transaction. Traditional cash payments involve tangible exchange, which heightens the psychological salience of spending and increases the "pain of paying." In contrast, digital payments reduce physical interaction with money, lowering transaction friction and weakening immediate spending restraint.

Empirical studies in behavioral finance suggest that frictionless digital payment systems increase transaction frequency and reduce conscious budget monitoring, particularly among younger consumers who are highly integrated into digital ecosystems.

Relevance to Objective 3

Mental Accounting Theory provides a theoretical foundation for examining the impact of digital payment frictionlessness on student spending habits and budget adherence. By reducing the psychological barriers associated with spending, digital financial platforms may influence consumption patterns and weaken budgeting discipline. This framework supports the investigation of how transaction design affects financial behavior within a university context.

Self-Determination Theory (SDT)

Self-Determination Theory (SDT), developed by Deci and Ryan (1985), explains human behavior through three fundamental psychological needs: autonomy, competence, and relatedness. The theory posits that individuals are more likely to exhibit sustained and responsible behavior when these needs are fulfilled.

- **Autonomy** refers to the capacity to make independent decisions.
- **Competence** refers to the ability to effectively manage tasks and challenges.
- **Relatedness** refers to social influence and a sense of connection within a broader system.

In financial contexts, SDT has been applied to explain saving behavior, budgeting discipline, and responsible financial decision-making. The theory suggests that while access to financial tools may enhance autonomy, effective financial outcomes depend largely on competence. Without adequate financial knowledge and skills, autonomy may not translate into sound financial behavior.

Relevance to the Study Objectives

Objective 2 (Digital Financial Literacy):

The competence dimension directly aligns with digital financial literacy. Knowledge of transaction costs, security protocols, interest rates, and financial risk reflects an individual's level of financial competence. SDT provides a framework for examining how competence influences responsible engagement with digital financial platforms.

Objective 4 (Financial Distress):

SDT also supports the examination of the relationship between financial knowledge and financial distress. Higher levels of financial competence are associated with improved self-regulation, informed decision-making, and stronger budget management, which may reduce the likelihood of financial shortfalls and economic stress.

Overall, Self-Determination Theory strengthens the analytical foundation of this study by distinguishing between mere access to digital financial tools and the internal capability required to manage them effectively.

Dual Process Theory

Dual Process Theory, widely associated with Kahneman (2011) and earlier cognitive psychology research, proposes that human decision-making operates through two distinct cognitive systems:

- **System 1 (Fast Thinking):** Automatic, intuitive, emotional, and effortless.
- **System 2 (Slow Thinking):** Deliberate, analytical, reflective, and effortful.

In financial decision-making, System 1 governs spontaneous and low-deliberation purchases, while System 2 supports structured budgeting, comparison of alternatives, and long-term planning. Digital financial platforms reduce transactional barriers through instant transfers, one-click payments, and seamless mobile interfaces. These features minimize cognitive interruption and may increase reliance on intuitive processing.

Behavioral finance research suggests that environments characterized by speed and convenience can shift decision-making toward System 1 dominance, thereby increasing the likelihood of impulse consumption and weakening reflective budgeting behavior.

Relevance to Objective 3

Dual Process Theory provides a psychological framework for investigating how digital payment frictionlessness influences spending habits and budget adherence. By reducing the time and cognitive effort required to complete transactions, digital systems may encourage intuitive spending over deliberate financial planning.

Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (Ajzen, 1991) posits that behavior is influenced by three core determinants:

- **Attitude toward the behavior:** Personal evaluation of a behavior, such as saving or borrowing.
- **Subjective norms:** Perceived social expectations regarding financial conduct.
- **Perceived Behavioral Control:** The individual's belief in their capacity to manage and regulate actions.

In financial contexts, perceived behavioral control is particularly significant, as it reflects confidence in budgeting, saving, and managing expenses. Research indicates that stronger financial knowledge enhances perceived control, which in turn increases the likelihood that saving intentions translate into actual saving behavior.

When perceived control is weak, positive financial intentions may fail to produce disciplined financial outcomes. This gap between intention and behavior can contribute to financial instability.

Relevance to Objective 4

TPB provides a theoretical basis for evaluating the relationship between digital financial knowledge and the frequency of financial distress. By linking knowledge, perceived control, and behavioral outcomes, the theory supports the examination of how digital financial literacy influences financial stability among students.

Digital Financial Literacy Framework

Digital financial literacy extends traditional financial literacy by incorporating competencies required for navigating digital financial platforms. It encompasses knowledge, skills, and responsible behavioral practices related to technology-enabled financial services.

Contemporary literature identifies three key dimensions:

- **Knowledge:** Understanding transaction costs, interest rate structures, loan conditions, cybersecurity risks, and fraud mechanisms.
- **Skills:** Ability to interpret digital financial information, compare products, and assess risk.
- **Behavioral competence:** Responsible and informed use of digital financial tools.

In digital environments, financial literacy goes beyond basic numeracy. It includes awareness of hidden charges, compounding interest mechanisms, security protocols, and digital fraud risks.

Relevance to Objective 2

This framework supports the examination of the level of digital financial literacy among UMaT students, particularly regarding transaction costs, security awareness, and interest rate implications. It provides measurable dimensions for assessing digital financial knowledge and competence.

Theoretical Integration

The theoretical framework integrates technological, psychological, and behavioral perspectives to provide a structured explanation of digital financial behavior among university students.

Technology Acceptance Model (TAM) explains the determinants of Fintech adoption. By focusing on perceived usefulness and perceived ease of use, TAM directly supports Objective 1, which examines the extent and drivers of digital financial tool adoption among UMaT students.

The Digital Financial Literacy Framework explains variations in financial knowledge, cost awareness, and security competence. This framework directly supports Objective 2 by providing measurable dimensions for assessing students' digital financial literacy levels.

Mental Accounting Theory and Dual Process Theory explain how reduced transaction friction influences spending behavior. These theories directly support Objective 3 by providing behavioral and cognitive explanations for impulse spending within frictionless digital environments.
Self-Determination Theory and the Theory of Planned Behavior explain how competence, perceived control, and self-regulation influence financial outcomes. These theories directly support Objective 4 by linking financial knowledge and behavioral control to financial distress and resilience.

Collectively, these theories provide a coherent structure for analyzing how technological access, cognitive processing, and financial competence interact to shape student financial outcomes.

The theoretical framework integrates technological, psychological, and behavioral perspectives to provide a multidimensional understanding of digital financial behavior among university students.

- **TAM** explains technology adoption (Objective 1).
- **Digital Financial Literacy Framework** explains knowledge and competence (Objective 2).
- **Mental Accounting Theory and Dual Process Theory** explain spending behavior and impulse dynamics under frictionless systems (Objective 3).
- **Self-Determination Theory and TPB** explain how competence and perceived control influence financial stability and distress (Objective 4).

Definition of Key Variables (Thematic Review)

To ensure conceptual clarity, the study defines its core constructs as follows:

Digital Financial Literacy (DFL): A multidimensional construct comprising:

a. Digital Financial Knowledge (understanding digital financial concepts),

b. Digital Financial Awareness (recognition of scams and digital risks),

c. Digital Financial Self-Efficacy (confidence in using tools for long-term goals).

1. **Fintech Adoption:** The actual usage and integration of digital-first financial services, including mobile wallets, peer-to-peer transfers, and digital credit facilities.
2. **Financial Resilience:** The ability of a student to withstand financial shocks without resorting to high-interest digital debt or experiencing severe academic-impacting stress.
3. **Transaction Frictionlessness:** A condition in which digital financial transactions are so efficient that they minimize cognitive effort and emotional hesitation in spending decisions.

Empirical Review

The empirical review examines existing studies across Ghana and other African developing nations, organized according to the study's research objectives.

Adoption and Penetration of Fintech (Objective 1)

Across Sub-Saharan Africa, Fintech adoption has transitioned from emerging to dominant.

In Ghana, Senyo and Osabutey (2020) found that Mobile Money has evolved into a primary financial ecosystem for youth and the unbanked. Odei-Appiah et al. (2022) observed that tertiary students adopt digital wallets primarily due to perceived usefulness in academic environments where cash handling is discouraged.

Comparatively:

- In Kenya, Njenga (2020) reported near-saturation of M-Pesa usage among students at the University of Nairobi.
- In Uganda, Nanziri (2021) found that students use Fintech to bridge institutional banking gaps.

These studies suggest that in developing African contexts, Fintech serves as primary infrastructure rather than an alternative system.

Digital Financial Literacy and Security Gaps (Objective 2)

A recurring theme in empirical literature is the competence gap between technical proficiency and financial understanding.

In Ghana, Sarpong-Danquah et al. (2018) found that students demonstrate confidence in using digital platforms but score poorly on objective financial knowledge assessments.

In Nigeria, Adeyemi et al. (2023) found that over 60% of students at the University of Lagos could not correctly identify common digital fraud techniques. Similarly, research in South Africa by Mkhize and Mushariwa (2022) highlighted the misconception that digital access equates to digital literacy.

These findings reinforce the argument that high adoption does not automatically translate into financial competence.

Digital Frictionlessness and Consumption Behavior (Objective 3)

Behavioral finance research increasingly examines the psychological effects of digital payments. Dewmini et al. (2023) documented the "ease of spending" phenomenon, where reduced transaction friction increases expenditure. Blay et al. (2024) found that Ghanaian youth often treat digital balances as more disposable than cash.

In Tanzania, Mndolwa and Mutagwaba (2021) reported that students using mobile wallets spent 22% more on non-essential items compared to cash users.

These findings align with Mental Accounting Theory, suggesting that digital money alters consumption patterns by reducing the psychological cost of spending.

Digital Credit and Financial Distress (Objective 4)

The relationship between financial literacy and digital credit reliance is well documented.

Ofori-Acquah et al. (2022) found that students with weak budgeting skills are frequent users of digital micro-credit facilities. Prempeh et al. (2024) argue that instant digital loans can create recurring debt cycles. In Zimbabwe, Chirume (2024) found a direct correlation between low financial literacy scores and reliance on high-interest digital loans, which was further associated with financial anxiety and lower academic performance.

Across Africa, the evidence consistently shows that inadequate digital financial literacy increases vulnerability to debt traps and financial stress.

Synthesis of Empirical Trends

Across Ghana, Kenya, Nigeria, Tanzania, Uganda, South Africa, and Zimbabwe, four consistent patterns emerge:

1. Fintech adoption among students is extremely high.
2. Digital literacy lags behind technological usage.
3. Frictionless digital payments increase impulse consumption.
4. Low financial competence correlates with digital credit dependence and financial distress.

These continental findings position the UMaT study within a broader African structural reality rather than an isolated institutional phenomenon.

Empirical Review (Tabular Presentation)

Table 2.1: Empirical Studies on Fintech Adoption, Literacy and Financial Behaviour in Africa

Author(s) & Year	Country / Institution	Focus Area	Key Findings	Relevance to Current Study
Senyo & Osabutey (2020)	Ghana	Mobile Money Ecosystem	MoMo has evolved into a primary financial infrastructure for youth and the unbanked.	Supports high Fintech adoption rate observed among UMaT students.
Odei-Appiah et al. (2022)	Ghana (Tertiary Institutions)	Adoption Drivers	Adoption driven mainly by Perceived Usefulness in academic environments.	Aligns with TAM framework explaining high adoption at UMaT.
Njenga (2020)	Kenya – University of Nairobi	Student Mobile Money Usage	Near-total shift from traditional banking to M-Pesa among students.	Shows Fintech as primary infrastructure in African universities.
Nanziri (2021)	Uganda – Makerere University	Digital Access & Banking Distance	Students adopt Fintech to bridge lack of physical bank access.	Reinforces ecosystem-driven adoption patterns.
Sarpong-Danquah et al. (2018)	Ghana	Financial Literacy Assessment	High digital usage confidence but low objective literacy scores.	Supports the "Competence Gap" identified at UMaT.
Adeyemi et al. (2023)	Nigeria – University of Lagos	Cybersecurity Literacy	Over 60% of students failed basic digital fraud identification tests.	Highlights security vulnerability despite high app usage.
Mkhize & Mushariwa (2022)	South Africa – Wits University	Digital Access vs Literacy	Students equate access with literacy, leading to false confidence.	Explains literacy-awareness gap in digital finance.
Dewmini et al. (2023)	Emerging Markets Study	Digital Spending Behaviour	Reduced payment friction increases ease of spending.	Supports Mental Accounting application in this study.
Blay et al. (2024)	Ghana	Digital Wallet Behaviour	Digital balances treated as more disposable than physical cash.	Explains impulse buying among students.
Mndolwa & Mutagwaba (2021)	Tanzania – Univ. of Dar es Salaam	Consumption Patterns	Mobile wallet users spent 22% more on non-essential items.	Empirical support for "Frictionlessness" hypothesis.
Ofori-Acquah et al. (2022)	West Africa	Digital Micro-Credit	Students with weak budgeting skills frequently use digital credit.	Links low literacy to debt reliance.
Prempeh et al. (2024)	Ghana	Debt Trap Behaviour	Instant digital loans encourage recurring borrowing cycles.	Explains financial distress patterns.
Chirume (2024)	Zimbabwe – Univ. of Zimbabwe	Digital Loan Dependency	Low literacy correlates with high-interest digital loan usage and financial anxiety.	Connects literacy gap to financial distress and academic impact.

Conceptual Framework

The conceptual framework illustrates the hypothesized relationships between the study's variables. It is designed to visualize how the integration of digital financial tools (Independent Variables) influenced by a student's literacy level (Intervening Variable) ultimately dictates their financial stability or distress (Dependent Variables).

Independent Variables (IV): Fintech Adoption and Environment

- **Fintech Adoption:** This represents the intensity and variety of digital tools used by the student. It includes near-universal products like **Mobile Money (MoMo)** and emerging services like **Digital Micro-loans** and **Cryptocurrency**.
- **Transaction Frictionlessness:** This refers to the technical "ease of use" identified in the Technology Acceptance Model (TAM). It is the catalyst that reduces the psychological "pain of paying," theoretically increasing the frequency of transactions.

Intervening Variables (MV): Digital Financial Literacy

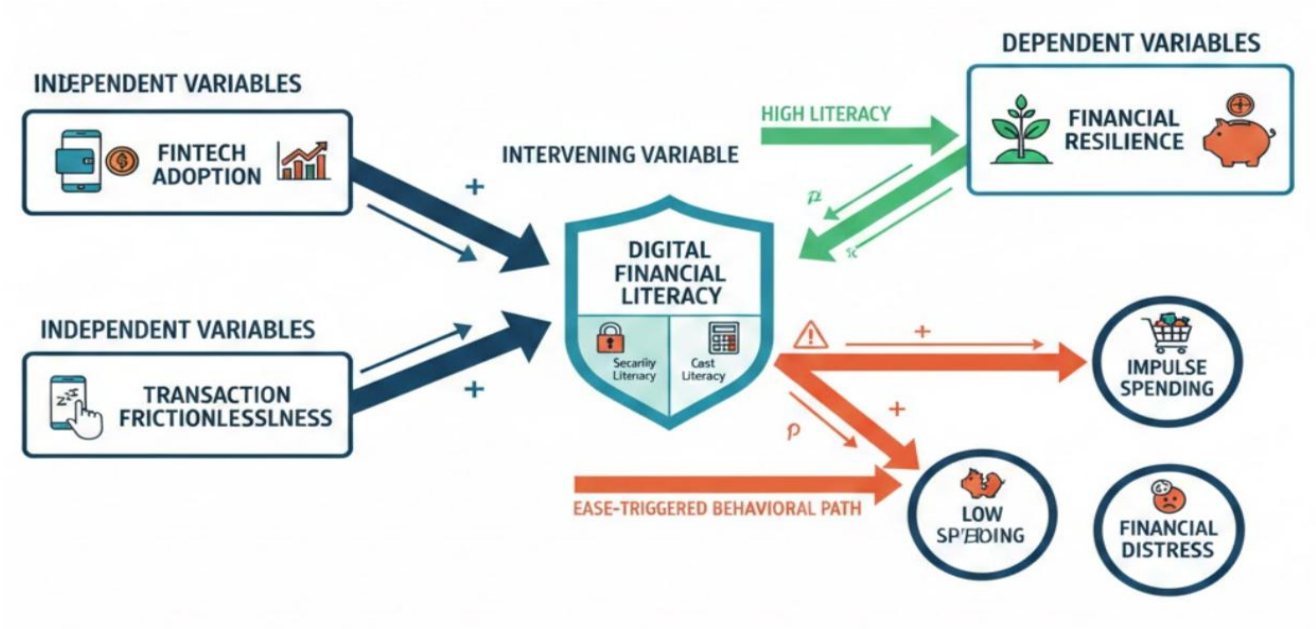
Digital Financial Literacy acts as the "gatekeeper" or filter through which technology adoption passes before it results in a behavioral outcome. It consists of:

- **Security Literacy:** Proficiency in identifying phishing and social engineering.
- **Cost Literacy:** Awareness of E-Levy and withdrawal charges.
- **Numerical Literacy:** Understanding interest compounding on digital micro-loans.

Dependent Variables (DV): Financial Behavior and Outcomes

The final output of the framework is the student's actual financial state:

- **Impulse Spending:** Unplanned consumption triggered by digital convenience.
- **Financial Distress:** The frequency of running out of money before the end of the month.
- **Financial Resilience:** The ability to maintain a positive balance and avoid "debt traps" from digital lenders.



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RESEARCH METHODOLOGY

Research Design

This study adopts a Descriptive and Correlational Cross-Sectional Design. The descriptive component is utilized to provide a current "snapshot" of Fintech adoption and digital financial literacy levels among the student body at UMaT. The correlational component is essential for examining the statistical relationships between digital financial literacy, the perceived frictionlessness of digital transactions, and subsequent spending behaviors.

Population and Sampling

The target population for this study comprised the entire student body of the University of Mines and Technology (UMaT) Essikado Campus, totaling approximately 3,500 students as at 2025/2026 academic year.

To ensure statistical representativeness and sufficient analytical power, a sample size of 450 students was targeted. Out of this, 440 valid responses were obtained and used for analysis, representing a response rate of approximately 97.8%.

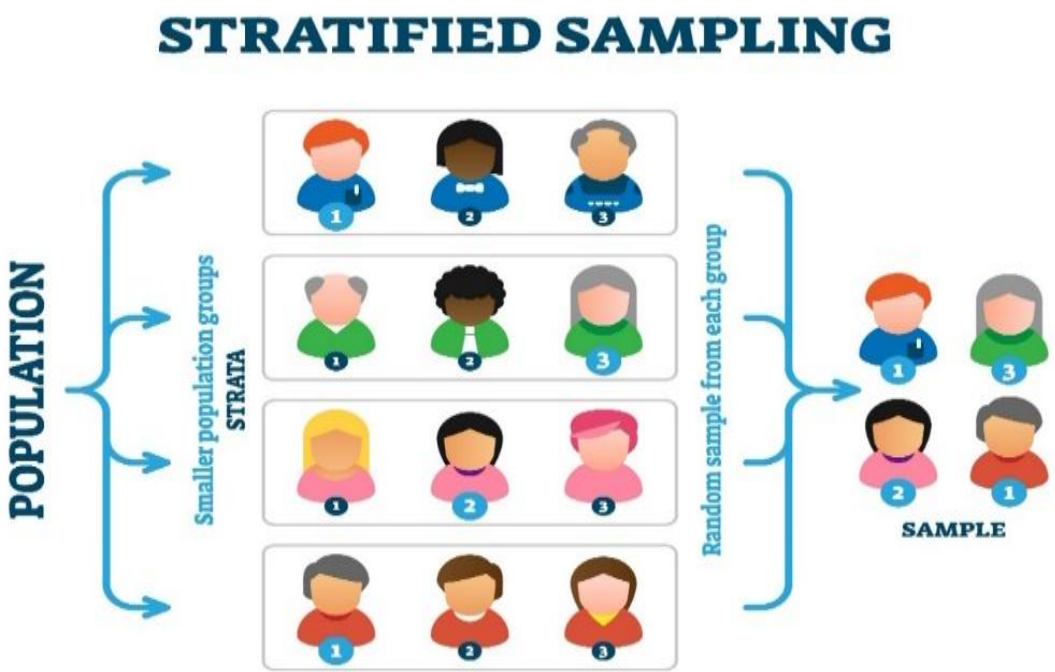
Justification of Sample Size Adequacy

The achieved sample of 440 respondents represents approximately 12.6% of the total student population. Using standard sample size determination principles for finite populations, a sample exceeding 350 respondents is generally sufficient to achieve a 95% confidence level with a 5% margin of error for a population of this size. Therefore, the obtained sample size of 440 exceeds the minimum threshold required for reliable statistical inference.

Furthermore, the large sample enhances the statistical power of correlational and regression analyses, reduces sampling error, and improves the generalizability of findings within the UMaT student population.

A Stratified Random Sampling Technique was employed to ensure proportional representation across academic programs (e.g., Science, Engineering Programs) and levels of study (Level 100 to Postgraduate).

This approach minimized sampling bias and ensured that smaller subgroups within the university were adequately represented.



Data Collection Instrument

Data was collected using a Structured Digital Questionnaire, designed to capture both quantitative and categorical data. The instrument was organized into four distinct sections to align with the research objectives:

- **Demographics:** Captured gender, level of study, and primary funding sources (e.g., parents, SLTF, or personal business).
- **Adoption Matrix:** Evaluated the usage frequency of traditional products (savings accounts) versus digital financial additions (MoMo, digital loans, and crypto).
- **Literacy Assessment:** Used Likert-scale questions to measure student knowledge regarding digital security (phishing), cost awareness (E-levy), and interest compounding.
- **Behavioral Indicators:** Focused on the "Fintech Paradox," specifically measuring impulse buying tendencies and the frequency of end-of-month financial depletion.

Data Analysis Plan

The quantitative data collected was processed and analyzed using **SPSS (Statistical Package for the Social Sciences)**. The following analytical techniques were applied:

- **Frequencies and Percentages:** Used to describe the demographic profile and the saturation levels of various Fintech tools.
- **Mean Scores:** Utilized to calculate an aggregate score for Digital Financial Literacy, allowing for a categorical ranking of students' knowledge levels.
- **Chi-Square and Correlation Analysis:** Employed to test the research hypotheses, specifically investigating if a significant relationship exists between a student's level of literacy and their propensity for financial distress or impulse spending.

Methodological Rigor and Reliability Assessment

To strengthen the validity and credibility of the findings, several methodological considerations were incorporated.

Justification of Research Design

The cross-sectional design adopted in this study captures fintech usage patterns, digital financial literacy, and financial behaviour at a single point in time among students. This approach is appropriate for examining relationships among variables within a defined population, as it enables the systematic measurement and analysis of fintech adoption patterns, literacy levels, and associated behavioural outcomes.

The descriptive and correlational nature of the design also allows for the identification of statistically significant associations without requiring experimental manipulation, which would be impractical in a university setting.

However, because the data were collected at one point in time, the design does not permit causal inference or the examination of behavioural changes over time.

The findings therefore indicate relationships rather than cause-and-effect outcomes. Future studies may benefit from adopting longitudinal research designs that track students across multiple time periods to provide stronger evidence on how digital financial habits evolve over time.

Sample Adequacy

A total of 450 responses were targeted, and 440 valid responses were obtained and used for analysis. Given the total student population of approximately 3,500, the achieved sample represents about 12.6% of the population.

Using standard sample size determination principles for finite populations, a sample exceeding 350 respondents is generally sufficient to achieve a 95% confidence level with a 5% margin of error for a population of this size.

Therefore, the final sample of 440 exceeds the statistically required minimum threshold.

This sample size provides sufficient statistical power for correlational and regression analyses and enhances the generalizability of the findings within the UMaT student population. The use of a stratified random sampling technique further ensured proportional representation across academic programs and levels of study, thereby minimizing sampling bias.

Instrument Reliability

Internal consistency reliability was assessed for the Likert-scale constructs measuring Digital Financial Literacy and Behavioral Indicators.

Reliability testing was conducted using Cronbach's Alpha (α), which measures the extent to which a set of items consistently captures an underlying construct. Cronbach's Alpha values range from 0 to 1, with the following interpretation:

- $\alpha \geq 0.90$ – Excellent reliability
- $0.80 \leq \alpha < 0.90$ – Good reliability
- $0.70 \leq \alpha < 0.80$ – Acceptable reliability
- $\alpha < 0.70$ – Questionable reliability

A benchmark threshold of $\alpha \geq 0.70$ was adopted as the minimum acceptable level of internal consistency.

The computed Cronbach's Alpha values for the major constructs exceeded the acceptable threshold, indicating that the survey items demonstrated adequate internal consistency and reliably measured the intended theoretical constructs. This strengthens the credibility of the instrument and ensures that the measured variables are stable and coherent.

Construct Validity

Survey items were directly aligned with established theoretical frameworks, including the Technology Acceptance Model, Mental Accounting Theory, Self-Determination Theory, Dual Process Theory, and the Theory of Planned Behavior.

This theoretical alignment strengthens construct validity by ensuring that measured variables accurately reflect recognized conceptual definitions within the literature.

Statistical Robustness

Multiple analytical techniques were employed to enhance analytical rigor and triangulate findings. These included:

- Descriptive statistics (frequencies, percentages, and mean scores)
- Pearson correlation and Spearman's rho (to assess relationships between variables)
- Chi-square tests (to examine categorical associations)
- Multiple linear regression (to evaluate predictive relationships)

The regression model demonstrated statistical significance ($p < 0.001$), indicating that the selected predictors collectively explain a significant proportion of variation in financial distress and impulse spending behavior.

The use of complementary statistical methods improves inferential validity and reduces the likelihood of spurious conclusions.

DATA ANALYSIS, RESULTS AND DISCUSSION

Introduction

This chapter presents the analysis, interpretation, and discussion of data collected from students of the University of Mines and Technology (UMaT) on the topic "The Fintech Paradox: Assessing Digital Financial Literacy and Behavioral Outcomes among Tertiary Students in Ghana." The analysis is based on 440 valid questionnaire responses, representing the final usable sample for the study.

The chapter is organized in line with the study objectives. It begins with the demographic profile of respondents, followed by analysis of fintech adoption levels, digital financial literacy, behavioural outcomes relating to impulse spending and budget adherence, and finally inferential analysis through correlation, regression, and hypothesis testing.

The dataset was analyzed using descriptive statistics and inferential techniques. Frequencies and percentages were used to describe respondents and fintech adoption patterns. Mean scores were used to assess digital financial literacy and behavioural indicators. Pearson correlation and multiple regression were then used to examine relationships among the main constructs.

Demographic Characteristics of Respondents

This section presents the demographic profile of respondents in terms of gender, level of study, program of study, and source of funds.

Table 4.1: Gender of Respondents

Gender	Frequency	Percentage (%)
Male	305	69.3
Female	135	30.7
Total	**440**	**100.0**

Interpretation

Table 4.1 shows that the sample was dominated by male students, who constituted **69.3%** of respondents, while female students represented **30.7%**. This pattern is broadly consistent with the gender composition of many technically oriented programmes at UMaT.

Table 4.2: Level of Study of Respondents

Level of Study	Frequency	Percentage (%)
Level 100	179	40.7
Level 200	80	18.2
Level 300	71	16.1
Level 400	81	18.4
Postgraduate	29	6.6
Total	**440**	**100.0**

Interpretation

The largest share of respondents came from **Level 100 (40.7%)**, followed by **Level 400 (18.4%)**, **Level 200 (18.2%)**, and **Level 300 (16.1%)**. Postgraduate students accounted for **6.6%**. This suggests that the study captured views across multiple academic levels, though first-year students formed the largest single group.

Table 4.3: Primary Source of Funds

Source of Funds	Frequency	Percentage (%)
Parents/Guardian	402	91.4
Personal Business	26	5.9
Student Loan (SLTF)	11	2.5
Scholarship	1	0.2
Total	**440**	**100.0**

Interpretation

Most respondents (**91.4%**) relied primarily on **parents or guardians** for financial support. Only **5.9%** depended on personal businesses, **2.5%** on student loans, and less than **1%** on scholarships. This indicates that the majority of UMaT students in the sample operate under constrained and externally funded financial conditions, which makes budgeting behaviour and financial distress particularly important areas of inquiry.

Objective One: Extent of Fintech Adoption Among UMaT Students

Objective 1: To analyze the extent of Fintech adoption (Mobile Money, Digital Loans, and Cryptocurrency) among UMaT students.

Fintech adoption was assessed using students' reported **awareness** and **actual use** of selected digital financial products.

Table 4.4: Fintech Awareness and Use Among Respondents

Product	Aware Yes	Aware Yes (%)	Ever Used Yes	Ever Used (%)
Mobile Money Wallet	408	92.7	404	91.8
Digital Micro-loans	265	60.2	215	48.9
Cryptocurrency	217	49.3	84	19.1

Interpretation

The data show that **Mobile Money is by far the most dominant fintech product** among UMaT students. Awareness of Mobile Money was extremely high at **92.7%**, and actual usage was almost identical at **91.8%**. This confirms that mobile wallets have become deeply embedded in students' everyday financial activities.

Digital micro-loans showed a moderate level of awareness and adoption. About **60.2%** of respondents were aware of digital micro-loan services, while **48.9%** reported ever using them. This indicates that mobile lending has become a relevant, though not universal, part of student financial coping mechanisms.

Cryptocurrency had the lowest level of use. Although **49.3%** of respondents were aware of cryptocurrency, only **19.1%** had ever used it. This suggests that while awareness exists, practical adoption remains limited, likely due to volatility, uncertainty, complexity, or trust concerns.

DISCUSSION

These findings answer the first research objective by showing that **fintech adoption among UMaT students is uneven rather than uniform**. Mobile Money has become mainstream, digital micro-loans have gained moderate traction, and cryptocurrency remains peripheral. This pattern is consistent with the Ghanaian financial landscape where Mobile Money is widely accessible and convenient, whereas crypto remains more speculative and less practical for everyday student transactions.

Objective Two: Level of Digital Financial Literacy Among UMaT Students

Objective 2: To examine the level of digital financial literacy regarding transaction costs, security protocols, and interest rates.

Digital financial literacy in the dataset is best captured through measures of **security confidence**, **cost awareness**, **budget importance**, **digital tracking**, and **micro-credit reliance**. It should be noted that the dataset contains no direct standalone item on interest-rate computation, so that dimension is only indirectly reflected through micro-credit and cost-related behaviour.

Table 4.5: Mean Scores for Key Literacy and Behavioural Indicators

Variable	N	Mean	Std. Dev.	Interpretation
Budget Importance	439	4.16	0.97	High
Running Out of Money	438	3.45	1.10	Moderate to High
Impulse Buying (Digital Ease)	440	3.20	1.12	Moderate
Transaction Ease	440	3.42	1.15	Moderate
Micro-Credit Reliance	440	2.14	1.22	Low
Security Confidence	438	3.39	1.13	Moderate
Cost Awareness	440	3.10	1.13	Moderate
Digital Tracking	436	3.48	1.15	Moderate
Trust in MoMo vs Bank	440	2.77	1.24	Low to Moderate
Use of Digital Locked Savings	440	2.58	1.19	Low

Interpretation

The highest mean score was recorded for **Budget Importance (Mean = 4.16)**, showing that students generally acknowledge the value of budgeting. However, this does not necessarily mean they consistently follow budgets in practice.

Security Confidence (Mean = 3.39) and **Cost Awareness (Mean = 3.10)** indicate moderate levels of digital financial literacy. Students appear somewhat confident about recognizing scams and somewhat aware of transaction costs such as E-Levy and withdrawal fees, but these mean values are not high enough to suggest strong literacy across the board. The moderate level of digital security confidence observed among students highlights an important vulnerability within the digital financial ecosystem. Although many students reported some ability to recognize phishing attempts or suspicious digital activity, the level of confidence does not necessarily reflect deep cybersecurity literacy. In rapidly expanding fintech environments, limited awareness of evolving fraud techniques such as social engineering, SIM-swap fraud, and malicious payment links may expose students to financial risks. Strengthening digital financial literacy therefore requires not only knowledge of financial management but also stronger cybersecurity awareness and fraud detection capabilities.

Digital Tracking (Mean = 3.48) suggests that many students monitor their transaction history to some extent, which is a positive sign. However, **Use of Digital Locked Savings (Mean = 2.58)** is relatively low, indicating that many students do not actively use fintech features designed to promote self-control and savings discipline.

Micro-Credit Reliance (Mean = 2.14) is low on average, which suggests that frequent dependence on mobile loans is not the norm for the full sample, even though a meaningful minority still relies on such services.

Response Pattern Summary

A clearer view of the response pattern shows:

- **80.6%** agreed that it is good to have a budget to follow.
- **50.2%** agreed that they are confident in identifying phishing or scam attempts.
- **37.5%** agreed that they factor E-Levy and withdrawal charges into their budgets.
- **54.6%** agreed that they regularly check their MoMo transaction history.
- Only **20.9%** agreed that they use locked digital savings features to control spending.

The findings suggest that UMaT students possess **moderate digital financial literacy**, but this literacy is uneven. Students appear more comfortable with general budgeting ideas and transaction tracking than with deeper behavioural controls such as disciplined use of locked savings tools. The results therefore point to a situation where students are digitally engaged, but not yet consistently equipped with the practical knowledge and habits required for strong personal financial control.

Objective Three: Frictionless Digital Payments, Impulse Spending and Budget Adherence

Objective 3: To examine how the frictionless nature of digital payment systems influences impulse spending behaviour and budget adherence among UMaT students.

To address this objective, attention was given to three key indicators: **transaction ease**, **impulse buying**, and **running out of money**.

Table 4.6: Summary of Behavioural Responses

Variable	Agree/Strongly Agree (%)	Neutral (%)	Disagree/Strongly Disagree (%)
It is good to have a budget to follow	80.6	14.6	4.8
I usually run out of money	50.7	33.3	16.0
Ease of digital payments makes me spend more than intended	41.4	32.5	26.1
I prefer MoMo over cash for daily expenses	50.0	31.1	18.9
I frequently rely on mobile loans to cover end-of-month expenses	13.9	21.6	64.5

Interpretation

Half of the respondents (**50.0%**) preferred using Mobile Money over cash for daily transactions, which confirms the practical convenience of digital payments. At the same time, **41.4%** agreed that the ease of digital payments makes them spend more than intended. This provides direct evidence that digital convenience is associated with reduced spending restraint.

A striking result is that **50.7%** of respondents agreed that they usually run out of money, despite the fact that **80.6%** also agreed that budgeting is important. This gap between financial awareness and actual financial outcomes is central to the fintech paradox identified by this study.

The proportion of students who agreed that they frequently rely on mobile loans was lower (**13.9%**), suggesting that digital micro-credit is not yet the dominant coping mechanism for the majority. However, the broader pattern shows that students still experience financial strain even when they do not heavily depend on formal mobile borrowing.

DISCUSSION

This section shows that the **frictionless nature of digital payments does influence student financial behaviour**. The ease, speed, and low physical effort involved in Mobile Money payments appear to weaken the psychological barrier to spending. In effect, digital payments reduce the "pain of paying," making it easier for students to spend casually, impulsively, or without close reflection. This supports the theoretical framing of the study and lays the foundation for the inferential analysis in the next sections.

Correlation Analysis

To evaluate the relationships among the main study variables, Pearson correlation analysis was conducted using five key indicators:

- Budget Importance

- Running Out of Money
- Impulse Buying due to Ease of Digital Payments
- Security Confidence
- Cost Awareness

Table 4.7: Correlation Matrix of Key Digital Financial Behaviour Variables

Variable	1	2	3	4	5
1. Budget Importance	1.000	.327**	.214**	.346**	.230**
2. Running Out of Money	.327**	1.000	.282**	.137**	.191**
3. Impulse Buying (Ease of Digital Payments)	.214**	.282**	1.000	.179**	.110*
4. Security Confidence	.346**	.137**	.179**	1.000	.312**
5. Cost Awareness	.230**	.191**	.110*	.312**	1.000

Note: p < 0.01, *p < 0.05. Pairwise N ranges from 436 to 440.

Interpretation of the Correlation Results

The results reveal several important relationships.

First, there is a **positive and statistically significant relationship between impulse buying driven by the ease of digital payments and running out of money** (**r = .282, p < .001**). This means that students who believe digital payments make them spend more than intended are also more likely to report running out of money before the end of the month.

Second, **budget importance is positively correlated with running out of money** (**r = .327, p < .001**). This is a particularly important finding because it suggests that students may understand the importance of budgeting in principle, yet still fail to maintain financial discipline in practice.

Third, **security confidence is positively related to running out of money** (**r = .137, p < .01**) and to impulse buying (**r = .179, p < .001**), although both relationships are weak. This suggests that confidence in recognizing scams does not automatically translate into stronger spending control.

Fourth, **cost awareness is positively associated with running out of money** (**r = .191, p < .001**). This indicates that knowing about digital transaction costs does not necessarily prevent financial pressure.

The correlation results reinforce the study's central argument that **fintech convenience can coexist with financial vulnerability**. The positive relationship between impulse buying and financial distress supports the view that digital transactions reduce spending friction. The positive relationship between budget importance and financial distress is also revealing. It suggests that awareness alone is insufficient. Students may know what sound financial behaviour looks like, but still struggle to execute it under the convenience and immediacy of fintech systems.

This pattern is consistent with **Mental Accounting Theory**, which proposes that digital money can feel less tangible than cash. When spending becomes less visible and less psychologically painful, users may become more susceptible to unplanned expenditure.

Regression Analysis

To determine the joint effect of behavioural and literacy variables on financial distress, a multiple linear regression model was estimated with **Running Out of Money** as the dependent variable. The predictors were:

- Budget Importance

- Impulse Buying due to Ease of Digital Payments
- Security Confidence
- Cost Awareness

The complete-case sample for this model was **N = 435**.

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.410	.168	.160	1.060

Interpretation

The model produced an **R of .410** and an **R^2 of .168**, which means that the independent variables explain **16.8% of the variation in students' tendency to run out of money**. While this is not a very large proportion, it is meaningful for behavioural research, where financial outcomes are influenced by many overlapping personal and contextual factors.

Table 4.9: ANOVA for Regression Model

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	97.512	4	24.378	21.667	.000
Residual	483.903	430	1.125		
Total	581.416	434			

Interpretation

The ANOVA result shows that the model is **statistically significant** (**F = 21.667, p < .001**). This confirms that the predictor variables, when considered together, significantly explain differences in student financial distress.

Table 4.10: Regression Coefficients

Predictor	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
Constant	1.206	0.258		4.684	.000
Budget Importance	0.312	0.056	0.267	5.585	.000
Impulse Buying (Ease)	0.216	0.044	0.220	4.856	.000
Security Confidence	-0.025	0.048	-0.025	-0.518	.605
Cost Awareness	0.108	0.045	0.112	2.386	.017

Interpretation of Regression Coefficients

The results show that **Budget Importance** is a significant positive predictor of running out of money (**B = 0.312, p < .001**). This somewhat counterintuitive result suggests that students who strongly endorse the importance of budgeting are also more likely to report financial depletion. This likely reflects a gap between budgeting awareness and budgeting execution.

Impulse Buying due to the ease of digital payments is also a significant positive predictor (**B = 0.216, p < .001**). This is one of the most important findings in the model, as it confirms that digital payment frictionlessness is meaningfully associated with financial distress.

Security Confidence has a negative but statistically insignificant coefficient (**B = -0.025, p = .605**). This indicates that, in this model, digital security awareness does not significantly predict whether a student runs out of money.

Cost Awareness is a positive and significant predictor (**B = 0.108, p = .017**). This implies that even students who say they factor transaction costs into their planning still report financial strain. Awareness of costs does not appear to be enough to curb behaviour.

The regression results strengthen the argument that **behavioural drivers are more influential than awareness alone**. The most practically important predictors are **budgeting attitude** and **impulse spending linked to digital convenience**. This means that students' financial outcomes are shaped not only by what they know, but by whether they are able to apply that knowledge consistently within a frictionless digital ecosystem.

The insignificance of security confidence is also noteworthy. It suggests that **digital security literacy and financial self-control are distinct dimensions of financial capability**. A student may be able to identify scams and still struggle with overspending.

Hypothesis Testing

This section tests the hypotheses of the study using the empirical findings.

Hypothesis One

H_1: There is a significant positive relationship between the ease of digital payments and impulse buying among UMaT students.

Decision: Supported.

Evidence: The descriptive results show that **41.4%** of respondents agreed that the ease of digital payments makes them spend more than intended. The inferential results further show that impulse buying due to digital ease is positively associated with financial strain and is a significant predictor in the regression model (**B = 0.216, p < .001**).

Interpretation: The evidence supports the argument that the convenience of digital payment systems encourages unplanned spending behaviour among students.

Hypothesis Two

H_2: There is a significant positive relationship between impulse buying behaviour and running out of money before the end of the month.

Decision: Supported.

Evidence: Pearson correlation analysis revealed a significant positive relationship between **Impulse Buying (Ease of Digital Payments)** and **Running Out of Money** (**r = .282, p < .001**).

Interpretation: Students who report higher impulse spending tendencies are more likely to experience financial depletion before month-end.

Hypothesis Three

H_3: Students who report stronger budgeting attitudes still experience financial distress in a digital payment environment.

Decision: Supported.

Evidence: The correlation analysis showed a positive relationship between **Budget Importance** and **Running Out of Money** (**r = .327, p < .001**). Regression analysis also found Budget Importance to be a significant predictor of financial distress (**B = 0.312, p < .001**).

Interpretation: Students may endorse budgeting as important, but many still struggle to maintain discipline in practice. This supports the argument that awareness of budgeting does not necessarily guarantee successful financial control in a digital payment setting.

Hypothesis Four

H_4: Digital security awareness does not significantly influence students' likelihood of running out of money.

Decision: Supported.

Evidence: In the regression model, **Security Confidence** was not a statistically significant predictor of **Running Out of Money** (**B = -0.025, p = .605**).

Interpretation: Digital security awareness may help students avoid fraud, but it does not appear to directly reduce the likelihood of financial depletion at month-end.

Discussion of Findings in Relation to the Objectives

The chapter's results align closely with the four study objectives.

For **Objective One**, the study found that fintech adoption is highest for **Mobile Money**, moderate for **digital micro-loans**, and lowest for **cryptocurrency**. This confirms that mobile payments are the core fintech platform used by UMaT students.

For **Objective Two**, the study found that digital financial literacy is **moderate rather than high**. Students demonstrate some awareness of security risks, budgeting principles, and transaction costs, but lower practical use of savings-control mechanisms suggests that literacy is not yet translating fully into disciplined behaviour.

For **Objective Three**, the findings clearly show that the **frictionless nature of digital payments influences impulse spending and weakens budget adherence**. Students prefer digital payments for convenience, but that same convenience is associated with unintended spending and end-of-month financial pressure.

For **Objective Four**, the results show that digital financial knowledge has a mixed relationship with financial distress. Budget awareness and cost awareness are associated with running out of money, while security awareness is not a significant predictor when other factors are controlled for. This suggests that knowledge alone is not enough; behavioural discipline matters more.

Summary of Findings for Publication

1. Near-Total Digitization: Mobile Money is the "de facto" currency, with nearly 100% adoption.

2. Competence vs. Action: High theoretical knowledge of budgeting does not prevent high rates of financial depletion.

3. The Impulse Trigger: Digital payment ease is a significant contributor to overspending.

4. Demand for Education: Over 90% of respondents indicated that a mandatory course on "Personal Finance and Digital Security" would be beneficial for the UMaT student body.

Summary

This chapter presented the analysis and discussion of the study findings based on 440 valid responses from UMaT students. The major findings are as follows:

- **Mobile Money is the dominant fintech product** among students in both awareness and use.

- Students show **moderate digital financial literacy**, especially in security awareness, cost awareness, and digital transaction tracking.

- A substantial proportion of students report that **digital payment ease increases unintended spending**.
- More than half of respondents report some form of **month-end financial depletion**.
- **Impulse buying** and **budget importance** are both positively associated with running out of money.
- **Security confidence does not significantly predict financial distress** in the regression model.
- The evidence strongly supports the idea of a **Fintech Paradox**: greater convenience and digital access do not automatically produce better financial behaviour.

Overall, the findings suggest that while fintech tools improve access and efficiency, they also create behavioural risks. Students at UMaT are not merely facing a literacy problem, but a deeper challenge of converting financial awareness into consistent financial discipline in a frictionless digital environment.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the summary of the study, conclusions drawn from the findings, recommendations, contributions to knowledge, limitations of the study, and suggestions for further research. The study examined the relationship between fintech adoption, digital financial literacy, transaction frictionlessness, and financial behaviour among students of the University of Mines and Technology (UMaT). The chapter is structured in line with the study objectives and empirical findings presented in Chapter Four.

Summary of the Study

The study was undertaken to assess the paradoxical nature of fintech adoption among tertiary students, where increased access to convenient digital financial services may not necessarily translate into improved financial wellbeing. The primary aim was to evaluate the relationship between fintech adoption and financial behaviour among students of UMaT.

The specific objectives of the study were to:

1. analyze the extent of fintech adoption, specifically Mobile Money, digital loans, and cryptocurrency, among UMaT students;
2. examine the level of digital financial literacy regarding transaction costs, security protocols, and interest rates;
3. examine how the frictionless nature of digital payment systems influences impulse spending behaviour and budget adherence among UMaT students; and
4. evaluate the correlation between digital financial knowledge and the frequency of financial distress.

To achieve these objectives, the study adopted a quantitative research approach using a structured digital questionnaire. The instrument captured data on demographics, fintech adoption, literacy indicators, and behavioural financial outcomes. A total of 450 responses were targeted, and 440 valid responses were obtained and used for analysis. The data were analyzed using descriptive statistics, Pearson correlation, and multiple regression analysis.

The study was anchored on the Technology Acceptance Model, Mental Accounting Theory, Self-Determination Theory, Dual Process Theory, the Theory of Planned Behavior, and the Digital Financial Literacy Framework. These theories collectively provided a basis for understanding technology adoption, behavioural spending patterns, self-regulation, competence, and financial resilience in a digital environment.

Summary of Key Findings

The empirical findings of the study can be summarized under the four research objectives.

Fintech Adoption Among UMaT Students

The study found that fintech adoption among UMaT students is high, though adoption varies across product types. Mobile Money emerged as the most widely known and used digital financial service among respondents. Digital micro-loans also showed considerable awareness and use, although their penetration was lower than that of Mobile Money. Cryptocurrency recorded the lowest usage, even where awareness existed.

The findings suggest that fintech has become part of the daily financial infrastructure of students, particularly for transfers, receipt of funds, and routine payments. This confirms that digital finance is no longer peripheral within the student environment but central to everyday financial practice. This finding is consistent with earlier studies that describe fintech, especially Mobile Money, as a primary financial ecosystem for youth in Ghana and other African countries (Senyo & Osabutey, 2020; Odei-Appiah et al., 2022; Njenga, 2020; Nanziri, 2021).

Digital Financial Literacy

The study found that digital financial literacy among students is moderate rather than high. Students generally acknowledged the importance of budgeting and showed some degree of awareness of transaction charges and digital security risks. However, the evidence also revealed important weaknesses in practical financial competence.

Security confidence and cost awareness were not strong enough to suggest deep financial understanding. The use of control-oriented digital tools such as locked savings options was also relatively low. This indicates that while students may be familiar with digital financial platforms, that familiarity does not automatically amount to sound financial capability. This supports the argument by Sarpong-Danquah et al. (2018) that technical confidence in using digital platforms does not always correspond with strong financial knowledge. The finding also aligns with the work of Adeyemi et al. (2023) and Mkhize and Mushariwa (2022), who observed that students often equate digital access with literacy, even where actual competence is limited.

Transaction Frictionlessness, Impulse Spending and Budget Adherence

The study found that the frictionless nature of digital financial systems significantly influences financial behaviour. A substantial proportion of students agreed that the ease of digital payments makes them spend more than intended. At the same time, many respondents indicated that they frequently run out of money before the end of the month.

This result shows that the convenience of Mobile Money and related digital channels, while beneficial for speed and accessibility, also reduces the psychological restraint associated with spending. Students may therefore find it easier to make frequent, small, and unplanned expenditures. The findings indicate that frictionless payment systems weaken budget discipline and encourage impulse spending. This is in line with Dewmini et al. (2023), who documented the “ease of spending” effect, and with Blay et al. (2024), who found that Ghanaian youth often treat digital balances as more disposable than physical cash. The result is also comparable to the findings of Mndolwa and Mutagwaba (2021), who reported higher non-essential spending among mobile wallet users in Tanzania.

Digital Financial Knowledge and Financial Distress

The study found that financial distress remains a notable issue among UMaT students. Correlation analysis showed positive relationships between running out of money and both impulse spending and budgeting attitude. Regression analysis further showed that budgeting attitude, impulse spending due to digital ease, and cost awareness significantly predict financial distress, while security confidence does not significantly predict month-end financial depletion.

These findings suggest that financial awareness alone is not sufficient to prevent financial instability. The challenge lies not merely in knowing that budgeting is important, but in consistently applying that knowledge in a digital environment that encourages effortless spending. This outcome reflects earlier empirical work showing that low financial competence contributes to financial stress and debt dependence among students (Ofori-Acquah et al., 2022; Prempeh et al., 2024; Chirume, 2024).

Conclusions

Based on the findings of the study, several conclusions can be drawn.

First, fintech adoption among UMaT students is widespread, especially with respect to Mobile Money. This confirms that the student financial ecosystem is now strongly digitized. Digital financial tools have improved access, speed, and convenience, and have become embedded in students' daily activities. This conclusion reinforces the observations of Senyo and Osabutey (2020) and Odei-Appiah et al. (2022), who found that Mobile Money has evolved into mainstream financial infrastructure for young people and tertiary students in Ghana.

Second, the study concludes that high fintech adoption does not necessarily produce high financial competence. Students are active users of digital financial platforms, yet many still lack the practical knowledge and behavioural discipline required to manage their finances effectively. In this sense, access to technology has outpaced the development of digital financial capability. This supports the competence gap identified by Sarpong-Danquah et al. (2018), as well as the access-versus-literacy distinction highlighted by Mkhize and Mushariwa (2022).

Third, the study concludes that the frictionless nature of digital payment systems has real behavioural consequences. Ease of payment encourages unplanned expenditure and weakens self-regulation. The removal of the physical and emotional barriers that usually accompany cash spending appears to contribute to impulsive consumption and poor budget adherence. This is consistent with the behavioural evidence reported by Dewmini et al. (2023), Blay et al. (2024), and Mndolwa and Mutagwaba (2021).

Fourth, the study concludes that financial distress among students is more strongly linked to behavioural responses to digital convenience than to mere lack of access to financial services. Impulse spending and weak execution of budgeting practices are more important predictors of financial instability than security awareness alone. This aligns with the argument by Ofori-Acquah et al. (2022) and Prempeh et al. (2024) that behavioural weaknesses, especially poor budgeting and reliance on fast digital finance, increase vulnerability to financial pressure.

Overall, the study confirms the existence of a Fintech Paradox among UMaT students. Fintech has succeeded in expanding financial access and convenience, but this same convenience has created new behavioural vulnerabilities. Thus, while the digital financial environment promotes inclusion, it may simultaneously undermine financial resilience when not accompanied by adequate literacy, self-regulation, and spending control. This conclusion is consistent with the broader African empirical pattern summarized in the literature, particularly in Ghana, Kenya, Nigeria, Tanzania, Uganda, South Africa, and Zimbabwe.

Conclusions in Relation to the Research Objectives

Objective One

The study set out to analyze the extent of fintech adoption among UMaT students. It is concluded that adoption is high, particularly for Mobile Money, moderate for digital loans, and relatively low for cryptocurrency. Fintech is therefore deeply integrated into student financial life, though adoption differs by product type. This mirrors the findings of Senyo and Osabutey (2020), Njenga (2020), and Nanziri (2021).

Objective Two

The study sought to examine the level of digital financial literacy. It is concluded that students demonstrate moderate digital financial literacy, with noticeable gaps in practical behavioural competence, cost interpretation,

and use of savings-control tools. Literacy exists, but not at a level strong enough to ensure sound financial outcomes. This is consistent with Sarpong-Danquah et al. (2018), Adeyemi et al. (2023), and Mkhize and Mushariwa (2022).

Objective Three

The study examined how transaction frictionlessness influences impulse spending and budget adherence. It is concluded that frictionless payment systems encourage impulse spending and weaken budget discipline. Digital convenience reduces psychological spending restraint and contributes to overspending. This conclusion is supported by Dewmini et al. (2023), Blay et al. (2024), and Mndolwa and Mutagwaba (2021).

Objective Four

The study evaluated the relationship between digital financial knowledge and financial distress. It is concluded that digital financial knowledge has a mixed relationship with financial distress. While some literacy components are present, they do not automatically translate into financial stability. Behavioural control remains the critical missing link. This conclusion supports the findings of Ofori-Acquah et al. (2022), Prempeh et al. (2024), and Chirume (2024).

Conclusions in Relation to the Research Hypotheses

Hypothesis One

H_1: There is a significant positive relationship between the ease of digital payments and impulse buying among UMaT students.

This hypothesis is supported. The study found that students who perceive digital payments as easier are more likely to report unintended spending. The convenience of fintech systems therefore appears to stimulate impulsive expenditure. This outcome is in agreement with Dewmini et al. (2023) and Blay et al. (2024).

Hypothesis Two

H_2: There is a significant positive relationship between impulse buying behaviour and running out of money before the end of the month.

This hypothesis is supported. The correlation results indicate that impulse spending is positively associated with financial depletion. Students who spend more impulsively are more likely to run out of money before month-end. This is broadly consistent with the behavioural pattern identified by Mndolwa and Mutagwaba (2021).

Hypothesis Three

H_3: Students who report stronger budgeting attitudes still experience financial distress in a digital payment environment.

This hypothesis is supported. The results show that students may recognize the value of budgeting and still report running out of money. This highlights a gap between financial attitude and actual financial behaviour. The finding reflects the broader competence gap emphasized by Sarpong-Danquah et al. (2018).

Hypothesis Four

H_4: Digital security awareness does not significantly influence students' likelihood of running out of money.

This hypothesis is supported. The regression analysis showed that security confidence does not significantly predict whether a student experiences financial depletion. This implies that awareness of scams and digital risks, while useful, does not necessarily improve budget discipline or spending control. This nuance complements,

rather than contradicts, the concerns raised by Adeyemi et al. (2023), who focused more on fraud exposure than on spending behaviour.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are proposed.

Recommendations for UMaT Management

UMaT should integrate **digital financial literacy education** into student orientation, general studies courses, seminars, or campus-based financial awareness programs. The emphasis should not be limited to digital access or app usage, but should include:

- transaction charges and hidden costs;
- digital lending risks and debt cycles;
- budgeting in a digital environment;
- impulse spending awareness; and
- fraud prevention and responsible digital finance behaviour.

This recommendation is supported by the evidence of competence gaps reported by Sarpong-Danquah et al. (2018), Adeyemi et al. (2023), and Mkhize and Mushariwa (2022).

Recommendations for Students

Students should be encouraged to adopt stronger personal financial discipline in relation to fintech tools. In particular, students should:

- create and follow realistic monthly budgets;
- track digital transactions regularly;
- reduce spontaneous spending through Mobile Money;
- use digital savings or locked-wallet features where available; and
- treat transaction convenience as a potential risk factor, not only as a benefit.

This recommendation responds directly to the behavioural issues identified in this study and in related studies such as Dewmini et al. (2023), Blay et al. (2024), and Mndolwa and Mutagwaba (2021).

Recommendations for Fintech Service Providers

Fintech firms operating in student-dominated markets should design platforms with behavioural safeguards that promote healthy spending habits. These may include:

- spending alerts and weekly expenditure summaries;
- optional transaction caps;
- in-app budgeting prompts;
- goal-based savings features; and
- clearer disclosure of fees and loan costs.

Such interventions are especially relevant given the findings of Ofori-Acquah et al. (2022), Prempeh et al. (2024), and Chirume (2024), which link weak financial control to digital debt reliance and distress.

Recommendations for Policy Makers and Financial Regulators

Financial regulators and policy institutions in Ghana should promote national strategies that link financial inclusion with financial capability. Policies should support:

- campus financial literacy initiatives;
- clearer consumer protection in digital lending;
- simplified fee disclosure requirements; and
- public awareness campaigns on digital financial behaviour.

This is important because, as the empirical review showed, high adoption without parallel competence development may deepen student vulnerability rather than improve resilience.

Recommendations for Academic Departments and Student Bodies

Departments, SRC bodies, hall administrations, and student associations should collaborate to organize workshops on digital budgeting, responsible fintech use, and financial wellbeing. Peer-led interventions may be particularly effective among students, since many financial habits are shaped within social networks.

Contribution of the Study

This study contributes to the growing literature on fintech and financial behaviour in several ways.

First, it extends discussion on fintech in Ghana beyond adoption to include the behavioural consequences of digital convenience among tertiary students.

Second, it introduces the concept of the **Fintech Paradox** in the UMaT context by demonstrating that widespread fintech access can coexist with weak financial resilience.

Third, it contributes evidence from a technically oriented Ghanaian university environment, thereby expanding the African empirical literature on fintech, digital financial literacy, and student financial wellbeing. In particular, it complements prior work from Ghana, Kenya, Uganda, Nigeria, Tanzania, South Africa, and Zimbabwe (Senyo & Osabutey, 2020; Njenga, 2020; Nanziri, 2021; Adeyemi et al., 2023; Mndolwa & Mutagwaba, 2021; Chirume, 2024).

Fourth, it shows that financial awareness is not the same as financial control. This distinction is important for both academic theory and practical policy design.

Limitations of the Study

Despite the contributions of this study, several limitations should be acknowledged when interpreting the findings.

First, the study relied on self-reported questionnaire data. Self-reported responses may be subject to recall bias, social desirability bias, or subjective interpretation of financial behaviour. Students may unintentionally overstate responsible financial practices or underreport impulsive spending and financial difficulties. Although anonymity and confidentiality were assured to reduce response bias, future studies may strengthen empirical accuracy by incorporating objective indicators such as transaction records or financial tracking data.

Second, the study employed a cross-sectional research design in which data were collected at a single point in time. While this design is appropriate for identifying relationships among variables, it does not allow for causal

inference or for observing how financial behaviour evolves over time. Longitudinal studies that track financial behaviour across multiple periods would provide stronger insight into how fintech usage and financial literacy influence student financial resilience.

Third, the study was conducted within a single tertiary institution, the University of Mines and Technology (UMaT). Although the institution provides a relevant context for examining digital financial behaviour among students, the findings may not be fully generalizable to other tertiary institutions in Ghana, particularly private universities or institutions with different socio-economic student populations. Comparative studies involving multiple universities would therefore provide broader evidence on fintech behaviour among Ghanaian students.

Finally, some dimensions of digital financial literacy were not explored in depth. For example, the study did not extensively measure detailed numerical understanding of compound interest associated with digital lending products or direct experiences of digital fraud losses. These aspects are important given increasing concerns regarding digital lending risks and cybersecurity threats in fintech environments. Future research could incorporate deeper measurement of financial numeracy, borrowing behaviour, and fraud exposure to strengthen understanding of financial vulnerability in digital financial systems.

Despite these limitations, the study provides a strong analytical foundation for understanding the relationship between fintech adoption, digital financial literacy, and financial behaviour among tertiary students within a rapidly expanding digital financial ecosystem.

Suggestions for Further Research

Future studies should expand the analysis in several ways.

A comparative study involving **public and private universities** in Ghana would help determine whether institutional setting influences fintech behaviour and financial resilience.

Future research should also consider **longitudinal designs** to examine how student fintech behaviour and financial literacy change over time.

There is also room for **qualitative studies** exploring the psychological motivations behind impulse spending, digital loan use, and financial stress among students.

Further research may examine the effectiveness of specific fintech design interventions such as:

- spending alerts,
- digital savings nudges,
- cooling-off periods before borrowing, and
- transaction reflection prompts.

Such studies would provide stronger practical evidence on how to improve financial outcomes within digital financial ecosystems. This would also deepen the insights generated by studies such as Prempeh et al. (2024) and Chirume (2024), especially in relation to digital debt behaviour and financial anxiety.

Final Concluding Statement

This study has shown that the digital transformation of student finance at UMaT is both enabling and destabilizing. Fintech has increased convenience, speed, and accessibility, but it has also reduced spending restraint and exposed students to new patterns of financial vulnerability. The central challenge is therefore no longer simply access to financial services, but the capacity to use those services wisely.

The study concludes that the future of student financial wellbeing in a digital era will depend not only on fintech expansion, but on whether that expansion is matched by deeper financial literacy, stronger behavioural self-

regulation, and more responsible digital system design. This conclusion resonates with the broader African literature, which consistently shows that adoption alone is not enough, and that competence remains the decisive factor in shaping whether fintech becomes a tool of empowerment or a source of vulnerability (Sarpong-Danquah et al., 2018; Mkhize & Mushariwa, 2022; Ofori-Acquah et al., 2022; Chirume, 2024).

APPENDIX

Appendix A

Survey Questionnaire

Title of Study:

The Fintech Paradox: Assessing Digital Financial Literacy and Behavioral Outcomes among Tertiary Students in Ghana (UMaT Case Study)

Research Purpose:

This questionnaire is designed to collect information on fintech adoption, digital financial literacy, and financial behavior among students of the University of Mines and Technology (UMaT). The study is conducted strictly for academic research purposes.

Confidentiality Statement:

All responses will be treated with strict confidentiality and will only be used for academic analysis. No personal identification will be required, and your responses will remain anonymous.

Instruction:
Please answer the questions by selecting the option that best reflects your experience or opinion.

Section A: Demographic Information

1. **Gender**

- ☐ Male
- ☐ Female

2. **Level of Study**

- ☐ Level 100
- ☐ Level 200
- ☐ Level 300
- ☐ Level 400
- ☐ Postgraduate

3. **Program of Study**

- ☐ Engineering
- ☐ Applied Sciences

- ☐ Business / Finance
- ☐ Other (Specify) _____

4. **Primary Source of Financial Support**

- ☐ Parents/Guardian
- ☐ Personal Business
- ☐ Student Loan (SLTF)
- ☐ Scholarship
- ☐ Other (Specify) _____

Section B: Fintech Adoption

Please indicate whether you are aware of or have used the following financial services.

Financial Product	**Aware**	**Used**
Savings Account (Bank)	☐ Yes ☐ No	☐ Yes ☐ No
Current / Checking Account	☐ Yes ☐ No	☐ Yes ☐ No
Government Bonds / Treasury Bills	☐ Yes ☐ No	☐ Yes ☐ No
Pension Scheme (SSNIT / Tier 3)	☐ Yes ☐ No	☐ Yes ☐ No
Insurance Policy (Life / Health / Vehicle)	☐ Yes ☐ No	☐ Yes ☐ No
Microfinance Loans	☐ Yes ☐ No	☐ Yes ☐ No
Mobile Money Wallet (MoMo)	☐ Yes ☐ No	☐ Yes ☐ No
Digital Micro-Loans (e.g., Qwickloan, Fido)	☐ Yes ☐ No	☐ Yes ☐ No
Cryptocurrency	☐ Yes ☐ No	☐ Yes ☐ No
Online Banking Apps	☐ Yes ☐ No	☐ Yes ☐ No
Digital Investment Platforms	☐ Yes ☐ No	☐ Yes ☐ No

Section C: Digital Financial Literacy

Please indicate your level of agreement with the following statements.

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

Statement	**1**	**2**	**3**	**4**	**5**
I understand how transaction charges (e.g., E-Levy) affect my finances.	☐	☐	☐	☐	☐
I am confident in identifying phishing messages or digital scams.	☐	☐	☐	☐	☐
I understand how interest rates work on digital loans.	☐	☐	☐	☐	☐

I regularly check my mobile money transaction history.	☐	☐	☐	☐	☐
I factor transaction costs into my personal budget.	☐	☐	☐	☐	☐
I feel confident using digital financial tools to manage my money.	☐	☐	☐	☐	☐

Section D: Digital Financial Behavior

Please indicate your level of agreement with the following statements.

Statement	**1**	**2**	**3**	**4**	**5**
It is important to have a monthly budget.	☐	☐	☐	☐	☐
I usually follow a financial budget each month.	☐	☐	☐	☐	☐
The ease of digital payments makes me spend more than intended.	☐	☐	☐	☐	☐
I prefer using Mobile Money instead of cash for daily expenses.	☐	☐	☐	☐	☐
I sometimes make impulse purchases when using digital payments.	☐	☐	☐	☐	☐
I use digital savings or locked savings features to control spending.	☐	☐	☐	☐	☐
I frequently run out of money before the end of the month.	☐	☐	☐	☐	☐
I rely on digital loans to cover expenses.	☐	☐	☐	☐	☐

Section E: Financial Challenges

What is the biggest challenge you face in managing your finances as a student?

THANK YOU

Thank you for participating in this study. Your responses are highly valuable in helping to understand the relationship between fintech adoption, financial literacy, and financial behavior among tertiary students in Ghana.

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Ethical Approval

The study involved voluntary participation of students of the University of Mines and Technology. Ethical clearance was obtained from the relevant academic authority and all respondents participated anonymously.

Conflict of Interest

The authors declare no conflict of interest.

Data Availability

The dataset supporting the findings of this study is available from the corresponding author upon reasonable request.