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Artificial Intelligence Literacy for Digital Learning: Investigating the Mediating Role of Digital Self-Efficacy in Financial Decision-Making among University Students

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Abstract

The rapid integration of artificial intelligence and digital technologies into higher education has created new opportunities for students to access information, develop digital competencies, and make informed decisions in everyday life, including financial decision-making. This study examined the relationship between Artificial Intelligence Literacy and Financial Decision-Making among university students and investigated the mediating role of Digital Self-Efficacy in this relationship. A quantitative, cross-sectional research design was employed, and data were collected from 397 university students from higher education institutions in Punjab and Sindh, Pakistan, through an adopted structured questionnaire administered online using Google Forms. The questionnaire measured Artificial Intelligence Literacy, Digital Self-Efficacy, and Financial Decision-Making using five-point Likert-scale items. The collected data were organized in Microsoft Excel and subsequently analyzed using IBM SPSS Statistics through descriptive statistics, reliability analysis, Pearson correlation, regression analysis, and mediation analysis. The findings demonstrated significant positive relationships among Artificial Intelligence Literacy, Digital Self-Efficacy, and Financial Decision-Making. Artificial Intelligence Literacy was found to positively contribute to students' Financial Decision-Making and Digital Self-Efficacy, while Digital Self-Efficacy also positively contributed to Financial Decision-Making. The mediation analysis further demonstrated that Digital Self-Efficacy significantly mediated the relationship between Artificial Intelligence Literacy and Financial Decision-Making, indicating that students' confidence in using digital technologies represents an important mechanism through which AI literacy can contribute to more effective financial decision-making. The study contributes to the emerging literature by integrating AI literacy, digital self-efficacy, and financial decision-making within a single framework and highlights the importance of developing students' technological knowledge, critical digital capabilities, and confidence for responsible decision-making in increasingly AI-driven environments.

Keywords: Artificial Intelligence Literacy, Digital Self-Efficacy, Financial Decision-Making, University Students, Digital Learning, Artificial Intelligence, Financial Behavior, Higher Education

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Introduction

Artificial Intelligence Literacy is essential for students as useful AI tools tend to surface within research utilizing digital learning environments and higher education. AI tools assist students with processes for information retrieval, understanding and concept formulation, summarization of academic content and idea generation, drafting, and task completion. Understanding basic AI components and how then how and when it is suitable to use AI systems is AI literacy. Any system is only as effective as the user and that also applies to AI. While we anticipate students to learn to use AI systems, what is of greater concern is understanding the system and how AI protects, sustains, or violates academic integrity. Literature suggests that students conform in their AI literacy depending on their educational foundations and AI technology exposure (Yani & Kotova, 2026). Universities have a responsibility of engaging the tech-based learning environment as a priority, with special emphasis on the diversification of AI literacy. Post AI integrative research supports and expands the current emphasis for AI literacy, especially as AI is employed in higher education and society at large (Puspitasari et al., 2026).

As students develop knowledge regarding AI, they must learn to practice critical thinking and evaluation for responsible AI use. AI tools allow for easier and quicker access to information, but can also provide inaccurate, biased, misleading, and even harmful information. AI-generated information must not be accepted as complete truth. According to (Alqurni, 2026), a key part of AI literacy is the ability to critically evaluate AI-generated information and understand the impacts that such information can have. Students must understand the importance of verifying the validity of information by assessing its accuracy and evaluating it against reliable sources prior to using it for important academic or personal purposes (Alkhalaileh & Qasim, 2026). A responsible user of AI must be critical of the ethical implications of AI (e.g., bias, privacy, transparency, integrity), and have an understanding of the issues related to its use. (Duong, 2026) suggest that the ethical dimension of AI literacy must not be overlooked. Studies have shown that in the absence of critical evaluation skills, students can be potentially harmed by AI technologies (Basri & Almutairi, 2023).

Beyond academic study and ethical use, AI literacy is more important than ever before as every day and professional activities engage with AI. AI has penetrated most of the economic, health, communication, banking, marketing, and financial services sectors. Likewise, university students are likely to encounter AI not only in their classrooms but also in both their personal and professional lives. Recent studies have shown that students' AI literacy is notably poor and that (now more than ever) there is a need for preparing students for an AI-integrated society (Siregar et al., 2025). AI systems have the ability to organize, group, tag, and structure data. They can make recommendations and assist in drafting or preparing reports and briefs. The benefits and opportunities of such technologies are realized if the user has the knowledge and the skills to interpret and analyze the data and output generated by the technologies. It has also been documented that AI literacy enhances the user's confidence (Wu et al., 2026). In the absence of AI literacy, digital technologies are likely to increase digital anxiety. Therefore, AI literacy is likely to further enhance Digital Self-Efficacy. This AI literacy and digital technology integration in higher education is new and important research area in higher education (Jia & Tu, 2024).

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Digital Self-Efficacy

Digital Self-Efficacy is the degree to which an individual feels confident when utilizing digital technologies. At the elementary and secondary levels, this includes interacting with devices such as laptops and learning management systems and mobile and web based tools and resources (Hasani & Shirbagi, 2025). An individual high with Digital Self-Efficacy is driven to learn how to use digital tools and systems and accomplish digital tasks along with being motivated and determined to deal with and overcome the challenges associated with using unfamiliar tools. Digital tools and technologies used for learning, communication, and completing academic tasks in higher education will be used for teaching and learning. Positive experiences with technology, combined with digital literacy, will enhance the individual's self-efficacy and digital learning engagement (Liang).

Users of the digital ecosystem, like students at universities, employ multiple services and tools, virtual classrooms, applications, and even artificial intelligence to perform both academic and personal tasks. Digital Self-Efficacy will help students develop confidence in using the digital ecosystem (Hajizadeh et al., 2026). Students who are confident in using the digital ecosystem become more likely to engage with new technologies and modalities, resolve more issues on their own, and eventually adjust to changes in digital contexts. A learner's positive engagement with digital technologies in a learning ecosystem and the satisfaction of learning objectives is directly correlated with Digital Self-Efficacy. Self-Efficacy is acquired and built through practice and by developing a positive outlook. Digital Self-Efficacy is not the same as digital skill development. It is more concerned with how students think and work collaboratively and independently with technology (Berdida et al., 2025).

The association between Digital Self-Efficacy and Artificial Intelligence Literacy stems from the fact that a student’s understanding of AI can impact their self-efficacy when using AI-based technologies. AI Literacy helps students understand the intent, purposes, functions, and capabilities of AI, as well as its limitations, while Digital Self-Efficacy is the confidence expressed by a student for using digital tools in a given context (He et al., 2025). Students being aware of AI diminishes their uncertainty when using AI, and consequently, possibly using other digital resources. There is a strong likelihood of students being more confident about AI and the related tools in a contextual environment of learning enhanced by experiential learning (Winarni et al., 2026). In combination with this, a growth in the students’ AI-related knowledge also positively impacts students’ confidence when dealing with new digital resources (Zayed & Zayed, 2026). Thus, understanding of AI can further the goal of Digital Self-Efficacy in reducing apprehension when dealing with tools in the digital world. Considering the context of the present study, it is imagined that the students with higher AI literacy can indulge a greater degree of self-efficacy when using digital resources along with a greater confidence to interact with a greater number of digital information resources that can support them in making better, informed decisions (Bipasha et al.).

Financial Decision-Making

Financial Decision-Making deals with how individuals manage and distribute their resources. Examples of this process are individuals’ decisions regarding their savings, expenditures, use of credit, budgeting, investment, and usage of financial service options (Zhan et al., 2024).

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Development of adequate Financial Decision-Making skills is vital for all students at the university level. This is the stage when most young adults are given the chance to assume management of their finances for the first time or are able to achieve a greater degree of financial independence. It involves financing their education, meeting personal financial needs, making savings, and meeting their financial needs of daily living (Ahmed, 2026). The short and long-term financial consequences of the decisions they make have considerable financial implications on the students' financial circumstances. Analysis of financial information helps the students to appreciate the consequences of different decisions. In addition, students must evaluate each alternative in terms of the risks involved, as well as the extent to which their requirements have been satisfied. It has been documented that the financial literacy and financial knowledge of young adult positively influences their financial behavior and the process of financial decision making (Agaoglu et al., 2025). The financial attitudes and experiences are key determinants of money management skills (Sharma et al., 2026). Digital Financial Literacy has assumed great importance given that students are more likely to rely on the internet to procure financial services and information (Falebita & Kok, 2025). Financial Decision-Making should not be restricted to only Financial Knowledge. Students must be able to understand and appreciate financial concepts and more importantly, the range of digital financial services that are available.

The way students manage their finances and obtain financial information is different due to increased use of digital technologies. A variety of digital banking systems and financial applications allow for convenient and quick banking. Financial technologies may include investment portals, digital wallets and online payment systems. Using these applications may not support students in making good financial decisions. Students must recognize the financial and digital services and risks that may arise (Ofem et al., 2024). Understanding how digital financial services work may help students in identifying reliable sources, evaluating available options and making decisions. Digital Self-Efficacy is the confidence to use digital technologies for financial decision making. Digital Self-Efficacy may encourage students to utilize the available sources and make informed decisions regarding financial technological services. Digital Financial Literacy may help in the financial management and the financial behavior of students. Financial Self-Efficacy supports the confidence or assurance a person has regarding their financial activities and decisions. Use of digital financial services may require both digital and financial skills and competences (Liu et al., 2026). Financial Self-Efficacy along with the knowledge of money may contribute to the students financial decisions.

Artificial Intelligence has created another dimension in students' financial decision-making. Utilizing AI, Decision-making in the world of finance can be facilitated. AI can provide robust analysis through data and can even predict the user's best course of action (Pham et al., 2025). Universities can give their students access to AI tools as students can learn about finance, compare finance options, manage their finances, and even request finance related advise. However, students must be careful not to place too much value on AI outcomes, as they may be incorrect, incomplete, and not financially appropriate (Zhang et al., 2026). AI Literacy may be of high importance to students, as they must learn how AI works, its boundaries, how to evaluate outcomes, and how to safely and functionally use AI. For students, it may be of great importance to advise and educate them about AI, as it can be a highly valuable asset in their financial decision-making. It will be of great interest in a student's decision-making process as they interact with it on a daily basis. It can become an important competency in the future due to an

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increase in AI technology in education and society (Ofem et al., 2024). A student's interaction with AI technology has a great impact on how the student interacts with AI technology (Ahmed, 2026). AI Literacy and Digital Self Efficacy may jointly contribute to the university students' financial decision-making. This is achieved by the students' ability to evaluate decisions, consider alternatives, and effectively use digital financial resources. AI Literacy and Digital Self-Efficacy also contribute to the students' understanding of how to download digital financial resources.

Research Objectives

- To examine the effect of Artificial Intelligence Literacy on Financial Decision-Making among university students.
- To examine the effect of Artificial Intelligence Literacy on Digital Self-Efficacy among university students.
- To examine the effect of Digital Self-Efficacy on Financial Decision-Making among university students.
- To investigate the mediating role of Digital Self-Efficacy in the relationship between Artificial Intelligence Literacy and Financial Decision-Making among university students.

Problem Statement

The rapid growth of AI and digital technology changes how university students learn, find information, and make decisions, including financial decisions. While AI tools aid decision-making, students may lack adequate AI Literacy to critique AI-generated information. Additionally, students may have differences in Digital Self-Efficacy that may affect their confidence to use digital technologies and apply digital information to real life situations (Wu et al., 2026). Earlier studies analyzed AI literacy, digital skills, and financial literacy separately. However, little research examined the impact of AI Literacy on Financial Decision-Making of university students through the mediating role of Digital Self-Efficacy (Duong, 2026). Hence, the impact of AI literacy on students' confidence to use digital technologies and the impact on their ability to make financial decisions is an area that requires more research. Understanding this relationship is necessary because university students are now living, learning, and making decisions in an AI-driven and digital world (Zuo et al., 2025).

Significance of the study

This research examines university students' Financial Decision Making and its relation to growing Artificial Intelligence Literacy in their Digital Lives. It is essential to understand students' knowledge and confidence concerning the tools and means they use in learning, searching for information, and managing their finances as they begin to integrate Artificial Intelligence and Digital Tools into their Finances. The study also considers Digital Self-Efficacy as a potential mediator to explain the mechanism of AI literacy in the context of Financial Decision Making. The findings will help university students recognize the importance of both Artificial Intelligence and Digital self-Efficacy, as well as responsible financial behavior. The study will also help University managers and educators adjust their focus and engage policymakers based on the evidenced AI literacy and digital self-Efficacy gaps. The study also

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provides a significant addition to the literature by combining AI literacy and digital self-Efficacy and drawing potential research direction for Digital Learning and Financial Behavior.

Literature Review

Artificial Intelligence Literacy is defined as the ability to explain, identify, and evaluate AI within a given context. In AI-driven academic contexts, Artificial Intelligence Literacy is an important concept to consider because students are more likely to rely on AI to help them find answers to their questions, provide them with solutions, help them analyze given data and constructs, come up with new ideas, and assist them with several other academic-related tasks. Users with higher Artificial Intelligence Literacy may be able to understand how an AI system is designed to help them and how they should use such system (Li et al., 2025). Using an Artificial Intelligence platform provides users with flexibility and ease to conduct their day-to-day activities. Literacy systems focus on affordances of Artificial Intelligence and help students use AI and work with it more purposefully. Similar focus is required at the university level systems. (Liu et al., 2026) state that the need for Artificial Intelligence Literacy is increasing as technology is rapidly becoming a part of daily and academic life. Hence, AI literacy can help students understand the technology and the implications of using AI-based technology in their everyday life (Wang et al., 2026).

More importance is required for students using AI and digital technology to obtain information about the financial domain. Financial decision-making encompasses making choices about saving and spending, budgeting and borrowing, investing, and selecting services. AI-based tools are designed to perform tasks to process data and to assist users by suggesting alternatives, and providing recommendations. Rasheed et al.

While AI can help users make decisions, systematic challenges associated with AI mean students must be able to evaluate AI-generated information. (Huang et al., 2026) indicated that digital financial literacy and the associated skills have a positive effect on the quality of financial decisions. In addition, (He et al., 2025) indicated that digital financial literacy positively affects the financial management behavior of students in Pakistan. For this reason, students must possess a combination of financial understanding, AI, and digital skills to appropriately use technology in making financial decisions.

The available literature indicates that the understanding of AI by students is likely to have a positive influence on their decisions regarding the use of AI in financial matters given that the users of AI, who are financially aware, are likely to know the limits of AI and check a variety of sources for AI generated information, consider alternative options and evaluate the potential risks of the financial decisions. (Obadă et al., 2025), emphasized the importance of having AI literacy to evaluate the increasing interactions of students with AI in their academics as well as in their careers. (Canbeldek Erol et al., 2026) listed AI literacy as a necessary competency for contemporary students. (Huang et al., 2026) indicated the utility of AI tools for financial analysis and investment-related decisions. Previous studies suggest that the ability to interpret financial information within the context of Artificial Intelligence (AI) may lead university students to make better financial decisions. AI-literate students are likely to be able to evaluate and make responsible financial decisions based on financial information processed by AI (Canbeldek Erol et al., 2026) .

Online ISSN: 3006-8886
Print ISSN: 3006-8878

Artificial Intelligence Literacy and Digital Self-Efficacy

Understanding AI may help students develop Digital Self-Efficacy, which is the confidence and willingness to use digital innovations and resolve problems that crop up during their interaction with digital technologies. Students now have to use various AI and other digital platforms to accomplish their academic and personal tasks. Awareness of AI at a foundational level may enable students to navigate digital tools and frameworks used with AI with more comfort instead of confusion. According to (Sial, 2026), education on AI literacy develops students' understanding and empowers them to work with AI technologies. In the same vein, (Zhao et al., 2025) have stated that students' AI literacy influences their confidence towards AI. Additionally, (Low et al., 2025) have demonstrated that the integration of AI in higher education systems increases positivity and confidence of students towards related technological tasks. Considering the existing evidence, AI literacy largely contributes to Digital Self-Efficacy, as it enhances learners' confidence to use digital systems and technologies.

Digital Self-Efficacy also requires familiarity with AI. Students should learn to utilize digital systems and technologies. There should be easy access to digital tools for students to learn how to handle technology-related issues and develop their confidence. Students who know how to use AI tools are more comfortable trying different AI tools and are less worried when they encounter different digital tools for the first time. According to (Adib & Intania, 2025), there is a positive relationship between students' understanding of AI tools and students' self-confidence when working with different technologies on their own. This also correlates with research done by (Bhagat, 2026), where it was shown that increasing the students' understanding of AI tools can be done through different levels of educational and academic activities. Lastly, (Yani & Kotova, 2026) researched the impact of AI self-confidence when students gain both AI knowledge and practical experience to better work with AI. As such, Digital Self-Efficacy of a student is enhanced when they have been more confident in dealing with digital technologies.

The interaction between Artificial Intelligence Literacy and Digital Self-Efficacy is especially important given the growth of AI within the digital ecosystems of students. AI Literacy is defined as students' understanding of the output of AI, and Digital Self-Efficacy refers to their overall confidence when working with different technologies. From a research standpoint, (Beyazhancer & Demir, 2025) have indicated that there is a positive correlation between Artificial Intelligence Literacy and AI Technologies confidence. (Ahmed, 2026)has also indicated that Artificial Intelligence Literacy has a positive correlation with technology self-efficacy. Lastly,(Low et al., 2025). have indicated that AI Technologies' practical experience leads to an overall increased confidence level. The recent (2025) study found that AI literacy enhances student confidence in undertaking tasks involving AI. The existing literature suggests that Artificial Intelligence Literacy has a positive influence on Digital Self-Efficacy of university students. When students come to understand and gain experience in using AI, they may become confident in their ability to use digital technologies competently, thus making Digital Self-Efficacy an important aspect to understand how AI literacy may influence students' future digital and pragmatic behavior.

Online ISSN: 3006-8886
Print ISSN: 3006-8878

The Role of Digital Self-Efficacy in the Relationship between Artificial Intelligence Literacy and Financial Decision-Making

As financial activities become more digitized, the role of Digital Self-Efficacy in Financial Decision Making is increasingly significant. University students utilize mobile banking and digital payment systems, and also use online shopping and digital services to help them undertake their financial transactions. Using these services not only requires the students possessing the infrastructure, but the confidence to use the services. Students with high Digital Self-Efficacy will be more likely to navigate financial services, explore different financial options, and manage their finances through digital platforms. Studies show that digital financial literacy is directly related to the financial management of university students in Pakistan (Duong, 2026). Likewise, digital financial skills augment the financial capability and financial decision-making of young people (Pham et al., 2026). In addition, financial confidence and digital financial literacy can influence financial management and financial well-being of students. Therefore, students who possess digital confidence are likely to access financial services which results in better Financial Decision-Making.

The role of Digital Self-Efficacy in Financial Decision-Making is strengthened, as students rely more on digital platforms to access financial information and services. Students with digital confidence are more likely to make use of digital banking, compare financial products, look for financial information, and learn how different digital financial services work.Just having confidence lacks the critical element of critical thinking regarding good financial decisions. There is a direct relation between digital financial knowledge and the efficient management of digital financial services (Pham et al., 2025). Furthermore, financial and digital skills help people to understand financial data and make better financial decisions (Cuong, 2025). (Nurfaizal, 2025) financial behavior of university students through self-efficacy. Thus, it can be hypothesized that Digital Self-Efficacy motivates university students to transform digital knowledge toward active financial behavior through the confidence to search for details, evaluate options, and employ digital financial tools to make financial decisions.

The relation may be further improved by AI (Artificial Intelligence) Literacy which acts as a facilitator to better understand and employ AI based technologies. AI literacy encompasses the understanding of AI technologies and Digital Self-Efficacy is about the confidence of using digital technologies. People who possess AI literacy would not feel as uncertain when using AI based tools, and therefore would feel confidence when using other digital technologies. (Esiyok et al., 2025) found positive correlation between AI literacy and self-efficacy among university students. AI literacy has been studied and shown to be useful in increasing students' interaction with AI based tools and technologies while at the same time, increasing students' understanding of the empowering nature of technology (Al-Mamary et al., 2025) also adds that AI literacy enhances students' confidence and comfort levels when dealing with AI technologies. AI literacy may enhance students' understanding of technology and Digital Self-Efficacy, which would give students the motivation to use technology and digital resources with greater frequency and confidence. This level of comfort when approaching financial-related information and services would allow students to be more financially responsible and independent. Therefore, Digital Self-Efficacy may link AI literacy and financial decision-making among students at universities (Atta et al., 2025).

Online ISSN: 3006-8886
Print ISSN: 3006-8878

Hypothesis

H1: There is a significant positive relationship between Artificial Intelligence Literacy and Financial Decision-Making among university students.

H2: Artificial Intelligence Literacy has a significant positive effect on Digital Self-Efficacy among university students.

H3: Digital Self-Efficacy has a significant positive effect on Financial Decision-Making among university students.

H4: Digital Self-Efficacy significantly mediates the relationship between Artificial Intelligence Literacy and Financial Decision-Making among university students.

Methodology

Research Design

The relationships among Artificial Intelligence Literacy, Digital Self-Efficacy, and Financial Decision-Making of university students were analyzed through a quantitative, cross-sectional research design. Data were collected through a self-administered researcher-developed questionnaire at a single, predetermined time. The data were statistically analyzed.

Population

The participants of the study were university students studying at universities in Punjab and Sindh, Pakistan. Participants were sampled from major educational centers such as Multan, Lahore, Faisalabad, Rawalpindi, Bahawalpur, Karachi, Hyderabad, Sukkur and Jamshoro. Participants were graduate and postgraduate students from a number of fields of study.

Sampling Technique

A non-probability convenience sampling technique was used to select the participants. Participants from Punjab and Sindh were selected using online means of communication and student forums. This was the most effective way to reach widely dispersed university participants from various fields of study.

Sample Size

Finally, 397 participants were selected for the study. 397 completed questionnaires were selected for data analysis. The sample was sufficient for determining relationships among variables and analyzing correlation, regression, and mediation.

Data Collection

The primary data were collected using a questionnaire which included sections for Artificial Intelligence Literacy, Digital Self-Efficacy, Financial Decision Making, and respondent demographics. Artificial Intelligence Literacy was assessed using Scale for Assessment of Non-Experts' AI Literacy (SNAIL), which constitutes three pillars: technical understanding, critical appraisal, and operational use. Digital Self-Efficacy was assessed using items inspired by the work of. Financial Decision Making was assessed using items concerning budgeting, saving, and

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the evaluation and comparison of financial information, as well as items assessing skill in the management of expenses and consideration of the financial implications of potential decisions. On a five-point Likert scale (where 1 = Strongly Disagree, and 5 = Strongly Agree), all the items were assessed. The questionnaire was reviewed for clarity and relevance before the data collection. Data were collected online, and the questionnaire was distributed to the targeted students. Leveraging the online communication systems, the voluntary survey was distributed to students from all universities in the provinces of Punjab and Sindh. The participants were informed about the study's academic purpose. Completed questionnaires were recorded automatically through Google Forms, and the data was exported for analysis.

Data Analysis

Data were collected using Google Forms and downloaded in the Excel format. Completeness, consistency, presence of missing data, and coding accuracy were assessed on the data prior to analysis. The dataset was analyzed using IBM SPSS Statistics. The study variables were summarized using selected descriptive statistics. For demographic variables, the measures of central tendency and dispersion were calculated. Cronbach's alpha was used to assess internal consistency for the measurement instruments used in the study. To examine the relationships between AI Literacy, Digital Self, and Financial Decision-making, correlation analysis was conducted to examine the relationships in terms of direction, strength, and significance. Multiple variables of the study were assessed for predictive relationships using multiple regression analysis. The relationships of interest were assessed along with the regression and standardized beta coefficients, the significance of the modeling and the multiple variables of the study, and the model's overall explanatory power (as denoted by R^2). For the relationships of interest, the mediation analysis was conducted using the Hayes' PROCESS, Model 4. The indirect effects were examined using 5,000 bootstraps and the 95% confidence interval. The mediation was considered significant when the 95% confidence interval did not include zero. The significance of the other metrics was assessed at $p < .05$.

Table 1: Demographic Characteristics of Respondents (N = 397)

Demographic Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	213	53.7
	Female	184	46.3
Age	18–21 years	126	31.7
	22–25 years	174	43.8
	26–29 years	67	16.9
	30 years and above	30	7.6
Academic Level	Undergraduate	268	67.5
	Master's	89	22.4
	MPhil/MS	31	7.8
	PhD	9	2.3
Academic Discipline	Social Sciences	87	21.9
	Business/Management	82	20.7

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Demographic Variable	Category	Frequency (f)	Percentage (%)
	Computer Science/IT	76	19.1
	Engineering	61	15.4
	Health Sciences	54	13.6
	Other disciplines	37	9.3
Province	Punjab	258	65.0
	Sindh	139	35.0
AI Usage Experience	Less than 1 year	72	18.1
	1–2 years	143	36.0
	3–4 years	119	30.0
	More than 4 years	63	15.9
Total		397	100.0

The 397 university students analyzed revealed relatively even female (46.3 %) and male (53.7 %) respondents. 43.8 % of respondents were between 22 and 25 years, and 31.7 % were between 18 and 21 years. Majority of respondents (67.5 %) were undergraduate students. The of the respondents were from Punjab (65 %) and Sindh (35 %). In terms of studies, Social Sciences (21.9 %) and Business/Management (20.7 %) were the most predominant. The respondents with 1-2 years of AI use had the highest proportion (36 %) of the respondents, as compared to the rest of the respondents of 3-8 years (30 %). In general, the respondents represented a variety of demographic, academic, geographical, and AI experience characteristics, which offers a good framework to examine AI literacy, digital self-efficacy, and financial decision making in university students.

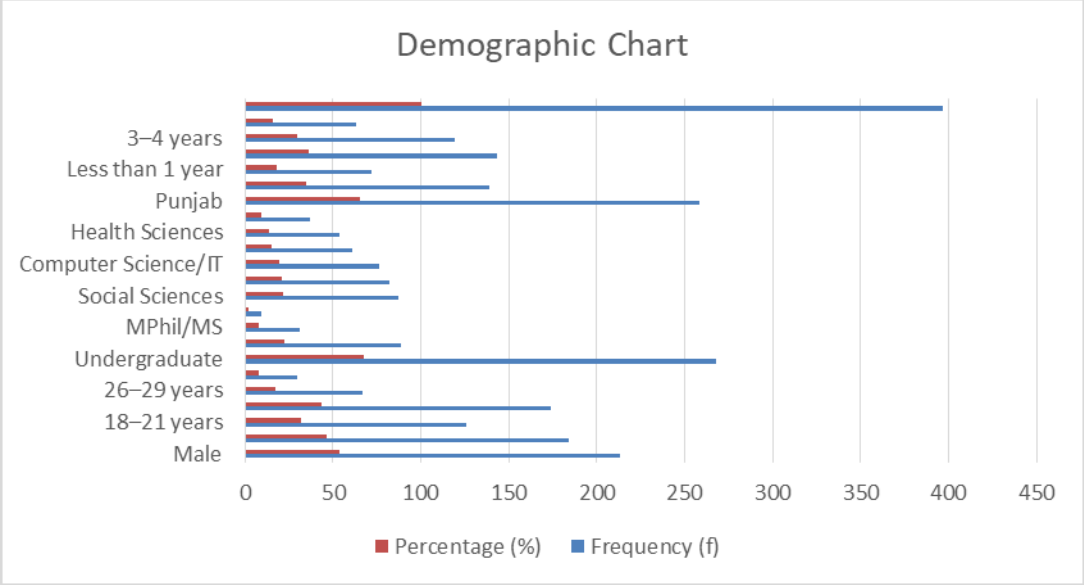

Fig.1 Demographic Chart

Online ISSN: 3006-8886
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Table 2: Reliability and Descriptive Statistics of Study Variables (N = 397)

Variables	No. of Items	Cronbach's Alpha (α)	Mean (M)	Std. Deviation (SD)
Artificial Intelligence Literacy	31	0.941	3.78	0.64
Digital Self-Efficacy	10	0.918	3.72	0.67
Financial Decision-Making	12	0.902	3.69	0.65
Overall Scale	53	0.951	3.73	0.65

For the analysis of the reliability and description, all the study variables demonstrated good internal consistency. Artificial Intelligence Literacy (M = 3.78, SD = 0.64, α = 0.941) and Digital Self-Efficacy (M = 3.72, SD = 0.67, α = 0.918) had an emphasis on Financial Decision Making (M = 3.69, SD = 0.65, α = 0.902). The overall scale also achieved very high internal consistency (α = 0.951). Since all mean scores were above the midpoint of the five point Likert scale, the respondents expressed a fair amount of AI literacy, digital self-efficacy, and financial decision-making. Defined in comparison to the standard deviations, the small variations expressed sufficiently good measurement consistency as confirmed by the reliability coefficients for subsequent statistical analysis.

Table 3: Pearson Correlation between Artificial Intelligence Literacy and Financial Decision-Making (N = 397)

Variables	Artificial Intelligence Literacy	Financial Decision-Making
Artificial Intelligence Literacy	1	.612**
Financial Decision-Making	.612**	1
Sig. (2-tailed)	—	< .001
N	397	397

According to the Pearson correlation analysis, Artificial Intelligence Literacy and Financial Decision-Making for university students was positively correlated. With Artificial Intelligence Literacy as the independent variable, and Financial Decision-Making as the dependent variable, the correlation value was r = .612, p < .001, and N = 397. This finding demonstrates that for Financial Decision-Making, university students who have greater Artificial Intelligence Literacy self-report greater ability. Considering the findings, the statistically significant positive correlation shows that which AI literacy university students possess directly shows the ability to make sufficient Financial Decisions. The positive correlation further demonstrates that there is a greater extent of Artificial Intelligence literacy that correlates to Financial Decision-Making ability.

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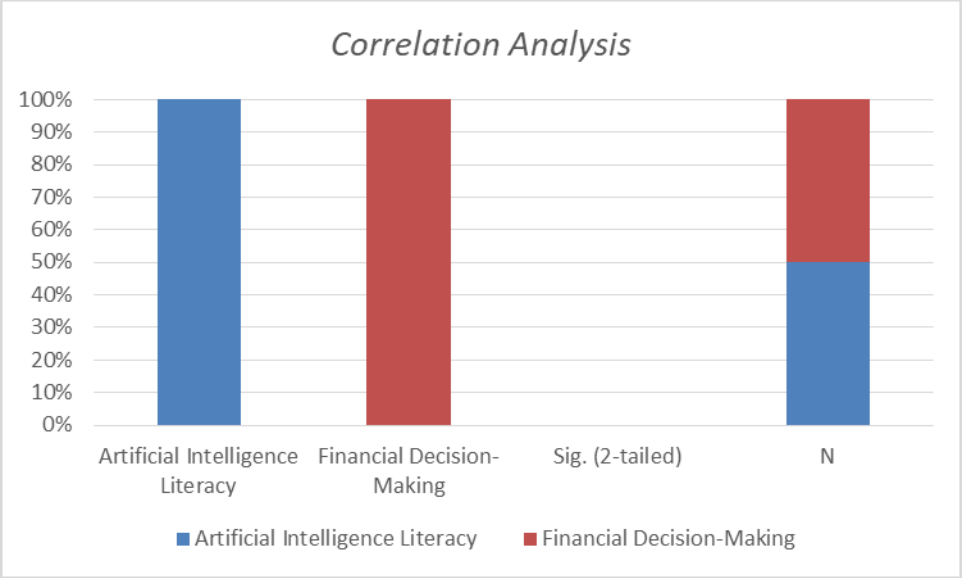

Fig.2 Correlation Analysis

Table 4: Multiple Regression Analysis Predicting Financial Decision-Making from Artificial Intelligence Literacy (N = 397)

Predictor	B	SE	β	t	p
Constant	1.214	0.184	—	6.598	< .001
Artificial Intelligence Literacy	0.657	0.048	.612	13.688	< .001

Model Statistics	Value
R	.612
R^2	.375
Adjusted R^2	.373
F	187.36
Sig. (F)	< .001

Multiple regression analysis shows that university students' Artificial Intelligence Literacy explains Financial Decision-Making. The regression analysis was statistically significant, $F(1, 395) = 187.36$, $p < .001$, with R^2 equaling .375, indicating that roughly 37.5% of Financial Decision-Making is attributable to Artificial Intelligence Literacy. Artificial Intelligence Literacy demonstrated a strong positive effect on Financial Decision-Making ($B = 0.657$, $\beta = .612$, $t = 13.688$, $p < .001$). Based on the results, the positive predictive relationship of Artificial Intelligence Literacy and Financial Decision-Making is supported.

Online ISSN: 3006-8886
Print ISSN: 3006-8878

Table 5: Pearson Correlation between Digital Self-Efficacy and Financial Decision-Making (N = 397)

Variables	Digital Self-Efficacy	Financial Decision-Making
Digital Self-Efficacy	1	.584**
Financial Decision-Making	.584**	1
Sig. (2-tailed)	—	< .001
N	397	397

According to the Pearson correlation analysis, there was a significant positive correlation between Digital Self-Efficacy and Financial Decision-Making among a sample of 397 university students ($r = .584$, $p < .001$). The participants reported an increase in the strength of their financial decision-making skills and digital self-efficacy. By the results of the regression analysis, Digital Self-Efficacy had a positive influence on Financial Decision-Making. The overall regression model was statistically significant, $F(1,395) = 168.48$, $p < .001$. This model explained 34.1% of the Financial Decision-Making variance ($R^2 = .341$). In the model, Digital Self-Efficacy ($B = .636$, $\beta = .584$, $t = 12.980$, $p < .001$) was positively related to Financial Decision-Making. Therefore, Digital Self-Efficacy and Financial Decision-Making are positively correlated, as hypothesized.

Table 6: Regression Analysis of Digital Self-Efficacy Predicting Financial Decision-Making (N = 397)

Predictor	B	SE	β	t	p
Constant	1.326	0.181	—	7.326	< .001
Digital Self-Efficacy	0.636	0.049	.584	12.980	< .001

Model Statistics	Value
R	.584
R^2	.341
Adjusted R^2	.339
F	168.48
Sig. (F)	< .001

The results of the regression analysis indicated that digital self-efficacy had a positive, significant effect on financial decision-making for the participants ($N = 397$). Overall, the regression model was statistically significant ($F(1, 395) = 168.48$, $p < .001$); thus, digital self-efficacy was a significant predictor of financial decision-making. Model values for R and R^2 were .584 and .341, respectively. This means that digital self-efficacy explained 34.1% of the variance in financial decision-making, and the adjusted R^2 was .339. Digital self-efficacy was positively related to financial decision-making ($B = 0.636$, $SE = 0.049$, $\beta = .584$, $t = 12.980$, $p < .001$). This means that participants with higher levels of digital self-efficacy demonstrated a better level of financial decision-making. This positive, significant effect indicated that, with a one-unit increase in digital self-efficacy, participants demonstrated a positive average change of

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0.636 financial decision-making units. Digital self-efficacy demonstrated a positive, significant effect on financial decision-making.

Table 7: Mediation Analysis of Digital Self-Efficacy in the Relationship between Artificial Intelligence Literacy and Financial Decision-Making (N = 397)

Path	Effect (B)	SE	β	t	p
AIL → DSE (a)	0.673	0.049	.568	13.735	< .001
DSE → FDM (b)	0.421	0.057	.387	7.386	< .001
AIL → FDM (c′) Direct Effect	0.373	0.051	.347	7.314	< .001
AIL → FDM (c) Total Effect	0.657	0.048	.612	13.688	< .001

Table 8: Bootstrapped Indirect Effect of Artificial Intelligence Literacy on Financial Decision-Making through Digital Self-Efficacy

Effect	Boot Effect	Boot SE	BootLLCI	BootULCI
AIL → DSE → FDM	0.283	0.041	0.207	0.368

Note. Bootstrap samples = 5,000; confidence interval = 95%. AIL = Artificial Intelligence Literacy; DSE = Digital Self-Efficacy; FDM = Financial Decision-Making. Mediation is supported when the bootstrap confidence interval for the indirect effect does not include zero.

Results indicate that Digital Self-Efficacy mediated the relationship between AI Literacy and Financial Decision-Making for students at university. AI Literacy influences Digital Self-Efficacy (B = 0.673, β = .568, p < .001), and Digital Self- Efficacy influences Financial Decision-Making (B = 0.421, β = .387, p < .001) after AI Literacy is controlled for. The direct impact of AI Literacy on Financial Decision-Making (B = 0.373, β = .347, p < .001) was kept, and so was the overall impact (B = 0.657, β = .612, p < .001). The indirect impact was 0.283 with a confidence interval of 0.207 to 0.368. Since the confidence interval did not include zero, the impact was considered to be present. This shows that the presence of AI Literacy means Financial Decision-Making is easier and becomes stronger. The inclusion of the mediator did not eliminate the direct impact, which shows partial mediation. In conclusion, Digital Self-Efficacy was successfully proven to mediate this relationship.

Discussion

There were positive relationships among Artificial Intelligence Literacy, Digital Self-Efficacy, and Financial Decision-Making for the selected participants. According to the authors, for these university students, Artificial Intelligence Literacy was a predictor for Financial Decision-Making. It can be inferred that students possessing a higher degree of Artificial Intelligence Literacy will be able to access and interpret technology-based information in the context of financial decisions. This finding corresponds to (Yani & Kotova, 2026), where AI-based data analysis and risk management as well as forecasting and optimal portfolio construction are associated with the process that Pakistani investors go through to make their investments.

For Digital Self-Efficacy, AI Literacy was a positive predictor as well. It has been documented that for participants, having a higher degree of Artificial Intelligence literacy has had a positive effect on their digital self-efficacy, and also on their overall self-efficacy in the use of technology (Atta et al., 2025). Reduction in the perceived complexity in Artificial Intelligence has been

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shown to have a positive effect on students' willingness to engage with a range of digital technologies, including the capability of using technology to solve problems (Hussein Ramadan Atta et al., 2025) as well as the ability to cope with and adopt new technologies.

This study found that these aspects of university students are related to each other: AI Literacy, Digital Self-Efficacy, and Financial Decision Making. The results showed that there was a positive connection of AI Literacy on Financial Decision Making. It showed that students with an understanding of the concepts of AI and its applications and constraints were more likely to be financially prudent (Peng et al., 2026). AI Literacy also predicted Digital Self-Efficacy, demonstrating that understanding of AI concepts and knowledge boosted confidence in dealing with Digital Technology. Self-Efficacy of Digital Technology was furthermore related to Financial Decision Making, demonstrating that students with higher confidence in technology were able to evaluate and understand digital data to make financial decisions (Ahmad et al., 2025).

In the mediation analysis, it was found that Digital Self-Efficacy had a significant relationship in the AI Literacy and Financial Decision Making. It was found that there was a direct and an indirect relationship, meaning that AI Literacy influenced Financial Decision Making via students confidence in digital technology (Doodman, 2026). It was noted that in today's university settings Financial Decision Making relies not just on traditional financial knowledge, but on confident and informed use of technology and the Digital world. It can be useful to promote confidence of students in the use of digital means in university education to enhance AI Literacy, as it may be the case that it creates more informed and critical user of AI and digital financial means (Sengul & SARIKÖSE, 2025).

Conclusion

Research is needed to broaden the scope of study subjects in Pakistan by including various provinces and higher education institutions. Research using larger sample sizes should attempt to trace the changes in AI literacy and digital self-efficacy and their effects on investment behavior. AI literacy and digital self-efficacy could also be studied along with financial self-efficacy, financial literacy, digital financial literacy, the perceived utility of AI, the credibility of AI information, and risk assessment to develop a more thorough understanding of investment behavior. It is necessary to conduct research across different countries to ascertain whether the relationships identified exist in different educational systems and cultures. Experimental research and interventions should be developed to measure the impact of AI literacy and digital-financial education on students' confidence to assess AI generated financial information.

AI literacy and digital self-efficacy were positively related to financial decision-making, showing that students' ability to manage finance, evaluate different options, and utilize digital financial services may be attributable to their self-efficacy with regard to the digital environment and their confidence with digital information. This is also congruent with who stressed the role of digital financial skills on financial management for university students in Pakistan, implying that financial management may be predicated not only on financial skills but also on confidence with digital tools and digital information.

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Future Implications

The most significant finding of this study is that Digital Self-Efficacy significantly mediated the relationship between Artificial Intelligence Literacy and Financial Decision-Making. This means that AI Literacy has an effect on Financial Decision-Making both directly and indirectly. It shows that AI Literacy can have a direct effect on Financial Decision-Making through students' ability to understand and analyze AI-based information. Further, the indirect effect is on the increase of students' confidence in using digital technologies. This in turn, shows that building students' AI Literacy in conjunction with Digital Self-Efficacy, the ability to critique, and Financial Education in higher education is of the utmost importance to prepare students to make informed and responsible decisions in the financial domain which has become dominated by Artificial Intelligence.

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