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RESEARCH ARTICLE

FinTech and Entrepreneurial Competencies as Mediators in an Extended Financial Literacy Model and Financial Satisfaction: A PLS-SEM Analysis

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ABSTRACT

The objective of this research is to investigate the crucial interplay of financial literacy, financial technology, entrepreneurial competencies and their impact on boosting financial satisfaction. Financial literacy represents as an essential construct for financial well-being. However, prior studies highlight that this factor alone is insufficient in enhancing financial outcomes. This study extends the conventional model of financial literacy by incorporating two crucial mediating factors, namely: FinTech and Entrepreneurial Competencies, strengthening the relationship with enhancing Financial Satisfaction (in creating better's trends). By adopting a descriptive correlation design with a structural equation modelling methodology known as Partial Least Squares - Structural Equation Modelling (PLSSEM), data were collected through a structured questionnaire distributed to members of the International Marketing Group (IMG). The results indicate that FinTech enhances decision speed in managing finances while Entrepreneurial Competencies assist individuals in leveraging their knowledge about finances for better Economics opportunities. This article not only validated the extended model of financial literacy but also provided new insights by demonstrating that both FinTech and Entrepreneurial Competencies are instrumental in boosting Financial Satisfaction. Furthermore, these results are statistically significant, thus adding a theoretical perspective to educational programs and policy implications and sparking further investigations to elevate our society on issues pertaining to financial literacy and FinTech so as enhance Entrepreneurial activities. However, such implications would be broader if more extensive research were carried out/revealed/cautioned within nations other than those studied because it depends upon several common factors that can determine whether this initiative is effective.

INTRODUCTION

Financial literacy—the capability to make informed and effective choices regarding personal financial management—is increasingly acknowledged as an essential component for achieving one's financial well-being (Kumar et al. 2023). It entails understanding fundamental concepts, such as budgeting, investing, debt management and retirement planning. However, research indicates that merely having financial literacy may not guarantee financial satisfaction, because numerous individuals find it challenging to apply their knowledge in real-world situations (Sabri et al. 2023). These revelations have spurred interest in exploring other factors, such as financial technology (FinTech) and entrepreneurial skills, that may mediate the relationship between financial literacy and financial satisfaction. This research aims to further explore this model through PLS-SEM analysis, examining how these variables together affect overall financial well-being.

In the context of the Philippines, individuals face many financial constraints: rising costs of living, insufficient savings, and high personal debt. This problem can significantly disrupt financial stability (Casingal and Ancho 2022). Recently, however, these problems have been exacerbated by global economic instability, especially as a result of the COVID-19 pandemic, which has worsened the financial crisis of many families. Researchers want to explore how integrating financial literacy with FinTech solutions and entrepreneurial skills can help individuals face these challenges and strengthen their financial situation (Hidayat-ur-Rehman 2024). While financial literacy provides valuable skills to society, the combination of FinTech and entrepreneurial skills can provide the practical tools and innovative approaches needed to achieve financial prosperity in a changing economic environment.

This survey was primarily targeted at individuals associated with the International Marketing Group (IMG) - a global entity dedicated to promoting financial independence through education and resources. The motivation to conduct this research stems from a strong desire to understand how improving financial literacy systems (including FinTech and entrepreneurial skills) can significantly improve the financial outcomes of IMG members. Using PLS-SEM analysis, this research aims to enrich the existing literature on financial literacy and provide practical insights into how individuals can use this additional knowledge to improve their financial well-being. However, the complexity of financial concepts can be a challenge for some people; however, the potential benefits are huge. Although this study focuses on a specific population, its impact can be reflected in all aspects of financial education, as understanding this relationship is important to advancing overall economic empowerment.

THEORETICAL FRAMEWORK

This study mainly focuses on financial theory, which Fong et al. (2021) defines as the understanding and control of financial principles that help people make informed financial decisions. This introductory course emphasizes the importance of financial literacy in helping people manage their finances, improve financial forecasting, and achieve financial success. However, despite the important role that financial literacy plays, research shows that financial literacy alone may not be sufficient to promote economic change or satisfaction (Rahman et al., 2021). Therefore, this calls for investigation of other variables that moderate the relationship between financial education and positive financial outcomes. Although financial literacy is the most important factor, it is not the only factor influencing these problems.

In this financial system, financial technology (FinTech) (short for financial technology) and business skills act as mediators, thereby improving the relationship between financial skills and financial satisfaction. Fintech gives people access to new tools that support financial management, enabling them to make more efficient and timely decisions. Marketing, however, helps financially literate people improve their knowledge in ways that lead to financial opportunity and reduce risk. Although the integration of these communication elements may seem difficult, this study aims to provide a strong understanding of how financial knowledge influences financial satisfaction in today's technology-driven economy.

METHODOLOGY

The study used PLS-SEM (Partial Least Squares Structural Equation Modeling) as the primary data analysis method for descriptive analysis. A questionnaire was used as the primary tool for data collection; it was distributed through Google Forms with the help of the Marketing CEO and Marketing Director. Permission was obtained from the CEO of International Marketing Group (IMG) to conduct this study and was approved by the CEO. PLS-SEM analysis was able to analyze the complex relationship between financial literacy, FinTech use, business skills, and financial satisfaction. This provided important insights into the mediation effect of the model. However, the complexity of these relationships suggests the need for further research as the findings may not fully explain what is involved.

The study follows the Input-Process-Output (IPO) framework, which divides the research into several stages. The organizational planning includes collecting respondents and opinions; source data analysis is conducted through PLS-SEM to support the expanded financial education model.

Ultimately, post-processing produced the final output: the extended model. However, it is essential to acknowledge that, although the methodology was rigorous, minor inconsistencies may still be present. Because of this, the findings should be interpreted with caution, although they provide valuable insights into the field. The study was conducted at IMG (a global financial education company) headquartered in Cebu, Philippines, which has a presence in numerous countries. IMG's mission is to empower individuals with financial knowledge and tools, operating through a variety of international satellite offices.

RESULTS AND DISCUSSIONS

This section provides analysis of the various constructs investigated, namely financial literacy (FL), financial technology (FT), entrepreneurial competencies (EC), and financial satisfaction FS). These constructs were derived financial literacy model. This model captures that financial literacy does not have a significant effect on financial behavior, financial technology has a significant effect on financial behavior, financial literacy has a significant effect on financial satisfaction, the use of financial technology has a significant effect on financial satisfaction, financial behavior has a significant effect on financial satisfaction, that financial literacy through financial behavior does not affect financial satisfaction, the use of financial technology through financial behavior does not affect financial satisfaction.

Financial literacy

The results in Table 1 highlight respondents' financial literacy across three dimensions: attitude, behavior, and knowledge. High scores in financial attitude, particularly in financial planning (M = 4.83, SD = 0.40) and goal setting (M = 4.42, SD = 0.70), suggest a strong readiness to adopt FinTech tools for managing finances. Positive financial behaviors, such as timely bill payments (M = 4.26, SD = 0.80) and having a financial plan (M = 4.57, SD = 0.60), are linked to higher financial satisfaction (FinSat). However, while respondents showed solid financial knowledge in investment (M = 4.39, SD = 0.70) and inflation awareness (M = 4.15, SD = 0.80), they scored lower in areas like investment diversification (M = 3.84, SD = 0.80) and profit calculations (M = 3.67, SD = 0.80), highlighting areas for improvement. FinTech solutions, such as automated portfolio management, could bridge these gaps.

Table 1: Indicators, mean, standard deviation and verbal description of respondent's perception on financial literacy (n = 477)

Indicators	Mean	SD	Verbal Description
Financial Attitude			
1. I keep a close personal watch on my financial affairs.	4.26	0.80	Strongly Agree
2. It is not important to set goals for the future.	4.42	0.70	Strongly Agree
3. I am aware of the importance of financial investment.	4.24	0.80	Strongly Agree
4. I always pay bills before due date.	4.66	0.60	Strongly Agree
5. Financial planning is important to me.	4.83	0.40	Strongly Agree
Financial Behavior			
1. Having a financial plan helps me to make decisions about financial investments.	4.57	0.60	Strongly Agree
2. I keep tract of monthly expenses.	4.19	0.80	Agree
3. I diversify my investment.	3.84	0.80	Agree
4. I allocate a portion of funds for charitable or social activities.	3.56	0.90	Agree
5. I always pay bills before due date.	4.26	0.80	Strongly Agree
Financial Knowledge			
I am aware of the importance of financial investment.	4.39	0.70	Strongly Agree
2. I evaluate spending regularly.	4.09	0.70	Agree

I am pretty good at calculation like profit and loss, percentage etc.	3.67	0.80	Agree
4. High inflation means that the cost of living is increasing rapidly.	4.15	0.80	Agree
5. I allocate part of my income to financial investment.	3.87	0.80	Agree

The integration of FinTech, FinSat, and entrepreneurial competencies into financial literacy education is promising. However, Allioui and Mourdi (2023)addressing gaps in complex financial knowledge remains crucial for fostering long-term financial stability and entrepreneurial success.

Table 2 describes the respondents' perception of financial technology with the following indicators: perceived usefulness, perceived ease of use, service trust, social influence, and attitude toward financial satisfaction. (Suryono, Budi, and Purwandari 2020) argue that the advent of financial technology poses challenges for various industries and business sectors.

Table 2: Indicators of financial technology (n = 477)

Indicators	**Mean**	**SD**	**Verbal Description**
Perceived Usefulness			
I think using Financial Technology service can make life more convenient	4.14	0.84	Agree
I think I can quickly get information using a Financial Technology service	4.07	0.72	Agree
I think I will not be restricted by time and location of using Financial Technology Service	3.84	0.81	Agree
I think I can't quickly get information using a financial technology service	4.01	0.69	
Perceived Ease of use			
I think it is easier to finalize transactions using Financial Technology services	4.04	0.73	Agree
I the interface process of Financial Technology is clear and easy to understand	3.95	0.81	Agree
I think it is effortless to learn to use Financial Technology	3.59	0.90	Agree
I believe most Financial Technology Services are easier to learn and use without going through the service manual	3.72	0.84	Agree
I think it is easier to download application programs from internet using Financial Technology service	3.95	0.82	Agree
Service Trust			
I am confident of the Financial Technology service provided by any investment platform	3.83	0.81	Agree
I think Financial Technology should take precautionary measures for investment matters	4.08	0.82	Agree
I think Financial Technology with internet banking should transfer the risk of potential loss due to major events to other vendors via insurance	3.83	0.8	Agree
I believe the transaction system of Financial Technology service is secured	3.8	0.8	Agree
Social Influence			
I think my friends and relatives would also use Financial Technology service	3.79	0.8	Agree
I think investors would also use Financial Technology Service	4	0.8	Agree
I think passive income earners would also use Financial Technology Service	3.98	0.8	Agree

I think many businesses in my community would Also use Financial Technology service	3.96	0.8	Agree
Attitude Toward Using FT			
I want to use the serve provided by Financial Technology Service	3.95	0.8	Agree
I do not want to use Financial Technology Service to connect information	3.78	0.8	Agree
I want to use Financial Technology Service to collect my investment	3.95	0.8	Agree
I want to use Financial Technology Service to increase my investment	3.97	0.8	Agree
I want to use Financial Technology Service to upgrade my investment	3.9	0.8	Agree

The growth of digital transformation has particularly led to the rise of financial technology initiatives, which are widely acknowledged as significant innovations in the financial industry. Financial technology is a new financial industry that applies technology to improve financial activities. Moreover, according to (Temitope Oluwafunmike Sanyaolu et al. 2024), financial technology financial technology, or FinTech, refers to innovative ideas that leverage technology to improve financial service processes, tailored to different business situations. Following the global financial crisis of 2008, the emergence of e-finance and mobile technology paved the way for FinTech innovation. This development involved integrating internet technology, social networking services, social media, artificial intelligence, and big data analytics. Traditional financial institutions, including banks, were faced with the challenge of adapting their business models to stay competitive. At the same time, startups saw this as an opportunity to enter the financial services industry. It shows the demographic data of the sampled respondents measuring the variables on the specific objectives of the study that investigate the nature of financial technology services and factors influencing the perceived usefulness, perceived ease of use, service trust, social influence, and attitude toward using financial technology. All the variables of the construct under financial technology are measured on a five-point Likert scale ranging from '1 = Strongly Disagree to '5 = Strongly Agree. It exhibits a strong agreement on the significance of financial technology concerning financial literacy.

Entrepreneurial Competencies

Table 3 describes the respondents' perception of the role and significance of entrepreneurial competencies in capturing the importance of financial literacy toward financial satisfaction. Entrepreneurial competencies play an important role in business continuity, as stated by previous research showing that entrepreneurial competencies significantly influence the business performance of a company (Wahyuni and Sara 2020).

Table 3: Indicators of entrepreneurial competence (n = 477)

Indicators	**Mean**	**SD**	**Verbal Description**
Strategic Competence			
I always monitor progress towards strategic goals.	4.09	0.81	Agree
I prioritize work in alignment with business goals.	4.06	0.73	Agree
I usually assess and link short term, day to day tasks in the context of long-term direction.	3.94	0.83	Agree
I evaluate results against strategic goals.	3.98	0.82	Agree
I align current actions with strategic goals.	3.99	0.84	Agree
Conceptual Competence			
I understand the broader business implications of ideas, issues and observations	3.88	0.83	Agree
I translate ideas, issues, and observations into the business context	3.84	0.86	Agree
I take reasonable job-related risks.	3.86	0.87	Agree
I monitor progress towards objectives in risky actions.	3.97	0.86	Agree
I am well planned in making decisions.	3.99	0.84	Agree

I remain proactive and responsive to changes.	4.06	0.74	Agree
Opportunity Competence			
I sought high quality business opportunities	4.03	0.85	Agree
I appreciate idea generation/envisioning.	4.09	0.77	Agree
I recognize societal and market requirements for business.	4.01	0.83	Agree
I take an idea or concept and make something out of it.	4.01	0.84	Agree
I scan the environment to explore opportunities.	4.02	0.84	Agree
Learning Competence			
I learn as much as I can in my field.	4.16	0.74	Agree
I attend lectures and seminar about business opportunity.	3.83	0.92	Agree
I keep up to date in my field.	3.99	0.83	Agree
I learn proactively.	4.04	0.82	Agree
I apply learned skills and knowledge to actual practice.	4.14	0.76	Agree
Personal Competence			
I maintain a positive attitude.	4.34	0.74	Strongly Agree
I prioritize tasks to manage my time.	4.32	0.74	Strongly Agree
I transform an idea into commercial opportunity.	3.99	0.83	Agree
I recognize and work on my own weaknesses.	4.11	0.74	Agree
Ethical Competence			
I engage in fair, open and honest marketing practices.	4.14	0.84	Agree
I try to be transparent and honest in business dealings.	4.2	0.87	Agree
I strive to be committed in offering financial products and services to all walks of life.	4.01	0.86	Agree
I always keep promises	3.98	0.78	Agree
Familism Competence			
I cultivate an entrepreneurial culture in my family.	3.99	0.82	Agree
I cooperate with and help others (especially with close associates) in business.	4.01	0.83	Agree
I identify and seek help from financial entrepreneur I trust.	3.99	0.80	Agree
I build a foundation for the next generation to continue the business.	3.96	0.81	Agree

(Seraj, Fazal, and Alshebami 2022) said that entrepreneurial competency encompasses a set of capabilities that have the potential to create value at cultural, social, or financial levels, thereby shaping society. Entrepreneurial competency is reflected in a sequence of integrated capabilities, including relevant attitudes, skills, and knowledge required for executing entrepreneurial actions. For the present study, we adopt the meaning of entrepreneurial competency to include opportunities recognition, creativity, leadership, communication, networking, and problem-solving skills, along with digital, financial, and legal know-how to deal with uncertainty, ambiguity, and risks.

Essential work-related competencies are vital skills that foster resilience in the workplace. Over time, developing these competencies—such as strategic, conceptual, learning, and ethical skills—can lead to resilient behavior, which is crucial for enhancing business resilience. Competencies encompass firm-specific knowledge and attitudes that leverage multidimensional resources, promoting sustainable enterprise performance. Personal competency is a key factor in resilience, with research indicating that it significantly predicts resilience and organizational sustainability (Erkmen, Günsel, and Altındağ 2020).

Financial satisfaction

Table 4 show indicators of financial satisfaction among the surveyed population (n = 477), with average ratings ranging from 3.39 to 4.13. Increased cash flow is a significant area of satisfaction, particularly regarding respondents' agreement that their income meets their needs (mean = 3.93) and their ability to pay bills on time (4.06). Satisfaction with long-term healthcare is also high (mean = 3.91), but lower satisfaction with short-term healthcare (mean = 3.45) suggests a gap in financial

security. Financial need is said to be successful if the individual can meet short-term needs for consumption and long-term needs without the slightest deficiency (Shrum, Fumagalli, and Lowrey 2023).

Table 4: Indicators of financial satisfaction (n = 477)

Indicators	Mean	SD	Verbal Description
Increased Cash Flow			
I am satisfied because the amount of my income receive can meet my needs.	3.93	0.83	Agree
I feel satisfied because I can have some valuable assets.	3.91	0.80	Agree
I feel satisfied because I can pay my bills on time every month.	4.06	0.81	Agree
I am satisfied because the amount of saving I currently have can meet my need.	3.87	0.90	Agree
Health Care			
I am satisfied that I have a long-term Healthcare.	3.91	0.92	Agree
I am satisfied that my long-term healthcare includes an investment.	3.86	0.93	Agree
I am satisfied that my healthcare includes pension plan program.	3.82	0.90	Agree
I am satisfied that I have a short-term Healthcare.	3.45	1.10	Agree
Income Replacement			
I am satisfied because I have proper life insurance coverage	3.86	0.9	Agree
I am satisfied because I can pay mu proper life insurance coverage	3.83	0.9	Agree
I am satisfied because I have a money machine through proper income replacement portfolio	3.63	1	Agree
I am satisfied because I can survive without active income when I retire	3.61	1	Agree
Debt Management			
I am satisfied because I can manage my current income and expenditure budget.	3.96	0.8	Agree
I am satisfied because I budget mu monthly expenses.	4.03	0.8	Agree
I am satisfied because I prioritize primary needs.	4.13	0.8	Agree
I am satisfied because I can pay my bills on time.	4.09	0.8	Agree
Emergency Funds			
I could manage for a period of time If I had a loss of income.	3.69	0.9	Agree
I am satisfied because I allocate funds for emergency purposes.	3.84	0.9	Agree
I am satisfied because I allocate part of my income to financial investment.	3.75	0.9	Agree
I am satisfied because I can buy the things I want.	3.73	0.9	Agree
Investment			
I am satisfied that I have investment in stock market.	3.41	1.1	Agree
I am satisfied that I have investment in Mutual Funds.	3.55	1.0	Agree
I satisfied that I have a long-term financial investment.	3.65	1.0	Agree
I am satisfied that I have a short-term financial investment.	3.39	1.0	Neutral

While satisfaction with income replacement is generally positive (mean = 3.86), concerns arise regarding the ability to survive without active income in retirement (mean = 3.61). Debt management shows the highest satisfaction levels, with mean scores reaching up to 4.13 for prioritizing primary needs, indicating effective budgeting (Sisto et al. 2020). Emergency fund satisfaction averages between 3.69 and 3.84, revealing a generally positive outlook but also areas for improvement.

Investment satisfaction is comparatively lower, particularly for stock market investments (mean = 3.41), suggesting hesitancy or a lack of confidence in investment strategies (Lee & Chen, 2024). While respondents express significant financial satisfaction, there are opportunities for improvement. Initiatives focused on financial literacy, affordable healthcare, and emergency fund management could enhance financial security and overall quality of life (Bell et al. 2020).

Structural equation model

Table 5 illustrates the outcomes of the indicator loadings, convergent validity and reliability assessments for several constructs within the framework of Structural Equation Modeling (SEM). SEM serves as a robust statistical method that enables scholars to investigate intricate relationships among variables (including latent constructs) by evaluating multiple interrelated dependencies at once. The analysis encompasses factor loadings, Cronbach's alpha, Composite Reliability (CR) and Average Variance Extracted (AVE) for each construct pertaining to financial literacy, financial technology, entrepreneurial competence and financial satisfaction. However, the implications (of these findings) may vary across different contexts; this is largely because of the diverse nature of the constructs being analyzed. Although the results are promising, further research is necessary to enhance understanding of these relationships. This complexity underscores the need for continued exploration in the field, but it also presents challenges that require careful consideration.

Table 5: Indicator loadings, convergent validity and reliability tests

Constructs	Items	Factors Loadings	Cronbach's α	CR	AVE
Financial Literacy	Financial Attitude	(0.834)	0.836	0.902	0.754
	Financial Behavior	(0.907)			
	Financial Knowledge	(0.861)			
Financial Technology	Perceived usefulness	(0.818)	0.926	0.944	0.773
	Perceived Ease of use	(0.893)			
	Service Trust	(0.907)			
	Social Influence	(0.894)			
	Attitude Towards Using Financial Technology	(0.880)			
Entrepreneurial Competence	Strategic Competence	(0.886)	0.956	0.964	0.791
	Conceptual Competency	(0.896)			
	Opportunity Competency	(0.892)			
	Learning Competency	(0.918)			
	Personal Competency	(0.878)			
	Ethical Competency	(0.869)			
	Familism Competency	(0.887)			
Financial Satisfaction	Increased Cash Flow	(0.838)	0.932	0.947	0.747
	Health Care	(0.869)			
	Income Replacement	(0.901)			
	Debt Management	(0.842)			
	Emergency Funds	(0.907)			
	Investment	(0.827)			

The concept of financial literacy incorporates several essential components: financial attitude, financial behavior and financial knowledge. A notable factor loading of 0.834 for financial attitude reveals a strong correlation with the overall construct. Furthermore, the Cronbach's alpha, calculated at 0.836, signifies a level of internal consistency that is deemed acceptable; however, the construct reliability (CR) is recorded at 0.902, while the average variance extracted (AVE) is noted at 0.754. This indicates that the results not only demonstrate commendable convergent validity but also reliability in the financial literacy construct. Thus, it is suitable for integration into structural equation modeling (SEM) frameworks (Noor, Batool, and Rehman 2022). Although some may question the measurements, it is clear that the robustness of this framework enhances its applicability in financial studies.

Conversely, the financial technology framework examines multiple dimensions, such as perceived usefulness, perceived ease of use, service trust, social influence and attitudes toward employing financial technology. With a factor loading of 0.818 for perceived usefulness, the framework gains further support from a substantial Cronbach's alpha of 0.926, which indicates a robust level of internal consistency. Additionally, the composite reliability (CR) recorded at 0.944, along with the average variance extracted (AVE) at 0.773, confirms that this framework is not only reliable (but also valid). This is significant because these strong psychometric characteristics considerably enhance the SEM analysis, offering more precise insights into the interactions between financial technology and other pertinent constructs (Alkhwaldi et al. 2022). However, one must consider that while these metrics are promising, the complexity of financial technology may present unforeseen challenges.

This construct encompasses a diverse array of competencies: strategic, conceptual, opportunity, learning, personal, ethical and familism. The strategic competence component, for example, demonstrates a factor loading of 0.886. Moreover, the Cronbach's alpha associated with entrepreneurial competence is particularly high—0.956—signifying excellent internal consistency. With a composite reliability (CR) of 0.964 and an average variance extracted (AVE) of 0.791, these findings confirm the reliability and convergent validity of this construct. Consequently, it reinforces its inclusion in structural equation modeling (SEM) frameworks to investigate its effects on financial satisfaction and literacy. However, one might question whether such metrics fully capture the complexities inherent in these competencies. Although the statistical indicators are impressive, the practical implications might require further exploration. This is especially pertinent because understanding the nuances of these competencies can lead to more informed decisions in both academic and professional contexts.

The concept of financial satisfaction, however, encompasses various indicators: increased cash flow, healthcare, income replacement, debt management, emergency funds and investments. The factor loading for increased cash flow is recorded at 0.838, which is complemented by a Cronbach's alpha of 0.932; both metrics illustrate a notable level of internal consistency. Furthermore, the composite reliability (CR) of 0.947 and the average variance extracted (AVE) of 0.747 indicate that financial satisfaction is a reliable construct, boasting impressive convergent validity. This is crucial for structural equation modeling (SEM) analysis, because it permits researchers to accurately depict the relationships between financial satisfaction and other constructs, thus deepening the comprehension of these dynamics. The results show that all constructs possess significant factor loadings, substantial reliability and commendable convergent validity, thereby validating their suitability for SEM analysis. The robust psychometric properties of these constructs (which include financial literacy, financial technology, entrepreneurial competence and financial satisfaction) enhance the ability to model complex interrelationships among them; this adds a rich layer of depth to the analysis. This modeling offers valuable insights into the financial behaviors and decision-making processes exhibited by individuals.

However, Table 6 illustrates the discriminant validity of the constructs according to the Fornell-Larcker criterion; it compares the square root of the Average Variance Extracted (AVE) with inter-construct correlations. The results reveal that for each construct—Financial Literacy (AVE: 0.868), Financial Technology (AVE: 0.879), Entrepreneurial Competence (AVE: 0.890) and Financial Satisfaction (AVE: 0.864)—the square roots of their AVEs surpass their correlations with other constructs. Although this confirms that each construct remains distinct, it also bolsters the reliability

of the Structural Equation Modeling (SEM) framework, which is crucial for understanding these relationships.

Table 6: Discriminant validity using the Forknell-Larcker criterion

Constructs	**1**	2	**3**	**4**
1. Financial Literacy	**0.868**	0.643	0.663	0.562
2. Financial Technology	0.643	**0.879**	0.806	0.660
3. Entrepreneurial Competence	0.663	0.806	**0.890**	0.751
4. Financial Satisfaction	0.562	0.660	0.751	**0.864**

Note: Diagonal values are the squareroot of AVE.

The findings presented herein establish a robust discriminant validity, suggesting that financial literacy, technology, entrepreneurial competence and financial satisfaction are indeed separate constructs. This distinction fortifies the credibility of their interrelationships in Structural Equation Modeling (SEM) analyses.

Table 7 illustrates the discriminant validity of these constructs through the application of the Heterotrait-Monotrait (HTMT) ratio of correlations. The HTMT criterion serves to evaluate whether the constructs are fundamentally different from one another; it does so by confirming that the HTMT ratios remain beneath the advised threshold of 0.85 to 0.90. Furthermore, it also ensures that the values reside within the 90% confidence intervals. However, the interpretation of these results must be approached with caution, because minor variations can influence overall conclusions.

Table 7: Discriminant validity using HTMT ratio of correlations

Constructs	1	2	**3**
2. Financial Technology	0.731 (0.658, 0.804)		
3. Entrepreneurial Competence	0.740 (0.667,0.813)	0.856 (0.782,0.930)	
4. Financial Satisfaction	0.636 (0.564,0.708)	0.710 (0.638,0.783)	0.797 (0.723.0.807)

Note: The HTMT ratios are all significant, that is p <0.05 (one-tailed). The values are within the lower and upper limits of the 90% confidence intervals.

All HTMT values fall within the 90% confidence intervals and are significant ($p < 0.05$), confirming discriminant validity among these constructs. This ensures that Financial Technology, Entrepreneurial Competence, and Financial Satisfaction are statistically distinct constructs, which strengthens the integrity of their use in Structural Equation Modeling (SEM).

Table 8 outlines the model fit and quality indices, which evaluate the performance and robustness of the structural equation model (SEM) using several key metrics. The Average Path Coefficient (APC) is 0.393 with a significance of $p < 0.001$, meeting the criterion of $p < 0.05$, indicating strong relationships between variables. Similarly, the Average R-Squared (ARS) is 0.566, and the Average Adjusted R-Squared (AARS) is 0.564, both significant at $p < 0.001$, reflecting good explanatory power of the model.

Table 8: Model Fit and quality indices

Index Name	**Values**	**Criterion (Kock, 2020)**
Average Path Coefficient (APC)	0.393, P<0.001	P <0.05
Average R-Squared (ARS)	0.566, P<0.001	P <0.05
Average Adjusted R-Squared (AARS)	0.564, P<0.001	P<0.05
Average block VIF (AVIF)	2.386	Acceptable if <= 5, ideally <=3.3
Average Collinearity VIF (AFVIF)	2.841	Acceptable if <= 5, ideally <=3.3
Tenenhaus GOF	0.658	Small >=0.1; median >=0.25; large >=0.36
Sympson's Paradox Ratio (SPR)	1.000	Acceptable if >=0.7, ideally =1
R-Squared contribution Ratio (RSCR)	1.000	Acceptable if >=0.9, ideally = 1

Statistical Suppression Ratio (SSR)	1.000	Acceptable if >=0.7
Nonlinear Bivariate Causality Direction Ratio	1.000	Acceptable if >=0.7

The Average block VIF (AVIF) is 2.386, and the Average Collinearity VIF (AFVIF) is 2.841, both below the acceptable threshold of 5 and close to the ideal value of 3.3, suggesting low multicollinearity. The Tenenhaus GOF value is 0.658, indicating a large effect size, which reflects a well-fitted model. The Sympson's Paradox Ratio (SPR), R-Squared Contribution Ratio (RSCR), and Statistical Suppression Ratio (SSR) are all 1.000, which are ideal values, showing consistency and absence of paradoxical suppression in the model. Lastly, the Nonlinear Bivariate Causality Direction Ratio is also 1.000, confirming that the model captures causal relationships effectively. All indices confirm that the model demonstrates excellent fit, strong predictive accuracy, and reliable causality directions, aligning well with SEM standards.

Table 9 shows the Coefficient of Determination (R^2), Full Collinearity VIF, and Stone-Geisser's Q^2 values for the endogenous constructs. The R^2 values indicate how well the independent variables explain the variance in each construct. Financial Technology has an R^2 of 0.433, Entrepreneurial Competence has 0.683, and Financial Satisfaction shows 0.581, suggesting moderate to strong explanatory power.

Table 9: Coefficient of determination, Full collinearity VIF, Q2

Endogenous Construct	**R^2**	**Full Collinearity VIF**	***Q^2***
Financial Technology	0.433	3.078	0.430
Entrepreneurial Competence	0.683	1.003	0.685
Financial Satisfaction	0.581	2.367	0.585

Note: R^2 – Coefficient of Determination, Q^2 – Stone-Geisser's Value

The Full Collinearity VIF values, which assess multicollinearity among all constructs, are below the threshold of 5, indicating no serious collinearity issues. Financial Technology has a VIF of 3.078, Entrepreneurial Competence shows 1.003, and Financial Satisfaction has 2.367, all acceptable according to SEM guidelines.

The Q^2 values, derived from Stone-Geisser's criterion, measure the predictive relevance of the model. Financial Technology has a Q^2 of 0.430, Entrepreneurial Competence is at 0.685, and Financial Satisfaction is at 0.585. All Q^2 values are positive, indicating good predictive accuracy for the constructs. The R^2, VIF, and Q^2 values confirm that the model is robust, with strong explanatory power, low multicollinearity, and good predictive relevance for all endogenous constructs.

Table 10 presents the results of hypothesis testing for direct and indirect relationships between Financial Literacy (FL), Financial Technology (FT), Entrepreneurial Competence (EC), and Financial Satisfaction (FS). All hypotheses were supported with significant P-values.

Table 10: Results of hypothesis testing

Hypothesis	**Path**	**β**	**P-value**	**f^2**	**Decision**
Direct Relationship					
1	FL → FT	0.658	<.001	0.433 (L)	Supported
2	FL → EC	0.238	<.001	0.159 (M)	Supported
3	FT → EC	0.650	<.001	0.524 (L)	Supported
4	FT → FS	0.112	0.007	0.074 (S)	Supported
5	EC → FS	0.589	<.001	0.443 (L)	Supported
6	FL → FS	0.110	0.008	0.064 (S)	Supported
Indirect Relationship					
7	FT →EC → FS	0.475	<.001	0.315 (M)	Supported
8	FL → EC → FS	0.140	<.001	0.081 (S)	Supported
9	FL → FT → FS	0.074	0.011	0.043 (S)	Supported

10	FL → FT → EC	0.531	<.001	0.352 (L)	Supported
11	FL → FT → EC → FS	0.313	<0.001	0.181 (M)	Supported

Note: FL – Financial Literacy; FT - Financial Technology; EC - Entrepreneurial Competence; FS - Financial Satisfaction.

$f^2 \geq 0.02$ (Small) - S; $f^2 \geq 0.15$ (Medium) - M; $f^2 \geq 0.35$ (Large) –L

For direct relationships, Hypothesis 1 (FL → FT) shows a strong effect with β = 0.658, p < 0.001, and a large effect size (f^2 = 0.433). Similarly, Hypothesis 2 (FL → EC) has a moderate effect (β = 0.238, p < 0.001, f^2 = 0.159), and Hypothesis 3 (FT → EC) displays a strong effect (β = 0.650, p < 0.001, f^2 = 0.524). Hypotheses 4 (FT → FS, β = 0.112, p = 0.007, f^2 = 0.074) and 6 (FL → FS, β = 0.110, p = 0.008, f^2 = 0.064) exhibit small effect sizes, while Hypothesis 5 (EC → FS, β = 0.589, p < 0.001, f^2 = 0.443) shows a large effect.

For indirect relationships, Hypothesis 7 (FT → EC → FS) has a strong mediated effect (β = 0.475, p < 0.001, f^2 = 0.315), while Hypothesis 8 (FL → EC → FS) and 9 (FL → FT → FS) have small but significant effects (β = 0.140, p < 0.001, f^2 = 0.081; β = 0.074, p = 0.011, f^2 = 0.043). Hypothesis 10 (FL → FT → EC) shows a strong mediation (β = 0.531, p < 0.001, f^2 = 0.352), and Hypothesis 11 (FL → FT → EC → FS) has a moderate effect (β = 0.313, p < 0.001, f^2 = 0.181).

The results highlight significant and meaningful relationships between financial literacy, technology, entrepreneurial competence, and financial satisfaction, with varying effect sizes that support the model's overall robustness.

Figure 1 illustrates the relationships between Financial Literacy (FinLit), Financial Technology (FinTech), Entrepreneurial Competence (EntComp), and Financial Satisfaction (FinSat). The paths show standardized beta coefficients (β) and significance levels, indicating the strength of these relationships.

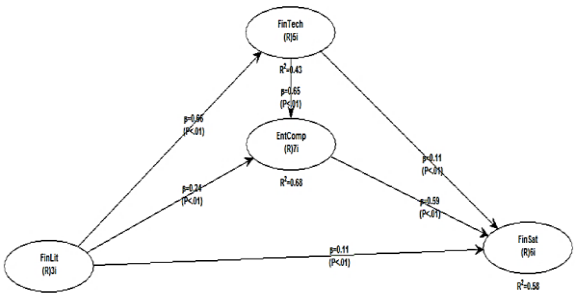

Figure 1: Structural model with beta coefficients

The R^2 values indicate that 43% of FinTech, 68% of EntComp, and 58% of FinSat variance are explained by the model, demonstrating the significant mediating role of EntComp between the constructs.

CONCLUSIONS

This study establishes significant interconnections among financial literacy, financial technology, entrepreneurial competence, and financial satisfaction. Higher financial literacy enhances the perceived usefulness and ease of use of financial technology, which is essential for developing entrepreneurial competence. While the relationship between financial literacy and financial satisfaction is confirmed, it is notably weak, indicating that entrepreneurial competence plays a vital mediating role (BILAL et al. 2021). Entrepreneurial competence mediates the relationship between financial literacy and financial satisfaction, emphasizing that financial literacy primarily enhances financial satisfaction through financial technology adoption and entrepreneurial skills development. Entrepreneurial competence is regarded as a pivotal element for attaining enhanced financial results (Esubalew and Raghurama 2020).

The findings substantiate the theoretical framework by revealing robust correlations among the diverse constructs. Financial literacy exerts a positive impact on the adoption of financial technology, which, in turn, bolsters entrepreneurial competence; this process ultimately culminates in heightened financial satisfaction. This alignment with existing literature not only confirms the framework's validity, but also underscores the importance of financial literacy and technology in fortifying both entrepreneurial competence and financial satisfaction (Hazem and Yanchao 2021). This research offers novel insights by emphasizing the mediating role of entrepreneurial competence, which is crucial for transforming financial literacy into tangible financial satisfaction. Although previous studies have acknowledged the significance of financial literacy and technology, few have scrutinized their interactive effects on financial outcomes (Panos and Wilson 2020). However, this gap in the literature highlights the need for further investigation.

The significance of this study (although it may seem straightforward) lies in its ability to inform educational initiatives and policies pertaining to financial literacy and technology. By clarifying the relationships that connect these factors to entrepreneurial success, the research lays out a framework for developing targeted interventions. Overall, this study enriches the existing body of knowledge (because it offers) empirical evidence that strengthens the integration of financial literacy and technology in fostering entrepreneurship and financial well-being. However, one must recognize that the implications of these findings extend far beyond simple academic interest. This research could, in fact, shape how we approach education in these crucial domains.

RECOMMENDATIONS

Based on this study's findings, it is recommended that educational and policy-making bodies prioritize integrated financial literacy and technology education programs that also focus on developing entrepreneurial competence. Given the strong connection between financial literacy and financial technology in fostering entrepreneurial skills, these programs should emphasize practical knowledge of financial tools, digital platforms, and their applications in business contexts. To enhance financial satisfaction, particularly through entrepreneurship, it is critical to adopt a curriculum that not only teaches financial concepts but also cultivates practical skills for leveraging financial technology.

Policymakers should consider creating accessible digital financial literacy resources and support systems, especially for emerging entrepreneurs. By understanding the crucial role that entrepreneurial competence plays in transforming financial literacy into tangible financial satisfaction, policies that promote skills in entrepreneurship—such as business planning, risk management, and financial decision-making—can make a substantial difference. Additionally, promoting collaborations between financial institutions and educational organizations could facilitate hands-on learning experiences with financial technology, making these resources more user-friendly and applicable to real-world scenarios.

Finally, as this research identifies entrepreneurial competence as a mediating factor, policymakers and educators should assess and address the barriers that inhibit individuals from developing these skills. This could involve the expansion of mentorship programs, access to micro-financing, or incentivizing participation in digital financial training. Ultimately, this holistic approach can enhance financial well-being by fostering an environment where individuals are equipped to leverage financial literacy and technology effectively within entrepreneurial pursuits.

LIMITATIONS

This study has several limitations. Reliance on self-reported data may introduce bias, particularly in subjective measures like financial satisfaction and entrepreneurial competence. Its limited demographic scope also restricts generalizability. Although associations among financial literacy, technology, entrepreneurial competence, and financial satisfaction are established, moderating factors such as socioeconomic status and prior experience remain unexplored. Additionally, minimal use of AI technologies limited the study’s capacity to identify complex patterns and reduce bias in self-reported data. Future research should address these limitations by incorporating diverse samples, exploring additional variables, and responsibly using AI to improve data accuracy and insights into financial outcomes.

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Misa: Conceptualization, drafting manuscript. Himang: Supervision, reviewing, data analysis, final approval, Arnado, A.: Conceptualization, supervision, data interpretation, Tagupa: Reviewing, data analysis, and interpretation, Cubillan: Editing, approval of the final draft of the manuscript, Arnado, M.: Reviewing, supervision, editing.

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