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Digital Marketing, Fintech Literacy, Financial Management, and Income Growth among Student Entrepreneurs



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Article Info	Abstract
Article History Submission: 2026-05-27 Accepted: 2026-10-19 Published: 2026-10-21 Keywords: <i>Digital Marketing; Financial Management; Fintech Literacy; Income Growth; Student Entrepreneurs.</i>	Student entrepreneurship has become increasingly intertwined with digital platforms and technology-enabled financial services, making digital and financial capabilities potentially important for sustaining business income. This study examined the relationships between digital marketing, fintech literacy, financial management, and income growth among student entrepreneurs in Medan, Indonesia. A quantitative approach was employed using questionnaire data collected from 100 student entrepreneurs. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. The results showed that digital marketing was positively and significantly associated with income growth ($\beta = .344, p < .001$), fintech literacy demonstrated a positive and significant relationship with income growth ($\beta = .262, p = .009$), and financial management was also positively and significantly associated with income growth ($\beta = .403, p < .001$). Among the three predictors, financial management showed the largest standardized path coefficient, indicating the strongest relative structural association with income growth. Collectively, digital marketing, fintech literacy, and financial management explained 79.4% of the variance in income growth ($R^2 = .794$). These findings indicate that income growth among student entrepreneurs is associated with complementary digital and financial capabilities, particularly the ability to expand market reach through digital marketing, understand and utilize fintech services, and manage business finances systematically. The study provides context-specific empirical evidence supporting the integrated development of digital marketing, fintech literacy, and financial management capabilities to strengthen the business activities of student entrepreneurs.

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I. INTRODUCTION

Digital transformation has fundamentally reshaped how businesses conduct transactions, market products, interact with customers, and manage their operations. The expansion of marketplaces, social media platforms, digital payment systems, and technology-enabled services has reduced spatial and temporal constraints on economic activities while creating broader opportunities for businesses to reach consumers. This shift is reflected in the expansion of e-commerce in Indonesia. Data from Statistics Indonesia (BPS) indicate that the number of e-commerce businesses increased from 2,995,986 in 2022 to 3,816,750 in 2023, representing growth of approximately 27.40% (BPS, 2025). This substantial increase suggests that digitalization is no longer merely a change in transaction channels but has become an important component of contemporary business strategies and value creation.

The utilization of digital technology also offers opportunities for businesses to improve efficiency and productivity. Firmansyah and Hartono (2023) found that information technology utilization was positively and significantly associated with labor productivity among medium and large enterprises in Indonesia, while Mendrofa et al. (2025) demonstrated that digitalization can improve the operational efficiency of MSMEs, including inventory management and customer service. Nevertheless, the extent to which

businesses utilize technology remains uneven. The availability of digital technologies alone therefore does not necessarily translate into improved business outcomes; the ability of business owners to use these technologies effectively remains important. University students represent a particularly relevant group in this context because of their relatively high familiarity with digital technologies and their increasing participation in entrepreneurial activities.

Student entrepreneurship has emerged as one form of younger generations' participation in the digital economy. Digital technologies enable students to initiate and develop businesses with relatively limited resources because promotion, sales, customer communication, and transactions can increasingly be conducted through digital devices and platforms. This development is also reflected in Indonesia's Student Entrepreneurship Development Program (*Program Pembinaan Mahasiswa Wirausaha [P2MW]*), which has demonstrated increasing student participation in business development and greater integration of digital technology into student entrepreneurial activities (Safitri et al., 2023). These developments indicate that students are not merely consumers of digital technology but are increasingly using it as an instrument for establishing businesses and generating income. However, entrepreneurial success cannot be attributed solely to access to technology. The ability to market products digitally, understand financial

technology, and manage financial resources represents a set of increasingly relevant capabilities for developing student-run businesses.

One capability that has become particularly relevant in this environment is digital marketing. Digital marketing enables entrepreneurs to reach broader consumer segments, communicate product information rapidly, interact with customers, and evaluate marketing activities through measurable digital indicators. Kotler et al. (2017) conceptualize digital marketing not as a complete replacement for conventional marketing but as a complementary approach that supports marketing activities across different stages of the customer journey. For student entrepreneurs, who commonly operate with limited capital and organizational resources, social media, marketplaces, and other digital channels provide relatively cost-efficient opportunities to increase product visibility and market reach. Empirically, Putri and Kusumawati (2025) found a positive and significant relationship between digital marketing and increased MSME income. However, the evidence remains inconclusive, as Putra and Setyowati (2024) reported that digital marketing was not significantly related to increased income. These contrasting findings suggest that the relationship between digital marketing and income growth may vary according to entrepreneurs' characteristics, their ability to utilize digital platforms, and the business context in which digital marketing is implemented.

In addition to digital marketing capabilities, fintech literacy has become increasingly relevant to entrepreneurial activities. The development of financial technology has expanded access to financial services through digital payments, electronic wallets, financing services, and various financial applications that can facilitate business transactions. Feyen et al. (2023) explain that fintech development has the potential to enhance efficiency, financial inclusion, competitiveness, and innovation within the economy. In an entrepreneurial context, fintech literacy extends beyond the ability to operate financial applications; it also encompasses an understanding of the functions, benefits, risks, and appropriate use of digital financial services. Maharani and Nurabiah (2024) found that fintech was positively associated with increased MSME income. In contrast, Amelia (2019) reported only a limited relationship between fintech utilization and income improvement. These differing findings indicate that the availability and adoption of financial technology may not generate equivalent economic benefits for all entrepreneurs. The extent to which entrepreneurs understand and use fintech services appropriately may therefore be particularly important when examining their relationship with business income.

Financial management represents another fundamental capability for business continuity and development. Entrepreneurs need not only to generate sales but also to plan, allocate, control, and evaluate the use of financial resources. Effective financial management can help entrepreneurs understand their financial position, control costs, determine capital requirements, and make decisions based on more systematic financial information. Robison et al. (2021) emphasize the importance of

financial planning and management in supporting business objectives and the efficient use of resources. Empirical findings, however, are not entirely consistent. Laoli et al. (2025) found that financial management was significantly related to increased MSME income, whereas Azizah et al. (2025) reported a comparatively limited relationship between financial management and income. Such differences suggest that the relationship between financial management capabilities and income may vary across entrepreneurial contexts and therefore requires further empirical examination.

Despite growing research on digital marketing, fintech, financial capabilities, and business outcomes, several gaps remain. First, much of the existing evidence has focused on MSME owners in general, whereas student entrepreneurs constitute a distinctive entrepreneurial group because they manage business activities alongside academic responsibilities and may face different constraints in terms of time, capital, experience, and managerial capacity. Second, previous studies have produced inconsistent findings regarding the relationships of digital marketing, fintech utilization or literacy, and financial management with business performance and income. Third, limited evidence has examined these three complementary capabilities simultaneously within a structural model specifically focused on income growth among student entrepreneurs. Examining them together is important because market-oriented digital capabilities, financial technology literacy, and internal financial management may represent distinct mechanisms through which student entrepreneurs support the development of their businesses.

This study addresses these gaps by integrating digital marketing, fintech literacy, and financial management within a single empirical model of income growth among student entrepreneurs in Medan, Indonesia. The three constructs represent distinct but complementary entrepreneurial capabilities. Digital marketing reflects the capability to expand market reach and develop interactions with consumers through digital channels; fintech literacy represents the capability to understand and appropriately utilize technology-enabled financial services; and financial management represents the capability to plan, allocate, control, and evaluate business financial resources. Examining these constructs simultaneously using Partial Least Squares Structural Equation Modeling (PLS-SEM) enables the study to assess their respective structural relationships with income growth and compare their relative path coefficients within the same model. This integrated perspective extends existing evidence by shifting attention from isolated digital or financial factors toward the combination of capabilities potentially relevant to the income development of student-run businesses.

Accordingly, this study aims to examine the relationships of digital marketing, fintech literacy, and financial management with income growth among student entrepreneurs in Medan and to identify the relative contribution of each predictor within the structural model. Academically, the study extends empirical evidence on student entrepreneurship within the context of the digital economy by integrating

market-oriented digital capability, financial technology literacy, and financial management capability in a single analytical framework. Practically, the findings may provide a basis for universities and student entrepreneurs to develop these capabilities in a more integrated manner to support the sustainability and development of student-run businesses.

Based on the conceptual arguments and previous empirical evidence, three hypotheses are proposed:

H1: Digital marketing is positively associated with income growth among student entrepreneurs;

H2: Fintech literacy is positively associated with income growth among student entrepreneurs; and

H3: Financial management is positively associated with income growth among student entrepreneurs. These hypotheses are examined through the structural path coefficients estimated using PLS-SEM.

II. METHOD

This study employed a quantitative explanatory cross-sectional design to examine the relationships of digital marketing, fintech literacy, and financial management with income growth among student entrepreneurs in Medan, Indonesia. Digital marketing, fintech literacy, and financial management were specified as exogenous constructs, while income growth was specified as the endogenous construct. Primary data were collected at a single period of observation; therefore, the structural relationships identified in this study were interpreted as statistical associations rather than definitive causal effects.

The target population comprised university students in Medan who were actively engaged in entrepreneurial activities in 2026. Because the exact number of student entrepreneurs in the target population was unknown, the minimum sample size was determined using the Lemeshow formula for an unknown population. The calculation yielded a minimum requirement of 96 respondents, which was subsequently increased to 100 student entrepreneurs as the final sample. Data collection was conducted from January to March 2026.

Data were collected using a structured closed-ended questionnaire administered online through Google Forms. The questionnaire measured four latent constructs: digital marketing, fintech literacy, financial management, and income growth. Digital marketing was represented by nine indicators, fintech literacy by six indicators, financial management by five indicators, and income growth by eight indicators. The same questionnaire format was administered to all participants to ensure consistency in data collection. Following data collection, all responses were screened for completeness and suitability for analysis. All 100 questionnaires were complete and were therefore retained in the final dataset.

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. PLS-SEM was used to evaluate the measurement properties of the latent constructs and the structural relationships between the three predictor constructs and income growth within an integrated analytical framework. The analysis was conducted sequentially through measurement model evaluation and structural model evaluation.

The measurement model was initially evaluated using the outer loadings of the observed indicators to assess indicator reliability. Outer loading values above .70 were considered satisfactory for retaining indicators in their respective constructs. Construct-level evaluation also considered convergent validity, internal consistency reliability, and discriminant validity as components of measurement quality. The structural model was subsequently evaluated after the measurement model assessment.

Structural model evaluation began with an assessment of collinearity among the predictor constructs using the Variance Inflation Factor (VIF), with values below 5 indicating the absence of critical collinearity problems. The hypothesized relationships were evaluated using standardized path coefficients (β), t -statistics, and p -values obtained through bootstrapping. Statistical significance was determined at the 5% level, with $t > 1.96$ and $p < .05$ used as the criteria for supporting the hypothesized structural relationships.

The performance of the structural model was further evaluated using the coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2_{predict}). The R^2 value was used to determine the proportion of variance in income growth accounted for by digital marketing, fintech literacy, and financial management. The f^2 statistic was used to assess the relative contribution of each predictor to the explanatory power of the model, with values of approximately .02, .15, and .35 interpreted as small, medium, and large effects, respectively. Predictive relevance was evaluated using Q^2_{predict} , with a value greater than zero indicating predictive relevance for the endogenous construct. Together, these procedures enabled the model to be evaluated in terms of measurement quality, structural relationships, explanatory capacity, relative predictor contributions, and predictive relevance.

III. RESULTS AND DISCUSSION

A. Results

Data collection was conducted from January to March 2026 and involved 100 student entrepreneurs in Medan, Indonesia. The questionnaire was administered online using Google Forms to provide respondents with flexibility in completing the research instrument. Following data screening, all 100 questionnaires were found to be complete and suitable for analysis; therefore, the entire dataset was retained for subsequent PLS-SEM analysis using SmartPLS 4.0. The analysis proceeded through evaluation of the measurement model followed by assessment of the structural model, including collinearity, structural path coefficients, explanatory power, effect sizes, and predictive relevance.

1. Measurement Model Evaluation

The measurement model was evaluated to determine whether the observed indicators adequately represented their respective latent constructs. The model comprised four constructs: digital marketing, fintech literacy, financial management, and income growth. Figure 1 presents the estimated outer loadings of the indicators and the structural relationships among the constructs.

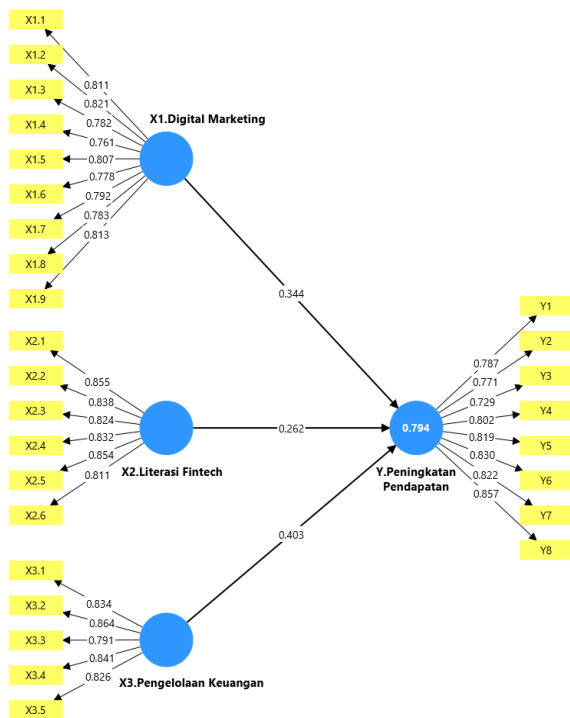


Figure 1. Measurement Model Evaluation

Digital marketing was measured using nine indicators, with outer loadings ranging from .761 to .821. Fintech literacy was represented by six indicators with outer loadings ranging from .811 to .855, while financial management was measured using five indicators with values ranging from .791 to .864. Income growth was represented by eight indicators, with outer loadings ranging from .729 to .857. All indicators therefore had outer loadings above .70, indicating satisfactory indicator reliability and supporting their retention in the measurement model. A complete assessment of construct-level convergent validity, internal consistency reliability, and discriminant validity additionally requires the corresponding Average Variance Extracted (AVE), reliability coefficients, and discriminant validity statistics.

2. Structural Model Evaluation

Following the evaluation of the measurement model, the structural model was assessed to examine the relationships of digital marketing, fintech literacy, and financial management with income growth. The evaluation included collinearity assessment, structural path coefficients and hypothesis testing, explanatory power, effect sizes, and predictive relevance.

a. Collinearity Assessment

Collinearity among the predictor constructs was examined before interpreting the structural path coefficients to determine whether substantial overlap among the predictors could affect the estimation of their relationships with income growth. Inner VIF values below 5 were used as the criterion for the absence of critical collinearity problems. The results are presented in Table 1.

Table 1. Collinearity Assessment

Predictor Construct	VIF
Digital Marketing → Income Growth	2.598
Fintech Literacy → Income Growth	2.798
Financial Management → Income Growth	1.794

As shown in Table 1, digital marketing had a VIF value of 2.598, fintech literacy 2.798, and financial management 1.794. All values were below the threshold of 5, indicating no critical collinearity problems among the predictor constructs. The structural path coefficients could therefore be evaluated without evidence that problematic collinearity substantially affected their estimation.

b. Structural Path Coefficients and Hypothesis Testing

The structural path coefficients were examined to determine the direction and magnitude of the relationships between each predictor construct and income growth. Statistical significance was evaluated using the bootstrapping results based on the *t*-statistics and *p*-values, with $t > 1.96$ and $p < .05$ used as the criteria for supporting the hypothesized relationships. Table 2 presents the structural path estimates and hypothesis-testing results.

Table 2. Structural Path Coefficients and Hypothesis Testing

Structural Path	β	SD	<i>t</i>	<i>p</i>	Decision
Digital Marketing → Income Growth	.344	.058	5.911	< .001	H1 supported
Fintech Literacy → Income Growth	.262	.101	2.605	.009	H2 supported
Financial Management → Income Growth	.403	.102	3.950	< .001	H3 supported

Digital marketing was positively and significantly associated with income growth ($\beta = .344$, $t = 5.911$, $p < .001$), supporting H1. Fintech literacy also demonstrated a positive and significant association with income growth ($\beta = .262$, $t = 2.605$, $p = .009$), supporting H2. Financial management was likewise positively and significantly associated with income growth ($\beta = .403$, $t = 3.950$, $p < .001$), supporting H3. Thus, all three hypothesized structural relationships were supported at the 5% significance level.

Comparison of the standardized path coefficients further showed that financial management had the largest coefficient ($\beta = .403$), followed by digital marketing ($\beta = .344$) and fintech literacy ($\beta = .262$). Accordingly, financial management demonstrated the strongest relative structural association with income growth among the three predictors included in the model.

c. Bootstrapping Results

The bootstrapping model provides a visual representation of the statistical significance of the estimated relationships between the predictor constructs and income growth. Figure 2 displays the significance values obtained for the structural paths and measurement indicators.

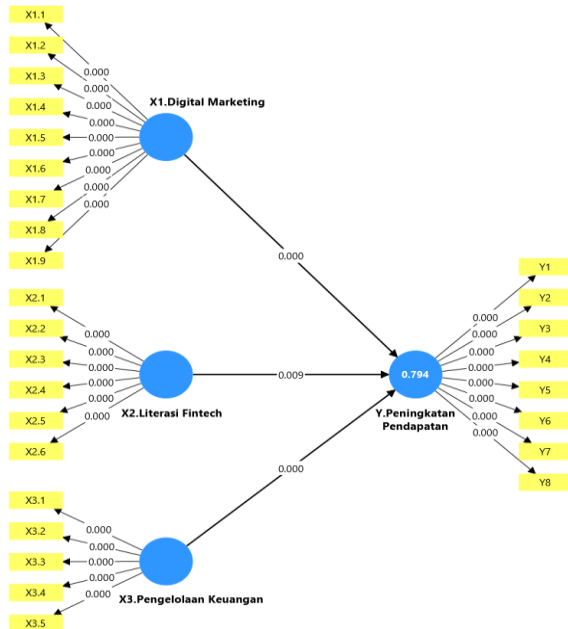


Figure 2. Bootstrapping Results of the Structural Model

As illustrated in Figure 2, the structural path from digital marketing to income growth was statistically significant ($p < .001$), as was the path from financial management to income growth ($p < .001$). The relationship between fintech literacy and income growth was also statistically significant ($p = .009$). These bootstrapping results are consistent with the hypothesis-testing results presented in Table 2 and provide statistical support for H1, H2, and H3.

3. Model Explanatory Power, Effect Sizes, and Predictive Relevance

The structural model was further evaluated beyond the significance of the individual structural paths by examining its explanatory power, the effect size associated with each predictor, and predictive relevance. These measures provide complementary information regarding the extent to which the model explains income growth and the relative contribution of each predictor within the structural model.

a. Explanatory Power

The explanatory power of the model was assessed using the coefficient of determination (R^2) for income growth as the endogenous construct. The coefficient indicates the proportion of variance in income growth accounted for by digital marketing, fintech

literacy, and financial management within the structural model.

Table 3. Coefficient of Determination for Income Growth

Endogenous Construct	R^2
Income Growth	.794

The R^2 value of .794 indicates that digital marketing, fintech literacy, and financial management collectively accounted for 79.4% of the variance in income growth among the student entrepreneurs examined. The remaining 20.6% of the variance was not accounted for by the predictor constructs included in the model. The coefficient therefore demonstrates substantial explanatory capacity for income growth within the analyzed sample but should not be interpreted as evidence that the three predictors causally determine 79.4% of changes in income.

b. Effect Sizes

The relative contribution of each predictor to the explanatory power of the endogenous construct was further evaluated using the f^2 effect size. Values of approximately .02, .15, and .35 were interpreted as small, medium, and large effect sizes, respectively. Table 4 presents the effect size associated with each structural relationship.

Table 4. Effect Sizes of Predictor Constructs on Income Growth

Structural Path	f^2	Interpretation
Digital Marketing → Income Growth	.217	Medium
Fintech Literacy → Income Growth	.117	Small
Financial Management → Income Growth	.440	Large

Financial management had an f^2 value of .440, representing a large effect size, while digital marketing had an f^2 value of .217, representing a medium effect size. Fintech literacy had an f^2 value of .117 and was therefore classified as a small effect. Financial management consequently demonstrated the largest contribution in terms of the change in explained variance represented by f^2 , followed by digital marketing and fintech literacy.

c. Predictive Relevance

Predictive relevance was evaluated for income growth using $Q^2_{predict}$. This assessment complements the explanatory evaluation based on R^2 by indicating whether the model demonstrates predictive relevance for the endogenous construct. A $Q^2_{predict}$ value

greater than zero was used as the criterion for predictive relevance.

Table 5. Predictive Relevance for Income Growth

Endogenous Construct	Q ² predict
Income Growth	.765

The Q²predict value for income growth was .765, which was greater than zero, indicating predictive relevance for the endogenous construct. Considered together with the R² value of .794, the result indicates that the structural model demonstrated both substantial explanatory capacity and predictive relevance for income growth in the analyzed data. However, the positive Q²predict value alone should not be interpreted as evidence of strong out-of-sample predictive accuracy without comparison with appropriate prediction benchmarks.

Overall, the results provide support for all three hypothesized relationships. Digital marketing, fintech literacy, and financial management were each positively and significantly associated with income growth among student entrepreneurs, with financial management demonstrating both the largest standardized path coefficient and the largest effect size. The model also accounted for a substantial proportion of variance in income growth and demonstrated predictive relevance for the endogenous construct.

B. Discussion

1. Digital Marketing and Income Growth among Student Entrepreneurs

The results showed that digital marketing was positively and significantly associated with income growth among student entrepreneurs ($\beta = .344, p < .001$), providing empirical support for H1. This finding indicates that greater utilization of digital marketing was associated with higher levels of income growth among the student entrepreneurs examined. Digital marketing also had the second-largest standardized path coefficient in the structural model, exceeding fintech literacy but remaining below financial management. Thus, digital marketing represents an important market-oriented capability associated with differences in income growth within the student entrepreneurship context.

The positive relationship can be understood through the role of digital marketing in expanding market access and facilitating interactions between entrepreneurs and consumers through social media, marketplaces, and other digital channels. For student entrepreneurs who may operate with limited capital, time, and organizational resources, digital channels provide opportunities to communicate product information, maintain customer interactions, and reach consumers beyond their immediate geographical environment. The value of digital marketing therefore extends beyond the availability of digital platforms themselves and depends on the

entrepreneur's capability to incorporate these platforms effectively into business activities.

From the Resource-Based View (RBV) perspective adopted in this study, the capability to utilize digital technology for marketing activities can be understood as part of an entrepreneur's internal capacity to deploy technological and organizational resources. Digital platforms are widely accessible and therefore do not necessarily constitute a source of advantage by themselves. Their relevance to business outcomes depends on how effectively entrepreneurs use them to create market visibility, establish customer relationships, and support commercial activities. The positive relationship observed in this study therefore suggests that the ability to transform accessible digital resources into marketing capabilities is relevant to income growth among student entrepreneurs.

This interpretation is further supported by the effect-size analysis. Digital marketing had an f^2 value of .217, representing a medium effect. Thus, its relevance within the structural model was evident not only from the statistical significance and magnitude of its path coefficient but also from its contribution to the explanatory power of the endogenous construct. Digital marketing can consequently be regarded as a meaningful component of the capability configuration associated with income growth among the student entrepreneurs examined.

The finding is consistent with Hadi et al. (2025), Putri and Kusumawati (2025), and Taher (2024), who reported positive and significant relationships between digital marketing and income growth. However, it differs from Putra and Setyowati (2024), who did not find a significant relationship between digital marketing and increased income. These contrasting findings indicate that the relevance of digital marketing to business income may not be uniform across entrepreneurial settings. Differences in entrepreneurs' digital capabilities, intensity of platform utilization, target markets, product characteristics, and business contexts may contribute to variation in the outcomes associated with digital marketing.

2. Fintech Literacy and Income Growth among Student Entrepreneurs

Fintech literacy was positively and significantly associated with income growth ($\beta = .262, p = .009$), supporting H2. This result indicates that higher levels of fintech literacy were associated with greater income growth among the student entrepreneurs examined. Although statistically significant, fintech literacy had the smallest standardized path coefficient among the three predictor constructs, suggesting that its relative structural association with income growth was weaker than those of digital marketing and financial management.

Fintech literacy represents more than the ability to access or operate digital financial applications. It reflects an entrepreneur's understanding of the functions, benefits, risks, and appropriate use of technology-enabled financial services. For student entrepreneurs, such knowledge can facilitate the

use of digital payments, electronic wallets, and other financial services that support business transactions. A better understanding of these services may enable entrepreneurs to select and utilize financial technologies more appropriately according to their business needs. Consequently, the positive relationship found in this study suggests that the value of fintech for student entrepreneurship is related not only to technology availability but also to entrepreneurs' capacity to understand and use digital financial services effectively.

From an RBV perspective, fintech literacy can be viewed as a form of knowledge-based human capability that enables entrepreneurs to utilize externally available financial technologies more productively. Digital financial services themselves are accessible to a broad range of users, but entrepreneurs may differ substantially in their ability to understand and incorporate these services into business activities. Fintech literacy therefore represents an internal capability through which technological financial resources can be translated into practical support for transactions and other financial activities.

The effect-size results provide a more nuanced interpretation of this relationship. Fintech literacy had an f^2 value of .117, which was classified as a small effect. Although the structural path was positive and statistically significant, its contribution to the explanatory power of income growth was comparatively smaller than those of digital marketing and financial management. Statistical significance should therefore not be interpreted as indicating an equally strong contribution across all predictors. Instead, the results suggest that fintech literacy is relevant to income growth but occupies a more limited relative position within the integrated structural model.

The finding is consistent with Delis and Lestari (2024), Lailiyah and Anwar (2025), and Maharani and Nurabiah (2024), who reported positive relationships between fintech and increased income. However, it differs from Amelia (2019), who found that fintech did not have a significant relationship with income growth. These differences reinforce the possibility that the economic relevance of fintech varies according to respondents' characteristics, the types of financial technology used, the intensity and purpose of utilization, and the broader business environment. In the context of student entrepreneurship, fintech literacy may therefore be most meaningful when digital financial services are integrated into actual business activities rather than merely adopted as transactional tools.

3. Financial Management and Income Growth among Student Entrepreneurs

Financial management was positively and significantly associated with income growth ($\beta = .403, p < .001$), supporting H3. The coefficient was the largest among the three predictors, indicating that financial management demonstrated the strongest relative structural association with income growth in the model. This finding suggests that the

ability to manage financial resources systematically occupies a particularly important position in explaining differences in income growth among the student entrepreneurs examined.

Financial management encompasses activities such as planning the use of funds, preparing budgets, maintaining financial records, allocating resources, and controlling business expenditures. These capabilities are particularly relevant for student entrepreneurs, who may operate businesses with limited financial resources while simultaneously managing academic responsibilities. Income generation alone does not ensure that financial resources are used effectively. The ability to distinguish business needs from other expenditures, monitor cash movements, control costs, and allocate available funds to productive activities can provide a stronger financial basis for maintaining and developing business operations.

The finding is consistent with the RBV perspective because financial management can be conceptualized as an internal managerial capability through which entrepreneurs organize, allocate, and control the financial resources available to their businesses. The relevance of financial resources depends not only on their availability but also on the capability of entrepreneurs to deploy them effectively. In this sense, systematic financial management may enable student entrepreneurs to transform limited financial resources into more productive business activities by supporting informed allocation and financial decision-making.

The importance of financial management is reinforced by its f^2 value of .440, representing a large effect and the largest among the three predictors. Unlike situations in which standardized path coefficients and effect sizes produce different rankings of predictor importance, both indicators in the present model show the same ordering. Financial management had both the largest standardized path coefficient and the largest f^2 value, followed by digital marketing and fintech literacy. This convergence provides stronger evidence that financial management occupies the most prominent relative position among the three capabilities included in the model, while still avoiding a causal interpretation of the observed relationship.

The finding is consistent with Laoli et al. (2025) and Seran et al. (2024), who reported positive and significant relationships between financial management and increased income. However, it differs from Azizah et al. (2025), who did not identify a significant relationship. Such variation suggests that the relevance of financial management may differ according to entrepreneurs' characteristics, business maturity, financial practices, and the context in which businesses operate. The present findings specifically indicate that financial management is particularly relevant within the context of student entrepreneurs in Medan.

4. Integrated Model of Income Growth among Student Entrepreneurs

Considered simultaneously, digital marketing, fintech literacy, and financial management provide an integrated explanation of income growth among student entrepreneurs. The model accounted for 79.4% of the variance in income growth ($R^2 = .794$), indicating substantial explanatory capacity within the analyzed sample. The remaining 20.6% of the variance was not accounted for by the three predictors included in the model and may reflect other relevant characteristics or conditions not examined in the present study. This unexplained variance should not be attributed to specific factors without empirical testing.

The relative contribution of the three predictors provides additional insight into the configuration of capabilities associated with income growth. Financial management had the largest standardized path coefficient ($\beta = .403$) and the largest effect size ($f^2 = .440$), followed by digital marketing ($\beta = .344$; $f^2 = .217$) and fintech literacy ($\beta = .262$; $f^2 = .117$). This consistent ordering indicates that financial management occupied the strongest relative position in the model, digital marketing made a meaningful secondary contribution, and fintech literacy provided a smaller but statistically significant contribution. The findings therefore suggest that income growth among student entrepreneurs is associated with a combination of internal financial capability, market-oriented digital capability, and financial technology knowledge rather than with a single entrepreneurial capability.

The model also produced a Q^2 predict value of .765 for income growth. Because this value was greater than zero, the model demonstrated predictive relevance for the endogenous construct. Together, the R^2 and Q^2 predict results indicate that the model possesses both substantial explanatory capacity and predictive relevance in the analyzed data. Nevertheless, a positive Q^2 predict value should not by itself be interpreted as evidence of strong out-of-sample predictive accuracy without comparison against appropriate predictive benchmarks.

Viewed through an RBV perspective, the integrated findings highlight the importance of entrepreneurs' capabilities to deploy different resources productively. Digital platforms, financial technologies, and financial resources are increasingly accessible, but access alone does not ensure favorable business outcomes. Student entrepreneurs also require capabilities to transform these resources into business activities: digital marketing supports market reach and customer interaction, fintech literacy supports informed utilization of digital financial services, and financial management supports the allocation and control of financial resources. The simultaneous significance of the three structural paths therefore supports a complementary-capabilities perspective in which digital and financial competencies jointly contribute to explaining differences in income growth.

The findings also have practical implications for entrepreneurship development in higher education. Entrepreneurship programs should move beyond encouraging students merely to establish businesses or adopt digital platforms. Training and mentoring can be designed to integrate digital marketing skills, fintech literacy, and financial management practices, while giving particular attention to systematic financial planning, recording, budgeting, and expenditure control. Digital marketing development can complement these financial capabilities by strengthening market access, whereas fintech literacy can support more informed and efficient use of digital financial services. Such an integrated approach is more consistent with the empirical model than treating digital marketing, fintech, and financial management as separate areas of entrepreneurial development.

These findings should nevertheless be interpreted within the boundaries of the study. The cross-sectional design does not establish temporal ordering or definitive causal relationships among the constructs. The study was also limited to 100 student entrepreneurs in Medan, which constrains the generalizability of the findings to student entrepreneurs in other geographical, institutional, or business contexts. In addition, the model included only three predictor constructs, despite the possibility that income growth may also be associated with other entrepreneurial, market, financial, and individual characteristics. Future research could employ longitudinal designs, examine student entrepreneurs across multiple cities or universities, and incorporate additional constructs that may improve understanding of income development. Further studies could also investigate whether the relationships identified in this study vary according to business age, type of business, entrepreneurial experience, or intensity of digital technology utilization.

IV. CONCLUSION

This study demonstrates that digital marketing, fintech literacy, and financial management are positively and significantly associated with income growth among student entrepreneurs in Medan, Indonesia. Among the three predictors, financial management showed the strongest relative association with income growth and the largest effect size, followed by digital marketing and fintech literacy, highlighting the particularly important role of systematic financial management alongside digital and financial technology capabilities. Collectively, the three predictors accounted for 79.4% of the variance in income growth, while the positive Q^2 predict value further indicated predictive relevance for the endogenous construct. These findings suggest that supporting the development of student entrepreneurship requires an integrated approach that strengthens financial planning and control, effective use of digital marketing channels, and the ability to understand and utilize fintech services appropriately. For higher education institutions, entrepreneurship development programs should therefore extend beyond business initiation by incorporating practical

competencies in financial management, digital marketing, and fintech literacy. Nevertheless, the cross-sectional design limits causal interpretation, and the focus on 100 student entrepreneurs in Medan restricts broader generalization. Future research should employ longitudinal or comparative designs, involve student entrepreneurs from different geographical and institutional settings, and examine additional entrepreneurial, financial, and digital factors that may contribute to explaining income growth.

CONFLICT OF INTEREST

The authors confirm that no financial interests, personal relationships, professional affiliations, or other circumstances existed that could reasonably be perceived as influencing the research or the reporting of its findings.

AUTHOR CONTRIBUTIONS

Andreas Aldo contributed to the formulation of the research problem, development of the study framework, data collection, statistical analysis, interpretation of the findings, and preparation of the original manuscript. **Latersia Br. Gurusinga** contributed to methodological development, evaluation of the analytical procedures, interpretation of the results, and critical revision of the manuscript. **Yusnaini** contributed to research supervision, validation of the study procedures and findings, and substantive review of the manuscript. All authors reviewed the completed manuscript, contributed to its final refinement, and approved the version submitted for publication.

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DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES

Generative AI technology was used during the manuscript preparation process for language refinement, improvement of English expression, and enhancement of textual clarity. The technology was not used to generate or modify the research data, perform the statistical analysis, or independently determine the interpretation of the findings. All AI-assisted text was critically reviewed, revised, and verified by the authors before inclusion in the manuscript. The authors retain full responsibility for the scholarly content, accuracy, originality, and integrity of the final article.

REFERENCES

Amelia, N. U. (2019). Peran Financial Technology dalam Meningkatkan Pendapatan Usaha Mikro Kecil dan Menengah Sektor Fashion di Kabupaten

Pangkep. *Jurnal Ekonomi Dan Manajemen*, 2(1), 1–14.

Azizah, Suriana, & Lubis, P. S. (2025). Pengaruh Modal dan Pengelolaan Keuangan terhadap Pendapatan UMKM di Desa Pematang Guntung Kecamatan Teluk Mengkudu Kabupaten Serdang Bedagai. *Jurnal Pendidikan Tambusai*, 9(3), 31031–31037.

BPS. (2021). *Kota Medan Dalam Angka 2021* (B. K. Medan (ed.)). BPS Kota Medan. <https://medankota.bps.go.id/id/publication/2021/02/26/695922e9701d335f2207cf74/kota-medan-dalam-angka-2021.html?>

BPS. (2025). Statistik E-Commerce 2023. In dan P. Direktorat Statistik Keuangan, Teknologi Informasi (Ed.), *Badan Pusat Statistik* (Volume 6). Badan Pusat Statistik. <https://www.bps.go.id/id/publication/2025/01/30/d52af11843aee401403ecfa6/statistik-e-commerce-2023.html>

Delis, & Lestari, E. (2024). Pengaruh Penggunaan Financial Technology Dan Media Sosial Terhadap Peningkatan Pendapatan UMKM di Kota Batam. *Economics and Digital Business Review*, 5(1), 373–384.

Feyen, E., Natarajan, H., & Saal, M. (2023). Fintech and the Future of Finance: Market and Policy Implications. In *Fintech and the Future of Finance: Market and Policy Implications*. <https://doi.org/10.1596/978-1-4648-1914-8>

Hadi, I., Tobing, Y. A. T. L., Hartanto, B., & Mardayanti, I. (2025). Peran Digital Marketing dan Modal Usaha dalam Meningkatkan Pendapatan: Studi Empiris pada UMKM di Desa Bandar Tengah Kecamatan Bandar Khalifah. 5(2), 567–583.

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R* (3rd Editio). Springer.

Hidayat, F. (2025). *Metodologi Penelitian Administrasi Manajemen & Akuntansi* (S. A. Parinduri (ed.); 1st ed.). Sekolah Tinggi Manajemen Bisnis Multi Sarana Manajemen Administrasi dan Rekayasa Teknologi.

Kotler, P., Hermawan Kertajaya, & Iwan Setiawan. (2017). *Marketing 4.0 Traditional to Digital*. https://books.google.co.id/books?id=jN9mDQAAQBAJ&printsec=frontcover&hl=id&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

Laoli, H. O., Hulu, P. F., Buulolo, N. A., & Gulo, H. (2025). Pengaruh Perilaku Pengelolaan Keuangan terhadap Pendapatan pada Pelaku UMKM di Kecamatan Hiliduho. *Journal of Artificial Intelligence and Digital Business (RIGGS)*, 4(3), 3326–3342.

Maharani, A., & Nurabiah. (2024). Pengaruh E-

- Commerce, Sosial Media, dan Financial Technology Terhadap Peningkatan Pendapatan Usaha Mikro Kecil Menengah (UMKM) di Sumbawa Besar. *Jurnal Bisnis Net*, 7(766–781).
- Marr, B. P. I. T. 75 M. E. M. N. to K. (2012). *Key Performance Indicators: The 75 Measures Every Manager Needs to Know*. Pearson.
- Putra, A. F., & Setyowati, E. (2024). *Analisis Pengaruh Digital Marketing terhadap Pendapatan UMKM di Kota Boyolali*. 7, 10566–10576.
- Putri, M. R., & Kusumawati, E. (2025). *Increasing UMKM Income: Working Capital, Digital Marketing, Education Level, Product Quality, And Production Costs Peningkatan*. 6(3), 2974–2986.
- Robison, L. J., Hanson, S. D., & Black, J. R. (2021). *Financial Management for Small Businesses Financial Statements & Present Value Models Second Open Edition*.
- Safitri, N., Andarwati, S., Wiwin, J., Dewobroto, W. S., Ramadhan, A. N., Huda, A., Wiguna, A. T., Rahman, F., Arfiah, F., Nasrullah, H., Indra, H. S., Fariha, H. I., Wahyuni, S., Setiawan, R. W., Noor, M. G., & Nurasa, S. (2023). *Mahasiswa Wirausaha Indonesia: Trajektori 2019-2022* (A. M. Salsabila (ed.)). Ditjen Diktiristek - Kemendikbudristek.