Digital Financial Literacy, Entrepreneurial Competencies and Local Government Initiatives: Keys to SMEs' Sustainability

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Abstract

This study examines the sustainability of Small and Medium-Sized Enterprises (SMEs') in the Special Region of Yogyakarta, Indonesia, by assessing the combined effects of local government initiatives, digital financial literacy, and entrepreneurial competencies. The objective is to determine how these factors enhance long-term business viability in an increasingly digital economy. A mixed-method design was employed. In the qualitative phase, observations and in-depth interviews with officials from the Department of Industry and Trade explored the policy environment and SMEs'' challenges, and themes from this stage were used to refine the survey instrument. In the quantitative phase, a structured survey of 338 SME owners measured digital financial literacy, entrepreneurial competencies, and sustainability practices. Data were analyzed using partial least squares structural equation modeling, including reliability and validity assessment, model fit evaluation, and bootstrapped hypothesis testing. Results show that both digital financial literacy ($\beta = 0.546$) and entrepreneurial competencies ($\beta = 0.367$) significantly influence SME sustainability, jointly explaining over 70% of the variance. The region's policy environment—through initiatives such as incubation programs, Jogja Mark, the Sibakul Jogja platform, QR code payment adoption, and training—plays an enabling role in this relationship. The findings emphasize that digital financial literacy has the stronger effect, highlighting the importance of secure payment use, budgeting, and record-keeping for resilience and growth. The study contributes by integrating local policy, digital literacy, and entrepreneurial competency into a single empirical model, offering novel evidence on how these dimensions interact to support SME sustainability. The results provide actionable guidance for policymakers to strengthen digital financial capacity and tailor competency programs to sectoral needs.

Keywords: Digital Financial Literacy, Entrepreneurial Competencies, Sustainability, SMEs', Yogyakarta

1. Introduction

Business sustainability refers to the ability of firms to achieve long-term viability by balancing economic, social, and environmental objectives. The concept gained prominence in the 1970s amid growing concerns over environmental degradation, and was formally articulated in the Brundtland Report [1], which defined sustainable development as "meeting the needs of the present without compromising the ability of future generations to meet their own needs. Concerns regarding sustainable development have transformed the corporate landscape and have become critical factors influencing business success [2], [3], [4]. The United Nations General Assembly (UNGA) adopted the 2030 Agenda in 2015, which comprises 17 Sustainable Development Goals, with the objectives of reducing poverty, securing the planet, and ensuring prosperity for all [3]. In the SME context, sustainability goes beyond short-term profit or operational continuity; it requires strategic management of resources, stakeholder engagement, and adaptability to external pressures such as digitalization and regulatory change. Supporting and sustaining business activities, particularly small and medium enterprises (SMEs'), is a crucial approach to ensuring prosperity. Entrepreneurs serve as significant catalysts for economic growth by generating new employment opportunities, fostering innovation, and enhancing competition and competitiveness [5], [6].

SMEs' have the potential to serve as a fundamental component of a nation's economy, employing a significant portion of the workforce and enhancing community empowerment. SME sustainability involves more than short-term profits;

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it requires maintaining operations while considering social and environmental impacts. However, ensuring business sustainability is not a simple task. The performance of a business is determined by its internal resources in relation to the external environment, therefore establishing a competitive advantage [7].

SMEs' are business activities initiated independently by the community. They are essential for local economic development, significantly contributing to job creation, poverty alleviation, and economic growth; however, they face numerous funding challenges [5], [8]. Several factors have been identified as obstacles to the implementation of sustainability management, including insufficient awareness of environmental and social impacts and a lack of resources to support implementation [9]. In addition to being a focal point in sustainability development strategies, SMEs' in developing countries face numerous challenges that hinder their sustainability. Nonetheless, the sustainability challenges faced by most SMEs' primarily result from structural adjustment policies rather than their inherent designs [10]. Previous research shows that there are several factors that influence the sustainability of SMEs', including government policies [11], [12], innovation [13], digital transformation [14], financial literacy [14], [15], entrepreneurial competencies [10], [13], etc. Policies issued by the government are not only related to funding, but also the provision of facilities, assistance in business development, and holding training to improve entrepreneurial skills and competencies.

Digital advancements influence many areas of life. A significant transformation has taken place within the financial system. Contemporary transactions for buying and selling have transitioned from cash to digital financial applications. This undoubtedly influences business management. Furthermore, there are benefits including transparent management and the ability for transactions to transcend regional boundaries. This digital payment system offers benefits for micro, small, and medium enterprises [15]. Beyond transactions, digital finance is also achieved through financial reporting applications. While some small-scale entrepreneurs may perceive financial reporting applications as difficult, they offer numerous advantages. Increasing digital financial literacy will help entrepreneurs adapt to technology.

Entrepreneurs must acquire abilities and competences to facilitate business management alongside adjusting to digital finance. The competency-based approach believes that when SMEs' possess a comprehensive array of competencies, they are more likely to take advantage of current resources, identify market demands, and discern new opportunities from economic, social, and environmental aspects [10]. Entrepreneurial competencies are regarded as the primary predictor of sustainable performance and growth in SMEs' [13], [16], [17]. Even in times of crisis SMEs' must adapt their leadership competencies to secure their survival and the sustainability of local communities [18]. Therefore, having competence in the field of entrepreneurship is important in supporting business success.

Micro, Small, and Medium Enterprises (MSMEs') are a critical driver of Indonesia's economy, contributing more than 60% of GDP and employing over 97% of the workforce [19]. Yogyakarta Special Region (DIY) is home to a vibrant MSME sector, with over 340,000 registered businesses across food & beverage, fashion, and creative industries. Provincial programs such as Sibakul Jogja provide digital marketplace access, free shipping and business development support [20]. The research concentrates on Yogyakarta, the sole region designated as a special region in Indonesia. The Special Region of Yogyakarta is governed by a royal family, possesses a substantial population, is culturally prosperous and become one of the favorite tourist destinations. SMEs' are the mainstay of the economy of Yogyakarta residents. Over 340,000 SMEs' are officially recognized in Yogyakarta, indicating a significant reliance on small and medium enterprises for livelihoods [21]. Hence, ensuring the sustainability of SMEs' should be a significant priority for the government. While prior studies have linked financial literacy to performance and others have modeled digital adoption in SMEs' few studies jointly examine digital financial literacy and competencies as drivers of sustainability performance using a predictive modeling approach. However, this research introduces a novelty by advancing it to digital financial literacy in response to technological advancements in the financial technology. This study aims to analyze how the development of Yogyakarta SMEs' is related to digital finance, what programs are provided by the government to support the sustainability of SMEs', and determine the impact of digital financial literacy and entrepreneurial competence on the sustainability of SMEs'. The novelty lies not in the concept of digital financial literacy itself but in contextualizing it to local SMEs' digital ecosystems, integrating competency-based theory into a joint structural model, and quantifying predictive relevance to support actionable policy.

2. Literature

2.1. Digital Financial Literacy and Business Sustainability

A comprehensive awareness of financial literacy enables entrepreneurs to comprehend finance, hence facilitating informed decision-making [15]. Financial literacy encompasses the comprehension, administration, and decision-making pertaining to financial matters, including savings, investments, loans, and budgetary management. Nonetheless, with the advancement of technology, proficiency in financial literacy has grown in digital finance. Digitalization in finance refers to the integration of digital technology to enhance efficiency, precision, and accessibility in financial administration and transactions. It encompasses the transition from manual systems to more integrated, secure, and user-friendly digital systems. Digital Financial Literacy (DFL) is anticipated to become a crucial component of education in the digital age, as individuals must enhance their knowledge of finances properly employ financial technology products and services, hence mitigating costly expenditures [22]. DFL educational practices must be carefully customized for particular populations to facilitate more equal economic development [23], [24]. state that prioritizing digital technologies, improving staff digital competencies, and conducting digital transformation plans are essential for increasing SMEs' performance and maintaining sustainable development. Digitalization significantly strengthens the relationship between dynamic capabilities and SMEs' performance, while only moderately influencing the connection between transforming capability and SMEs' performance [25], [26].

Business sustainability defines an approach that guarantees operational continuity and long-term growth by evaluating economic, social, and environmental implications. Digitalization is essential for attaining corporate sustainability by effectively addressing the core pillars of the circular economy and sustainable development [27]. Digitalization presents numerous potential impacts for SMEs', including enhanced productivity, improved product quality and process efficiency, superior decision-making, increased flexibility, reduced time-to-market, innovation in business models, a transformed role for consumers, and, importantly, environmental sustainability [28], [29]. An entrepreneur must possess digital financial literacy to effectively adapt and implement digital finance within their organization. Adapting to advances in financial technology will have a positive impact on business performance [24], [26], [30] and support business sustainability [14], [15].

2.2. Entrepreneurial Competencies and Business Sustainability

Competency pertains to the quality of actions executed by entrepreneurs, so it directly influences short-term venture outcomes, including monthly or annual sales, cash flow, receivables, quality, and timeliness [31]. The abilities required for an entrepreneur encompass various domains, including technical, managerial, and personal skills, which are barriers and capitalizing on opportunities in the business landscape. Previous research found that entrepreneurial competencies significantly affect the success of business performance in the creative industry [32], [33], [34]. According to competency-based theory, SMEs' possessing a comprehensive set of abilities are more capable of making the most of their resources, identifying market demands, and seeing new possibilities, this idea encourages learning by doing, which is the basis for the internal growth and sustainability of the company [10]. The sustainability of SMEs' depends on innovation, which is positively and significantly impacted by entrepreneurial competencies. Research has indicated that proprietors possessing robust proficiencies are inclined to engage in innovation, resulting in the creation of novel products and continuous enhancement of manufacturing and promotional procedures [10], [13], [35]. Acquiring various entrepreneurial abilities will facilitate the establishment of a sustainable business with effective methods. Personal attributes including interpersonal orientation, conceptual thinking, commitment, opportunity awareness, strategic knowledge, and organizational skills are important competencies linked to successful work performance [36]. Achieving effective sustainable performance is essential for companies aiming to attain a comprehensive integration of environmental, economic, and social objectives [13], [37], [38]. Drawing on competency-based theory, we conceptualize entrepreneurial competencies as bundles of knowledge, skills, and abilities that directly enhance SMEs' sustainability by enabling owners to recognize opportunities, make strategic decisions, and implement innovative practices.

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3. Method

Before you begin to format your paper, first write and save the content as a separate text file. Keep your text and graphic files separate until after the text has been formatted and styled. Do not use hard tabs, and limit use of hard returns to only one return at the end of a paragraph. Do not add any kind of pagination anywhere in the paper. Do not number text heads-the template will do that for you.

Finally, complete content and organizational editing before formatting. Please take note of the following items when proofreading spelling and grammar:

3.1. Research Framework

The research's conceptual framework is shown in figure 1. While digitalization is widely credited with enhancing SMEs'' competitiveness, several studies highlight its limitations. Barriers include unequal digital access, cybersecurity risks, and the costs of adopting new technologies, which can exacerbate inequalities among SMEs' [28], [29]. Similarly, although financial literacy is associated with improved performance, some studies find that its effects are contingent on complementary factors such as access to credit or managerial capabilities [39]. This suggests that digital financial literacy may not automatically translate into sustainability gains unless combined with supportive ecosystems and entrepreneurial competencies. These debates underscore the importance of examining how competencies and digital financial skills interact within specific local contexts—an area this study addresses in the case of Yogyakarta SMEs'. Drawing on competency-based theory, SMEs'' performance and sustainability are determined not only by their access to resources but by the skills and abilities to deploy them effectively [40]. Digital financial literacy equips entrepreneurs with the knowledge and practices to manage transactions, budgeting, and risk in increasingly digital markets, thereby fostering resilience and sustainable growth. Similarly, entrepreneurial competencies—such as opportunity recognition, strategic decision-making, and innovation—enable SMEs' to adapt to environmental, economic, and social demands, ensuring continuity and long-term viability. Accordingly, the study hypothesizes:

H1: Digital Financial Literacy has a positive impact on the Sustainability of SMEs'

H2: Entrepreneurial competencies have a positive impact on the Sustainability of SMEs'

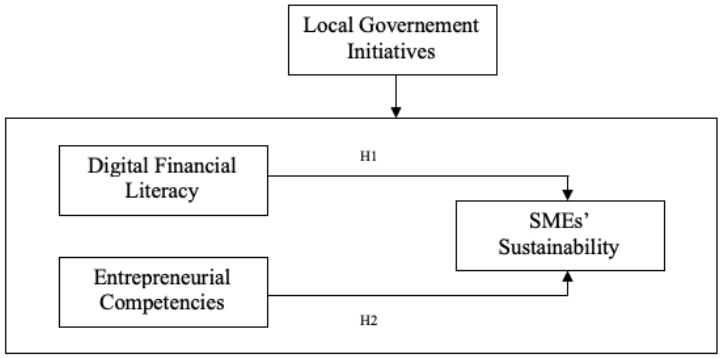

Figure 1. Research Framework

3.2. Research Location and Data Collection

The research location was conducted on Special Region of Yogyakarta Indonesia. The data gathered in this study are categorized as primary data and secondary data. Primary data is collected through observations, in-depth interviews, and questionnaires, while secondary data is acquired from documents that enhance the comprehensiveness of the study data. The researcher initially performed observations and in-depth interviews with representatives from the Department of Industry and Trade of the Special Region of Yogyakarta. The researcher investigated diverse information regarding Yogyakarta SMEs', including the type of businesses, the number of registered SMEs', government initiatives designed to encourage SMEs' advancement, and the level of digital technology utilization among SMEs'. At this stage, the researcher gathered documents that substantiate the validity of the data and information. The qualitative findings were not integrated into the SEM model but were used to refine survey items for contextual relevance, and interpret

quantitative results within the local policy and cultural setting. This triangulation strengthens methodological rigor by providing explanatory depth alongside statistical evidence. The subsequent phase involves disseminating online questionnaires to SMEs' to quantitatively assess digital financial literacy, entrepreneurial competency, and business sustainability. The data collected is further analyzed utilizing a Structural Equation Model - Partial Least Squares (SEM-PLS)- through the SmartPLS program.

The in-depth interviews with officials from the Department of Industry and Trade were conducted between September to October 2024. The online questionnaire survey was fielded from November 2024 to January 2025. These data collection activities occurred after the implementation of the QRIS (QR Code Indonesian Standard) in 2020 and the expansion of the Sibakul Jogja e-commerce platform in 2021, both of which significantly shaped the digital landscape for SMEs' in Yogyakarta. Situating the data collection within this timeframe is important, as SMEs' adoption of digital finance and e-commerce may have been influenced by these contemporaneous policy rollouts.

3.3. Sampling and Recruitment

The population frame comprised registered SMEs' in the Special Region of Yogyakarta. Questionnaires were distributed through SMEs' associations, government-provided lists, and online platforms. The inclusion criteria required respondents to be registered SMEs', operating for at least one year, and actively engaged in business activities. SMEs' that were unregistered or provided incomplete responses were excluded. A total of 380 SMEs' were invited to participate, with 338 complete responses obtained. To mitigate self-selection bias, multiple reminders were sent, participation was voluntary and anonymous, and respondents were assured that the data would be used strictly for academic purposes.

3.4. Questionnaire Development and Instruments

The questionnaire instrument was prepared by referring to previous research and expert opinions. Details of the instrument are presented in table 1. The questionnaire consists of two sections: demographic profile of respondents and items on digital financial literacy, entrepreneurial competence and business sustainability. Digital financial literacy has been formulated as a multi-dimensional construct with 13 measurement items across four indicators [23], [39], [41]. Entrepreneurial competencies consist of 8 items categorized under 3 indicators [17], [40], [42], whereas SMEs' sustainability comprises 11 items based on 3 indicators [43], [44]. The full wording of the measurement items is provided in Appendix A. All constructs were measured using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). A pilot test with 30 SMEs' respondents was conducted to refine clarity and ensure face validity, yielding acceptable reliability (Cronbach's $\alpha > 0.70$). Initially, 13 items were designed to measure Digital Financial Literacy (DFL), 8 items for entrepreneurial competence (COMP), and 11 items for SMEs' sustainability (SUST). During the evaluation of the measurement model, items exhibiting factor loadings inferior to 0.70 or exhibiting problematic cross-loadings were eliminated. Specifically, 4 DFL items, 2 COMP items and 6 SUST items were removed. Although item removal reduced the number of indicators, construct coverage was preserved, as the retained items sufficiently captured the conceptual domains. This procedure aligns with best practices in PLS-SEM [45]. Appendix A summarizes the retention flow.

Table 1. Instrument of questionnaire

Variables	Indicators	Source
Digital Financial Literacy (DFL)	Knowledge about digital finance Utilization of technology in finance Trust and security in digital finance Skill and challenges in digital finance	[23], [39], [41]
Entrepreneurial Competencies (COMP)	Managerial competency Marketing competency Operational competency	[17], [40], [42],
Sustainability Business (SUST)	Economy Social Environment	[43], [44]

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3.5. Demographic Respondents

A resume of demographic respondents is served in table 2. Total data collected is 338 SMEs'. The demographic data of SMEs' respondents shows that the majority are female (61%) compared to male (39%). Most respondents are aged 21–40 years old (54%), followed by those over 40 years old (41%), and under 20 years old (5%). In terms of educational background, the largest groups are those with a bachelor's degree (44%) and high school education (41%), while a smaller percentage have junior high school (4%), elementary school (1%), or other types of education (10%). In terms of business type, the majority of respondents operate in the services sector (13%), whereas a smaller proportion operates in the accessory sector (7%). This indicates that SMEs' are predominantly driven by well-educated individuals in their productive age, with a notable focus on the service industry.

Table 2. Demographic Respondents

Category	Subcategory	Frequency	Percentage
Gender	Male	132	39%
	Female	206	61%
Age	Under 20 years old	17	5%
	21 - 40 years old	183	54%
	Over 40 years old	138	41%
Education	Elementary school	3	1%
	Junior high school	14	4%
	High school	139	41%
	Bachelor degree	148	44%
	Others	34	10%
Type of Business	Accessories	25	7%
	Services	43	13%
	Handcraft	53	16%
	Foods and Beverages	145	43%
	Fashion	72	21%
Annual Turnover	< USD 3,000	128	38%
	USD 3,000 - 6,000	101	30%
	USD 6,000 - 12,000	72	21%
	> USD 12,000	37	11%

4. Results and Discussion

4.1. SMEs' Special Region of Yogyakarta Profile Description

Information regarding SMEs' in Yogyakarta was obtained effectively through in-depth interviews with representatives from the Department of Industry and Trade of the Special Region of Yogyakarta. The Special Region of Yogyakarta is one of the largest provinces in the Republic of Indonesia and is a famous tourist destination. Yogyakarta, as a special region, is the only area that receives a special grant from the Government of the Republic of Indonesia. Then the local government of Yogyakarta allocated some amount of the special grant to encourage the growth of SMEs'. The allocation of funds for the development of SMEs' is implemented through various activities such as mentoring, training, providing e-commerce platforms, free shipping subsidies for online buying and selling, and the provision of tools or production machines that can be borrowed by SME centers. The government supports incubation programs SMEs'. These initiatives encompass technical consults, branding, marketing, promotion, and packaging assistance. The objective is to prepare items for market readiness. The incubation programs are financed by the regional budget and aim to support SMEs' with consultants until they are prepared to reach the market. SMEs' in Yogyakarta are now accustomed to cashless transactions, using digital finance such as QRIS (QR Code Indonesian Standard), mobile banking, and e-wallets, both for online shopping and in-store shopping. Another program to facilitate digitalization, the Yogyakarta government established an e-commerce platform named Sibakul Jogja to enable online transactions for

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SMEs'. The government also provides free shipping subsidies throughout Indonesia for transactions at Sibakul Jogja. A label called Jogjamark was created by the government with the aim of validating the authenticity of goods originating from Yogyakarta as well as being a distinctive feature. This brand also will facilitate SMEs' in accessing other facilities provided by the local government. Of the 338 SMEs' surveyed, around 71 percent have conducted transactions at Sibakul Jogja, while the remainder have not, as they offer food that is prepared on-site or in restaurants. Based on the survey, it was also discovered that 97% of SME respondents had received skills training related to entrepreneurship.

4.2. Measurement Model

The measuring model was evaluated by various assessments. The first step is internal reliability consistency, the second step is convergent validity, and the third step is discriminant validity. The first step to assess the reliability of the item is through outer loading. The outer loading value must be 0.7 or above for the item to be declared reliable [45]. After testing, there were several items that scored below 0.7 so they had to be dropped from the research data. The final reliable item data is presented in table 3. The second step is to conduct a convergent validity assessment which is measured through the composite reliability and Average Variance Extracted (AVE) values. The composite reliability value must be above 0.7 and the AVE value must be above 0.5 [45]. Table 3 presents the composite reliability and AVE values that have met the required scores. Instead of reiterating general criteria for reliability and validity, the measurement model results can be presented with a sharper focus on construct-specific performance. For example, the digital financial literacy construct retained eight items with loadings between 0.709 and 0.766, indicating strong and balanced representation of the construct dimensions. Entrepreneurial competencies retained four items with loadings between 0.701 and 0.761, suggesting robustness despite item reduction. For sustainability, five items achieved loadings above 0.75, capturing social and economic aspects strongly but less comprehensively covering environmental aspects after removal of certain items. It should be acknowledged that dropping certain sustainability items—such as those related to energy use and government support—may narrow the construct's coverage. While statistical thresholds justified their removal, these items represent important dimensions of environmental and institutional sustainability. Their exclusion suggests that the operationalization of sustainability in this study leans more heavily toward economic and social indicators. This limitation underscores the need for future studies to refine measurement instruments that can reliably capture a broader spectrum of sustainability practices among SMEs'.

The third step is assessment of discriminant validity. Discriminant validity is a test in statistical analysis that is used to ensure that a construct in research is truly different from other constructs that should not be highly correlated [45]. Discriminant validity is measured by cross loading and HTMT values below 0.9. Discriminant validity was assessed using the Heterotrait–Monotrait Ratio (HTMT). Table 4 illustrates that each construct in the measurement model is genuinely unique and has a low correlation with other constructs with all HTMT values were below the recommended 0.90 threshold: DFL–COMP = 0.825, COMP–SUST = 0.890, DFL–SUST = 0.892. Bias-corrected bootstrapped 95% confidence intervals did not include 1.0 (CI < 1.0) respectively), confirming discriminant validity [46].

Table 3. Construct Validity and Reliability

Variables	Items	Outer Loading	Cronbach's α	CR	AVE
Digital Financial Literacy	DFL 1	0.751	0.892	0.913	0.537
	DFL 2	0.720			
	DFL 4	0.705			
	DFL 5	0.766			
	DFL 7	0.736			
	DFL 8	0.709			
	DFL 9	0.738			
	DFL 12	0.739			

Variables	Items	Outer Loading	Cronbach's α	CR	AVE
	DFL 13	0.730			
Entrepreneurial Competencies	COMP 1	0.761	0.786	0.853	0.538
	COMP 4	0.759			
	COMP 5	0.718			
	COMP 6	0.701			
	COMP 8	0.727			
Sustainability	SUST 2	0.784	0.885	0.916	0.686
	SUST 3	0.759			
	SUST 5	0.873			
	SUST 6	0.852			
	SUST 7	0.867			

Notes: All loadings ≥ 0.70; CR ≥ 0.70; AVE ≥ 0.50.

Table 4. Discriminant Validity by HTMT Ratio

Construct Pair	HTMT	95% CI (Bias-Corrected)
DFL – COMP	0.825	[0.703, 0.902]
COMP – SUST	0.890	[0.819, 0.945]
DFL – SUST	0.892	[0.798, 0.943]

Table 5 explains the predictive power of the model. The model explains 71% of the variance in SMEs'' sustainability ($R^2 = 0.711$), which indicates substantial explanatory power in behavioral and management research. The effect size for digital financial literacy ($f^2 = 0.532$) is considered large, suggesting that improvements in entrepreneurs' digital financial skills translate into meaningful advances in sustainability outcomes. Entrepreneurial competencies also show a medium effect size ($f^2 = 0.240$), underscoring their importance while indicating that digital financial literacy exerts the stronger influence. These results illustrate the practical importance of investing in digital financial training alongside competency development programs. Overall model fit (PLS-based) is acceptable with SRMR = 0.061, below the conventional 0.08 guideline [45].

Table 5. Predictive Relevance

Construct	R^2	R^2 adj.	f^2		Q^2
			COMP → SUST	(DFL → SUST)	
SUST	0.711	0.709	0.240 (medium)	0.532 (large)	0.480

4.3. Hypothesis Testing

The research hypotheses and analysis results revealed in table 6. Using the bootstrapping method, the structural model was evaluated to examine the relationship between the constructs [13]. As per data shown in table 6, both digital financial literacy and entrepreneurial competencies have positive effect on sustainability of SMEs'. DFL → SUST has a positive and significant effect ($\beta = 0.546$, $t = 8.934$, $p < 0.001$, 95% CI [0.435, 0.633]), as does COMP → SUST ($\beta = 0.367$, $t = 7.843$, $p < 0.001$, 95% CI [0.291, 0.444]). All path coefficients are standardized estimates obtained using the PLS path weighting scheme. Bootstrapping was performed with 5,000 subsamples and one-tailed significance testing at $\alpha = 0.05$. These results indicate that both digital financial literacy and entrepreneurial competencies are significant predictors of SMEs' sustainability. The hypothesis testing results align with and extend prior findings. The effect of digital financial literacy on sustainability ($\beta = 0.546$) is stronger than comparable studies that reported coefficients ranging from 0.30 to 0.45 [14], [15] suggesting that the digital ecosystem in Yogyakarta amplifies the role

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of financial literacy. Entrepreneurial competencies also showed a significant effect (β = 0.367), consistent with international studies [10], though slightly higher than averages reported in other developing-country contexts. These comparisons reinforce the novelty of situating competency-based theory within a digitally advancing local economy.

Table 6. Hypothesis Testing

Variables	Standardized Beta	Sample mean	Standard deviation	T values	P values	95% CI (Lower–Upper)	Result
DFL → SUST	0.546	0.541	0.061	8.934	0.000	[0.435, 0.633]	H1 Supported
COMP → SUST	0.367	0.364	0.047	7.843	0.000	[0.291, 0.444]	H2 Supported

4.4. Discussion

The selected research site is the Special Region of Yogyakarta, the only region in Indonesia governed by a royal family, which receives special grant, part of which is allocated to enhance the sustainability of SMEs'. The local government implements several innovative and creative programs to encourage the development of SMEs', which are not widely adopted by other governments. Allocating substantial cash for initiatives, such as establishing an e-commerce platform for SMEs' transactions in Yogyakarta named Sibakul Jogja, necessitates boldness and awareness. Sibakul Jogja aims to facilitate the expansion of local Yogyakarta products into national and international markets within the growing e-commerce landscape. The implementation of the Jogja Mark mark is an innovative method to preserve the quality and distinctiveness of authentic Yogyakarta products. The incubation program provides entrepreneurs with training and mentorship to cultivate their firms, encompassing aspects such as establishment, financial management, marketing, and waste management of production outcomes.

This study updates prior research on the impact of financial literacy [47], [15] and entrepreneurial competence on SMEs' performance [33], [48], [49] by focusing on the sustainability of SMEs' and the effects of digital financial literacy and entrepreneurial competence on it. In recent decades, sustainability has emerged as a goal for nations globally, encompassing environmental, economic, and social dimensions. Because of problems with pollution or the overuse of the planet's resources, technological advancements are frequently seen as potentially hazardous to the environment [29]. Sustainable growth will need to be a benchmark that SMEs' pursue as demand to adopt sustainable practices arises as a result of new rules and strong stakeholder pressure in many nations [29]. The results of this study indicate that digital financial literacy influence the sustainability of SMEs'. Digitalization provides advantages including enhanced promotional efficiency, an expanded target market, and simplified transaction processes, making it essential for SMEs' to compete effectively and respond to swift market fluctuations [50]. Digital finance facilitates access to financial services for SMEs' through different forms, including e-wallets, QR codes, and digital banking. Enhanced finance and payment alternatives enable SMEs' to increase their liquidity and broaden their markets. Digital financial literacy assists SMEs' to identify financial risks, use fintech services, and utilize digital platforms like e-commerce and payment gateways, enabling them to implement strategic business initiatives, enhance resilience, and ensure long-term sustainability. According to data on Yogyakarta SMEs', over 71% have engaged in transactions via the Sibakul Jogja e-commerce platform, indicating a growing adaptation to digitization among these enterprises. Furthermore, the majority have conducted transactions with QRIS. By possessing robust digital financial literacy, SMEs' can enhance organizational performance and mitigate the risks associated with financial digitalization.

Another result found that entreprenuerial competencies significantly effect SMEs' sustainability. The results of this study are also similar to several previous studies [10], [35], [48]. To attain sustainability and maintain competitiveness, SMEs' must effectively and innovatively manage their competencies [10]. An entrepreneur must engage with environmental influences, necessitating proficiency across multiple dimensions, including intellectual, attitudinal, behavioral, technological, and managerial characteristics [35]. According to data on Yogyakarta SMEs', 97% of respondents indicated that they participated in competency training provided by the local government. The competency training demonstrates that their skills may enhance the sustainability of their organizations from economic, social, and environmental perspectives. With strong competencies, SMEs' can more effectively respond to changes in the economic, technological, or regulatory landscape. Moreover, it can promote the adoption of business practices that

foster social, economic, and environmental sustainability. Although this study focused on registered SMEs' as listed in government records and associations, this criterion inevitably excluded informal or unregistered SMEs'. Exclusion of these enterprises may introduce bias, as informal SMEs' often face more acute challenges in accessing finance, adopting digital tools, and developing competencies. Consequently, the findings of this study may represent an optimistic picture of SMEs'' sustainability, as registered firms typically have greater institutional support. Future research should explicitly include unregistered SMEs' to capture the full diversity of the sector and to assess whether the positive effects of digital financial literacy and entrepreneurial competencies generalize across formal and informal enterprises.

5. Conclusion

This study conducted at Special Region of Yogyakarta, Indonesia. The local government's creative initiatives, including incubation programs, Jogja Mark, the Sibakul Jogja e-commerce platform, QRIS implementation, and competency training, have been essential in advancing digitization and skill enhancement among SMEs'. This study emphasizes the essential roles of digital financial literacy and entrepreneurial competencies in improving the sustainability of SMEs' in the Special Region of Yogyakarta, Indonesia. Data obtained from 338 SMEs' show that digital financial literacy and entrepreneurial competence have a positive impact on the sustainability of SMEs'. Augmented digital financial literacy empowers SMEs' to mitigate financial risks, embrace fintech solutions, and adapt to market volatility, hence enhancing business performance and sustainability. Likewise, entrepreneurial competencies enable SMEs' to adjust to evolving regulatory, economic, and technical environments, fostering enduring competitiveness and sustainability.

The results offer actionable insights not only for Yogyakarta but also for other Indonesian provinces and emerging economies facing similar SMEs' digitalization challenges. Given that digital financial literacy has the strongest effect on sustainability ($\beta = 0.546$), regional SMEs' programs across Indonesia should prioritize secure digital transaction skills. Provinces with high SMEs' density but low digital adoption could replicate initiatives such as Sibakul Jogja's free-shipping and marketplace integration but add a cybersecurity literacy component to address fraud risks. The significant role of entrepreneurial competencies ($\beta = 0.367$) suggests that competency-based training modules should be embedded in national entrepreneurship curricula, focusing on opportunity recognition and eco-innovation — skills that drive sustainable business practices. For regions with different sectoral compositions, program content can be tailored to sector needs: digital supply-chain management for farmers, sustainable tourism design for hospitality businesses, etc.

While the findings emphasize the value of digital financial literacy and entrepreneurial competencies in advancing SMEs'' sustainability, several limitations should be acknowledged. First, the use of a cross-sectional survey restricts the ability to infer causal relationships, and future research could employ longitudinal or experimental designs to establish temporal ordering. Second, the study relies on self-reported survey data, which may introduce measurement bias due to social desirability or recall limitations. Although pilot testing and validity checks were conducted, the possibility of over-or under-reporting remains possible. Third, the sample, while sizable, represents registered SMEs' in Yogyakarta and may not fully capture informal businesses or regions with different economic characteristics, limiting generalizability. Despite these constraints, the study contributes by contextualizing digital financial literacy within a local ecosystem shaped by government programs and by integrating competency-based theory with sustainability outcomes. Future research could examine cross-regional comparisons, explore sector-specific pathways, and investigate how digital finance interacts with institutional and cultural factors. Such work would provide deeper insights into the mechanisms that drive SMEs'' sustainable growth.

6. Declarations

6.1. Author Contributions

Conceptualization: A.S., D.K.R., A.L., and K.W.J.; Methodology: D.K.R.; Software: A.S.; Validation: A.S., D.K.R., A.L., and K.W.J.; Formal Analysis: A.S., D.K.R., A.L., and K.W.J.; Investigation: A.S.; Resources: A.S.; Data Curation: A.S.; Writing Original Draft Preparation: A.S., D.K.R., A.L., and K.W.J.; Writing Review and Editing: A.S.,

D.K.R., A.L., and K.W.J.; Visualization: A.S.; All authors have read and agreed to the published version of the manuscript.

6.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6.3. Funding

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6.4. Institutional Review Board Statement

Not applicable.

6.5. Informed Consent Statement

Not applicable.

6.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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