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Research article

Financial and digital financial literacy through social media use towards financial inclusion among batik small enterprises in Indonesia

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ABSTRACT

Batik, an Indonesian textile art form, holds immense economic and cultural importance. Small and medium enterprises (SMEs) specialising in batik play a crucial role in Indonesia's economic growth and cultural preservation, contributing significantly to the gross domestic product (GDP) and preserving the nation's heritage. Nevertheless, these enterprises face several challenges, such as slow growth and limited access to credit. The batik industry also lags in financial literacy and the adoption of digital marketing strategies, hindering its development. This quantitative study aims to investigate the relationship between financial literacy, digital financial literacy, and financial inclusion in batik SMEs and also examined the moderating effect of online social networks. A survey was conducted involving 535 managers, owners, and financial officers of small batik enterprises. Subsequently, the SmartPLS statistical analysis method was employed for data analysis. The results demonstrate that financial literacy and digital financial literacy play a significant role in accessing financial inclusion for batik small enterprises. Moreover, the utilisation of social media was found to moderate these relationships, amplifying the impact of financial and digital literacy on financial inclusion. The findings contribute to the existing knowledge, provide insights for enhancing batik small enterprises, and propose a digital financial model to promote financial inclusion.

1. Introduction

Small and medium enterprises (SMEs) in Indonesia play a crucial role in the country's social and economic growth. They significantly contribute to the macroeconomic index and comprise a substantial portion of the national economy. According to Kristiningrum et al. [1], Indonesian SMEs contribute approximately 60.34 % to the gross domestic product (GDP) and provide employment opportunities for a significant number of people. Therefore, SMEs can be considered as the economic pillars of Indonesia. Despite their significant economic contribution, many SMEs, including batik small enterprises, experience slow growth [2]. One of the major

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obstacles these enterprises face is limited access to credit, posing difficulty for small businesses to expand their operations. Many batik small business owners struggle to obtain financing, which restricts their expansion strategies. Limited funding is not the only barrier to developing small enterprises in Indonesia. Raya et al. [3], stated that some other barriers are internally and externally present. One of the major issues faced by many small businesses in Indonesia, including batik small enterprises, is financial management [4] due to the lack of financial literacy. Small enterprise owners with limited banking knowledge lack awareness regarding the procedures and mechanisms for obtaining bank loans [5]. Another limitation of micro-enterprises causing limited capital and financial access is financial skills, namely inappropriately implemented financial administration and management systems [6]. This limitation causes banks or financial institutions to face difficulties in determining the enterprise's assets and operating income. Micro, small, and medium enterprises (MSMEs) generally experience capital, human resources, law, and accountability constraints. Capital constraints experienced encompass limited capital and access to financing. Bank Indonesia noted that 60–70 % of MSMEs do not have access to banking financing [7].

Limited access to financing among MSMEs in lower middle-income ASEAN countries can be attributed to their low levels of financial literacy [8]. Micro-enterprise owners with limited banking knowledge often lack awareness regarding the procedures and mechanisms for acquiring bank loans. As stated earlier, another limitation of micro-enterprises that causes limited capital and access to finance is financial skills, namely inappropriately implemented financial administration and management systems. This inappropriate implementation causes banks or financial institutions to face difficulty in determining the enterprise's assets and operating income. The low level of financial literacy also causes financial records to be kept simple. Although micro-enterprises often neglect to keep financial records, such records are essential when applying for loans from financial institutions [9].

Indonesia's digital economy has witnessed exponential growth over the past few years. According to a report by Oratmangun [10], the country's e-commerce market is expected to reach $124 billion by 2025. The digital revolution has allowed businesses to access new markets and reach more customers. Unfortunately, some industries have been slower in adopting digital marketing strategies, particularly small businesses in traditional industries, such as batik [11]. For example, digital financial literacy has garnered unprecedented attention from entrepreneurs, academic institutions, and educational organisations as it is recognised as a crucial skill set in the modern digital era [12]. The rapid technological advancements and the growing prevalence of digital financial services have made it imperative for individuals and businesses to possess the knowledge and skills required to navigate and leverage these digital platforms effectively.

In addition, the online social network has been recognised as an effective development approach that plays a pivotal role in the development of small Indonesian enterprises, exerting a significant influence on financial inclusion and business growth [13]. Platforms such as Facebook, Instagram, and Twitter provide a vast reach and accessibility to a global audience, allowing batik enterprises to showcase their products and connect with potential customers beyond their physical locations [14]. Additionally, these social networks facilitate direct communication and engagement with customers, enabling these enterprises to build relationships, receive feedback, and tailor their products to meet market demands effectively [15]. Nevertheless, many small enterprises, such as batik enterprises, have not efficiently utilised digital financial literacy and social networks [2,3] as most small businesses lack information technology (IT) competencies [16,17]. Therefore, the aim of this study is to investigate the relationship between financial, digital literacy and financial inclusion through the moderating effect of online social networks among batik enterprises in Indonesia through addressing the following research questions:

Q1: Does financial literacy influence the access of small batik enterprises to financial inclusion?

Q2: What is the influence of digital financial literacy on the ability of small batik enterprises to access financial inclusion?

Q3: Does the use of social media moderate the relationship between financial literacy, digital financial literacy, and financial inclusion?

This study makes substantial contributions by addressing the gap in existing literature regarding the role of digital financial literacy in financial inclusion within Indonesia's batik industry. First, it establishes a strong correlation between financial literacy and financial inclusion through an empirical model, supporting human capital theory and highlighting the contribution of digital financial literacy to the resource-based view. Second, the research reveals the moderate impact of social media on these relationships, identifying it as a critical intangible asset that enriches the resource-based view perspective. Third, the study provides a practical model to improve financial management and inclusion in batik enterprises through investment in financial and digital literacy training and strategic social media use. These insights offer valuable guidance for entrepreneurs, policymakers, and financial institutions, emphasising the need for educational programs and support to enhance financial inclusion, promote economic development, and foster entrepreneurship in the batik industry.

2. Literature review

2.1. Batik small enterprises in Indonesia

Today, batik production in Indonesia is still primarily carried out by small enterprises, often operated by families in rural areas. The industry continues to be a vital part of Indonesia's cultural heritage and economy, with batik designs evolving to reflect contemporary styles and trends. The Indonesian batik industry is a part of the creative industry and has the potential to become a favourite fashion choice in Indonesia. It has been recognised by UNESCO as a masterpiece within the oral and intangible heritage of humanity [18]. This sector employs approximately two million people, and small enterprises account for a significant portion of this workforce. According to Suparno et al. [19], Indonesian Batik plays a central role in the nation's economic growth, ranks third in Indonesian exports and employs more than 2.79 million people. It can meet up to 70 % of the domestic clothing demand. The Industry Ministry reported that the export value of batik in 2020 reached US$533 million [20]. Thus far, the batik industry has significantly contributed to the national economy by creating many job opportunities as MSMEs dominate it. The small businesses are usually family-owned and operated, with skills and techniques passed down from generation to generation. They often operate from home, indicating low overhead costs and that batik can be produced at a lower price point than larger businesses. In addition to supporting the local economy, batik small enterprises contribute to Indonesia's tourism industry. Tourists worldwide visit Indonesia to see and buy batik, often used to make traditional clothing and accessories. Therefore, the Indonesian Industry Minister declared that the batik industry has been given priority for development due to its significant potential to boost national economic growth [20]. Although there are a large number of batik firms in Indonesia, only 208 batik enterprises succeeded in extending their size to large and medium-scale batik industry groups [21]. Several factors constrain the growth of small batik enterprises, particularly access to funds [3]. For example, as shown in Fig. 1, the performance of batik MSMEs in Indonesia has been decreasing gradually since 2015 [22].

Another issue is the impact of the COVID-19 pandemic, which has weakened various sectors, including SMEs, which were forced to shut down temporarily. One of the most significant challenges faced by SMEs, including the batik industry in East Java, was a sharp decline in turnover, which reached as high as 70 % [23]. One of the primary challenges batik small enterprises face is the lack of access to finance. As most of these businesses are family-owned and operated, they may not have the collateral or financial history required to secure loans from traditional financial institutions. Notably, financial literacy is a skill that can be acquired through education and experience [24]. While general skills, such as oral and written communication, are vital for any successful worker, unique skills, such as financial literacy, are needed for successful self-employment.

2.2. Theoretical background and hypothesis development

Driven by the theory of human capital and RBV, this study explain the relationship between financial literacy, human capital, and financial inclusion in small businesses. Introduced by Becker and Schultz in the 1960s [25], human capital theory highlights the importance of educational, training, and health investments for economic growth. The concept of human capital posits that these investments enhance individuals' productive capacity, leading to higher economic growth rates and improved living standards.

Studies have linked human capital to overall entrepreneurial success, including the ability to recognise opportunities, access critical financial resources, and launch ventures [26]. Successful entrepreneurs require unique skills, particularly in financial literacy, to make informed financial decisions and effectively manage their finances [27]. Financial literacy empowers individuals to understand and navigate the complexities of the financial landscape, thus improving their financial well-being and increasing their chances of financial inclusion. Furthermore, digital financial literacy, specifically through digital financial knowledge and digital financial awareness, plays a pivotal role in small enterprises' financial inclusion, equipping them with the necessary skills and understanding to navigate digital financial platforms and access essential financial services [28]. Therefore, human capital theory was employed to explain the relationship between financial, digital financial literacy, and financial inclusion.

This study also utilises Barney's RBV theory [29]. According to the theory, social media is defined as the firm's capability and lies in intangible assets and is useful to recognise, assess and implement novel opportunities in a not reluctantly counterfeit fashion [30]. The widespread adoption of social media enables seamless information sharing and learning experiences, which may influence SMEs' capability to access financial inclusion. Through features such as feedback and two-way communication with users, consumers, shareholders, and stakeholders, businesses can meet their requirements and sustain their performance [31]. Notably, previous research has primarily examined social media usage and sustainable firm performance in developed countries, leaving a significant gap in understanding its impact in developing nations [31].

As shown in Fig. 2, this study highlights the importance of financial literacy and human capital in fostering financial inclusion. Financial literacy equips individuals and businesses with the knowledge and skills to access and effectively use financial services. Embracing digital finance presents opportunities to enhance financial inclusion efforts and expand financial access for individuals and small businesses, ultimately promoting economic empowerment and inclusive growth.

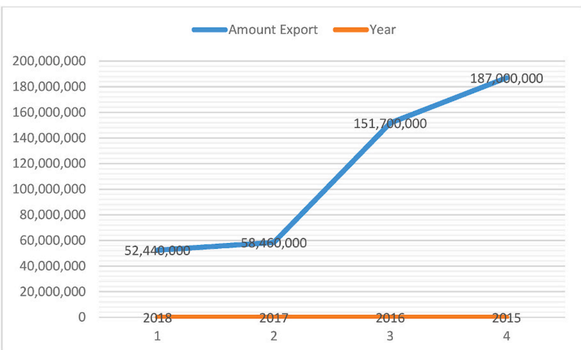

Fig. 1. Batik exports of Indonesia (in million USD).
Source [22].

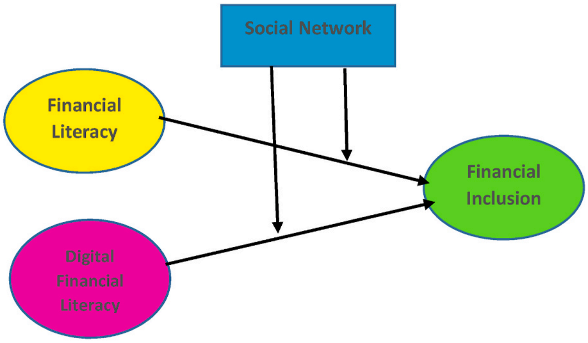

Fig. 2. Framework.
Source: Authors

2.3. *Theoretical framework*

Financial literacy refers to financial management knowledge and skills, which are important assets that facilitate the growth of batik small enterprises. Small enterprises with financial literacy skills tend to make better financial decisions with fewer management mistakes than their financially illiterate counterparts [32]. The term "financial literacy" is often used interchangeably with "financial education" or "financial knowledge," but they are conceptually distinct constructs. Treating them as synonyms can lead to confusion, as financial literacy encompasses more than solely education. According to Huston [33], the Organisation for Economic Co-operation and Development (OECD) further outlines three dimensions of financial literacy: financial knowledge, financial behaviour, and financial attitude. Financial knowledge is a form of human capital acquired throughout the life cycle, influencing one's ability to manage income, expenses, and savings effectively. It is developed through information sharing and group interactions [34]. Financial attitude refers to the combination of concepts, information, and emotions that shape individuals' predisposition to act favourably in the context of learning [35]. Financial behaviour is regarded as a crucial component of financial literacy and recent studies have linked it to financial literacy [36]. Assessing financial literacy is challenging due to the complexity of understanding how individuals process financial information and make decisions based on that knowledge [35].

Xu et al. [37], investigated the relationship between financial literacy, formal credit access, and informal businesses in urban areas of China. By utilising data from the 2015 China Household Finance Survey, the study revealed that higher financial literacy among informal business owners is associated with an increased likelihood of their businesses obtaining bank loans. Nevertheless, this positive link is specifically observed in businesses owned by individuals with rural hukou, and the effect is more pronounced in areas with limited accessibility to formal credit. Another study by Xu et al. [38], discovered that financial literacy positively impacts formal bank account and credit card holdings and participation in financial markets, commercial insurance, and pension plans through limited attention channels facilitating access to specific financial information. Therefore, this paper hypothesises the following:

H1. Financial literacy has a positive significant relationship with financial inclusion.

Digital financial literacy has recently received significant attention from entrepreneurs, academic institutions, and educational organisations. It is now recognised as a crucial skill set in the modern digital era (Setiawan et al., 2022). The rapid advancements in technology and the widespread availability of digital financial services make it imperative for individuals and businesses to acquire the knowledge and skills necessary to navigate and leverage these digital platforms effectively. Digital financial literacy is a multidimensional concept Lyons & Kass-Hanna [39], that includes "knowledge of digital financial products and services, awareness of digital financial risks, knowledge of digital financial risk control, and knowledge of consumer rights and redress procedures". Incorporating digital finance into trading can attract more customers and increase business sales [40]. demonstrated that individuals with higher financial literacy are better equipped to navigate and leverage digital platforms for their financial needs. Technical literacy, including digital knowledge and skills, is important for effectively utilising digital financial services [27] and facilitating access to digital financial platforms. Therefore, this research hypothesises the following:

H2. Digital financial literacy has a positive significant relationship with financial inclusion.

Over the past decade, social media has witnessed remarkable growth in various countries Chokpitakkul & Anantachart [41], presenting entrepreneurs with new opportunities across multiple sectors [42,43]. Popular social media platforms, such as Facebook, LinkedIn, Twitter, Instagram, and YouTube, have gained widespread popularity worldwide and are significantly impacting the behaviours and processes of entrepreneurs and organisations [44]. The social media phenomenon has exerted influence on numerous industries and has emerged as an undeniable trend for entrepreneurs and key stakeholders in the entrepreneurial ecosystem [45]. Notably, social media is transforming entrepreneurship by disrupting traditional patterns of entrepreneurial activities [46] and unveiling new frontiers for enterprising individuals. The entrepreneurial landscape is undergoing rapid transformation, fuelled by the emergence of new social media platforms that facilitate the creation and development of digital-based entrepreneurship.

Social media platforms are effective in diffusing information, fostering interpersonal ties, providing sociability, support and a sense of belonging and enabling the sharing of personal opinions, thoughts, experiences, and social identity [47]. Engagement in social networking has been a widely discussed topic in marketing practice and entrepreneurial ventures, as it facilitates the sharing of information and operational interactions [48]. Small enterprises utilise social networks to create more effective promotional strategies, build aspirational branding, stimulate customer interactivity and involvement, and cultivate strong customer relationships through shared experiences. Social capital also plays a key role for entrepreneurs as they often rely on their social connections to access and acquire resources.

Researchers have argued that financial literacy, which empowers small businesses with financial knowledge and skills, occurs within a network [49]. Networks embedded in social capital, through relationships among entrepreneurs, facilitate access to scarce resources. These resources may include knowledge, skills, ideas, financial and physical resources. Therefore, the level of social networking among entrepreneurs can potentially moderate the relationship between financial literacy and financial inclusion. Okello Candiya Bongomin et al. [50] confirmed that networks positively and significantly moderate the relationship between financial literacy and financial inclusion. Therefore, this research hypothesises the following:

H3. Social media use moderates the relationship between financial literacy and financial inclusion.

H4. Social media use moderates the relationship between digital financial literacy and financial inclusion.

3. Research design

This study employed a quantitative research methodology by employing a questionnaire with a Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree) to collect data. As stated earlier, the study's primary objective was to examine the relationship between two independent variables, financial literacy and digital financial literacy, and their influence on the dependent variable of financial inclusion. Furthermore, the study explains the moderating effect of social media use on this relationship. Financial literacy was measured through fifteen items divided into three sub-constructs, which are financial awareness (five items), financial behaviour (six items) and financial knowledge (four items), adopted from Ref. [51]. Second, digital financial literacy was measured through nine items divided into two sub-constructs, which are four items concerning digital financial awareness and five items related to digital financial knowledge adopted from Ref. [27]. Third, financial inclusion was measured through ten items adopted from Ref. [52]. Finally, social media was measured through five items adopted from Ref. [53].

3.1. Sample

The responses collected from managerial-level respondents within batik enterprises in Solo, Indonesia, including owners, managers, and financial officers, play a crucial role in justifying the study's purpose. The research population consists of 320 batik enterprises in Solo, and it was carefully selected to ensure unbiased representation. Selection criteria included specific roles (owners/managers, financial officers, marketing, others), direct involvement in financial management, a minimum of one year of work experience, and full-time employment status. These individuals, directly engaged in financial management and possessing a minimum of one year of work experience, provide nuanced insights. Their perspectives offer a comprehensive understanding of the challenges and opportunities within the batik industry, ensuring a well-rounded and insightful analysis. The study utilised online surveys, hardcopies sent to offices, and email submissions to reach out to the selected 320 batik enterprises. Nevertheless, we received confirmations from 240 firms. Invitations were extended to a total of 720 respondents, comprising owners or managers, financial officers, and marketing professionals. Among them, 350 responded online, 98 via hardcopies, and 272 through email softcopies. We employed various channels, including online surveys, hardcopy questionnaires, and email softcopies, to reach a diverse pool of participants. The study also acknowledged the pivotal role of social media and networks in enhancing financial system outreach and networking opportunities, which is essential for promoting financial literacy and inclusion in the digital age. Out of the 720 questionnaires distributed through, 539 were returned to the researcher. Subsequently, rigorous analysis was undertaken, which involved the removal of incomplete questionnaires with more than 30 % unanswered questions and those with insufficient engagement. This process resulted in 525 completed and valid questionnaires, achieving an approximate response rate of 73 %. According to Podsakoff et al. [54], common method variance may occur in single-sourced data or a cross-sectional study design [55]. In order to mitigate common method bias concerns, Harman's one-factor test was employed and confirmed that data variance could not be largely attributed to a single factor, indicating that common method bias did not significantly impact the data's integrity [56]. These meticulous steps in sample selection, data collection, and analysis underscore the robustness of the study's methodology and the reliability of the obtained responses.

4. Data analysis

The partial least square structural equation modelling (PLS-SEM) served to measure the complex cause-effect relationship models with latent variables [57]. Essentially, comparing covariance-based SEM methodologies is deemed adequate to evaluate higher-order constructs and sophisticated conceptual models through mediation effects [57]. The PLS-SEM technique with SmartPLS optimally assessed the causal-effect links presented in this model as the research sample exceeded the suggested rate (n = 525).

4.1. Demographic characteristics

Table 1 displays the respondents' demographic characteristics, including their personal information. There were 273 female respondents, representing 52 % of the total sample. On the other hand, male respondents comprised 48 % (n = 252) of the sample. Most of the respondents were firm owners (38 %), followed by 22 % managers, and they had long experience, with 55 of them possessing more than ten years of experience. In addition, the majority of firms' types were private enterprises (76 %). In terms of engagement in financial literacy training, the majority of respondents stated that they never had access to such training, accounting for approximately 44 %, while 31 % reported rarely attending. Additionally, most respondents mentioned that their enterprises employ approximately 1903 part-time workers and 1422 full-time workers.

4.2. Validity and reliability

In the initial stage of the study, the selected constructs were subjected to rigorous evaluation to ensure the measurements' reliability and validity. Convergence validity, discriminant validity, construct reliability, and indicator reliability were assessed using established statistical measures. Cronbach's alpha and composite reliability (CR) were employed to evaluate the constructs' dependability, with a CR value exceeding 0.07 considered reliable. The results indicated that all constructs demonstrated satisfactory levels of construct dependability, as evidenced by the CR values exceeding the threshold (See Table 2). Furthermore, the constructs' convergent validity was assessed using the average variance extracted (AVE), which should exceed 0.50 [57]. The analysis revealed that all constructs achieved significant AVE values, confirming their convergent validity. Detailed values for construct dependability (CA), CR, and AVE can be found in Table 2.

4.3. Discrimination validity

In this study, discriminant validity was rigorously assessed using established methods. The Fornell and Larcker criterion [58] was meticulously applied by comparing the square root of each construct's AVE with inter-construct correlations. When the square root of AVE exceeded these correlations, it unequivocally confirmed the discriminant validity of the assessed variables. Additionally, cross-loading analysis was conducted to scrutinise each construct's outer loading, ensuring that each specific construct's loading surpassed those of other constructs to ensure optimal discriminant validity. The study also employed the heterotrait-monotrait ratio (HTMT) [57], where values above 0.85 signified a high level of discriminant validity. A thorough analysis of the results presented in Tables 3 and 4 reveals a clear pattern. All construct loadings were notably higher than other constructs, indicating the variables' robust discriminant validity. These findings were consistent with the Fornell-Larcker criterion and were further supported by the significant relationships between the constructs, confirming their distinctiveness and demonstrating clear discriminant validity. In sum, the

Table 1
Demographic and business characteristics.

		Number	Percentage
Gender	Female	273	52 %
	Male	252	48 %
What is your position in your business?	Owner	201	38 %
	Manager	116	22 %
	Chief-account	109	21 %
	Chief-marketing	99	19 %
	Others/specify	0	0 %
What is your HIGHEST educational qualification or nearest equivalent?	High school	251	47 %
	Bachelor degree	254	48 %
	Master degree	11	2 %
	Higher degree	9	2 %
	Others, please specify	0	0 %
Do you ever attend management training programmes related to financial management?	Never	233	44 %
	Rarely (From 1 to 2 attentions)	162	31 %
	Sometimes (3–4 attentions)	111	21 %
	Often (More than 4 attentions)	19	4 %
	Always	0	0 %
What best describes the form of ownership of your business?	Private enterprise	398	76 %
	Limited company	109	21 %
	Joint stock company	0	0 %
	State company	0	0 %
	Others	18	3 %
How long has your business been established?	Less than 2 years	29	6 %
	2–5 years	75	14 %
	6–10 years	134	26 %
	More than 10 years	287	55 %
How many employees does your business currently have?	Full-time (From 175 firms)	1422	43 %
	Part-time (From 175 firms)	1903	57 %

Table 2
Validity and reliability.

Construct	Mean	SD	CA	CR	AVE
Digital Financial Literacy	3.77103	1.069578	0.909	0.925	0.577
Financial Inclusion	3.7253	1.086298	0.866	0.890	0.527
Financial Literacy	3.773	1.066175	0.917	0.927	0.545
Social Media	3.643	1.092054	0.861	0.900	0.645

Table 3
Discrimination validity.

	DFL	FI	FL	SMU
DFL	0.76			
FI	0.575	0.653		
FL	0.102	0.245	0.678	
SMU	0.279	0.473	0.084	0.803

Note: FL = Financial Literacy; DFL = Digital Financial Literacy; SMU = Social Media Use; FI = Financial Inclusion.

Table 4
Loadings and cross-Loading.

	Digital Financial Literacy	Financial Inclusion	Financial Literacy	Social Media
DFA1	0.720	0.455	0.045	0.226
DFA2	0.786	0.473	0.099	0.288
DFA3	0.765	0.489	0.096	0.201
DFA4	0.781	0.503	0.107	0.279
DFK1	0.779	0.377	0.105	0.161
DFK2	0.744	0.411	0.060	0.172
DFK3	0.728	0.357	0.025	0.183
DFK4	0.765	0.434	0.055	0.195
DFK5	0.767	0.386	0.096	0.172
FA1	0.066	0.148	0.621	0.031
FA2	0.002	0.138	0.624	0.051
FA3	0.012	0.074	0.629	−0.043
FA4	0.040	0.135	0.634	0.004
FA5	0.015	0.096	0.625	0.001
FB1	0.089	0.175	0.748	0.094
FB2	0.054	0.078	0.743	0.011
FB3	0.132	0.214	0.762	0.062
FB4	0.116	0.187	0.739	0.098
FB5	0.100	0.251	0.709	0.093
FB6	0.054	0.149	0.748	0.071
FI1	0.263	0.631	0.221	0.354
FI11	0.615	0.607	0.131	0.243
FI12	0.615	0.633	0.086	0.265
FI2	0.231	0.682	0.220	0.329
FI3	0.236	0.680	0.203	0.295
FI4	0.287	0.753	0.167	0.380
FI5	0.298	0.652	0.176	0.274
FI6	0.282	0.658	0.115	0.455
FI7	0.274	0.707	0.325	0.307
FI8	0.227	0.609	0.174	0.318
FI9	0.520	0.546	−0.001	0.194
FK1	0.124	0.198	0.596	0.039
FK2	0.040	0.139	0.684	0.119
FK3	0.049	0.148	0.584	0.024
FK4	0.105	0.157	0.691	0.069
SMU1	0.268	0.363	0.091	0.769
SMU2	0.228	0.397	0.082	0.867
SMU3	0.201	0.377	0.103	0.735
SMU4	0.242	0.399	0.072	0.825
SMU5	0.180	0.359	0.015	0.812

Note: FL = Financial Literacy; DFL = Digital Financial Literacy; SMU = Social Media Use; FI = Financial Inclusion.

measurement model ensured that the discriminant validity was well established [59].

The AVE serves as a measure for both convergent and divergent validity, which reflects the average communality for each latent factor in a reflective model. In a well-fitted model, AVE should exceed 0.5 [1] and surpass the cross-loadings, indicating that the factors should explain at least half of the variance of their respective indicators. On the other hand, AVE values below 0.50 imply that error variance surpasses explained variance. As shown in Table 4, the study's model demonstrates both convergent and divergent validity where the loading values exceed 0.5, ensuring the findings' accuracy and reliability.

The structural model for this study is depicted in Fig. 3, where R2 represents the value for any endogenous and predicted latent variable. In the case of the dependent variable, financial inclusion, R2 is 0.486. This finding indicates that the two independent variables, financial literacy and digital financial literacy, explain 48.6 % of the variance in financial inclusion.

Bootstrapping was employed in this study to determine the statistical significance of the path coefficient and calculate the t-values. All calculated values are shown in Table 5. The t-value of the hypothesised path of financial literacy and financial inclusion is 3.658, which is higher than 2.57 ($\alpha = 0.01$; two-sided test), and the p-value is 0.000. Thus, the hypothesis path of financial literacy and financial inclusion of the inner model is statistically significant. Therefore, H1 was accepted. The significance of financial literacy in promoting financial inclusion among batik small enterprises in Indonesia is evident. It empowers business owners and managers with the necessary knowledge and skills to make informed decisions, participate in the formal financial system, and contribute to their enterprise's growth and stability. Therefore, the study's finding confirms Hypothesis 1. The t-value of the hypothesised path of digital financial literacy and financial inclusion is 8.447, which is above 2.57 ($\alpha = 0.01$; two-sided test), and the p-value is 0.000. Therefore, the hypothesised path of digital financial literacy and financial inclusion of the inner model is statistically significant. Therefore, H2 was accepted.

Table 5 and Fig. 4 illustrate the moderating effect of social media use on the relationship between digital financial literacy and financial inclusion. As shown in Table 5, the path coefficient of 0.106 represents the magnitude of this moderating effect, indicating the extent to which social media use influences the relationship between digital financial literacy and financial inclusion. The significant t-value of 2.253 (p-value = 0.025) supports the finding that networks play a positive and significant role in moderating the relationship between financial literacy and financial inclusion. Thus, social media use plays a crucial role in shaping the impact of digital financial literacy on financial inclusion for batik small enterprises in Indonesia. Thus, Hypothesis 4 is accepted.

Finally, Table 5 and Fig. 5 illustrate the moderating effect of social media use on the relationship between financial literacy and financial inclusion in batik small enterprises in Indonesia. The path coefficient of 0.089 indicates the strength of this moderating effect, and the t-value of 2.137 (p-value = 0.033) signifies its statistical significance. Thus, Hypothesis 3 is accepted.

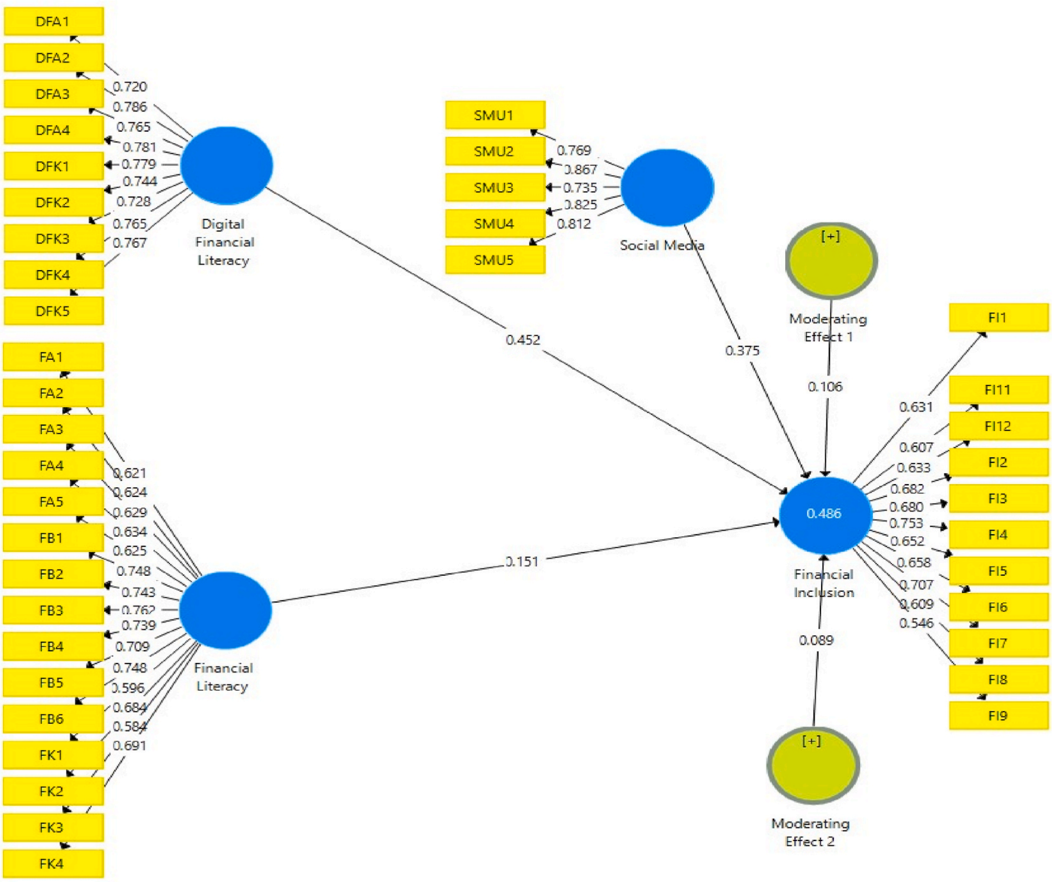

Fig. 3. Measurement model assessment.

Table 5
Path coefficients.

Hypotheses	Path	T-Value	P Values
FL - > FI	0.151	3.658	**0.000**
DFL - > FI	0.452	8.447	**0.000**
Moderating Effect 1 - > Financial Inclusion	0.106	2.253	**0.025**
Moderating Effect 2 - > Financial Inclusion	0.089	2.137	**0.033**

Note: ***p < 0.001; **p < 0.01; *p < 0.05 (one-tailed test); β = Path Coefficient.

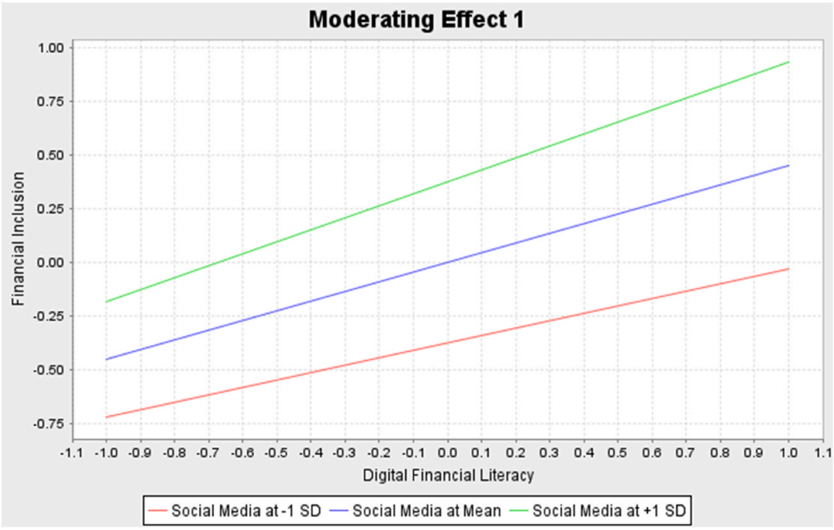

Fig. 4. The moderating effect of social media use on the relationship between digital financial literacy and financial inclusion.

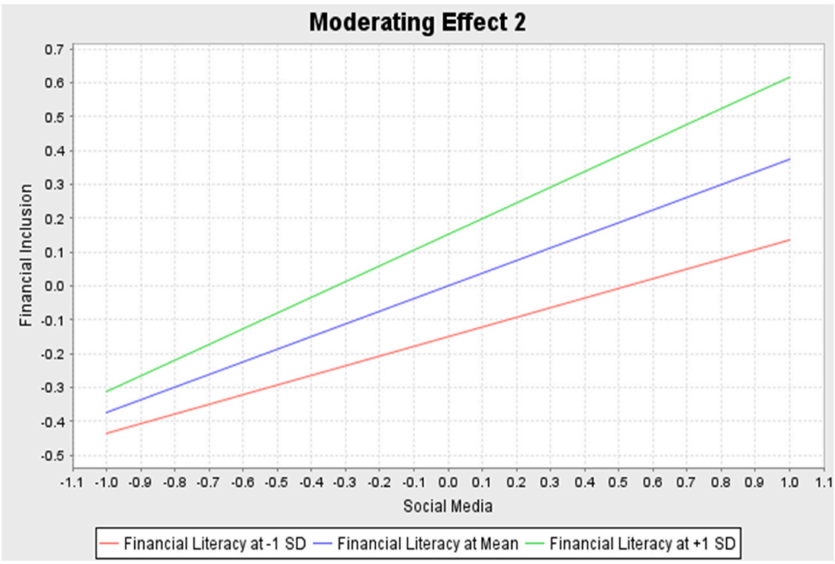

Fig. 5. Moderating effect of social media use on the relationship between financial literacy and financial inclusion.

5. Discussion

The results, derived through rigorous bootstrapping, shed light on the intricate dynamics of financial literacy, digital financial literacy, and financial inclusion within Indonesian batik small enterprises. Notably, as indicated by the robust t-values presented in Table 5, the statistical significance of the path coefficients reaffirms the importance of these relationships. It offers valuable insights into how and why financial inclusion operates in this specific context.

The first research question explained the relationship between financial literacy and financial inclusion in Indonesian batik enterprises. The present study uncovered a significant positive relationship, affirming financial literacy as a vital catalyst. Proficiency in financial literacy empowers entrepreneurs by enabling them to navigate intricate financial systems confidently. With a deep understanding of finance, these individuals transcend conventional financial participation and evolve into skilled decision-makers, strategically engaging with funding opportunities and efficiently managing resources. This transformation reflects an investment in human capital development, enhancing entrepreneurs' abilities to navigate complex financial landscapes [27]. These findings validate the symbiotic bond between financial literacy and financial inclusion by illuminating how financial literacy propels small enterprises towards informed decision-making. This process not only fosters economic growth and stability but also emphasises the pivotal role of financial literacy as a fundamental agent in achieving sustainable financial inclusion within the batik industry [60].

The second research question investigated the relationship between digital financial literacy and financial inclusion in the Indonesian batik industry. The findings reveal a robust and significant correlation between digital financial literacy and financial inclusion. This study underscores that comprehending digital financial services, online platforms, and digital payment systems is not merely a matter of convenience but an essential requirement for engaging with the modern financial landscape [61]. Digital financial literacy bridges the divide between traditional financial practices and evolving digital ecosystems [28]. Entrepreneurs proficient in digital financial literacy gain access to a wider array of financial services, tap into online markets, and bolster their financial resilience.

The third research question delved into the nuanced relationship between financial literacy, digital financial literacy, and financial inclusion by examining the moderating role of social media. The study unearthed compelling evidence, emphasising the pivotal role of social media use as a robust moderator in shaping the connections between digital financial literacy and financial inclusion. These findings highlight the indispensability of social media platforms within Indonesian batik enterprises. Businesses with adept social media strategies gain a significant edge by effectively bridging the gap between digital financial literacy and financial inclusion, aligning seamlessly with prior research [50]. Additionally, the study unveiled the substantial moderating influence of social media use on the relationship between financial literacy and financial inclusion. These nuanced dynamics harmonise with the firm's strategic approach, where social media is harnessed for product and service promotion, brand building, nurturing customer relationships, and gathering valuable market insights and customer profiles. These significant moderating effects underscore the direct impact of social media on the relationship between financial literacy and financial inclusion, aligning perfectly with the study's objective of unravelling intricate interactions within batik enterprises. Integrating these insights into the RBV framework accentuates social media's unique status as a rare and non-substitutable asset for batik small enterprises. Proficient utilisation of social media enhances internal capabilities and shapes external competitive positioning. This study bolsters RBV theory by emphasising the strategic use of social media as integral to these enterprises' competitive advantage, effectively translating digital financial literacy into tangible financial inclusion outcomes [49].

5.1. Theoretical contribution

In contrast to previous studies primarily focused on financial literacy as a proxy for financial inclusion, this research addresses a significant gap by delving into factors like digital financial literacy, often overlooked despite the rapid growth of digital markets. This study makes substantial contributions to the existing literature in several key ways. Firstly, it empirically establishes a strong correlation between financial literacy and financial inclusion within batik small enterprises, aligning seamlessly with human capital theory. This alignment highlights the pivotal role of equipping business owners and managers with financial knowledge, enabling them to make informed decisions and actively participate in formal financial systems. Secondly, the research underscores the critical importance of digital financial literacy, encompassing digital awareness and knowledge, in enhancing financial inclusion. This discovery, supporting human capital theory, emphasises the need to equip individuals with digital skills, acting as a valuable form of human capital. Digital literacy becomes essential, enabling well-informed financial decision-making and active engagement with formal financial systems, especially in the digital age. This insight not only validates human capital theory but also offers practical guidance for promoting financial inclusion, recognising digital literacy as fundamental for financial capability. Lastly, the study reveals the moderate impact of social media use on the relationship between financial literacy, digital financial literacy, and financial inclusion in SMEs, particularly within the distinctive landscape of Indonesian batik enterprises. Rooted in Barney's Resource-Based View (RBV) theory, social media emerges as a pivotal intangible asset, empowering SMEs to identify, assess, and implement new opportunities effectively. It underscores the transformative potential of social media in facilitating seamless information sharing and learning experiences, allowing businesses to align their operations with user and stakeholder needs. This research addresses a crucial gap by explaining social media's influence within the specific context of financial literacy and digital financial literacy in developing nations, particularly in the domain of Indonesian batik enterprises. These insights offer a valuable understanding of social media as a catalyst, amplifying financial inclusion efforts within small enterprises, especially in regions with limited financial knowledge.

5.2. Practical contribution

This study outlines a practical model for enhancing the financial management of batik enterprises in Indonesia and improving their financial inclusion. Managers and owners can enhance their financial management capabilities through targeted strategies. Firstly, they can improve their knowledge and decision-making skills by investing in financial literacy training programmes, enabling informed choices regarding funding and resource management for sustainable business practices. Secondly, batik enterprises can invest in training their workforce in digital financial services and online platforms by recognising the importance of digital financial literacy. Integrating digital tools into their operations broadens their access to financial services and online markets, facilitating financial inclusion. Furthermore, the strategic use of social media by managers, involving active promotion and engagement with customers, creates valuable channels for business growth and financial transactions. By bridging the gap between digital literacy and financial inclusion, these measures empower batik enterprise managers and owners, ensuring their businesses' long-term sustainability and financial health.

5.2.1. Policy implication

The study's findings have significant implications for policy formulation and business strategies within the Indonesian batik industry. Firstly, the study emphasises the transformative potential of financial literacy for entrepreneurs, enabling them to make informed financial decisions and engage effectively with funding opportunities. By investing in financial knowledge, entrepreneurs enhance their ability to navigate complex financial systems, fostering economic growth and stability within the industry. Secondly, digital financial literacy emerges as a fundamental requirement for engaging with the modern financial landscape. Entrepreneurs proficient in digital financial literacy can access a broader array of financial services and enhance their financial resilience. Thirdly, social media use acts as a valuable resource, bridging the gap between digital financial literacy and financial inclusion. Businesses adept in social media strategies gain a competitive edge, transforming digital financial literacy into tangible financial inclusion outcomes. These findings underline the importance of equipping entrepreneurs with financial and digital literacy skills while leveraging social media platforms strategically. Implementing targeted educational programmes and providing support for social media utilisation could enhance financial inclusion efforts within the batik industry, promoting economic development and fostering entrepreneurship in Indonesia.

5.3. Limitation and future research

While this study has provided valuable insights, recognising its limitations is crucial. Firstly, this study was confined to batik small enterprises in Indonesia, potentially restricting the findings' applicability to diverse industries and countries. In order to overcome this limitation, future studies should examine the interplay between financial literacy, digital financial literacy, and financial inclusion across various sectors and regions, fostering a more comprehensive understanding of these dynamics. Secondly, this study delved into the significance of financial literacy, digital financial literacy, and social media use in fostering financial inclusion among batik small enterprises. Nevertheless, other factors, such as digital entrepreneurial competencies, may also influence financial inclusion. Therefore, future studies should consider integrating these additional variables to offer a more holistic perspective on enhancing financial inclusion in batik small enterprises. Digital entrepreneurial competencies, encompassing skills such as online marketing, e-commerce proficiency, and social media management, are vital factors influencing financial inclusion in small enterprises, emphasising the need for their inclusion in future research studies. Lastly, this study relied on self-reported survey data, raising concerns regarding response biases and limitations inherent in self-report measures. In order to address this concern, future research endeavours could explore alternative data collection methods, such as interviews or observations. These methods could provide a more objective assessment of financial literacy, digital financial literacy, and financial inclusion, thereby enhancing the reliability and depth of the study's findings.

5.4. Conclusion

This study, aimed at explaining the dynamics of financial literacy, digital financial literacy, and social media use and their impact on financial inclusion within batik small enterprises in Indonesia, utilised a structured questionnaire with Likert scale responses as its primary methodology. The study confirmed the critical importance of financial literacy by engaging with 525 respondents from batik enterprises in Solo, Indonesia. It demonstrated a positive correlation between financial literacy and financial inclusion, showcasing how entrepreneurs armed with financial knowledge made informed decisions, strategically engaged with funding opportunities, and managed resources effectively. Digital financial literacy emerged as another linchpin, enabling entrepreneurs to access diverse financial services, tap into online markets, and enhance their financial resilience. Moreover, social media's role as a powerful moderator was underscored in bridging the gap between financial literacy, digital financial literacy, and tangible financial inclusion outcomes. By strategically utilising social media, businesses aligned their digital capabilities with financial literacy, fostering economic growth and stability within the batik industry. These findings advocate for targeted interventions, emphasising the need to enhance financial capabilities and leverage digital platforms for sustainable economic advancement in Indonesia's batik sector. Policymakers, businesses, and financial institutions can draw upon these insights to inform policies and initiatives, promoting inclusive economic development in the digital age.

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CRediT authorship contribution statement

Samer Ali Al-shami: Writing – original draft, Validation, Investigation, Conceptualization. **Ratna Damayanti:** Writing – review & editing, Formal analysis. **Hayder Adil:** Project administration, Funding acquisition. **Faycal Farhi:** Visualization, Software, Funding acquisition. **Abdullah Al mamun:** Writing – review & editing, Data curation.

Declaration of competing interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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