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OIL PALM SMALLHOLDERS ENTREPRENEURS AND FINANCIAL LITERACY: TECHNOLOGY ADOPTION

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ABSTRACT
This study examines how financial literacy affects the business financial practice of oil palm smallholders within Malaysia, and how their financial literacy hinders them in effectively managing finances and business sustainability. The survey was based on 1,500 smallholders from six regions of Malaysia and applies SEM to investigate the relationships among attitude toward financial literacy, financial literacy, and business financial practices. The findings present strong positive associations of these constructs: a positive attitude toward financial literacy correlates with increased financial literacy, leading to improved business financial practices that facilitate access to bank loans and grants, hence leading to better business performance. Precisely, business financial practices explains a 0.549 influence on business performance, hence its crucial role in the success of smallholders. This study theoretically contributes to the literature on rural entrepreneurship by investigating the use of financial literacy in oil palm cultivation. Practically, this study implies that targeted financial literacy programs, particularly those integrated with digital tools, could improve financial management by facilitating rural economic growth and sustainable agricultural practices among smallholders. The findings bring forth important policy and implications for financial institutions through the integration of technology in financial literacy programs to strengthen economic resilience among smallholder enterprises.
Keywords : *Financial Literacy, Smallholder Entrepreneurs, Business Performance, Technology Adoption, Oil Palm Industry*

1. Introduction

In recent times, financial literacy has been as a key competence for economic empowerment and business prosperity, not least among smallholders in developing economies. Smallholders are important players in Malaysia's agriculture, having oil palm as one of its major crops and important sectors that contribute to the nation's economy. Yet presently, many Malaysian smallholders often face financial problems inhibiting them from sustaining and further expanding their respective enterprises. Many smallholders report monthly incomes below RM2000, largely due to inadequate financial management skills, limited access to credit, and financial dependency on single-crop income sources. This situation reflects broader issues faced by smallholders worldwide, where limited financial knowledge restricts effective decision-making and access to essential resources, ultimately impacting livelihoods (Ntakyo et al., 2021). It can also be supported by Benedict et al. (2024) stresses that most smallholders does not possess the required financial literacy to comprehend the intricate nature of some financial products, which could tempt them into poor decision making in periods of financial instability. Furthermore, according to Zhllima et al. (2024) suggests that financial literacy is determinant for better access to formal financial services, which small holders are not exploiting due to their partial comprehension.

Although it has been established that financial literacy is one of the vital ingredients in ensuring business resilience, there is a limited of focused studies on how financial literacy impacts the business performance of Malaysian smallholders. The literature was also biased towards general financial literacy without actually addressing impacts associated with these unique challenges posed to the smallholders. For instance, Sarfo et al. (2023) raise the issue that most rural populations lack definite financial education programs and thereby worsen their conditions. On the other hand, Gikonyo et al. (2022) indicate that the literature has failed to assess how technology has played its role in enhancing financial literacy among smallholders and hence leaves a gap in the knowledge base on what works. This therefore calls for the determination of the effect of financial literacy on financial practices among oil palm smallholders, a very critical but underestimated group within the economy of Malaysia. This study is very important because small-scale farmers invest meager resources in one commodity, making them more susceptible to financial instability and financial literacy is thus one of the major influences driving the economic resilience of these farmers. Therefore, the relationships between attitude towards financial literacy and financial literacy towards business financial practices will be modeled through the Structural Equation Modeling. Since this study made use of SEM, it was possible to delve deep into how financial literacy influences business success, not only by directly impacting but indirectly influencing various financial practices as well. This goes beyond a simple analysis of correlations to explain how financial literacy may enhance financial resilience, improve business outcomes among smallholders, and informatively support policy and financial institutional choices.

Recent studies have placed greater emphasis on the issue of financial literacy within both a rural and entrepreneurial context, situating this study within the wider academic conversation. Other studies, such as Midamba et al. (2024) and Ntakyo et al. (2021), identified the positive effect of financial literacy training among rural farmers in Uganda and Owusu et al. (2019) examined financial literacy as a moderator between financial resources and SME growth in Ghana. In another vein, Cruz et al. (2023) discussed financial inclusion in Southeast Asia and established that financial knowledge significantly enables smallholders to adopt sustainable economic practices. Besides, Soekarni et al. (2024) investigate the integration of financial technology into rural areas in several West Java regions of Indonesia. The findings are dedicated to how technologies nurture financial literacy, hence increasing resilience. The aforementioned studies, put together, outline the possibility that financial literacy could turn out as a path toward economic sustainability within rural communities, hence justifying focused research on smallholders in Malaysia.

Despite the existing literature on financial literacy and entrepreneurship, some gap still exists in exact effects that it has on rural smallholders, particularly in Malaysia. Most of the studies, such as Hainzer et al. (2023) and Adegbite et al. (2021) look at general impacts of financial literacy without addressing the specific challenges faced by smallholders and how technology has made financial management easy. Besides, there is also a gap in the empirical research as far as a direct influence of financial literacy on business financial practice in small holder agriculture is concerned. This study will fill these gaps by examining how attitude towards financial literacy influences the financial literacy, and consequently the business financial practices of oil palm smallholders in Malaysia. Therefore, against the backdrop of the issues highlighted above, this study will contribute to the body of knowledge on how financial literacy is increasingly crucial to stimulating sustainable agriculture and economic robustness among rural entrepreneurships.

2. Literature Review

Sources for this literature review were identified through a cautious selection in relation to the themes of interest which focusing on financial literacy and smallholder entrepreneurship, between 2019 and 2024. A systematic search via Emerald Insight, Google Scholar, Scopus, and WoS has been carried out to retrieve those peer-reviewing journal articles that deal with the relationship between financial literacy and business financial practices in terms of bank loan, government grant and business performance among smallholders as well as relationship between financial literacy and technology. Such a review, in this case, represents existing knowledge and thus can be viewed as a reliable starting point of the research.

2.1 Financial Literacy in the Context of Smallholder Entrepreneurship

Financial literacy is an important competence in entrepreneurship, especially in micro and small business enterprises. It provides insight into the proper attitude and knowledge of handling finance in the right direction and making appropriate decisions towards securing the future (Zaimovic et al., 2023). In the perspective of smallholders, particularly in developing regions, the capability for survival and growth rests in their financial literacy. Recent research has pointed to the significance of financial literacy in enhancing smallholders' entrepreneurial abilities. For example, Kwaramba et al. (2022) argue that the ability to attain financial literacy enables smallholders to acquire the relevant competencies in making informed decisions on finances, hence core in their sustainability of business operations. While such research is of great significance in providing valuable insights, such a body of literature often misses the nuances in what the smallholders are facing in various agricultural sectors. This indicate that this study is vital as it is considering unique contexts of different smallholder groups particularly in Malaysia

2.2 Relevance of Financial Literacy in Entrepreneurship

There is significant evidence linking financial literacy with entrepreneurial success. The fact that it does not deal with basic financial management, but it goes up to strategic decision-making which may crucially affect business viability. According to Raza et al. (2023), a financially literate entrepreneur will be better prepared to deal with the market fluctuations and investment decisions. However, most literature discusses financial literacy in general but does not specifically point to the exact competencies of a smallholder entrepreneur, such as market intelligence and cost-benefit analysis in farming practices. This is because, to smallholders, it encompasses not only cash flow management or loan access but also market intelligence, cost-benefit analysis in various farming practices, and future investment decisions. As such, according to Ullah et al. (2024), the level of financial viability of the business enterprises of smallholders, profitability and survivability over time are influenced to a great extent by their level of financial literacy. Thus, this study is significant as it is targeting the specific financial literacy needs among smallholders.

2.3 Financial Literacy and Business Performance

A growing number of studies associate financial literacy with improved business outcomes of smallholders. For instance, Avdeenko et al. (2019) found that small entrepreneurs who were financially literate tended to handle their finances more favorably, hence posting positive business results. This can be supported by Raza et al. (2023), which they found that higher financial literacy level associates with better credit access and improved business outcome. In the agriculture-based industry, a proper understanding of finances is important. According to various research, it is shown that small-scale farmers who understand financial literacy can possibly diversify their sources of income, invest in productive assets, and reduce the risks occurring in agriculture due to sudden weather conditions as well Amfo and Ali (2020). However, most studies fall short in discussing how financial literacy translates into better business performance, with most ignoring how contextual issues like local economic conditions and access to financial services influence this. In fact, this is so crucial in the case of oil palm smallholders since they depend on one crop and are thus very prone to changes in market conditions. Therefore, this study will fill the gap by providing deeper approach regarding such a relationship.

2.4 Challenges in Financial Literacy Among Smallholder Entrepreneurs

The difficulty with financial literacy acquisition for smallholder entrepreneurs continues to be very acute, despite the acknowledged critical role for financial literacy. Among these, as identified by Dalal and Habib (2023) and Derbyshire et al. (2023) smallholders have limited access to educational resources and inadequate tailored financial literacy programs targeting this stratum. In most developing countries, rural education hardly emphasizes financial literacy, and the absence of specific programs exacerbates this gap. Moreover, most smallholders rely on informal financial systems that reduce their exposure to the benefits accruable from formal financial services (Masinde, 2019; Mpofu & Sibindi, 2022). Cultural factors also apply. People in some communities either distrust formal financial organizations or unaccustomed with dealing with them, which pushes them toward the informal means of saving money, which include the ROSCA. These methods can be particularly helpful, but they lack the same growth and security as the formal products do (Mamuye, 2021; Mutsonziwa & Fanta, 2020). Although these research identifies most of the challenges facing smallholders, details about how to solve these problems and strategies for overcoming their existing situation are not usually developed. Addressing this gap through this study becomes vital for devising appropriate interventions that will improve financial literacy among smallholders.

2.5 Impact of Financial Literacy on Access to Financial Services

Financial literacy strongly enhances the propensity of smallholders to access any form of financial services. Xu et al. (2020) present evidence that individuals who are financially literate have a higher possibility of using formal financial institutions. Furthermore, it has been recorded that people who are low in financial literacy have lower bank account opening, lower loan taking, and insurance buying (Lusardi & Messy, 2023; Xu et al., 2022). On the contrary, financially literate people can often get better lending terms since they understand the terms of borrowing. Without that knowledge, smallholders easily fall into the trap of predatory lending, which can further lead to spiraling debt, according to Choudhury et al. (2020). However, most literature has failed to consider some other socio-economic factors that could influence access to these services, such as gender and location. Therefore, this study will provide more comprehensive information on financial literacy about access to financial services.

2.6 Role of Technology in Promoting Financial Literacy

Application of technology in finance literacy programs introduced new avenues through which financial capabilities among smallholders can be enhanced. Recent literature, for example, Frimpong et al. (2022), identified how it is possible to distribute knowledge on finance using digital instruments and mobile phone applications. This is in line with Carlin et al. (2022) which stated that technology can make financial information real-time, personalized advice, and management tools (Rauf et al., 2019; 2023). Various mobile-based programs on financial literacy have been implemented successfully in a number of developing countries by way of giving the farmers access to information which was not previously readily available (Batista & Vicente, 2020). Nevertheless, most such studies, while relevant in using technology, have remained silent on the knowledge gap existing on the prevailing digital divide between smallholders, particularly from the rural setups. This is because, digital platforms reduce barriers for smallholders in their access to suitable credit, savings, and insurance product. Even some of the fintech companies extend microloans based on transaction history and mobile usage, which assist those smallholders who do not have traditional credit scores in the first place (More & Aslekar, 2022). Hence, this study is crucial as it is focusing on how best to bridge the divide so as to realize equal opportunities in technological resources.

2.7 Financial Literacy and Technological Adoption

The relationship between financial literacy and technology adoption is one aspect that has been catching up with relevance in the digital economic era for managing finances. Those entrepreneurs who know how to manage their money are more likely to adopt the tech tools that can better their business; things like digital payments, mobile money, and financial management software that can improve efficiency and profits. This is in line with Kakinuma (2022) and Silitonga et al. (2023), which stated that higher financial literacy could also mean greater financial technology adoption. Su et al. (2021) and Wang and He (2020) further stated that financial literacy among smallholders can maximize the benefits from technology to foster sustainable development in rural settings. The literature, however, tends to miss the specific barriers to the adoption of such technology by smallholders, such as lack of training and infrastructure. This oversight shows that this study is vital as it is investigated on how financial literacy can enable technological adoption amongst smallholders for eventual better business performance.

From the literature reviewed above, it can thus be stated that the main objective of this study are indirectly connected to investigating the trend in attitude toward financial literacy in determining the financial literacy and the resultant business financial practices of oil palm smallholders in Malaysia; and its relation to the contribution of technology in improving financial management. This study has noted, through critical review of recent studies, a lack in the existing literature regarding how such technological use in rural areas is being applied. This understanding will inform the methodology that shall employ quantitative surveys so as to capture comprehensive data on the financial practices of smallholders. It will dwell on how financial literacy and the adoption of technologies relate to the performance of the business, making the insight both relevant and actionable by policymakers and financial institutions.

3. Theoretical Framework

This study adapted form of the conceptual framework proposed by Lusardi and Mitchell (2014), where financial literacy is based on the core of optimal financial decision-making processes. A positive attitude towards financial literacy would, therefore, raise the financial literacy among the smallholders, and this would translate into improved business financial practice. The present study departs from the existing theories by including a place for technology within the financial literacy programs; it even goes further to argue that such knowledge gaps and financial outcomes for oil palm smallholders might be resolved with the help of certain digital tools. Theoretically, this extension is important for any explanation of financial literacy dynamics within smallholder entrepreneurship.

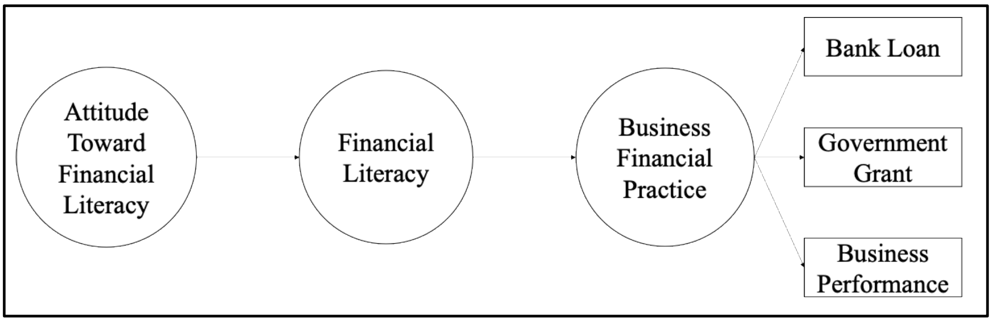

Fig. 1. Theoretical Framework

4. Methodology

This study utilize SEM to analyze the complex relationships among attitude towards financial literacy, financial literacy, and business financial practices of Malaysian oil palm smallholders. The appropriateness of SEM in this study is due to the fact that it allows considering multiple interdependent relationships, thereby capturing both direct and indirect effects (Hair et al., 2016). SEM enables researchers to test theoretical models involving latent constructs such as attitude toward financial literacy and business financial practice, providing a comprehensive understanding of the multidimensional impact of financial literacy on smallholder outcomes (Kline, 2015). This method is useful in contexts where the variables are related, enabling us to see how the financial literacy influences business financial practice, both directly and how the financial literacy mediates its effect between attitude toward financial literacy and business financial practice.

4.1 Respondent Details

This study utilized the stratified sampling in order to select the respondent within the regions. There are 216 smallholder entrepreneurs selected from six regions in Malaysia, represented by a response rate of 14.4% from the questionnaires distributed. The sample was drawn with considerations for diverse demographics of age, gender, education level, and years of experience in oil palm cultivation, while most were service sector, at 50.9%, followed by retail and wholesale at 40.7%, and manufacturing at 8.3%. In contrast, diversity provides an avenue toward how different levels of financial literacy might have differing influences on enterprise performance in diverse contexts. The highly valued representativeness of the sample allows for very useful generalization of the findings into insights applicable within a wider population of smallholder entrepreneurs in Malaysia.

4.2 Data and Instruments

These data were obtained through the administration of a structured questionnaire, capturing information on the profile of the respondents, attitude towards financial literacy, financial literacy, business financial practices in terms of experiences in securing bank loans, government grants, and business performance. The five-point Likert scale was employed throughout the instrument, with the use of the terms ‘strongly disagree’ and ‘strongly agree’ corresponding to each item. In designing this, consideration was made towards adapting the existing and validated instruments in a manner that best suits the objectives of this study concerning oil palm smallholders. This will give insight into the financial behaviors and challenges experienced by smallholders, hence enabling a better understanding of the relationship between financial literacy and business financial practices.

4.3 Data Collection

Various steps had been taken to make the research more reliable and transparent. The sampling frame developed was based on the 2018 Felda Annual Report, which estimated about 26,000 registered smallholder entrepreneurs in Malaysia, with the total number of questionnaires distributed amounting to 1,500 in six regions, targeting regions with high concentrations of smallholders. The collection process was carried out on November 2019 by online through Google Form, right before the COVID-19 pandemic, hence it is representative of the level of financial literacy at a period prior to the occurrence of economic disruptions. Follow-up reminders were provided for increasing the response rate after initial distribution across respondents. This helps retain an appropriate sample size for statistical analysis. Upon collection, questionnaires were checked for completeness and consistency. The data were then analyzed using SmartPLS to ensure that consistency was maintained, and human error was minimal during data entry. Also, the whole process of sampling and data collection was designed to lessen bias and enhance the validity of results. The whole study, in short, is aiming at getting reliable results that will actually reflect the real landscape of financial literacy among smallholder entrepreneurs in Malaysia through a structured manner of sampling and data collection.

5. Results and Discussions

The analysis has given important highlights of the interesting linkage that exists between financial literacy and business performance among oil palm smallholders in Malaysia. The mean score on financial literacy was 61.1%, representing a relatively moderate level of financial literacy among the subjects. Results from the hypothesized model using Structural Equation Modelling indicated that a positive attitude toward financial literacy enhances the level of financial literacy, while a high level of financial literacy enhances business financial practices. These practices are very vital in accessing bank loans and government grants for enhancing business performance. This is in line with the previous studies by Ntakyo et al. (2021), which indicated that financial literacy training develops management skills in finance and enables the rural entrepreneur to run the business sustainably. In this context, financially literate smallholders are likely to undertake good budgeting, follow through with expenses, and loan repayments that contribute to the performance of the business.

At the same time, referring to the literature, a variable would be acceptable if it has the outer loading of at least 0.7. From Table 1, all items in the study had Cronbach's Alpha and Composite Reliability scores above 0.7, assuring this model was well fitted for internal consistency and convergent validity. Further and subsequently, each item also obtained AVE above 50% (Hair et al., 2016).

Table 1 - Construct Reliability and Validity

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Attitudes towards financial literacy	0.849	0.897	0.689
Financial practices	0.885	0.908	0.526
Business performances	0.885	0.912	0.634
Government loan/grant performance	0.845	0.883	0.721
Bank loan performance	0.864	0.915	0.784

The purpose of discriminant analysis was to show that each of the constructs was different. Using both the Fornell and Larcker (1981) criterion and the cross-loading techniques, the study checked on the discriminant validity by comparing squared correlations with other latent constructs. As indicated in Table 2, all correlations are lower than the square root of AVE; thus, the model has discriminant validity.

Table 2 - Discriminant Validity

	Attitudes towards financial literacy	Bank loan performance	Financial practices	Business performance	Financial literacy	Government loan/grant performance
Attitudes towards financial literacy	0.830					
Financial practices	0.489	0.402	0.725			
Business performance	0.390	0.364	0.549	0.797		
Financial literacy	0.238	0.062	0.207	0.196	-	
Government loan/grant performance	0.118	0.564	0.252	0.251	0.012	0.849
Bank loan performance	0.346	0.885				

From Table 3, it can be observed that all the VIF values were less than 10; hence, no problem of collinearity exists among variables. It has been reveals that through R^2, attitudes account for 5.7% of the variance in financial literacy, while financial literacy explains 4.3% of the variance in financial practices among smallholders. Financial practices, on one hand, explain 16.2% of bank loan performance, 6.3% of government grant performance, and 30.2% of overall business performance.

Table 3 - Path Coefficients

	Original Sample	Standard Deviation	T Statistics	VIF
Attitude → Financial literacy	0.238	0.058	4.129***	1.000
Financial literacy → financial practices	0.207	0.069	2.989***	1.000
Financial practices → Government loan/grant performance	0.252	0.070	3.610***	1.000
Financial practices → Bank loan performance	0.402	0.072	5.551***	1.000
Financial practices → Business performance	0.549	0.045	12.165***	1.000

The path analysis in Figure 1 revealed that the associative path between attitude towards financial literacy and financial literacy was 0.238; between financial literacy and business financial practices was 0.207 and affect access to financial resources represented by coefficients for government loans at 0.252, bank loans at 0.402, and business performance at 0.549. All associations are significant at $p < 0.001$. These findings are supported by previous studies that show that increased financial literacy means better financial management and access to credit (Hasan et al., 2021; Yuwono et al., 2023) The finding by Anshika and Singla (2022) and Widyastuti et al. (2023) affirms this hypothesized relationship, noticing that financially literate entrepreneurs are more likely to obtain finance for expanding their businesses, while Owusu et al. (2019) only pointed out that financial literacy improves SMEs' access to credit.

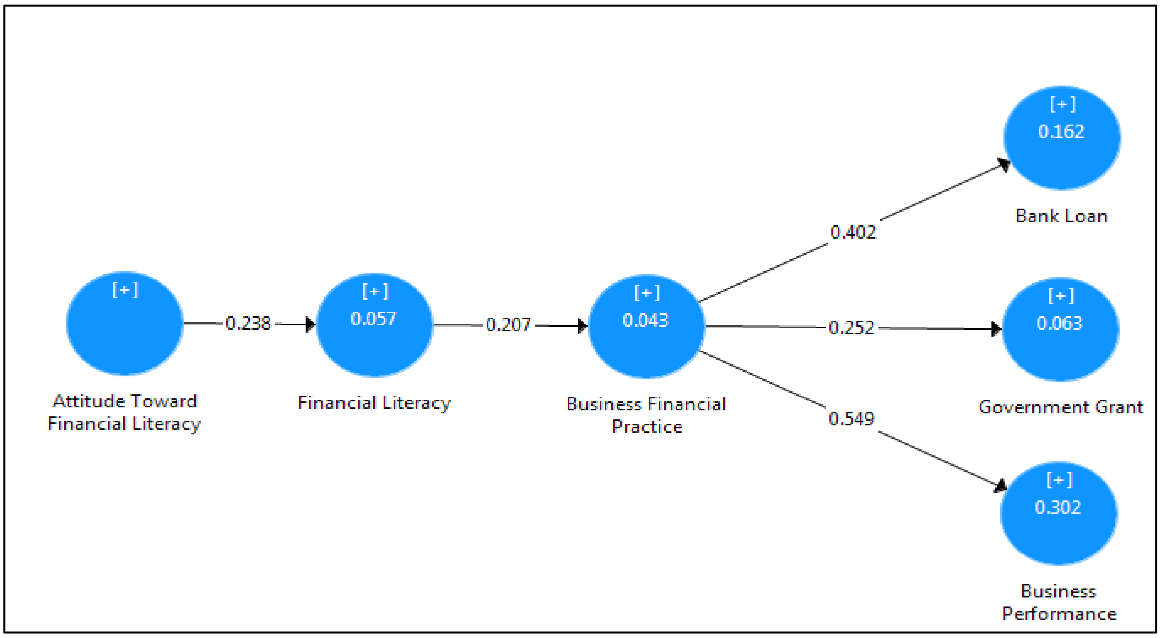

Fig. 2. Path Analysis

In this regard, this study contributes to the literature, as it has shown with specificity how certain attitudes toward financial literacy have a positive impact on business financial practices and, hence, business performance. The novelty of this study is that financial literacy does have a measurable effect on access to credit and grants, which is not yet particularly well-documented in the literature for Malaysian smallholders. This is important because these findings imply that financial literacy improvements have dividends on actual gains in terms of financial access and hence the long-term viability of smallholders' businesses. The study also identified how such gaps in financial literacy for smallholders can be bridged by digital tools. The integration of mobile banking apps and educational platforms can empower smallholders with real-time information and personalized advice, enhancing their ability to make informed financial decisions (Qonita & Wandebori, 2023). This aspect aligns with recent trends in fintech development aimed at improving access to finance for underserved populations (Lagna & Ravishankar, 2022).

The implications of this study transcend the mere context of oil palm smallholders in Malaysia or other smallholders in developing countries who are constrained by the same financial resources and could thereby also benefit from financial literacy programs tailored to their needs. The emphasis on financial literacy as a driver of business financial practice would suggest that such interventions might usefully be scaled up to enhance the financial capabilities of smallholders worldwide. Policymakers could help in promoting sustainable rural entrepreneurship by providing the relevant financial skill to the smallholders so that they achieve resilience and growth across diverse agricultural sectors.

Thus, this present study identified the key contribution of financial literacy towards improving the business financial practices on aspects of government loans, bank loans, as well as business performance of oil palm smallholders in Malaysia. The findings deduce that high levels of financial literacy come with the best business financial practices, hence easy access to all forms of finances. This study shall help in developing the understanding of how financial literacy could be leveraged in supporting the smallholder entrepreneurs in pursuit of sustainable business outcome.

6. Theoretical and Practical Contribution

This study has pointed out the need for smallholders to appreciate financial literacy skills in order to positively influence business financial practices, in term of bank loans, government grants and business performance. Financially literate smallholders are more empowered to engage in proper financial management, which may translate into better business performance and ultimately bring economic stability. Theoretically, this study moves the literature on financial literacy one step forward by showing the multidimensional influence it can have on rural entrepreneurship. Since this study links financial literacy with business financial practices, it corroborates the theory of financial knowledge being an integral part of smallholders' economic resilience. Practically, this implies that focused financial literacy programs, especially those using digital tools, might offer a way to enhance the financial management capabilities of smallholders. Policymakers and financial institutions should thus develop financial education programs that assist rural entrepreneurship through financial access programs aimed at enhancing the budgeting skills, debt management, and usage of digital tools for better financial decisions. Furthermore, long-term sustainability would also be further facilitated.

7. Conclusion and future research

This study puts into perspective the greater role of financial literacy in the context of rural economies and is instructive in informing policy as well as future research. Future research could investigate the long-term impact of financial literacy programs targeting rural entrepreneurship and how technology might play a complementary role in enhancing the financial literacy outcomes, thereby encouraging the broadening of efforts toward better knowledge on how to support smallholders in their financial journey. Secondly, comparing studies on the experiences of smallholders in various regions would greatly contribute to developing an understanding of how financial literacy shapes the resilience of rural businesses around the world. Such an understanding would require additional investment in financial education as one means of securing sustainable economic growth amongst smallholders. Finally, it would be useful to examine how government policy and financial institutions can cooperate to upscale financial education programs in support of sustainable rural development.

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