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FINANCIAL LITERACY, INFRASTRUCTURAL FACILITY AND FINANCIAL INCLUSION OF MICRO, SMALL AND MEDIUM ENTERPRISE OWNERS IN NIGERIA

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ABSTRACT

More than two billion micro, small and medium enterprise (MSME) owners worldwide lack access to financial accounts, while others have sporadic use of financial services. Previous efforts to address this issue primarily focused on financial institutions providing affordable banking products. This study examines the effect of financial literacy on financial inclusion as moderated by infrastructural facilities. The study encompasses 11,289 MSME owners in Ondo State, Nigeria, using exploratory research design. Data was analyzed using descriptive statistics and structural equation modeling (PLS-SEM). The findings indicate that independent variables explain 76 percent changes in the dependent variable, with a standardized regression estimate (SRE) of 0.74, significant at 0.05. Additionally, the study finds that infrastructural facilities partially mediate the correlation between independent variables and dependent variable, with coefficient of 0.274, significant at $p< 0.05$. As a result, the study suggests the implementation of financial inclusion programs, including financial literacy initiatives integrated into school curricula and community programs, to enhance financial knowledge, experience, and awareness among MSME owners in the study areas. Furthermore, the study recommends infrastructural facilities such as mobile phones and mobile internet access to address specific financial inclusion challenges.

Keywords: Financial literacy, infrastructural facility, financial inclusion, MSMEs owners.

INTRODUCTION

More than two billion MSME owners globally lack access to financial accounts, and recent efforts to address this issue have shifted towards enhancing demand-side factors, particularly financial literacy. Initiatives and policies aims to bolster financial literacy encompassing knowledge, awareness, and experience. Prior studies, such as Allen (2016), Klapper and Lusardi (2020), Barajas (2020), and Cole (2021), have demonstrated a causal link between financial literacy and financial inclusion, emphasizing the benefits that knowledgeable MSME owners could reap from the use of formal financial services. The provision of formal financial services has increased due to its significant to the economic growth and development. Financial inclusion is now recognized as an antidote to the high rate of unemployment in the country. Despite the importance of financial inclusion, achieving high levels of financial inclusion remains a global challenge, with a substantial number of MSMEs owners worldwide lack access to formal financial services, particularly in developing economies like Nigeria. The major challenges of financial inclusion in Nigeria were the slow adoption of seamless financial technology, connectivity issues, and concerns about fraud and security among MSMEs owners in Lagos State. Additionally, inadequate infrastructural facility such as mobile phones, mobile internet, and ATMs, poses barriers to financial inclusion, especially in rural areas. Although advancements in digital banking have improved accessibility, but financial exclusion still persists among the MSMEs owners, driving many MSMEs owners to rely on informal financial services with higher costs and risks. Financial literacy empowers MSME owners to make prudent financial decisions, as emphasized by scholars such as Pahlevan and Sharif (2020). To enhance financial inclusion in the study area, this research aims to foster a supportive environment, streamline the regulatory framework, and improve product design and outreach to encompass all categories of MSME owners. This will be achieved through the provision of adequate infrastructure, which is expected to address cost-related and physical barriers to accessing formal financial services. Consequently, it becomes essential to examine the mediating role of infrastructure facility in the relationship between financial literacy and financial inclusion of MSMEs owners. Furthermore, the presence of infrastructural facility like mobile phones and internet access enhances the capacity of financially literate MSME owners to navigate financial services efficiently and effectively.

Despite the potential of digital banking to expand financial inclusion, inadequate infrastructure, high costs, and low awareness hinder its uptake among MSMEs owners, particularly in rural areas. Addressing these challenges is crucial for bridging the gap between financial service availability, accessibility, and utilization among MSMEs owners. Given the above discussed, the study intends to provide answers to the hypotheses below:

H^1: There is relationship between financial literacy and financial inclusion of MSMEs owners in Ondo State, Nigeria.
H^2: The infrastructural facility mediates the connection between financial literacy and financial inclusion of MSMEs owners in Ondo State, Nigeria.

This study delves into various nations' strategies to bolster financial inclusion, tailored to their economic dynamics and local demographics. Some countries prioritize alternative financial entities like microfinance institutions and Self-Help Groups to extend services to marginalized communities, while others focus on enhancing existing products and infrastructure to overcome barriers hindering MSMEs' access to modern financial services. There is prior empirical evidence related to this study, for instance, Srinivasan (2019) used survey data to measure the nexus between financial literacy and financial inclusion of SMEs owners in Belgium and France. The findings reveal that financial literacy significantly influences financial inclusion of MSMEs owners. However, the finding was conducted at a point in time which does not allowed for the study of trend over time. Kpodar (2021) investigated the determinant of financial inclusion among the Africa's countries. The findings reported that a significant number of Africa's populace does not have access to formal financial services with financial literacy and infrastructural facility acting as hindrances. Nonetheless, the study incorporated both geographic and demographic outlets in an index and which may overstate the level of financial inclusion in the study areas. Ortega (2019) used a methodology similar to Tran, Nguyen, & Nguyen (2018) to measure the effect of demand and supply-side factors on household financial inclusion. The findings reported that financial literacy and infrastructural access play a significant role in household financial inclusion. But unfortunately, equal weight was assigned to each variable and in reality, they might have different contributions. Abdullahi (2024) used push-pull theoretical framework to investigate the determinants of financial inclusion in Nigeria. The findings reported that factors such as level of income and education, literacy rates, level of awareness, risk preference and social network significantly influence financial inclusion of MSMEs owners in Nigeria. However, the study shared the same limitations as Srinivasan (2019). Similarly, Chukwumeka (2024) identifies illiteracy as major obstacle of financial inclusion of MSMEs owners in Nigeria, while Roux (2022) highlights the impact of trust, education, age, and internet access on financial inclusion of SMEs owners in Zimbabwe. This study has the same limitation as his prior study. Moreover, Punam (2020) examines factors affecting financial inclusion of SMEs owners in India, emphasizing the role of financial experience and awareness. However, this study used a subjective methodology as noted in the case of Srinivasan (2019). Toyebi (2023) investigates the impact of transaction costs' on MSMEs' access to credit facility in Nigeria, emphasizing high interest rates and collateral requirements as major barriers. Sapana and Thakur (2019) measured the impact of mobile banking on financial inclusion in India. The findings reported a positive and significant impact of mobile banking on access to financial services. Similarly, Tran, Nguyen, & Nguyen (2018) reported that maintaining financial intermediary accounts promotes mobile money usage in Vietnam, and consequently enhancing financial inclusion. Joseph and Varghese (2020) analyzed the impact of financial inclusion on India's economy, focusing on indicators like ATM utilization and bank branch density. However, the use of ATM was considered using land area and population which may overstate the usage of ATM.

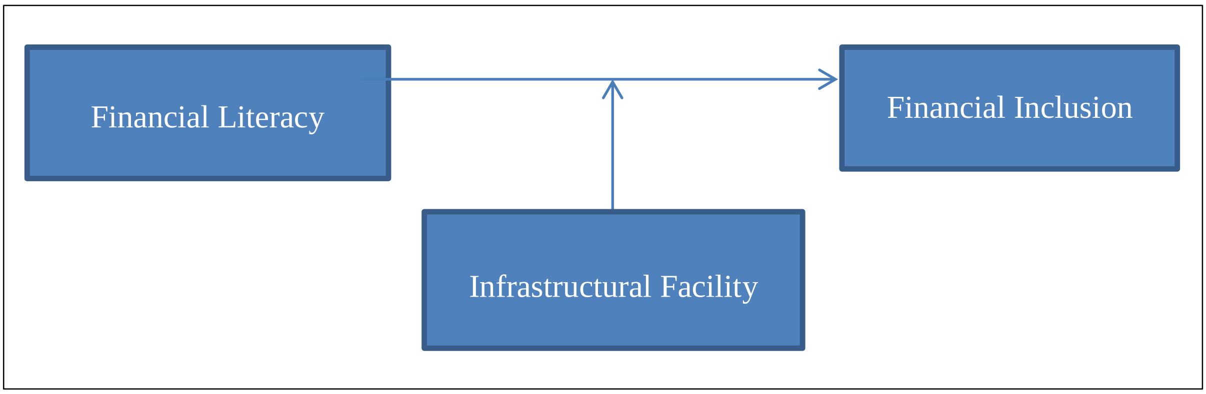
Yilmaz, Marius, and Dragos (2021) investigated the relationship between mobile phones and internet usage on access to finance in European Countries. The finding reported that mobile phone and internet significantly influence access to finance among European Countries. Andrianaivo (2022) established a positive correlation between mobile phone penetration and financial inclusion in African countries. In the same vein, Bruneau (2022) and Arvidsson (2024) reported that mobile phone penetration promotes financial inclusion, though security concerns still persist among the users. Zeng (2024) and Barik (2023) revealed a positive association between mobile phones, internet growth, and financial inclusion in Cambodia and SAARC countries, respectively. Kwenda (2024) identifies an unidirectional causality from financial inclusion to mobile phones in various countries. Similarly, Anand (2017) demonstrates the positive relationship between ICT indicators and financial inclusion globally, suggesting ICT development as a means to enhance financial inclusion. Kimty (2019) investigate the impact of electronics banking on access to finance in Cambodia. The findings reveal that electronics banking does not have significant impact on access to finance. However, this finding was provided for a single period, which does not allow for comparisons over years. Miguel (2020) reported that mobile technologies and access to finance contribute to higher incomes in East Indonesia. Adio (2020) also highlights financial institutions as key drivers of financial inclusion in Sub-Saharan Africa. However, this study does not construct an index but accounted for some of the indicators individually.

Akwasi, Boafo, and Francis (2023) applied ordinary least squares regression to examine the influence of financial literacy on the savings behavior of students in tertiary institutions. The study revealed that financial literacy levels among these students were moderate, particularly among those pursuing business and management science courses. This may be attributed to the finance-related nature of their academic programs compared to other fields of study. Additionally, the findings indicated that most respondents, regardless of age group, believed that seeking financial information and advice significantly influenced their decision-making. However, the study did not permit an analysis of trends over time. Abdulrasaq and Abdullahi (2023) investigated how tax enforcement strategies could effectively address non-compliance with tax regulations among SMEs in North-West Nigeria. The study employed quantitative data collected from 345 SME owners, selected through a combination of random and purposive sampling methods, who were duly registered in the region. Using both descriptive and inferential statistical analyses, including measures of central tendency and multiple regression, the study found that three tax enforcement strategies—utilizing tax clearance certificates ($\beta=0.024 < 0.003$), granting tax amnesty ($\beta=0.025 < 0.020$), and imposing tax penalties ($\beta=0.013 < 0.014$)—had a significant positive impact on improving tax compliance among SMEs in the area. Overall, this study underscores the importance of synchronizing financial literacy and infrastructural facility to promote financial inclusion effectively.

The theoretical framework of this study is based on financial literacy theory. Financial literacy was initially introduced by Noctor, Stoney, and Stradling (1992) and has since been refined by Jump and Coalition (1997) as the ability to make informed decisions and manage finances effectively. Scholars have expanded on this concept over time, with Atkinson and Messy (2022) highlighting that financial literacy encompasses not only financial knowledge but also awareness, skills, attitudes, and behaviors necessary for making sound financial decisions and improving personal well-being. It's important to recognize that financial literacy goes beyond mere knowledge and includes a broader spectrum of competencies essential for effective financial management. However, the criticisms of financial literacy theory were the theory often assumes that individuals, once educated, will make rational financial decisions, while overlooks the emotional, social, and cognitive biases that influence decision-making such as overconfidence and procrastination. Also, prior studies reported a mixed result regarding the long-term effectiveness of financial literacy programs because many MSMEs owners struggle to retain and apply what they learn in real-world contexts (Lusardi & Mitchell, 2014).

Figure 1

Conceptual Model on Financial Literacy, Infrastructural Facility and Financial Inclusion



Author's Conceptualization, (2024)

METHODOLOGY

This study employed an exploratory research design to examine the role of infrastructural facility as a mediator in the relationship between financial literacy and financial inclusion of MSMEs owners in Ondo State, Nigeria. The study specifically targeted MSMEs owners operating in Akoko North East, Akoko North West, Akoko South East, Akoko South West, Ondo East, and Ondo West Nigeria. These local governments were chosen due to high level of financially excluded and illiterate MSMEs owners in the study areas, as reported by FINSCOPE (2023). The total population of the study was 79,324, with a sample size of 384 MSME owners which was determined using Krejcie and Morgan (1960). Purposive sampling was employed to select these groups based on the significance of the respondents in the study area. Within each chosen local government, a random sampling method was applied to select 384 respondents through a lottery approach, wherein each MSME owner was assigned a number, and participants were randomly chosen to reach the desired sample size. Among these respondents, adult representatives aged between 18 to 65, who were MSME owners, were purposively selected. The questionnaire items were adapted from the work of Atkinson and Messy on financial literacy (2022). The collected data underwent analysis using descriptive statistics along with inferential statistics with the aid of the Social Sciences Package for Social Sciences (SPSS) and Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the formulated hypotheses in the study.

Financial literacy was assessed through financial awareness, experience, and knowledge. The indicators for financial literacy utilized in this research were derived from the framework developed by Atkinson and Messy (2022). The specific items comprising the financial literacy construct are detailed in Table 1.

Table 1

Financial Literacy

Financial Literacy
1. FL_1- I am knowledgeable about the interest rates imposed by financial institutions.
2. FL_2- I regularly review my personal financial statement.
3. FL_3- I always try to diversify my investments.
4. FL_4- I consistently assess financial products before making any decisions.
5. FL_5- I have an experience in managing my bank accounts

Source: Atkinson and Messy financial literacy (2022)

The indicators for infrastructural facility in this study were sourced from the framework outlined by Atkinson and Messy (2022). The specific items comprising the infrastructural facility construct are detailed in Table 2.

Table 2

Infrastructural Facility

Infrastructural Facility
1. IF_6- I am confident that I can use my phone to perform banking operations.
2. IF_7- I am confident that there is always internet on my phone.
3. IF_8- I have the capability to obtain a loan from the bank using mobile applications.
4. IF_9- I use my mobile phone to efficiently manage my financial goals.
5. IF_{10}- There is ease and usable access to internet in my financial institution

Source: Atkinson and Messy financial literacy (2022)

The indicators for financial inclusion in this study were drawn from the financial inclusion construct employed by Atkinson and Messy (2022). The specific items constituting the financial inclusion measure are outlined in Table 3.

Table 3

Financial Inclusion

Financial Inclusion
1. FI_{11}- There is good road providing access to the nearest formal financial institution.
2. FI_{12}- I reside within less than 1 kilometer from an ATM, which make it easy to access my account.
3. FI_{13}- I've utilized my savings account to set aside funds for future expenses.
4. FI_{14}- I've utilized mobile money services to receive funds.
5. FI_{15}- I receive prompts assistance when encountering issues with my transactions.

Source: Atkinson and Messy financial literacy (2022)

RESULTS

The descriptive statistics revealed that in the selected local government areas of Ondo State, there were a greater percentage of male respondents (72.9%) in comparison to female respondents (27.1%) among the MSMEs owners. This gender imbalance suggests a prevalence of male entrepreneurs in the sample, possibly reflecting broader gender disparities in entrepreneurship within the region. Analysis of marital status among respondents reveals that single individuals comprised the largest percentage (42.7%), followed by married individuals (38.8%), and then divorced individuals (18.5%). This diversity in marital statuses among MSMEs owners participating in the study is notable. Regarding academic qualifications, a significant number of MSMEs owners have secondary education (26%), followed by tertiary education with (22.4%) and primary education (16.1%). Additionally, there is presence of MSMEs owners with advanced degrees such as M.Sc. with (17.7%) and PhD with (17.7%). This variation in educational backgrounds suggests a mix of skills and expertise among MSMEs owners in the study area. Professional qualifications held by respondents also demonstrate diversity, with ICAN (34.4%) and ANAN (19.5%) being the most common one. 18.2% MSMEs owners have CIBN, while 9.6% MSMEs owners have other qualifications which contributes to this diversity, while a notable percentage (18.2%) indicated no professional qualifications. This distribution indicates a range of specialized knowledge and training among MSMEs owners. Categorization of MSMEs based on size shows that small-sized MSMEs owners constituted the majority (50%), followed by micro-sized SMEs (32.8%) and medium-sized SMEs (17.2%). This breakdown offers insights into the prevalence of small-scale entrepreneurial ventures in selected local governments in Ondo State. These summaries provide concise descriptions of the demographic characteristics of MSMEs owners in the region, covering gender, marital status, educational and professional qualifications, and the distribution of MSMEs owners by sizes.

Table 4

Demographic characteristics of the MSMEs owners

Characteristics	Category	Frequency	Percent
Gender of Respondents	Male	208	72.9
	Female	104	27.1
	Total	**384**	**100.00**
Marital Status	Single	164	42.7
	Married	149	38.8
	Divorce	71	18.5
	Total	**384**	**100.00**
Academic qualification	Primary	62	16.1
	Secondary	100	26
	Tertiary	86	22.4
	M.Sc.	68	17.7
	Ph.D.	68	17.7
	Total	**384**	**100.00**
Professional qualification	ICAN	132	34.4
	ANAN	75	19.5
	CIBN	70	18.2
	Others	37	9.6
	None	79	18.2
	Total	**384**	**100.00**
Category of MSME Owners	Micro	126	32.8
	Small	192	50
	Medium	66	17.2
	Total	**384**	**100.00**

Source: Author's Computation, (2024)

A measurement model was developed using Analysis of Moment Structures and Confirmatory Factor Analysis (CFA). This analysis was conducted on 384 participants to assess its reliability and validity. The evaluation of CFA results relied on various criteria, including model fit indices, standardized CFA loadings, Cronbach's alpha, composite reliability, and average variance extracted (Hair, 2018). Composite reliability values for all variables ranged from 0.814 to 0.890, indicating satisfactory levels of reliability according to Hair's criteria. Consequently, all reflective variables in the study demonstrated appropriate internal consistency and reliability. Similarly, Cronbach's alpha values for all variables ranged from 0.854 to 0.901, indicating acceptable to excellent levels of internal consistency (Hair, 2018). Additionally, the reliability and validity of the constructs were confirmed through composite reliability (CR), exceeding the benchmark of 0.70 for all constructs, as shown in Table 5. Convergent validity was established using Average Variance Extracted (AVE), which surpassed the benchmark of 0.50 for all variables, as stated in Table 5.

Table 5

Internal Consistency Reliability and Convergent Validity

Variables	Items	Loading	CA	CR	AVE
Financial Literacy	FL_1	0.803	0.882	0.880	0.693
	FL_2	0.791			
	FL_3	0.743			
	FL_4	0.681			
	FL_5	0.813			
Infrastructural Facility	IF_1	0.921	0.854	0.890	0.955
	IF_2	0.893			
	IF_3	0.761			
	IF_4	0.901			
	IF_5	0.807			
Financial Inclusion	F_{I1}	0.944	0.901	0.814	0.703
	F_{I2}	0.711			
	F_{I3}	0.799			
	F_{I4}	0.806			
	F_{I5}	0.722			

Note: FL: Financial literacy, IF: Infrastructural facility, FI: Financial inclusion.
Source: AMOS Output (2024)

The structural equation models outlined in Table 6 were employed to investigate whether there exists a noteworthy connection between financial literacy and financial inclusion, as posited in hypothesis One. Surprisingly, the results contradict this hypothesis, demonstrating a positive and statistically significant link between financial literacy and financial inclusion. This assertion is supported by a standardized regression estimate (SRE) of 0.74, with a critical ratio of 4.51, significant at the 0.05 level. Additionally, the substantial R^2 value of 0.76 suggests that financial literacy accounts for 76 percent of the variability in financial inclusion. This outcome aligns with prior studies such as Tran, Nguyen, and Nguyen (2018), which suggest that individuals with greater financial knowledge tend to make more informed financial choices. Furthermore, the analysis underscores the considerable influence of infrastructural facilities on financial inclusion, confirming hypothesis H_2 with an SRE of 0.87 and a critical ratio of 5.93. Access to infrastructural facilities empowers MSMEs owners to navigate financial exclusion challenges, enabling them to make informed financial choices and secure their financial well-being. Consequently, enhancements in infrastructural facilities lead to heightened financial inclusion, as MSME owners equipped with such resources feel more empowered and capable of managing their finances effectively, ultimately leading to greater satisfaction and overall financial inclusion. The importance of financial inclusion is particularly emphasized in regions where MSMEs encounter difficulties in accessing infrastructural facilities like mobile phones, mobile internet, ATM and POS as addressed in the study. The substantial R^2 value of 0.68 further indicates that infrastructural facilities account for 68 percent of the variance in financial inclusion. In addition, financial literacy theory provides a framework for understanding how knowledge gaps and infrastructural facility hinder access to formal financial services.

The Result of the Structural Equation Model was depicted in the table below;

Table 6

Path Coefficient/Direct Relationship

Hypotheses	Relationship	Std.Reg. Estimate	Critical Ratio	Decision	R^2
H_1	FL-FI	0.74	4.51	Supported	0.76
H_2	IF-FI	0.87	5.93	Supported	0.68

The mediation hypothesis H_2 was examined using an empirical approach outlined by Nagil (2019), with results presented in Table 7 detailing both direct and indirect relationships between financial literacy, infrastructural facilities, and financial inclusion. Despite the presence of infrastructural facilities as a mediator, direct effects remained significant, with the ratio of indirect to total effects stood at 0.274. These results strongly support the anticipated connection between financial literacy and financial inclusion, both directly and indirectly through infrastructural facilities. The result also indicates that financial literacy predominantly influences financial inclusion, as evidenced by the highest direct effect estimate. These findings are consistent with earlier research conducted by Musardi and Kitchell (2021) and Lusardi and Mitchell (2019). This suggests that financial literacy alone cannot explain financial inclusion; rather, the presence of supporting infrastructural facilities is also crucial, as noted by Mayer (2020). Notably, the validation of these findings across the overall sample population of MSME owners in the study areas underscores their significance. One plausible explanation for this validation is the widespread adoption of information communication technology by financial institutions, making it imperative for MSME owners to be financially literate to effectively utilize infrastructural facilities such as mobile phones and internet services. Thus, hypothesis H_2 was deemed partially supported.

Table 7

Analysis of mediation Result

Hypothesis	Relationship	Direct Estimate	Indirect Estimate	Total Estimate	Result
H_2	FL-IF-FI (H_2)	0.622	0.274	0.896	Partial mediation

It is significant at 0.05; FL- Financial Literacy; FI- Financial Inclusion; Infrastructural Facility
Source: AMOS Output (2024)

CONCLUSION

Drawing from these findings, the study presents empirical proof of a notable positive correlation between financial literacy and financial inclusion, with infrastructural support acting as a mediating factor in Ondo State, Nigeria. The mediation result shows that direct and indirect effects remain significant, with the ratio of direct and indirect to total effects stood at 0.622 and 0.274 respectively. These results strongly support the anticipated connection between financial literacy and financial inclusion, both directly and indirectly through infrastructural facilities. The findings also reported that factors such as financial knowledge, experience, and awareness positively and significantly influence the level of financial inclusion among individual MSME owners. It can be confidently inferred that enhancing financial literacy will bolster the capacity of MSME owners to achieve financial inclusion.

Recommendations

Fostering financial inclusion globally requires joint efforts from both governmental and private entities. Integrating financial literacy into initiatives is paramount to expand the scope of financial inclusion. Programs aimed at financial inclusion should incorporate educational initiatives, such as integrating financial literacy into school curricula and community programs, to boost understanding, experience, and awareness of financial matters among MSMEs owners in the targeted regions. Furthermore, ensuring the availability of infrastructural support, such as reliable mobile phone, internet services, ATM and POS are essential to address issues of financial exclusion in the study areas.

Contributions and Implication

This study contributes to the body of existing literature by investigating the interaction between financial literacy, infrastructural facilities, and financial inclusion of MSMEs owners in Ondo State. Unlike previous research, this study underscores the significance of infrastructural facilities alongside financial literacy in fostering financial inclusion, a dimension often overlooked by previous studies. Notably, subjective measures were chosen over objective measures to address inherent limitations, offering insights into how MSMEs owners perceive the impact of financial literacy and infrastructural facilities on financial inclusion of MSMEs owners. The implications of these findings are far-reaching, affecting policymakers, educational administrators, financial analysts, planners, and MSME owners. Policymakers can utilize these findings to design financial education programs aimed at empowering MSME owners. Additionally, given that MSME owners with low financial literacy are particularly vulnerable to online fraud and cybercrimes, the study emphasizes the importance of addressing these risks. To address the above stated risks, financial institutions should design a products and services that align with the literacy levels and needs of MSMEs owners, ensuring they are both accessible and comprehensible. Also, adequate infrastructure can amplify the benefits of financial literacy by enabling more widespread and effective use of financial tools.

Constraints and Avenues for Future Research

Study's constraints stem from a limited literature, particularly within the context of developing countries, hindering direct comparisons with its findings. This lack of access to local and developing country sources undermines the study's intended groundwork. Conducted solely in one state, replicating it across other states would be beneficial for broader empirical insights. The study employed a cross-sectional design, offering a snapshot of a specific point in time. In practice, the perceptions and behaviors of individuals and MSMEs owners evolve over time and across different contexts, which may require a longitudinal approach to gain deeper insights and a more accurate representation of the variables being examined. Conducting a long-term longitudinal study or randomized control trials (RCTs) could potentially enhance the findings. Future investigations might consider qualitative methodologies to examine how infrastructural facilities mediate the link between financial literacy and financial inclusion.

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