

THE INFLUENCE OF MICRO AND SMALL DEVELOPMENT WITH A NON-FORMAL EDUCATION MODEL AND COMPETITOR PRESSURE ON BUSINESS ACTORS READINESS TO ADOPT TECHNOLOGICAL TRANSFORMATION

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Abstract

The dynamic evolution of digital technology poses a critical challenge to the sustainability of Micro, Small, and Medium Enterprises (MSMEs) amid increasingly aggressive market competition. However, amidst these challenges, there is a significant digital divide among business owners. This study aims to analyze the influence of capacity building using a non-formal education model and competitor pressure on the technology adoption readiness of MSME entrepreneurs in Banyumas Regency. The research method is quantitative, with data collected through structured questionnaires administered to MSME entrepreneurs selected using random sampling. Data analysis was conducted using the SPSS statistical platform. The results of the analysis indicate that capacity building through a non-formal education model has a positive and significant effect on the technology adoption readiness of MSME entrepreneurs. Conversely, the analysis of the competitor pressure variable revealed that it has no significant effect on the technology adoption readiness or adoption rate of business owners. These findings indicate that internal capacity built through a foundation of comprehensive education and mentoring is far more significant than external threats in driving the digital transformation of MSMEs in Banyumas Regency.

Keywords: *MSMEs, Competitor Pressure, Nonformal Education, Technology Adoption, Entrepreneurs*

INTRODUCTION

The development of digital transformation within the global economic ecosystem has created disruptions that demand the emergence of new concepts in business operations (Mhlongo et al., 2024). The current era of the Fourth Industrial Revolution is characterized by massive integration and convergence between digital technology, biotechnology, and physical technology (Teixeira & Tavares-Lehmann, 2023). This phenomenon presents major challenges for business operators, both in terms of resources and operations. Success in navigating this disruption depends heavily on the level of readiness business actors have in adopting these digital technologies.

Readiness is therefore a crucial aspect that requires special attention in supporting the development of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia (Akhmad et al., 2023). In conceptual terms, readiness refers to an individual's overall state, encompassing knowledge, understanding, motivation, and skills in dealing with change (Violinda et al., 2023). In this context, business operators refer to individuals or business entities actively running MSMEs—that is, businesses owned by individuals or business entities that meet the criteria for micro and small-scale

operations (Qoriani et al., 2025). Legally, the classification of MSMEs in Indonesia is regulated by Government Regulation No. 7 of 2021 based on criteria for working capital and annual turnover, as presented in Table 1 below:

Table 1. MSMEs classification		
Bussines Type	Criteria	
	Capital	Revenue
Micro	Maximum 1 Billion	Maximum 2 Billion
Small	1-5 Billion	1-15 Billion
Medium	5-10 Billion	15-50 Billion

Source: Act No. 7 of 2021

MSMEs are the cornerstone of national economic stability in the era of the Fourth Industrial Revolution, employing 97% of the workforce and contributing more than 60% of the national GDP (Coordinating Ministry for Economic Affairs of the Republic of Indonesia, 2021; Sumardana & Damayanti, 2024). The flexible and adaptive nature of MSMEs has proven capable of serving as the frontline in facing crises, including during the post-COVID-19 pandemic recovery (Tambunan, 2023). Nevertheless, the dynamics of the Fourth Industrial Revolution and Society 5.0 require MSMEs to transform through the adoption of digital technologies such as social media and online marketplaces to adapt to global consumption trends (Saragih et al., 2024; Sulistyono et al., 2022).

However, this digital transition presents complex challenges in the form of limited digital literacy, inadequate infrastructure, and government support that is not yet inclusive (Anatan & Nur, 2023; Mardiana et al., 2024). These conditions have led to a significant digital divide among business owners (Mhlongo et al., 2024). This gap is heavily influenced by internal factors, such as the mental readiness and mindset of MSME operators in integrating technology (Costa et al., 2023; Renza & Thamrin, 2025). This multidimensional readiness encompasses everything from optimism about innovation to the mitigation of digital security risks (Hastuti et al., 2023; Techanamurthy & Iqbal, 2025). Broadly speaking, this readiness is shaped by internal factors, such as digital literacy, age, and educational background (Sudarmaji, 2021), as well as external factors such as infrastructure and business environment pressures (Alfarisi et al., 2025). Among these factors, improving the quality of human resources (HR) and responding to competition are considered the most dominant variables (Haer & Mulyaningsih, 2023).

Improving the quality of MSME human resources can be achieved through nonformal education using participatory and contextual approaches (Al-Ghifary et al., 2025; Zulhadrizal, 2023). This capacity-building model is effective in providing practical skills, increasing income, and reducing business owners' resistance to innovation (Ibrahim et al., 2023). Externally, MSME entrepreneurs also face competitive pressure as digital platforms proliferate (Lady et al., 2023; Lokot et al., 2023). The impact of this competitive pressure remains a subject of debate (research gap); some studies suggest that competition serves as a stimulus for innovation (Rahayu & Hidayah, 2023; Setiawardani, 2022), while others indicate that extreme pressure actually triggers anxiety and hinders technology adoption (Rasdi & Baki, 2025).

This contradictory phenomenon is clearly evident in Banyumas Regency, the focus of this study. As one of the economic growth centers in Central Java with a dynamic base of 92,000 MSMEs (such as the mendoan and getuk goreng food sectors, handicrafts, and services), the utilization of digitalization in this region remains suboptimal. According to data from the 2026 Indonesian Digital Society Index (IMDI), Central Java leads nationally, with the highest percentages recorded in Banjarnegara Regency (58.98%) and Semarang City (58.59%) (KOMDIGI, 2026). Ironically, Banyumas Regency which has a large MSME population does not rank among the top in this index, indicating a gap between the region's potential and the reality of digital adoption on the ground. Based on empirical data from the MSME Division of Banyumas Regency, the following table shows the

distribution of MSMEs that have participated in large-scale capacity-building and digitalization initiatives:

Table 2. Data on MSMEs That Have Undergone Capacity Building

No	Bussines Sector	Training	Mentoring	Total
1	Trade	48	6	54
2	Culinary	96		96
3	Services	12	1	13
4	<i>Handicraft</i>	3	1	4
5	Food and Beverages	13	6	19
6	Manufacturing	11		11
7	Livestock Farmers	1	1	2
8	Wood Workers	2		2
9	Health and Beauty	1		1
10	Home Industry	23	5	28
Total 2026		210	20	230
Total through 2025				4250
Grand Total				4.480

Source: Banyumas Regency Industry and Trade Office, MSME Division, 2026

Data from the Banyumas Regency MSME Division shows that the number of business owners participating in the agency's official capacity-building programs remains very low compared to the total MSME population, which is projected to reach 92,000 units by 2026. The lack of data on MSMEs that have actually gone digital means that technology adoption must be estimated based on training participation. Based on this empirical data, the number of business owners recorded as having adopted technology remains below 5%, or only about 4,250 business owners. This phenomenon of "digital reluctance" is reinforced by Utari's (2022) findings, which show that out of 400 samples, only 187 MSMEs use technological systems, while the rest still operate conventionally due to educational background constraints and intense market competition.

This disparity highlights a critical urgency and research gap. The majority of previous studies have focused more on the impact of technology implementation on business performance (Asrida et al., 2025) or have treated technology adoption merely as a mediating variable in digital transformation (Maulana & Dwi Saputra, 2026). Furthermore, studies on educational implications generally remain broad in scope, and there is inconsistency in the findings regarding whether competitor pressure is always directly proportional to the readiness for technology adoption among businesses in developing regional economies.

The novelty of this study lies in the integration of a non-formal educational development model and market competition dynamics (competitor pressure) within a single holistic analytical framework to predict the digital readiness of business actors. Thus, this study is urgently needed to empirically demonstrate how the synergy between education and environmental conditions can foster digital self-reliance among the lower economic classes.

LITERATURE REVIEW

Technology Readiness Index (TRI) Theory

The Technology Readiness Index (TRI) theory is a model first developed by Parasuraman (2000). The Technology Readiness Index theory is the result of a collaboration between Parasuraman and Rockbridge Associates. This theory is intended to assess the level of readiness and use of modern technology services. In general, the theory is defined as a measurement tool used to gauge the readiness of users both individuals and groups to adopt and use new technologies. The highly dynamic pace of technological development has given rise to a

phenomenon where further research is needed to analyze society's readiness to face technological transformation. (Parasuraman, 2000) explains that the TRI is a multi-item scale with high psychometric properties designed to provide a deep understanding of technological readiness both in terms of interacting with and adopting technology. (Parasuraman, 2000) divides the TRI model into four main dimensions originally five, but with overlapping aspects. These dimensions include Optimism, which represents a positive view of technology and the belief that technology will provide greater flexibility and efficiency. Next is the Innovation dimension, which signifies a tendency to be a pioneer and leader. The following dimension is the discomfort and insecurity dimension, which can be interpreted as a condition in which individuals feel fear and distrust regarding their ability to use technology and feel overwhelmed when using it. The four dimensions proposed by Parasuraman (2000) are divided into two segments: drivers of technology readiness and barriers to technology readiness. The optimism and innovation dimensions serve as drivers of an individual's or group's technology readiness. Conversely, the discomfort and insecurity dimensions act as barriers to an individual's technology readiness.

Capacity Building Using the Nonformal Education Model

The role of MSMEs in economic development is regulated by Law of the Republic of Indonesia No. 20 of 2008 on MSMEs, which stipulates that the empowerment of MSMEs must be carried out comprehensively and sustainably through the development of a conducive enabling environment. MSME empowerment is also regulated by Government Regulation No. 32 of 1998 concerning the guidance and empowerment of MSMEs, the core of which is the recognition of efforts to empower and guide MSMEs.

One way to empower MSMEs in Indonesia is through a comprehensive guidance process. The guidance referred to here is a structured, tiered, and effective process. Guidance is defined as activities carried out consciously, in a structured and planned manner to enhance and develop the capacity and capabilities of business actors in running their businesses to achieve business objectives (Ibrahim, 2025). Comprehensive capacity building in Indonesia is currently being integrated with the non-formal education model, which differs from formal education in that the educational process is carried out in a structured manner and based on an analysis of the needs of business owners (Novitasari & Faristiana, 2022).

H1 : Capacity building through nonformal education has a positive impact on bussines owner readiness to adopt technological transformation

Competitor pressure

One phenomenon that has emerged in the context of business and technology adoption is the emergence of competitor pressure. This pressure refers to a situation in which individuals face internal and external pressures that drive them to perform at their best and make them feel the competition (Li et al., 2025). Meanwhile, a competitor is defined as an individual or company operating in the same business sector and producing the same products (Ishak et al., 2023). Competitive pressure is defined as a phenomenon in which business actors whether individuals or business entities compete to achieve their desired goals, with forms of competition including marketing strategies, product variety and innovation, and customer experience (Dewi et al., 2024).

H2 : Competitor pressure has a positive impact on bussines owner readiness to adopt technological transformation

Business Actors' Readiness to Adopt Technology

According to (Arifin & Kohar, 2022), business actors' readiness to adopt digital technology is a condition in which they possess both the capability and willingness internally and externally to begin adopting and integrating digital tools such as e-commerce, social media, and digital management systems into their businesses in order to sustain their operations and remain competitive in the face of dynamic economic pressures.

Readiness itself refers to the extent of business owners' capabilities, skills, and willingness to adopt new knowledge or technology, which then actively drives innovation within their businesses whether in business management, customer service, or business strategies that prioritize

technological aspects (Suharyanto et al., 2025). Simply put, business owners' readiness to adopt technology can also be defined as their attitude toward digital technological pressures specifically, their willingness to implement these technologies into their businesses and their belief that, with the help of technology, their businesses will operate more effectively and efficiently (Yudiandri et al., 2024).

H3 : Capacity building through nonformal education and competitor pressure simultaneously have a positive impact on business owner readiness to adopt technological transformation

RESEARCH METHODS

This study employs a quantitative approach using a survey method, in which data were collected via questionnaires and analyzed using statistical tests. The research was conducted in Banyumas Regency, Central Java Province, from February to June 2026. There are two types of variables in this study: independent variables, consisting of Capacity Building through the Non-Formal Education Model (X1) and Competitor Pressure (X2); and a dependent variable, namely Entrepreneurs' Readiness to Adopt Technological Transformation (Y).

The population in this study consists of MSME entrepreneurs in Banyumas Regency. According to Sugiyono (2016), the population is the domain of generalization comprising objects or subjects possessing specific qualities and characteristics defined by the researcher for study, from which conclusions are subsequently drawn. Based on data from the Banyumas Regency Department of Labor and Industry for the year 2026, there are approximately 91,000 MSMEs that have been recorded out of a total estimated population of more than 100,000 units. Due to the large population size, a sample was selected. Sugiyono (2016) states that a sample is a subset of the population that shares the same characteristics as the population. Sampling in this study employed probability sampling using the simple random sampling method, which, according to Sugiyono (2016), is a technique for selecting sample members from a population at random without considering the strata within that population, thereby giving every element of the population an equal chance of being selected.

Research data were categorized into two types: primary data and secondary data. Primary data refers to information related to variables X1, X2, and Y that was collected directly from respondents via questionnaires distributed both online and in person in the field. Meanwhile, secondary data includes supporting information obtained through literature reviews, such as journals, articles, websites, and local regulations (Suliyanto, 2018). Data collection utilized a closed-ended questionnaire technique, with assessment criteria based on the Likert scale to measure the attitudes, opinions, and perceptions of individuals or groups regarding social phenomena (Hendajani et al., 2025). The collected data were then statistically analyzed using the Statistical Package for the Social Sciences (SPSS).

RESULTS AND DISCUSSION

Result of Hypotesis Testing by t-test and f-test

This section delivers the empirical verification and subsequent academic discourse derived from the statistical treatment of primary data gathered from 109 MSME entrepreneurs systematically distributed across the districts of Banyumas Regency. To rigorously evaluate the hypothesized structural model, a multiple linear regression analysis was executed utilizing the SPSS platform. The inferential statistical evaluation was conducted in two sequential phases: first, a partial significance test (t-test) was deployed to isolate and measure the individual predictive influence of each independent construct—namely, Capacity Building through a Non-formal Education Model (X1) and Competitor Pressure (X2)—on the dependent construct, Entrepreneurs' Readiness to Adopt Technological Transformation (Y). Second, a simultaneous significance test (f-test) was performed to assess the collective explanatory power and overall fit of the regression model.

Prior to interpreting the structural pathways, standard regression diagnostics were satisfied. To establish a transparent foundation for the ensuing theoretical discussion, the comprehensive empirical parameters generated from the sample of 109 respondents are synthesized in the tables below:

Tabel 3. Hypotesis test result

Variable	t-value	t-table	f-value	f-table	Sig.	Decision
PNF > TRI	4,636	1,659	-	-	<0,001	H1 Accepted
CP > TRI	0,632	1,659	-	-	0,529	H2 Rejected
PNF, CP > TRI	-	-	11,405	3,93	<0,001	H3 Accepted

Source : Primary data, processed 2026

Following the empirical presentation of these statistical outcomes, a comprehensive and systematic discussion regarding the interpretation of each structural pathway, its alignment with established theoretical frameworks, and its practical implications for MSMEs in Banyumas Regency is elaborated in the subsequent subsections.

The Impact of Regional MSME Capacity Building Using a Nonformal Education Model on Entrepreneurs' Readiness to Adopt Technological Transformation

The results obtained from the calculations in this study indicate that the capacity-building variable, using a non-formal education model, has a positive influence on the readiness of business owners to adopt technological transformation in Banyumas Regency. The results of the statistical analysis prove that the calculated t-value of 4.636 > the critical t-value of 1.659, yielding a p-value of <0.001, which is smaller than the alpha level of 0.05. Based on these results, the study concludes that the more effective the non-formal education-based capacity-building program provided to business owners, the more their readiness to adopt technological transformation will increase. This also supports the acceptance of H1 in this study.

These results also indicate a positive impact felt by business owners when participating in the capacity-building program on their ability and readiness to adopt technological transformation into their businesses; however, on the other hand, business owners do not only need capacity-building but also mentoring programs that help them sustain their businesses. Therefore, capacity-building programs need to be tailored to community needs so that capacity and capability building can be maximized.

When linked to theories regarding non-formal education, capacity-building programs conducted based on the principles and characteristics of non-formal education have the potential to yield significant positive impacts (Handrian & Mansoor, 2021). Capacity-building programs must also be tailored to the needs and characteristics of the community so that the objectives of the programs can be effectively achieved.

Based on the respondents' answers in this study, the highest percentage for the capacity-building variable using the non-formal education model was found in two different indicators: learning management and program evaluation, each scoring 73.9%; however, the program evaluation indicator also had the lowest score of 66.6%—though this was in response to a different question. This indicates the need for improvements to capacity-building programs using the non-formal education model, whether through training, outreach, mentoring, or various other forms of non-formal education.

Based on open-ended questions posed to respondents during the study, it was also found that if capacity-building programs are implemented effectively and efficiently, they have the potential to enhance business competitiveness on a global scale. Some business owners in the study sample also stated that the capacity-building programs they currently receive are insufficient to keep pace with the times, particularly for those located far from urban centers and local government offices. The Banyumas Regency government is constantly striving to improve the

quality and quantity of capacity-building programs for business owners to support progress and help them ensure the sustainability of their businesses.

The Impact of Competitor Pressure on Business Owners' Readiness to Adopt Technological Transformation

The results of this study found that the competitor pressure variable had a t-value of 0.632 and a significance level of 0.529. Based on the criteria for hypothesis testing, it was concluded that the competitor pressure variable does not have a significant effect on business actors' readiness to adopt technological transformation.

When viewed through the lens of Porter's Five Forces theory, the "competitor pressure" variable represents a real threat within the industry's competitive landscape, particularly in the dimensions of "rivalry among existing competitors" and "threat of new entrants" (specifically digital-based new entrants). When tested partially (t-test), the pressure from Porter's Five Forces proved to be insignificant because the aggressiveness of external competitors tends to exploit the "inhibitors" in TRI theory namely, triggering a sense of insecurity regarding business sustainability and discomfort resulting from the necessity to change conventional work methods among MSME actors in Banyumas. Without intervention, this market pressure, as described by Porter's theory, actually leads business owners to experience strategic paralysis because they feel threatened but lack the capabilities to respond. Based on the research findings and statistical analysis, it was found that the indicator with the lowest percentage score was the production cost indicator. This finding relates to the emphasis on production costs, as business owners find it difficult to reduce production costs in order to remain competitive and ensure business sustainability.

When Competitive Pressure is considered simultaneously with Non-Formal Education and Training, the dynamics change drastically. The presence of non-formal training programs acts as an instrument that mitigates these inhibiting factors and transforms them into driving factors (contributors) within the TRI. Digital literacy training and business group mentoring foster a sense of optimism and a spirit of innovation among business owners.

The reason for the low influence value of the "competitor pressure" variable, based on the results of open-ended questions asked during the study, is that most MSMEs in rural areas feel they have their own distinct markets and are typically still tied to close family relationships. The new findings of this study provide a fresh perspective to complement existing research, namely that traditional business owners still believe that every business has its own distinct market and maintains strong family ties even in the context of business competition.

The Effect of Training Using a Nonformal Education Model and Competitor Pressure on Entrepreneurs' Readiness to Adopt Technological Transformation

Based on the results of the tests conducted to examine whether there is a simultaneous effect (F-test) of the variables "mentoring in nonformal education models" (X1) and "competitor pressure" (X2) on the dependent variable "business owners' readiness to adopt technological transformation" (Y), the test results revealed that both independent variables simultaneously influence the dependent variable, with a calculated F-value of 11.405 > the critical F-value of 3.93 and a significance level < 0.05; thus, the third hypothesis of this study is accepted. The results of this study also indicate that the respondents' level of readiness to adopt digital technology can be shaped by the interaction among the study's variables.

In relation to the grand theory of this study the Technology Readiness Index (TRI) it is explained that an individual's technology readiness is shaped by a balance between driving factors (optimism and innovativeness) and opposing inhibiting factors (discomfort and insecurity). In the partial test (t-test), the variable "competitor pressure" was found to be insignificant when tested individually because such pressure tends to exploit the inhibitory factors of business actors namely, triggering a sense of insecurity regarding business sustainability and discomfort resulting from the necessity to change conventional work methods. However, when "Competitor Pressure" was tested simultaneously with "Non-Formal Education Training," the dynamics changed drastically. The

presence of non-formal training programs acts as a bridge that mitigates these inhibitory factors while simultaneously converting them into driving factors (contributors). Digital literacy training, workshops, and business group mentoring foster a sense of optimism that digital technology is easy to use and brings operational benefits, while also stimulating the innovative spirit of business owners to win in the competitive market. Therefore, the simultaneous interaction of these two variables successfully creates a positive mental balance according to TRI theory, thereby triggering a mature readiness to adopt technology among MSME entrepreneurs.

CONCLUSION

Based on the statistical analysis and inferential hypothesis testing regarding the readiness of MSME entrepreneurs in Banyumas Regency to adopt technological transformation, this study establishes several integrated empirical conclusions. First, internal capacity building through a non-formal education model is empirically proven to exert a positive and significant partial effect on entrepreneurs' digital technology adoption readiness; thus, the first hypothesis (H1) formulated in this study is officially accepted. The statistical robustness of this capacity-building program is reflected by a t-value of 4.636, which exceeds the critical t-table threshold of 1.659, with an impressive significance level of $p < 0.001$. This finding underlines that structured, demand-driven educational interventions effectively mitigate the psychological barriers defined in the Technology Readiness Index (TRI) theory specifically discomfort and insecurity and successfully convert them into drivers of optimism and innovation to facilitate digital acceleration.

Conversely, the second empirical finding reveals that competitor pressure does not partially exert a significant influence on the technology adoption readiness of business actors; hence, the second hypothesis (H2) of this study is officially rejected. This partial evaluation is supported by a minimal t-value of only 0.632 and a high significance value of 0.529, well above the standard alpha level ($\alpha = 0.05$). Evaluated through the lens of Porter's Five Forces theory, aggressive external market dynamics in the digital era tend to induce strategic paralysis rather than innovation among rural MSMEs due to their severe operational capability constraints. Furthermore, a unique sociocultural phenomenon was observed across Banyumas Regency, where traditional entrepreneurs maintain a deep-rooted belief that every enterprise has its own distinct market and predetermined livelihood, alongside strong familial and community ties that effectively absorb and dampen destructive competitive friction.

Despite the lack of significance in the partial test of the second variable, when both independent constructs are evaluated simultaneously, the interplay between non-formal education capacity building and competitor pressure exhibits a positive and highly significant collective influence on the technological readiness of MSMEs, which signifies that the third hypothesis (H3) of this study is officially accepted. This collective pathway is mathematically validated by an f-value of 11.405, substantially outperforming the f-table baseline of 3.93 with a significance level of $p < 0.05$. This simultaneous dynamic proves that external market threats, which initially act as psychological deterrents, can be effectively transformed into mature innovative stimuli provided they are systematically bridged by inclusive digital literacy workshops and structured group mentoring. This synergy successfully fosters a positive mental equilibrium as conceptualized by the TRI framework by reinforcing internal mechanisms to proactively respond to external environment constraints.

In final conclusion, the core novelty of this research highlights that establishing an internal educational foundation and fostering localized, supportive mentoring programs are far more critical and meaningful than merely enduring external market threats in ensuring the successful digital transformation of the MSME ecosystem within developing regional economies such as Banyumas Regency.

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