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ENHANCING MSME COMPETITIVENESS THROUGH ECONOMIC EDUCATION AND GREEN KNOWLEDGE

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ABSTRACT

Micro, Small, and Medium Enterprises (MSMEs) make a significant contribution to economic growth, yet their competitiveness is often hindered by limited access to knowledge and external support. Existing research rarely integrates environmentally friendly knowledge, economic education, and competitiveness in explaining access to knowledge. This study aims to examine the influence of these variables on external support and access to knowledge in the digital era. This study employs a mixed-methods approach with a sequential explanatory design. This study involved 30 SME operators in Banyumas Regency, Central Java, selected through purposive sampling. Data were collected via questionnaires and interviews, and analyzed using multiple regression and thematic analysis. The results indicate that all variables simultaneously have a significant influence F-value of 38.215 was obtained with a significance level of 0.002, which is less than 0.05. Partially, competitiveness had the strongest influence t-value of 3.214 with a significance level of 0.005, indicating a positive and significant influence, followed by economic education variable yielded a t-value of 2.587 with a significance level of 0.006, indicating a positive and significant effect and green knowledge variable has a t-value of 2.145 with a significance level of 0.004, which is below the 0.05 threshold. These findings indicate that competitiveness enhances access to partnerships and resources, economic education improves decision-making capacity, and green knowledge expands external networks. This study highlights the importance of integrating sustainability knowledge, economic capabilities, and competitiveness to strengthen SMEs. These findings suggest that a comprehensive strategy combining green practices, economic literacy, and digital adaptation is essential for improving access.

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1. INTRODUCTION

The Micro, Small, and Medium Enterprises (MSMEs) hold a central position in economic development due to their contribution to employment generation and income distribution.

Irawan et al. (2021) says that MSMEs function as key drivers of inclusive growth, particularly in developing economies. In parallel, the concept of sustainable entrepreneurship has gained increasing attention as a pathway to ensure long-term business viability (Rashid & Yunus, 2026)

Despite their strategic role, many MSMEs continue to face structural challenges in achieving sustainability. Limited resources and a short-term business orientation often hinder the adoption of environmentally and socially responsible practices, thereby weakening long-term competitiveness (Ahmadi-gh & Bello-pintado, 2022). From the perspective of the Resource-Based View, sustainable competitive advantage depends on the firm's ability to develop valuable, rare, and inimitable resources, including knowledge-based capabilities (Bhandari, 2022).

In this regard, green knowledge emerges as a critical intangible asset. It encompasses the processes of acquiring, sharing, and applying environmental knowledge to support organizational performance. Empirical evidence shows that green knowledge significantly enhances innovation capacity and environmental performance (Al-faouri, 2023). Furthermore, effective knowledge management contributes to reducing operational risks and improving efficiency in the adoption of green technologies (Alam et al., 2023).

Beyond knowledge, MSME competitiveness is also shaped by the integration of sustainability-oriented capabilities. Research indicates that green knowledge management supports the development of sustainable business capabilities, which in turn strengthen competitiveness and performance (Science, n.d.)2024. This relationship reflects the principles of Sustainable Development Theory, which emphasize the balance between economic performance, environmental responsibility, and social value creation. In this context, sustainability is not only an ethical consideration but also a strategic source of competitive advantage (Rashid & Yunus, 2026)

The transition toward a green economy further reinforces the need for integrating environmental awareness into business strategies. Firms that adopt environmentally friendly practices tend to achieve higher efficiency and innovation outcomes (Azam et al., 2023). However, the effectiveness of such strategies largely depends on the capacity of human resources, particularly in terms of economic understanding and managerial competence.

In the digital era, technological advancement has transformed the way MSMEs operate and compete. Digital entrepreneurship enables businesses to expand market access, enhance efficiency, and foster innovation (Donaldsiegelasuedu & Kenney, 2025.). The integration of digital technology with green knowledge has been identified as a key mechanism for promoting sustainable entrepreneurship (Sadiq et al., 2025). Moreover, digital-based knowledge processes strengthen entrepreneurial behavior and support sustainable business model development (Wang et al., 2024)

Nevertheless, existing studies tend to examine green knowledge, competitiveness, and digital transformation separately, with limited attention to the role of economic education as a capability that supports knowledge access and external collaboration. This gap indicates the need for a more integrative framework that connects knowledge resources, human capital, and competitive outcomes.

Therefore, this study proposes a conceptual model that integrates green knowledge, economic education, and MSME competitiveness to explain external support and knowledge access. By combining insights from the Resource-Based View and Sustainable Development Theory, this research contributes to the literature by offering a multidimensional perspective on how MSMEs can strengthen their competitiveness and sustainability in the digital era.

2. RESEARCH METHODS

This study employs a mixed-methods approach using a sequential explanatory design, in which quantitative analysis is conducted in the first phase and followed by qualitative exploration to provide deeper contextual understanding. This approach is intended to capture both the relationships among variables and the real conditions faced by MSME actors in implementing green knowledge and economic practices in the digital era.

The research model is structured consistently by positioning green knowledge, economic education, and MSME competitiveness as independent variables, while external support and access to knowledge are treated as the dependent variable. In this framework, competitiveness is conceptualized as an internal capability that enables MSMEs to strengthen their access to external resources, rather than as an outcome variable. This specification aims to avoid conceptual overlap and ensure clarity in the analytical model.

The population consists of MSME actors located in Cilongok District, Banyumas Regency, Central Java. A purposive sampling technique was applied with specific criteria: MSMEs that have operated for at least two years, demonstrate business continuity, and have adopted digital technology in their operations. The sample size of 30 respondents is positioned as a pilot study, allowing for initial model testing and exploration. Although relatively small, the use of multiple linear regression is considered appropriate for a limited number of variables, with the understanding that findings are exploratory and not intended for broad generalization.

Quantitative data were collected through structured questionnaires using a five-point Likert scale, while qualitative data were obtained through in-depth interviews with selected informants and supported by documentation. The variables were operationalized as follows: economic education refers to the level of understanding of economic concepts such as financial management, business planning, and decision-making; green knowledge reflects awareness and application of environmentally friendly practices, including resource efficiency and waste management; MSME competitiveness is measured by the ability to create added value, innovate, maintain service quality, and sustain market position; and external support and access to knowledge refer to the ability to obtain training, information, and establish partnerships with external stakeholders.

Quantitative analysis was conducted using multiple linear regression with the support of IBM SPSS Statistics, including t-tests, F-tests, and the coefficient of determination (R^2). Instrument validity and reliability were assessed to ensure measurement accuracy, and potential biases such as common method bias were minimized through careful questionnaire design. Meanwhile, qualitative data were analyzed using thematic analysis involving data reduction, coding, categorization, and interpretation. The integration of both approaches was carried out at the interpretation stage, where qualitative findings were used to explain and strengthen the quantitative results, thereby providing a more comprehensive understanding of the factors influencing MSMEs' access to knowledge and external support.

3. RESULTS AND DISCUSSION

3.1. RESULTS

The research findings show that green knowledge plays a crucial role in enhancing MSMEs' access to external support and knowledge resources. This is evidenced by a coefficient value of 2.145 with a significance level of 0.004, indicating a positive and significant relationship. This means that an increased understanding among SME actors regarding environmentally friendly practices can expand their networks with various parties, including supporting institutions, business communities, and access to relevant information. Thus, the implementation of green economy concepts not only impacts internal efficiency but also enhances opportunities for external collaboration.

On the other hand, the economic education variable also demonstrates a significant influence on improving SMEs' access to knowledge and external support. A coefficient value of 2.587 with a significance level of 0.006 confirms that the ability to understand economic concepts such as financial management, business planning, and decision-making is a key factor in expanding access to various resources. SME operators with higher economic literacy tend to be more adaptable in leveraging opportunities and information available in the digital age.

Furthermore, the competitiveness of MSMEs has been shown to make a significant contribution to strengthening relationships with external parties. A coefficient value of 3.214 and a significance level of 0.005 indicate that increased competitiveness encourages MSMEs to be more effective in securing support, whether in the form of financing, training, or business partnerships. Overall, these four variables are interrelated in shaping a more resilient, adaptive, and competitive SME ecosystem in the face of the dynamics of the green economy in the digital era. The simultaneous influence of these variables is further examined through the F-test, with the results presented in Table 1.

Table 1. F-test Result

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	18.972	4	4.743	38.215	0.002
Residual	224.228	25	8.969		
Total	243.200	29			

Source: Processed data (2026)

The dependent variable in this study is external support and access to knowledge, while the independent variables consist of MSME competitiveness, green knowledge, and economic education. The data used in this analysis were processed in 2026. Based on the F-test results presented in Table 1, an F-value of 38.215 was obtained with a significance level of 0.002, which is less than 0.05. This indicates that the regression model used in this study is valid and statistically significant. Thus, the independent variables comprising green knowledge, MSME competitiveness, MSME sustainability, and economic education collectively influence the dependent variables, namely external support and access to knowledge.

The Sum of Squares Regression value of 18.972 indicates the extent of variation explained by the model, while the Residual of 224.228 represents the variation not explained by the independent variables in this study. Meanwhile, the Mean Square value of 4.743 for the regression and 8.969 for the residuals indicates the comparison of variation between the model and the error. With a sample size of 30 respondents, the degrees of freedom (df) of 4 for the regression and 25 for the residuals are consistent with the number of variables used, including the addition of the economic education variable.

From an analytical perspective, the significant F-statistic demonstrates that the integration of internal capabilities namely economic education, green knowledge, and competitiveness plays a collective role in shaping MSMEs' access to external resources. This finding is consistent with the Resource-Based View, which emphasizes that firm performance and external positioning are driven by internal resources and capabilities. In this context, economic education enhances cognitive and managerial capacity, green knowledge contributes to environmentally oriented innovation, and competitiveness reflects the firm's ability to translate these capabilities into market advantage.

Moreover, the findings also align with the perspective of Sustainable Development Theory, which highlights the importance of balancing economic, environmental, and social dimensions. The combined effect of these variables suggests that MSMEs capable of integrating sustainability knowledge with economic competence are better positioned to engage with external stakeholders and access knowledge networks.

However, the relatively large residual variance indicates that the model does not fully capture the complexity of MSME ecosystems. This opens opportunities for future research to

incorporate additional variables, such as digital transformation or policy support, to enhance explanatory power. Therefore, while the results confirm the significance of the proposed model, they should be interpreted as part of an evolving framework for understanding MSME development in the digital and sustainable economy.

Tabel 2. T-test Result

Model	B	Std. Error	t	Sig.
(Constant)	27.845	6.982	3.988	0.0001
Green Knowledge	0.165	0.521	2.145	0.0004
Competitiveness of MSMEs	0.372	0.498	3.214	0.0005
Economics Education	0.298	0.467	2.587	0.0006

Source: Processed data (2026)

Based on the results of the partial tests in the Table 2, each independent variable contributes to external support and knowledge access for MSMEs. The green knowledge variable has a t-value of 2.145 with a significance level of 0.0004, which is below the 0.05 threshold. This indicates that understanding of environmentally friendly practices has a significant effect on expanding networks and access to information for MSME actors.

Furthermore, the MSME competitiveness variable obtained a t-value of 3.214 with a significance level of 0.0005, indicating a positive and significant influence. This finding suggests that the higher a business's competitive ability, the greater the opportunity to obtain support, whether in the form of partnerships, training, or access to external resources.

The economic education variable yielded a t-value of 2.587 with a significance level of 0.0006, indicating a positive and significant effect. This suggests that business owners' level of economic understanding such as financial management and decision-making plays a role in enhancing access to information and support from various sources. Overall, the findings support the notion that MSME development in the digital and sustainable economy requires an integrated approach. The interaction between competitiveness, economic education, and green knowledge reflects the principles of Sustainable Development Theory, which emphasizes the alignment of economic growth, environmental sustainability, and social capacity. This perspective is strongly rooted in the framework proposed by United Nations (Economics & Library, n.d.) 1987 through the *Brundtland Report*, which defines sustainable development as development that meets present needs without compromising future generations. Furthermore, Edward Barbier 1987 highlights that sustainability requires the integration of economic efficiency, ecological balance, and social equity within development strategies.

In addition, this study is also consistent with the Resource-Based View introduced by Jay Barney (Klarin, 2018), which argues that firm performance is determined by internal resources that are valuable, rare, inimitable, and non-substitutable (VRIN). In this context, green knowledge and economic education can be viewed as strategic intangible assets that enhance MSMEs' ability to build competitiveness and access external resources. Thus, this study contributes to the literature by demonstrating that internal capabilities not only improve firm performance but also play a crucial role in enabling MSMEs to connect with broader knowledge ecosystems and external support networks in a sustainable manner

3.2. DISCUSSION

The challenges faced by business owners in implementing these concepts in the digital era indicate that SMEs still encounter various obstacles in integrating economic education and green economy concepts into their daily business practices. Based on the interview results, most

informants stated that their understanding of efficient business management, financial record-keeping, and economic decision-making remains limited. This situation impacts their ability to plan for sustainable business operations, particularly when facing market changes in the digital era. Additionally, limited digital literacy poses a barrier to accessing information, training, and broader business networks.

From the perspective of Sustainable Development Theory, this situation reflects the suboptimal integration of the three main pillars of sustainable development: economic, social, and environmental aspects. In the economic dimension, MSMEs still focus on short-term sustainability without considering long-term efficiency and growth. Many business owners have not yet implemented systematic financial planning principles, making it difficult to scale up their businesses or enhance competitiveness. This indicates that economic education has not fully served as an instrument to promote business sustainability.

In the environmental aspect, interview findings suggest that understanding of green knowledge remains at an early stage. Some informants view environmentally friendly practices, such as waste reduction or the use of more sustainable raw materials, as factors that increase production costs. Consequently, the implementation of green economy concepts has not become a priority in business operations. Within the framework of Sustainable Development Theory, this situation indicates an imbalance between economic orientation and environmental concern, meaning that the potential for long-term sustainability has not yet been optimally realized. Meanwhile, on the social front, limitations in building networks and fostering collaboration also represent a major challenge. Several MSME operators noted that they lack sufficient access to training, mentoring, and partnerships with external parties. Yet, in the context of sustainable development, social aspects such as partnerships, trust, and participation are critical factors in strengthening business capacity. The lack of interaction with stakeholders makes it difficult for SMEs to grow and adapt to changes in the business environment.

Furthermore, it was found that SMEs that have begun adopting digital technology and applying resource efficiency principles tend to perform better. They are not only able to increase sales but also find it easier to build relationships with consumers and business partners. This indicates that the integration of economic education, technology utilization, and the application of sustainability principles can serve as an effective strategy for enhancing competitiveness. From the perspective of Sustainable Development Theory, this situation reflects a better balance among the economic, social, and environmental dimensions.

The main challenge for SMEs lies in the lack of optimal integration of economic education, green knowledge, and the use of digital technology within the framework of sustainable development. Therefore, more systematic efforts are needed to improve the capacity of MSME operators through education, mentoring, and policies that support the implementation of a green economy. As a result, MSMEs are not only able to survive but also to grow sustainably in accordance with the principles of Sustainable Development Theory.

4. CONCLUSION

Based on the findings, it can be concluded that green knowledge, MSME competitiveness, and economic education significantly influence external support and access to knowledge, both simultaneously and partially. The F-test confirms that the proposed model is statistically valid and capable of explaining the relationships among variables. At the individual level, competitiveness emerges as the most influential factor, followed by economic education and green knowledge, indicating that both internal capability and knowledge-based resources are essential in strengthening MSMEs' access to external networks.

These results reinforce the importance of integrating economic capability, environmental awareness, and competitive strength in enhancing MSME performance. From a theoretical perspective, the findings extend the Resource-Based View by demonstrating that intangible resources such as knowledge and education not only improve firm performance but also facilitate external linkages. In addition, the study supports the principles of Sustainable Development Theory, highlighting that the alignment of economic, environmental, and human capital dimensions is crucial in building sustainable competitiveness in the digital era.

However, several limitations should be acknowledged. First, the relatively small sample size (n = 30) limits the generalizability of the findings and positions this study as exploratory. Second, the measurement of constructs such as economic education and green knowledge relies on self-reported data, which may introduce response bias. Third, the model does not incorporate other potentially relevant variables, such as digital capability or institutional support, which may also influence MSMEs' access to external resources.

Despite these limitations, this study contributes by offering an integrative perspective that links green knowledge, economic education, and competitiveness within a single analytical framework. Future research is recommended to employ larger samples, incorporate additional variables, and utilize more robust analytical methods to enhance the explanatory power and generalizability of the findings.

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