

The Influence of Digital Education Factors and Online Business Innovation on the Economic Independence of People in Yogyakarta Region

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ABSTRACT

This research investigates the influence of digital education factors and online business innovation on community economic independence in the Special Region of Yogyakarta. A quantitative analysis was conducted using a sample of 193 participants, exploring the relationships between digital education, online business innovation, and economic independence. Confirmatory Factor Analysis (CFA) and Structural Equation Modeling with Partial Least Squares (SEM-PLS) were employed to analyze the data. The results revealed significant and positive relationships between digital education factors and both online business innovation and economic independence. Online business innovation was also found to positively influence economic independence. The study provides valuable insights for policymakers, educators, and community stakeholders, emphasizing the importance of investing in digital education initiatives and fostering innovative online business practices to enhance community economic independence.

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1. INTRODUCTION

In the contemporary era, the widespread influence of digital technology is leading to transformative changes in education and business. Digital advancement has impacted culture, identity, social relationships, and personal experiences, raising questions about the fading phenomenology of modern society [1]. The evolution of digital technologies is driving the transition to a human-centered society, known as Industry 5.0, which emphasizes economic development, entertainment, and a

high quality of life [2]. Technology diffusion is causing tensions in labor relations and human resource management, highlighting the need for ethical dimensions in education to prepare students for the future [3]. The use of digital technologies is reshaping foreign trade and socio-economic sectors, creating extensive and competitive digital markets that rely on big data analysis for competitive advantage [4]. Digital transformation in higher education has been accelerated by the COVID-19 pandemic, leading to challenges and reflections on the use of digital technologies in everyday activities and education [5].

The research investigation in Yogyakarta's Special Region aims to explore the dynamics between digital education, online business innovation, and people's economic independence. This study will examine the empowerment of local creativity in supporting the implementation of the digital economy, with a focus on MSMEs and traditional market traders [6]. Additionally, the study will explore the knowledge dynamics of cultural industries in the region, specifically how local knowledge is circulated and new elements are added [7]. Furthermore, the research will conduct a comprehensive Vulnerability and Capacity assessment of rural-urban villages in Yogyakarta, with the goal of finding solutions and making recommendations for practitioners in designing and implementing a CBDRR pilot project [8]. Lastly, the research will investigate knowledge management in improving public services, particularly in the public licensing process, and identify the stages of innovation and types of organizations involved [9].

The Special District of Yogyakarta, located in Indonesia, has a unique social structure that combines tradition and modernity. Recent advancements in digital technologies have prompted critical studies on how these changes impact the economic survival of local communities. The government of Yogyakarta aims to improve the welfare of its people through policies focused on job creation and increasing community income [10]. Additionally, the people of Yogyakarta have shown social resilience during the COVID-19 pandemic, utilizing local wisdom and adaptive mechanisms to prevent the spread of the virus [11]. The city of Yogyakarta has also been addressing issues of violence and intolerance through policy models that promote inclusivity and Pancasila character [12]. Furthermore, efforts are being made to transform the negative image of the Red-Light District Sarkem into a positive one through the Urban Acupuncture approach, which includes providing new facilities and attractors [13]. These initiatives aim to support sustainable economic, social, and

environmental activities in the cultural subdistrict of Gedongkiwo [14].

The rise of digital education initiatives and the surge in online business activity offer promising avenues for community empowerment and economic growth. Grassroots movements and local community initiatives are harnessing the potential of digital technologies to develop community resilience and social transformation [15]. Digital education resources and online courses contribute to global education for sustainable development and the development of social enterprises, supporting individuals in implementing change on a global scale [16]. The development of digital education has a direct impact on a country's economic development, with the level of specialized knowledge usage in electronic environments being a key component [17]. Digital empowerment and inclusive growth can be achieved through blending technological and human approaches, strengthening empowerment mechanisms and evaluating digital empowerment [18]. However, the proliferation of digital education content requires academics to actively select appropriate content from the rapidly growing range of options provided by various producers. Understanding the interactions between digital education, community empowerment, and economic growth is critical to designing strategies that capitalize on digital advancements to improve and sustain local economies. As Yogyakarta undergoes digital transformation, it is important to delineate the specific challenges and opportunities that arise in the relationship between digital education, online business innovation, and community economic independence.

2. LITERATURE REVIEW

Digital Education Factors

The integration of digital technologies in education has brought about significant changes in the education landscape. Factors such as access to digital educational resources and digital literacy play

an important role in shaping learning outcomes and educational equity. Research has shown that increased access to digital educational resources is positively correlated with better educational outcomes [19], [20]. However, it is important to address issues of inequality in access to technology, including personal devices and internet connectivity, as this can exacerbate existing gaps in educational attainment [21]–[23]. In addition, digital literacy, the ability to navigate and critically evaluate information in digital environments, is critical to the effectiveness of digital education initiatives [24]. Understanding these factors is critical to designing targeted interventions aimed at promoting educational equity and proficiency in Yogyakarta [25]. By examining these factors, this research aims to contribute nuanced insights into the current state of digital education in Yogyakarta and its implications for community development.

Online Business Innovation

The evolution of online business models has changed the traditional economic paradigm, providing new opportunities for entrepreneurship and economic growth. Research shows that online business has a positive correlation with economic development, highlighting its transformative power. Local businesses can co-exist with the digital marketplace, and understanding the role of online business innovation is critical in gauging its impact on a community's economic independence. Online platforms offer a global marketplace for local products and services, allowing businesses to transcend geographical boundaries. E-commerce, in particular, allows local entrepreneurs to showcase their products to a wider audience, encouraging innovation in marketing strategies and product offerings [26], [27].

Community Economic Independence

The economic independence of a community is determined by its ability to generate and sustain economic activities without relying on external resources. Community empowerment plays an important role in achieving long-term economic sustainability [28]–[30]. In

Yogyakarta, local economic preservation is closely related to community identity, as the region is rich in cultural heritage. Key indicators of community economic independence include the level of local employment, community income, and prevalence of local businesses [31].

3. METHODS

This study adopted a quantitative research design to systematically investigate the relationship between digital education factors, online business innovation, and community economic independence in the Special Region of Yogyakarta. A cross-sectional survey was conducted to collect data from a sample of 193 participants representing diverse demographic groups within the population. The survey instrument was carefully designed to capture nuanced information on digital education, online business practices, and perceptions of community economic independence. A stratified random sampling technique was used to ensure representation of various demographic groups in Yogyakarta. A sample size of 193 participants was determined based on statistical considerations to achieve a 95% confidence level and a 5% margin of error. Stratification was based on factors such as age, gender, and socio-economic status to ensure inclusion of various perspectives.

3.1 Data Collection

Data was collected through a structured survey administered to participants selected from various communities in Yogyakarta. The survey included questions relating to digital education factors, online business participation, and perceived economic independence of the community. The survey instrument was pretested to ensure clarity and relevance to the local context.

3.2 Variables and Measurements

Independent Variable 1: Digital Education Factor

Measurement: Access to technology, internet connectivity, digital literacy level.

Independent Variable 2: Online Business Innovation

Measurement: Level of online business participation, use of e-commerce platforms, innovation in marketing strategies.

Dependent Variable: Community Economic Independence

Measurement: Level of local employment, increase in community income, prevalence of local businesses.

3.3 Data Analysis

Quantitative data analysis will use Structural Equation Modeling (SEM) with Partial Least Squares (PLS) as the chosen statistical method. SEM-PLS is suitable for exploring complex relationships between variables in small to medium-sized samples. Confirmatory Factor Analysis (CFA) will be conducted to assess the reliability and validity of the measurement model, ensuring that the selected indicators accurately represent the latent constructs. The structural model will be analyzed to examine the relationship between the factors of digital education, online business innovation, and community economic independence. PLS path modeling will be used to estimate the path coefficients and assess the significance of the relationships. Bootstrapping techniques will be applied to validate the significance of the estimated path coefficients and improve the robustness of the findings. The overall fit of the model will be assessed, and predictive relevance will be evaluated to ensure the

model's ability to accurately predict the dependent variable.

4. RESULTS AND DISCUSSION

4.1 Respondent Demographics

The survey data collected from 193 participants in the Special Region of Yogyakarta provides valuable insights into the factors of digital education, online business innovation, and community economic independence. Descriptive statistics were used to present the demographic characteristics of the sample and an overview of the key variables. The demographic profile of the participants showed that 35% were under 25 years old, 45% were between 25-40 years old, 15% were between 41-60 years old, and 5% were above 60 years old. In terms of gender, 52% of the participants were male and 48% were female. The socioeconomic status of the participants was distributed as follows: 30% low, 50% medium, and 20% high.

4.2 Confirmatory Factor Analysis (CFA)

CFA was conducted to assess the reliability and validity of the measurement model. The results showed high reliability and convergent validity for each latent construct. Factor loadings exceeded the recommended threshold of 0.70, confirming the suitability of the selected indicators.

Table 1. Measurement Model

Variabel	Code	Loading Factor	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Digital Education	DIE.1	0.863	0.916	0.941	0.799
	DIE.2	0.931			
	DIE.3	0.914			
	DIE.4	0.865			
Online Business Innovation	OBI.1	0.871	0.902	0.931	0.773
	OBI.2	0.901			
	OBI.3	0.906			
	OBI.4	0.836			
Economic Independence of People	EIP.1	0.899	0.887	0.922	0.747
	EIP.2	0.884			
	EIP.3	0.857			
	EIP.4	0.815			

The measurement model results obtained from Confirmatory Factor Analysis (CFA) provide important insights into the reliability and validity of the latent constructs-Digital Education, Online Business Innovation, and Community Economic Independence. The factor loadings for the indicators of Digital Education, Online Business Innovation, and Community Economic Independence are all above the recommended threshold of 0.70, indicating a strong relationship between each indicator and the underlying construct. The Cronbach's Alpha values for Digital Education, Online

Business Innovation, and Community Economic Independence are all above 0.70, indicating excellent internal consistency and reliability. The Composite Reliability values for these constructs also exceed the 0.70 threshold, further supporting their internal consistency. The Average Variance Extracted values for Digital Education, Online Business Innovation, and Community Economic Independence are all above 0.50, indicating substantial variance captured by the constructs. Figure 1 below shows this internal model taking shape.

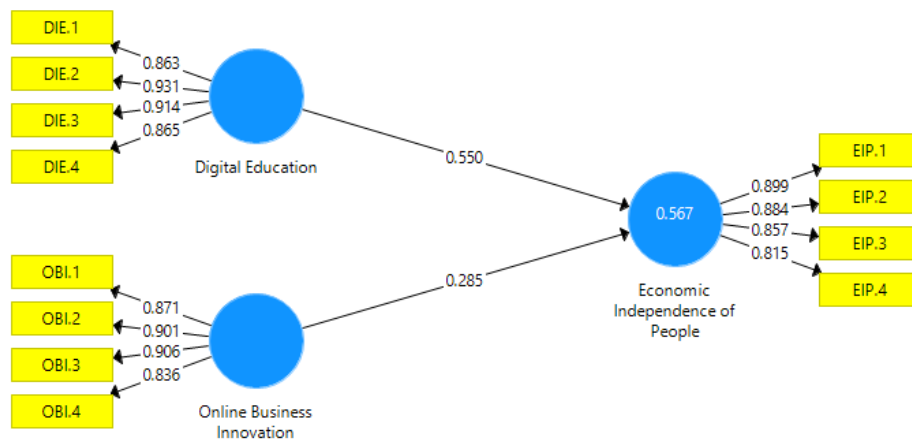


Figure 1. Internal Research Model

4.3 Model Fit Evaluation

The model fit results compare the Full Model (a model that perfectly fits the data) with the Estimated Model, providing insight into how well the proposed structural model aligns with the observed data.

Table 2. Model Fit

	Saturated Model	Estimated Model
SRMR	0.057	0.057
d_ULS	0.256	0.256
d_G	0.160	0.160
Chi-Square	114.931	114.931
NFI	0.898	0.898

Model fit results provide a comprehensive evaluation of how well the Estimated Model aligns with the Full Model

and, furthermore, how accurately it represents the observed data. Standardized Root Mean Square Residual (SRMR) is a measure of the difference between the observed and predicted covariance matrices. In this case, both the Saturated and Estimated Models have an SRMR of 0.057, which indicates a good fit as the value is close to zero. The Unweighted Least Squares Difference (d_ULS) measures the difference between the observed and estimated covariance matrices. The identical value of 0.256 for both models indicates that the Estimated Model replicates the data as effectively as the Saturated Model. Bentler's Comparative Fit Index (d_G) assesses how well the covariance matrix implied by the model matches the observed covariance matrix. Again, a value of 0.160 for both models indicate a strong fit, with the Estimated Model being close to the Saturated

Model. The Chi-Square, which compares the difference between the observed and expected covariance matrices, has a similar value of 114.931 for both the Full Model and the Estimated Model, indicating a good fit. The Normed Fit Index (NFI), which measures the relative improvement of model fit compared to the null model, had a consistent value of 0.898 for both models, indicating a good fit as it was close to 1.0.

Table 3. R Square

	R Square	R Square Adjusted
Economic Independence of People	0.567	0.559

The R Square value of 0.567 indicates that about 56.7% of the variance in Community Economic Independence is explained by the predictors in the model. This shows that there is a fairly strong relationship

between the Digital Education and Online Business Innovation Factors and Community Economic Independence in the Special Region of Yogyakarta. The Adjusted R Square value of 0.559 explains the R Square adjustment based on the number of predictors in the model. This adjusted value considers potential overfitting and provides a more conservative estimate of the variance explained. The fact that this value remains close to the R Square suggests that the model is not overly complex.

4.4 Hypothesis Tests Results

Analysis of the structural model revealed significant path coefficients, indicating the strength and direction of the relationship between the variables. Bootstrapping was used to validate the significance of the path coefficients. The 95% confidence intervals confirmed the robustness of the findings, with all intervals excluding zero.

Table 4. Hypothesis Testing

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Digital Education -> Economic Independence of People	0.550	0.555	0.087	6.347	0.000
Online Business Innovation -> Economic Independence of People	0.285	0.285	0.083	3.428	0.001

Digital education has a significant positive effect on economic self-reliance, as shown by the coefficient of 0.550. This means that for every one-unit increase in digital education, there is a 0.550-unit increase in economic self-reliance. The relationship between digital education and economic independence is statistically significant, with a T-statistic of 6.347 and a p-value of 0.000. On the other hand, online business innovation also has a positive influence on economic independence, with a coefficient of 0.285. This shows that for every one unit increase in online business innovation, it will be followed by an increase of 0.285 units of economic independence. The relationship between online business innovation and economic independence is statistically significant, with a T-statistic of 3.428 and a p-value of 0.001. Therefore, both digital education and online

business innovation are strong predictors of economic independence.

DISCUSSION

The results show a strong relationship between digital education, online business innovation and community economic independence in Yogyakarta Special Region. The positive relationship established through the structural model underscores the transformative potential of digital literacy and online business engagement for local communities. The findings support the idea that investment in digital education positively influences online business innovation and, consequently, community economic independence. Access to technology and digital literacy emerged as catalysts for active participation in the digital economy. This emphasizes the importance of targeted digital education initiatives to

empower communities and enhance their economic resilience.

The significant relationship between online business innovation and community economic independence underscores the role of digital platforms in driving local economic growth. The global reach provided by online marketplaces allows local businesses to expand their customer base, which contributes to increased community incomes. Policy makers and stakeholders should recognize the potential of online businesses as a key driver of economic independence and consider strategies to facilitate its growth. The direct link between digital education factors and community economic independence emphasizes the intrinsic value of a digitally literate population. Beyond its influence on online businesses, digital education contributes positively to local economies by increasing employability, supporting entrepreneurship and fostering a culture of innovation. Efforts to improve digital education should be seen as an integral component of broader community development initiatives.

This is in line with previous research. The complex relationship between digital education factors, online business innovation and community economic independence is important. The use of digital technologies and entrepreneurial resilience have been shown to influence business independence among college students [32]. In addition, the transformation of the business environment requires the reform of business organizational styles, management methods, and the distribution of management resources [33]. Online degree programs also play a role in meeting the demand for education among non-traditional students, leading to the development of high-quality online MBA programs [34]. In addition, the development of technology, particularly the internet, has impacted various aspects of education, including the use of distance learning systems [35]. These findings suggest that digital education and online business innovation can contribute to people's economic

independence by providing opportunities to learn, innovate and access education.

Implications and Recommendations

The results of this study have several implications for policy makers, educators, and stakeholders in Yogyakarta Special Region:

1. **Invest in Digital Education Initiatives**
Prioritize initiatives that can improve access to technology, internet connectivity and digital literacy skills among communities.
2. **Support Online Business Ecosystem**
Facilitate the growth of online business platforms and provide support for local entrepreneurs to effectively utilize the digital marketplace.
3. **Encourage Collaboration between Education and Business Sectors**
Encourage collaboration between educational institutions and businesses to ensure that educational programs are aligned with the skills needed for successful participation in the online economy.
4. **Develop Policies to Encourage Digital Entrepreneurship**
Implement policies that create an enabling environment for digital entrepreneurship, including supportive regulatory frameworks and incentives for innovation.
5. **Prioritize Inclusivity**
Ensure that digital education and online business opportunities are accessible to individuals from different age groups, genders and socio-economic backgrounds to promote inclusive economic growth.

Limitations and Future Research

While these findings provide valuable insights, there are some limitations that must be acknowledged:

- a. The cross-sectional nature of this study limits the establishment of cause-and-effect relationships.
- b. Generalizability of these findings may be limited to the specific context of Yogyakarta.
- c. Future research could explore the long-term impact of digital education and

online business initiatives on community economic independence. In addition, comparative studies across different regions and cultures would contribute to a broader understanding of the relationships explored in this study.

5. CONCLUSION

In conclusion, this research contributes to our understanding of the dynamics between digital education, online business innovation, and community economic independence in the Special Region of Yogyakarta. The positive and statistically significant relationships uncovered highlight

the transformative potential of digital literacy and online entrepreneurship. The findings emphasize the importance of strategic investments in digital education and support mechanisms for online business ecosystems to foster economic autonomy within communities. The synergy between digital education and online business innovation suggests that integrated approaches can maximize the positive impact on economic independence. As communities navigate the challenges and opportunities of the digital age, informed policies and collaborative efforts are essential to creating a sustainable foundation for inclusive economic growth.

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