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Artificial Intelligence in E-Entrepreneurship Training:
Enhancing Digital Skills and Innovation Diffusion in Indonesia

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ABSTRACT

This study explored the integration of artificial intelligence (AI) in e-entrepreneurship education, focusing on its impact on personalized learning, skill development, and student engagement. Using the diffusion of innovations framework, it examined factors influencing AI adoption, including infrastructure, educator preparedness, and ethical concerns. Through semi-structured interviews with Gen Z learners and focus groups with educators and AI technologists, the research identified key challenges—AI complexity, resistance to change, and data privacy. The study demonstrated that AI tools, such as personalized learning systems and business simulations, enhance entrepreneurial training by providing adaptive learning and real-time feedback. It concluded with policy recommendations to ensure inclusive access, especially for underserved entrepreneurs and contributes to understanding AI's transformative potential in bridging Indonesia's digital skills gap.

KEYWORDS

Artificial Intelligence, E-Entrepreneurship, Indonesia, Education, Diffusion of Innovations

INTRODUCTION

Artificial intelligence (AI) has become a crucial driver of digital transformation in global markets, particularly in e-commerce. AI applications, such as automated customer service, predictive analytics, personalized marketing, and fraud detection, have enabled businesses to operate more efficiently and adapt to dynamic consumer demands (Baijal et al., 2022). Indonesia, the largest digital economy in Southeast Asia, has experienced rapid expansion in e-commerce, fintech, and digital entrepreneurship. The *e-Conomy SEA 2024* report (Bain & Company et al., 2024) indicates that Indonesia's digital

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economy reached $95 billion in U.S. dollars in gross merchandise value in 2024, with projections to exceed $110 billion in U.S. dollars by 2025. The rise of AI-driven video commerce, which now accounts for 20% of Indonesia's total e-commerce gross merchandise value, represents a fundamental shift in digital shopping behavior, increasing from just 5% in 2022 (Bain & Company et al., 2023). Despite this strong growth, AI adoption remains uneven across businesses, especially among small and medium enterprises (SMEs). While large e-commerce platforms use AI-driven logistics and marketing, SMEs struggle with limited access to AI-powered digital marketing and financial analytics (Badan Pusat Statistik, 2023).

Indonesia's e-commerce sector accounted for 60% of the country's digital economy in 2024, growing at 15% each year (Bain & Company et al., 2024). AI-powered automation and digital marketing tools are revolutionizing customer engagement, supply chain management, and fraud detection (Baijal et al., 2022). One of the most significant AI-driven trends is video commerce, which integrates AI-powered recommendations and interactive shopping experiences. In Indonesia, video commerce gross merchandise value expanded from less than 5% in 2022 to 20% in 2024, reshaping consumer behavior and digital sales strategies (Bain & Company et al., 2024). However, AI adoption in Indonesia's e-commerce industry remains dominated by large marketplaces, such as Tokopedia, Shopee, and Bukalapak, while smaller businesses lack the resources to implement AI solutions (Badan Pusat Statistik, 2023). This highlights the need for affordable and accessible AI tools for SMEs.

The *e-Conomy SEA 2023* report highlights that Indonesia's digital payments market is projected to reach $417 billion in U.S. dollars by 2025, driven by AI-powered payment systems and fraud detection algorithms (Bain & Company et al., 2023). AI is playing a pivotal role in streamlining financial transactions, assessing credit risk, and enabling personalized banking services (Baijal et al., 2022). Despite these advancements, AI-driven lending and wealth management remain underutilized among SMEs and micro-entrepreneurs, limiting access to financial resources for business growth (Bain & Company et al., 2023). Expanding AI-driven credit scoring models and automated lending platforms could enhance financial inclusion for digital entrepreneurs.

Digital Skills Gap and Workforce Readiness

A critical challenge in Indonesia's e-commerce sector is the digital skills gap, particularly in AI expertise. According to the *Overview Indonesian Digital Society Index* report, Indonesia scored 58.25 out of 100 in the digital skills pillar, indicating widespread digital literacy, yet only 25.66 in the empowerment pillar, highlighting the disconnect between AI training and real-world business applications (Indonesian Digital Society Index, 2024). Similarly, the *Ipsos AI Monitor 2024: A 32-Country Ipsos Global Advisor Survey* (Ipsos, 2024) reported that 87% of Indonesians believe that AI will change their jobs within the next five years, but only 36% feel adequately prepared for these changes. This mismatch between AI awareness and AI skill development presents a significant barrier to innovation-driven entrepreneurship. Additionally, 69% of business leaders in Indonesia state that they would not hire individuals who lack AI competencies, reflecting the urgency of AI training initiatives (Badan Pusat Statistik, 2023).

Furthermore, AI literacy and usage remain highly concentrated in urban areas, while rural populations lag behind in AI adoption and e-commerce integration (Bain & Company et al., 2023). The Google-commissioned Kantar survey found that digital adoption rates among urban Indonesians are nearly double that of suburban users, particularly in e-commerce and fintech applications (Bain & Company et al., 2023).

AI Training Initiatives and Policy Interventions

Indonesia has launched several digital skills development programs, yet AI-specific training remains limited. The Digital Talent Scholarship (DTS), managed by the Ministry of Communication and Digital, has provided digital literacy programs, but only 45.3% of Indonesian businesses currently offer AI-focused training to their employees (Indonesian Digital Society Index, 2024).