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Development of an e-commerce-based entrepreneurship training model to improve community empowerment: An innovative approach

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ABSTRACT

The purpose of this study is to develop an e-commerce-based entrepreneurship training model to empower the community. The study uses a mixed-method research approach combining quantitative and qualitative Research and Development (R&D). The study population consists of 675 participants in e-commerce-based entrepreneurship training at 23 Community Learning Centers (CLCs) in Karawang Regency, West Java Province, Indonesia, all of whom were included in the study sample. The research steps were carried out as follows: preliminary study, planning, initial product development, expert validation and revision, initial product revision, large-scale product testing, final product development, model effectiveness testing, and implementation and dissemination of the e-commerce-based entrepreneurship training model for community empowerment. The results show that conventional entrepreneurship training has not significantly improved participants' skills and knowledge, leaving the community's entrepreneurial knowledge, attitudes, and skills relatively low. Therefore, an e-commerce-based training model was developed and implemented through planning, implementation, and evaluation stages. The use of the e-commerce-based training model resulted in excellent improvements among participants, particularly in their skills in utilizing e-commerce technology to start and manage online businesses, thereby supporting the research objective of improving the community's skills and knowledge in digital entrepreneurship.

Keywords: community empowerment; community welfare; digital marketing; entrepreneurship training; e-commerce-based.

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INTRODUCTION

Amid the acceleration of globalization, digital-based entrepreneurship is becoming increasingly important because competition, changes in consumer behavior, and technological advances require people to acquire new competencies to survive and thrive (Androsova, 2020; Garaja Aliyev, 2022). The integration of ICT in digital marketing and e-commerce has not only transformed conventional business practices into digital marketing but also opened up opportunities for marginalized groups, including rural residents, women, and individuals with low levels of education (Sianturi et al., 2026; Mustanir et al., 2025; Purbaningrum et al., 2024; Song et al., 2025). E-commerce-based entrepreneurship training has proven relevant in strengthening community empowerment through participatory approaches, collective agency, and the utilization of local assets. However, it still faces obstacles such as limited internet access, insufficient understanding of digital entrepreneurship's potential, and minimal institutional support (Ratten, 2020; Sulaiman et al., 2023; Talmage, 2021; Wood et al., 2021; Sianturi et al., 2026). Therefore, it is urgent to strengthen ICT infrastructure, develop easily accessible digital training platforms, and increase capacity in digital marketing, transaction security, and technological innovation, to ensure that digital entrepreneurship can function as a major driver of inclusive, sustainable economic development

that is adaptive to market changes (Asaithambi et al., 2024; Cao, 2021; Harini et al., 2023; Huang et al., 2021; Riaño Solano et al., 2024; Zhu, 2025).

In Indonesia, the trend of e-commerce-based entrepreneurship training has grown significantly. The government, private institutions, and non-governmental organizations offer various entrepreneurship training programs. E-commerce-based entrepreneurship training covers a range of topics, from an introduction to basic entrepreneurship concepts and business planning to digital marketing. Thus, e-commerce is part of digital marketing. In general, e-commerce is part of digital marketing. E-commerce is more focused on transactions and sales, while digital marketing encompasses broader strategies for promoting products or services online. Digital marketing is a more general concept, while e-commerce is a specific application of digital marketing focused on sales transactions. In Indonesia, the government's strategy to empower communities economically through entrepreneurship training has significantly improved socio-economic conditions, enhanced participants' skills, and supported the management of home-based businesses. Non-formal education models, such as those implemented in Sragen, emphasize sustainable growth and independence for micro, small, and medium enterprises (MSMEs) through facilitation and communication grounded in local culture (Suryono et al., 2023). Cross-border e-commerce platforms have empowered small and medium-sized entrepreneurs by providing fair participation opportunities and improving entrepreneurial performance through structural empowerment and resource bricolage (Fan & Zhai, 2023). The e-commerce-based entrepreneurial competency model in rural areas encompasses dimensions such as personal behavior, knowledge capital, thinking skills, psychological characteristics, and executive abilities, providing a framework for practical training and self-improvement (Fan & Zhai, 2023; Sianturi & Nababan, 2026). In Malaysia, practical e-commerce-based entrepreneurship training is hampered by a lack of understanding of web system concepts, even though other pedagogical factors also significantly impact learning outcomes (Nasri & Hanum P Iskandar, 2021).

Despite its enormous potential, the application of digital marketing and e-commerce in entrepreneurship training still faces various obstacles, including suboptimal adoption strategies, low digital literacy, and a lack of institutional support and community participation. If e-commerce-based training is not strengthened, the community risks struggling to adapt to market changes, losing opportunities for innovation, and failing to create jobs, ultimately weakening the national economy's competitiveness (Anwar et al., 2025; Santoso & Purnomo, 2024). This challenge highlights the need for a dynamic, relevant, and inclusive training ecosystem, especially since e-commerce acts as a catalyst for economic growth and community empowerment, including in developing countries such as Indonesia. By leveraging digital technology, entrepreneurship training can expand market access, enhance competencies, and strengthen the economic resilience of individuals and groups, as demonstrated by recent research (Al-Awlaqi et al., 2021; Hagebakken et al., 2021; Yadav, 2024). Amid accelerating digitalization and global economic uncertainty, the development of e-commerce-based entrepreneurship training has become increasingly urgent to ensure the community is not left behind and can contribute to inclusive and sustainable development (Alvarado-Morán et al., 2024).

Empowerment theory emphasizes increasing the capacity, agency, and control of communities over their economic decisions, and this is in line with the ABCD model, which focuses on utilizing local assets; PRA, which emphasizes community participation in decision-making; and CLD, which places collective action as a driver of change (Al-Kautsari, 2019; Habib, 2021; Mulyono et al., 2023; Qur'ainny et al., 2025). In the context of digitalization, the development of e-commerce-based entrepreneurship training models is urgently needed to strengthen community empowerment, especially in areas that are not yet reached by conventional training (Al-Awlaqi et al., 2021; Bilal & Fatima, 2022; Bischoff et al., 2020; Indarti, 2021). This training improves digital literacy, online marketing skills, business innovation, and broader market access, thereby reducing the digital divide and opening up more inclusive economic opportunities (Fatima et al., 2024; Hagebakken et al., 2021; Liu et al., 2025; Sianturi & Nababan, 2026). Research findings show that structured entrepreneurship training can improve entrepreneurial orientation, business resilience, business formation, and sustainable development, especially when integrated into a community empowerment framework such as CLC. Thus, e-commerce-based entrepreneurship

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training not only improves skills and income but also strengthens the local ecosystem, fosters economic independence, and supports equitable digital transformation in society (Gunartin et al., 2025; Hagebakken et al., 2021; Rubyutsa et al., 2024; Suryono et al., 2023).

The concept of e-commerce-based entrepreneurship training in community empowerment can be explored across various contexts, highlighting its novelty and value in expanding economic opportunities and enhancing social welfare. Programs that combine technical skills with entrepreneurship training, including digital marketing strategies, platform management, and online business operations, have shown significant success. This entrepreneurship training program aims to produce a product and improve technical competencies, and to expand market access through digital platforms, thereby increasing family income.

In the contemporary era marked by the proliferation of digital marketing, e-commerce has emerged as a significant catalyst for global economic progress. Formulating an e-commerce-centric entrepreneurship training paradigm is crucial for community empowerment, especially in developing countries such as Indonesia. The design of e-commerce-oriented entrepreneurship training is a strategic initiative aimed at community empowerment. By leveraging e-commerce's inherent capabilities, it can uncover new prospects, enhance competencies, and promote inclusive economic development. Such training is essential given the challenges posed by globalization and rapid technological evolution. To introduce innovative solutions, this study proposes a new methodology for community empowerment through the use of digital technology. E-commerce provides access to a broader market without geographical boundaries.

Entrepreneurship training as a non-formal education program is influenced by the pedagogical principles of Paulo Freire, a figure in non-formal education, and catalyzes community empowerment through the promotion of reflective decision-making and the development of socio-cultural values (Rubyutsa et al., 2024). With improved digital and entrepreneurial skills, training participants are expected to be able to increase their income, expand their business networks, and sustainably improve their quality of life. Therefore, this study is important to determine the effectiveness of the training and its impact on the economic empowerment of communities in CLC environments. Thus, this study focuses on whether e-commerce training can bridge the economic gap between urban and rural areas, providing fairer opportunities for all segments of society. Through this study, effective ways to implement e-commerce-based entrepreneurship training programs that can improve the empowerment and welfare of the community as a whole can be identified. E-commerce-based entrepreneurship training can offer a new approach to community empowerment. This study aims to reveal data on the actual entrepreneurial competencies of the community prior to entrepreneurship training, the development of an e-commerce-based entrepreneurship training model concept, the implementation of an e-commerce-based entrepreneurship training model, and the results and impact of developing an e-commerce-based entrepreneurship training model in improving community empowerment.

METHOD

This study uses a mixed-method Research and Development (R&D) approach to develop an e-commerce-based entrepreneurship training model for community empowerment. The model was developed through a series of systematic steps, starting from needs identification, theoretical review, prototype design, expert validation, and limited and extensive testing. After refinement, the model was implemented and disseminated in Community Learning Centers (CLC), then evaluated for impact to ensure its long-term effectiveness. This entire process ensured that the resulting model was valid, applicable, and capable of meeting the needs of entrepreneurship training in the digital age.

The population in this study consisted of participants in e-commerce-based entrepreneurship training at CLC, with a total of 675 respondents at 23 CLC in Karawang Regency, West Java Province, Indonesia, all of whom were included in the research sample.

Data analysis in this study used descriptive techniques to process and interpret data so that it could be generalized. The researcher used the TCR (Respondent Achievement Level) technique,

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which assesses respondent achievement based on the ranking of various measured characteristics. This research method used the Master Scale assessment scale, which is a five-level measurement scale that describes the variation of a particular trait, as shown in the Table 1.

Table 1. Respondents' achievement levels

No	Presentation of Achievements	Criteria
1.	85% - 100%	Excellent
2.	66% - 84%	Good
3.	51% - 65%	Average
4.	36% - 50%	Deficient
5.	0% - 35%	Unacceptable

Meanwhile, to calculate the respondents' achievement levels and relationship criteria, a formula developed by Sugiyono (2013) as follows (1).

$$TCR = \frac{Average\ score}{Maximum\ score} x100\% \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

FINDINGS AND DISCUSSION

Findings

The results of the study show that e-commerce-based entrepreneurship training implemented at CLC can bring about significant changes in participants' capacity in terms of knowledge, digital skills, and entrepreneurial practices. The training program, which was designed based on the real needs of the learners as training participants, ranging from training needs analysis, local potential resources, understanding of e-commerce platforms, to digital marketing strategies, has succeeded in improving the participants' readiness to manage their businesses more independently and market-oriented, thereby ultimately empowering the community's economy. The research results show that the factual conditions of entrepreneurship training based on pre-test and post-test before and after e-commerce-based entrepreneurship training can be seen in the Figure 1-4.

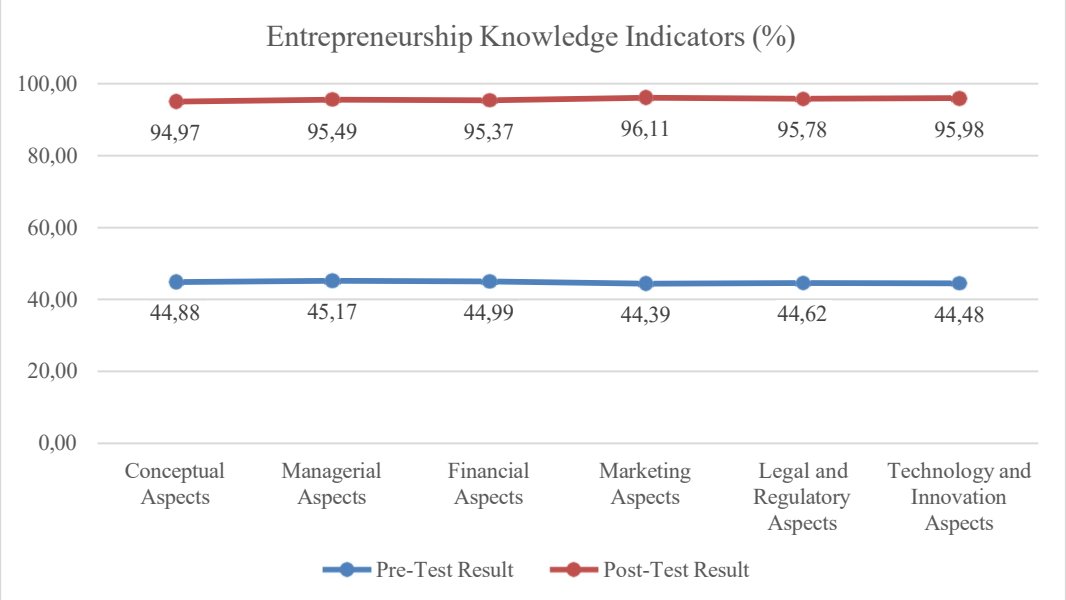


Figure 1. Before and After Treatment of Entrepreneurship Knowledge Indicators

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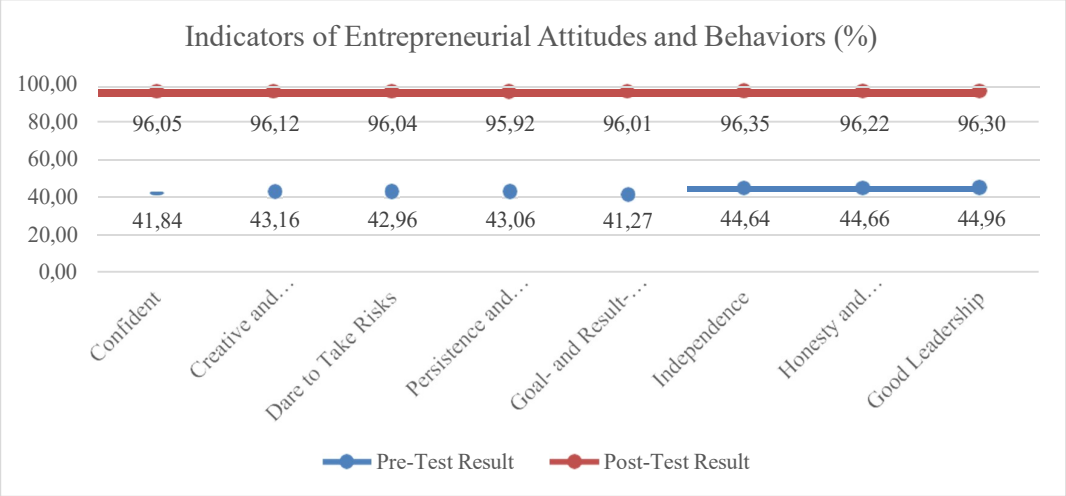


Figure 2. Before and After Treatment of Entrepreneurial Attitude and Behaviour Indicators

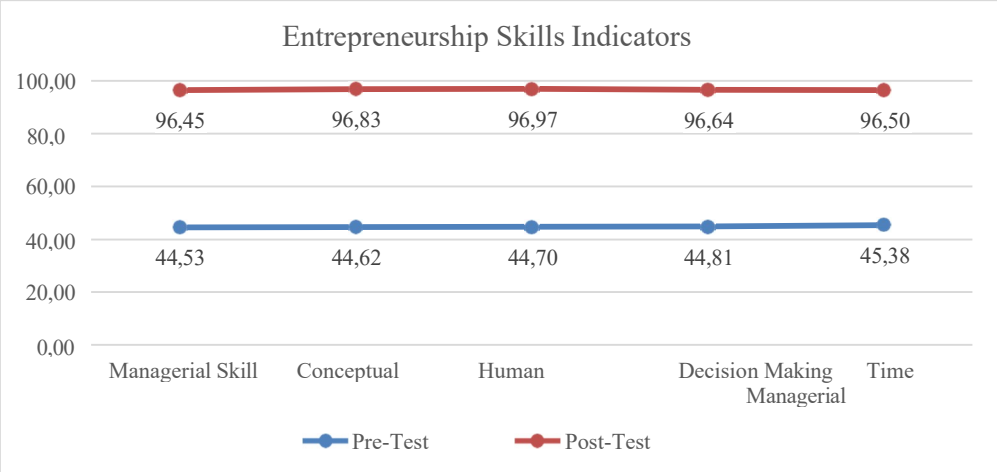


Figure 3. Before and After Treatment of Entrepreneurship Skills Indicators

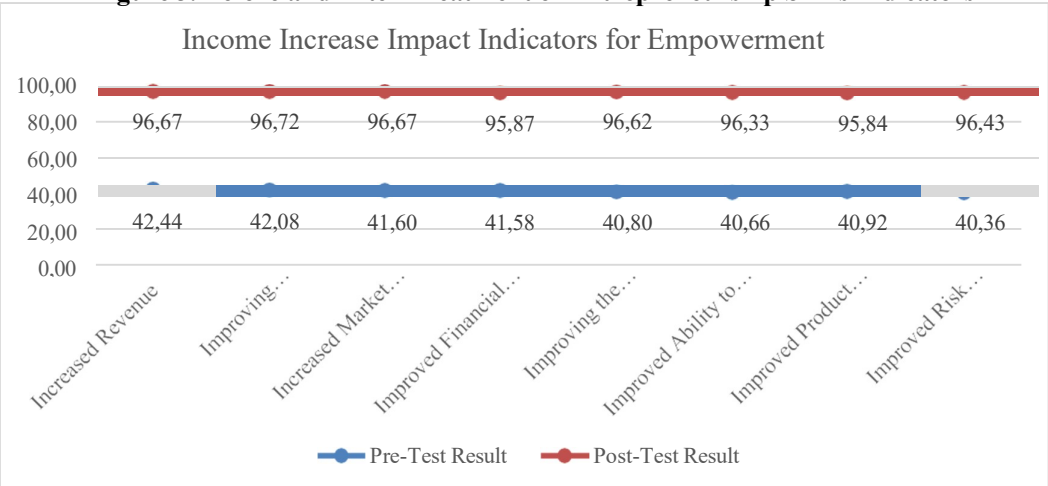


Figure 4. Before and After Treatment Indicators of Income Growth Impact on Community Empowerment

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Discussion

Actual conditions prior to e-commerce-based entrepreneurship training for the community

The results of the research in the figures above show that the initial entrepreneurial competence of CLC participants before attending e-commerce-based training was in the poor category. Pre-test data showed weaknesses in all aspects, ranging from entrepreneurial knowledge, entrepreneurial attitudes and behavior, managerial skills, and the ability to utilize digital technology. These findings confirm that the conventional training previously conducted by CLC has not been able to improve the capacity of participants significantly, nor has it provided the digital literacy support needed by the community in facing the digital economy. This challenge reinforces the urgency of developing a new training model that is in line with the needs of participants and the latest technological developments. The figures above show that after conducting a pre-test prior to implementing e-commerce-based entrepreneurship training, the participants' knowledge, attitudes, behaviors, and entrepreneurial skills were found to be lacking. The entrepreneurial knowledge indicator was poor (44.69%). The entrepreneurial attitude and behavior indicator was poor (43.34%). Furthermore, the entrepreneurial skills indicator was poor (44.74%). The indicator of the impact of increased income on community empowerment was poor (41.16%).

Development of an e-commerce-based entrepreneurship training model design to improve community empowerment

The development of an e-commerce-based entrepreneurship training model for community empowerment was carried out through the stages of training planning, model design development, which designed a training curriculum covering entrepreneurship material, the use of e-commerce platforms, digital marketing, and model testing by conducting training trials to obtain feedback from participants. The development of the e-commerce-based entrepreneurship training model design was carried out through the following stages: (1) Identification of potential and problems, which resulted in a document analyzing the needs (competency needs and existing gaps); (2) Literature study and theoretical review to obtain a theoretical basis for existing training models through a review of entrepreneurship, e-commerce, and adult learning (andragogy) theories; (3) Designing a preliminary model (Prototype I) to create a preliminary design for an e-commerce-based entrepreneurship training model, determining the training objectives (entrepreneurship and digital marketing/e-commerce competencies). At this stage, a draft e-commerce-based entrepreneurship training model is produced; (4) Expert validation to ensure the model is feasible before being tested in the field (Prototype II); (5) Small Scale Trial to test the effectiveness of the entrepreneurship training model on a small scale to produce initial trial results and model revisions; (6) Large Scale Trial to test the model more broadly and diversely to produce a more mature model, ready for implementation; (7) Model refinement aimed at producing a final model ready for implementation, resulting in a final model (Prototype III) and implementation guidelines for e-commerce-based entrepreneurship training; (8) Dissemination and implementation to disseminate the training model and adopt it in the field; (9) Impact evaluation to measure the long-term impact several months after the training is implemented in order to see the sustainability of the business, turnover, and changes in the entrepreneurial behavior of the community.

The proposed training model facilitates entrepreneurship training using active pedagogy and technological innovation. This model helps training participants identify entrepreneurial skills, propose solutions to social problems, and develop cognitive dominance, especially during the quarantine period due to the pandemic (Portuguez Castro & Gomez Zermeño, 2021). Lifelong learning programs and affordable, flexible short training programs are essential for improving entrepreneurial knowledge and skills, especially for women entrepreneurs (Mohd Noor et al., 2024). A platform for various educational resources on innovation and professional e-commerce entrepreneurship has been developed, allowing users to publish training information and access shared resources. This platform demonstrates good operational performance, strong load capacity, and high safety performance (Cao, 2021).

E-commerce-based entrepreneurship training is a form of technical intervention that serves as a means of social participation, gender equality, and sustainable economic development. The

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combination of digital technology with a framework for community empowerment has shown significant potential in increasing the capacity of women, youth, and other marginalized communities, while simultaneously acting as a catalyst for economic and social transformation. Thus, the integration of e-commerce into entrepreneurship training for community empowerment is a rapidly growing field, characterized by digital innovation, participatory methodologies, and an increasing emphasis on sustainable community participation. While significant strides have been made, ongoing research and practice must address remaining barriers and capitalize on emerging trends to realize the full transformative potential of these interventions. E-commerce-based entrepreneurship training aims to empower entrepreneurs located in rural areas to transform their aspirations to engage in digital commerce so that they can improve the progress of their businesses. However, infrastructure and socio-economic barriers remain, necessitating adjustments to the design of entrepreneurship training programs and the formation of collaborative partnerships with relevant stakeholders (Choudhary, 2025; Ji & Zhuang, 2023; Mohamad et al., 2025). The implementation of efficient digital literacy training must also encourage the development of social capital, given that information literacy serves as a facilitator for engagement in e-commerce-based entrepreneurship (Wang et al., 2024). E-commerce platforms, when integrated with improved digital literacy and social capital investment, have the potential to serve as a significant catalyst for inclusive entrepreneurship and community empowerment, which still face many obstacles and require further attention.

The provision of digital literacy and marketing skills training has proven successful in empowering entrepreneurs. An approach based on community involvement, which includes the Digital Literacy Class Mentor Program, Networking Meetings, Best Practices, and Special Skills Training, has significantly improved digital capabilities among micro, small, and medium enterprises (MSMEs) under its leadership, thereby promoting local economic development (Helmi et al., 2025). The integration of digital entrepreneurship programs into the Technical and Vocational Education and Training (TVET) framework has proven to be an important part of equipping the workforce with the skills needed to thrive in the digital economy. This integration fosters innovation, adaptability, and competitiveness, which are essential for developing modern entrepreneurship. An entrepreneurship training curriculum that integrates digital marketing skills, including social media marketing, search engine optimization (SEO), and content marketing, is essential for individuals and communities aspiring to develop their businesses (Chen & Ifenthaler, 2023).

From a design perspective, this research produced a new training model that combines the principles of andragogy, local community potential, digital literacy, and a phased training cycle. This model differs from conventional training because it combines three core elements: (1) short needs-based theory training, (2) weekly coaching by CLC tutors, and (3) hands-on practice in opening a digital store. Thus, participants not only understand the concepts but also immediately apply their skills through real activities. The hands-on approach has been proven to reduce fear of using digital platforms and increase participants' motivation to develop online businesses.

Implementation of e-commerce-based entrepreneurship training model development to improve community empowerment

During the implementation stage, training is carried out by organizing training sessions according to the schedule and materials that have been prepared, and the training methods are interactive, such as discussions, simulations, and hands-on practice. During the evaluation and reflection stage, the effectiveness of the training is measured through pre-tests and post-tests as well as participant feedback. Data analysis is conducted using statistical analysis to evaluate improvements in skills and knowledge. The reflection stage involves compiling a report on the strengths and weaknesses of the training model. The follow-up stage involves monitoring participants who have completed the training to see their progress and continuous development, and compiling follow-up programs for participants so that they can continue to develop. By following these stages, it is hoped that the training model developed can provide real benefits in empowering the community through e-commerce-based entrepreneurship. E-commerce-based entrepreneurship training aims to empower the community economically. In the context of

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entrepreneurship, empowerment means increasing the capacity of individuals to manage their businesses independently so that they can improve their economic well-being. In the context of e-commerce-based entrepreneurship training at the Community Learning Center (CLC), community empowerment occurs when training participants acquire the knowledge and skills that enable them to utilize digital technology independently, increase their business capacity, and take control of their economic development. Thus, this training not only improves technical skills but also strengthens the social and economic position of the community in a sustainable manner.

Results and impact of developing an e-commerce-based entrepreneurship training model in empowering communities

The results of the study show that before the training, the participants' level of entrepreneurial knowledge achievement was in the low category, with an average score of 2.24 or 44.69%. After the training, the score increased to 4.78 or 95.49% in the excellent category. The increase in score of 2.54 points indicates an improvement in conceptual, managerial, financial, marketing, legal, and technological innovation understanding of entrepreneurship. The N-Gain calculation result was 0.92, which is in the highly effective category. This means that the training significantly improved the participants' mastery of entrepreneurial concepts and insights.

The pre-test results for entrepreneurial attitudes and behavior showed an average score of 2.17 or 43.34%, which is in the poor category. After the treatment, the score increased to 4.81 or 96.14%, which is in the excellent category. This increase reflects significant changes in the aspects of self-confidence, creativity, risk-taking, persistence, result orientation, independence, business ethics, and leadership (Gunartin et al., 2025). The N-Gain calculation of 0.93 indicates very high effectiveness. This means that the training model shapes a positive entrepreneurial mindset and behavior.

Before the training, participants' entrepreneurial skills were in the poor category with an average score of 2.24 (44.74%). After the training, the score increased to 4.84 (96.70%) in the excellent category. There was a significant improvement in skills, including managerial, conceptual, interpersonal (human skills), decision-making, and time management skills. The N-Gain value of 0.94 indicates an improvement in the highly effective category. These results show that practice-based training and e-commerce simulations have had a direct impact on improving participants' functional skills.

Next, regarding the results and direct impact on community empowerment through increased income. Before the training, the average score was 2.06 (41.16%) in the poor category. After the training, it increased to 4.83 (96.52%) in the excellent category. An increase of 2.77 points resulted in an N-Gain value of 0.97, which is in the highly effective category. This shows that e-commerce-based training not only improves individual competencies but also has a real economic impact in the form of increased income and expanded market access.

The overall average calculation results show a score of 2.18 before treatment and 4.82 after treatment, with an N-Gain value of 0.94. Based on the criteria of Hake and Reece (1999), these values fall into the highly effective category. Thus, it can be concluded that the e-commerce-based entrepreneurship training model developed has proven to be highly effective in improving the entrepreneurial competencies of the community in the four main dimensions: knowledge, attitude, skills, and economic empowerment impact.

The above research results illustrate that key elements such as live streaming, digital marketing strategies, and operational management play an important role in improving participants' ability to manage e-commerce-based businesses (Ho & Chen, 2023). The training curriculum emphasizes digital marketing, mobile transaction security, and the adoption of new technologies such as artificial intelligence and augmented reality to strengthen participants' competitiveness and engagement (Deirmentzoglou et al., 2025). The focus of training on innovation helps participants improve their entrepreneurial competencies in line with economic and technological developments (Qiang et al., 2024). Therefore, practical evaluation and feedback mechanisms are needed to improve training quality, including through open feedback processes

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and comprehensive mentoring services (Zeng et al., 2022). Qualitative findings indicate that personalized, communicative, and flexible training is more effective in supporting e-commerce learning success.

Furthermore, the impact of increased income on community empowerment is excellent. Several studies on the impact of entrepreneurship on community empowerment in several countries show that in the UK, for example, the facilitation of community empowerment in the context of regional regeneration policies often prioritizes the interests of alternative stakeholders rather than representing the needs of the wider community, thus encouraging research on the actual objectives and success of entrepreneurship programs (Lawson & Kearns, 2014). Empowerment initiatives must address interrelated gaps to ensure a collaborative approach to achieving lasting results. Participatory action research conducted in various countries underscores the need to understand and address these gaps (Shaw et al., 2020). Entrepreneurship training programs play an important role in promoting economic empowerment in communities. For example, research conducted in Gunungkidul Regency, Indonesia, shows that entrepreneurship training initiatives in pioneering tourist villages have significantly improved participants' understanding and practical skills, which have had an impact on the economic empowerment of the community (Purbaningrum et al., 2024).

Furthermore, in Austria and Serbia, community-managed rural tourism has demonstrated its potential to improve economic sustainability and cultural preservation, where proactive community involvement can foster a sense of ownership and community empowerment (Cvijanović et al., 2025). Many entrepreneurs, especially women working in micro, small, and medium enterprises (MSMEs), face significant barriers in integrating digital technology and maintaining online security. This framework aims to improve digital literacy and marketing competencies in the community development process (Helmi et al., 2025). There is a difference between contemporary entrepreneurship training and the anticipation of a rapidly growing digital industry. The training curriculum must integrate advanced digital communication competencies, including social media marketing, search engine optimization, and content marketing, to adequately equip prospective entrepreneurs (Papageorgiou et al., 2021).

A study in Indonesia developed a model called "Creative Pedagogy-Based Social Action Projects," which significantly improved entrepreneurial competencies among junior high school teachers. This model emphasizes problem solving, networking, action, guidance, and sharing (Widiastuti et al., 2023). Other studies highlight the importance of integrating e-commerce-based entrepreneurial training in rural areas with entrepreneurial training in higher education institutions to increase students' motivation and skills for e-commerce-based entrepreneurship in rural areas (Zeng et al., 2022). Entrepreneurship training programs in various regions, including the United States, UAE, China, India, and Pakistan, show that access to digital devices and trainer competency are critical to the success of the programs. These programs help improve skills and address regional disparities (Anwar et al., 2025). In Tanzania, combining technical skills training with psychological mindset training resulted in higher levels of entrepreneurial action and self-efficacy among participants (Morris et al., 2023). E-commerce-based training significantly influences people's attitudes and intentions toward entrepreneurship. A study involving Saudi students found that the components of education and entrepreneurial attitudes based on digital marketing are strong predictors of entrepreneurial intentions and motivation through e-commerce platforms (Mohammed et al., 2023). E-commerce-based entrepreneurship in rural China shows that professional knowledge, resources, information and communication technology, and logistics infrastructure have a positive impact on entrepreneurial intent and motivation, while market channels previously had a negative impact (Huang et al., 2021). The entrepreneurship training program developed has been proven to improve entrepreneurial competence and business management skills, with the mediating role of entrepreneurial self-efficacy (Davies et al., 2023).

On the qualitative side, e-commerce training has brought about fundamental changes in three dimensions of community empowerment: (1) personal empowerment, as seen in increased self-efficacy in using technology; (2) economic empowerment, marked by increased income and the ability to manage businesses independently; and (3) social empowerment, where a supportive community has been formed among participants and CLC managers. These socio-economic

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impacts show that e-commerce is not merely a medium for transactions, but a tool for social transformation that strengthens the social capital of the community.

Novelty of research

The novelty of this research lies in the full integration of community empowerment, e-commerce training, and a non-formal approach based on CLC as a non-formal educational institution that serves marginalized communities and those from diverse educational backgrounds. The training model developed is designed according to the local context, combining problem-based learning, direct entrepreneurial practice, and continuous mentoring. Unlike general one-way training, this training utilizes the local potential of the community (home-based products, culinary, crafts), facilitates experience-based learning, and builds a digital ecosystem at the community level. Thus, this model contributes new insights to the literature on e-commerce training, which has not been widely studied in the context of CLC and community empowerment.

Relevance of findings to previous empirical studies

These findings are in line with international studies that emphasize the importance of digital integration in entrepreneurship training. Previous studies have shown that digital literacy, online marketing, and business management skills are key factors in the success of micro-enterprises in the digital age. The results of this study reinforce these findings by providing empirical evidence that e-commerce training at CLC can improve digital literacy, reduce market access barriers, and support community business innovation. Significant improvements in knowledge, attitudes, and skills indicate that the model developed is practical and relevant for application in communities with low digital literacy.

Recent findings (2019-2024) emphasize the dual function of entrepreneurship training, which aims to foster autonomy and resilience while leveraging digital innovation to reduce socio-economic disparities (Awashreh, 2025; Song et al., 2025). Therefore, e-commerce-based entrepreneurship training can be implemented in the community. Recent scientific studies over the past five years have revealed a significant gap in combining the concept of community empowerment with e-commerce-based entrepreneurship training. This empirical study shows that although there is great potential to utilize e-commerce digital platforms to empower communities and increase entrepreneurial competencies, obstacles such as the digital literacy gap, gender inequality, infrastructure limitations, and the demand for continuous and contextually relevant training remain inadequately addressed (Awashreh, 2025; Jeong et al., 2024; Song et al., 2025; St-Jean et al., 2022). However, the integration of the community empowerment paradigm with e-commerce-oriented entrepreneurship training continues to face many challenges—particularly those related to a lack of digital literacy, infrastructure limitations, and persistent gender disparities (Awashreh, 2025; Helmi et al., 2025; Mondal et al., 2024; Song et al., 2025).

This approach empowers disadvantaged groups by increasing the use and recommendation of digital trading platforms (e-commerce), which is essential for driving innovation in electronic commerce (Munyoka, 2022). Experiential Learning and Empowerment integrates experience-based training, which enhances meaning, competence, self-determination, and impact on community empowerment. This approach is highly effective in the context of poverty and demonstrates that similar methods can be applied to e-commerce training to encourage innovation (Santos et al., 2019). These models support the sustainable growth of micro, small, and medium enterprises (MSMEs), which can be crucial for driving innovation in e-commerce (Suryono et al., 2023).

Relevance of local context and implementation challenges

E-commerce platforms have significantly improved the entrepreneurial performance of grassroots entrepreneurs by providing equal opportunities for participation and overcoming resource constraints. This improvement is mediated by resource bricolage, which allows entrepreneurs to creatively utilize available resources to improve their business performance (Fan & Zhai, 2023). The Government Empowerment and Enterprise Program (GEEP) in Nigeria has

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had a significant impact on business turnover, reduced production costs, and increased profitability and return on investment (ROI) for women entrepreneurs. This shows that similar e-commerce-based training models can improve economic outcomes for participants (Okolo-Obasi & Uduji, 2024). The growth of e-commerce in rural areas has led to the creation of part-time jobs for women, although it has not significantly changed traditional gender roles. This shows that while e-commerce can provide economic opportunities, additional measures may be needed to comprehensively address social empowerment (Li & Zhou, 2025). The National E-Commerce Demonstration City Pilot Program (NEDCPP) in China has significantly increased urban entrepreneurial activity, particularly in sectors such as wholesale, retail, and information technology. This shows that e-commerce initiatives can drive broader economic development and community welfare (Jiang & Qin, 2024). E-commerce has been proven to reduce rural depopulation by creating jobs, encouraging rural entrepreneurship, and increasing rural income and infrastructure. This shows that e-commerce-based training models can contribute to supporting rural communities (Zhao et al., 2024). For e-commerce-based training to be practical, focus must be placed on improving digital skills and supporting infrastructure. This is crucial for enhancing participants' innovation capabilities and ensuring they can take full advantage of e-commerce opportunities (Qiang et al., 2024).

Further discussion shows that the success of training is greatly influenced by a needs-based training approach that is relevant to the local context. Challenges such as low digital literacy, limited internet access, and a lack of prior ongoing mentoring were significant obstacles to the effectiveness of the training. The training model developed in this study overcomes these obstacles through the integration of simple digital technology, easy-to-understand learning media, and intensive mentoring that allows participants to gain a comprehensive learning experience. This strategy has proven effective in increasing participant engagement and encouraging changes in entrepreneurial behavior.

Structural impact on reducing the digital divide

E-commerce training also has a structural impact on community empowerment, especially in the context of the digital divide between urban and rural areas. This program is able to open up market access that was previously unattainable for participants and increase opportunities for new digital-based businesses. Research findings confirm that e-commerce can overcome geographical barriers by providing broader marketing channels, reducing operational costs, and improving the sustainability of micro-enterprises. These impacts are crucial in enhancing the economic independence of rural communities and marginalized groups.

Potential for replication and strengthening the role of CLC

The training model developed has also proven to be replicable. Through its flexible and participatory design, CLC can adopt this model as a sustainable community empowerment program. The phased training approach, which involves needs assessment, hands-on practice, business mentoring, and impact evaluation, has been proven to increase the economic empowerment of participants and contribute to the socio-economic development of the community. This reinforces the role of CLC as an adaptive center for digital transformation.

CONCLUSION

The integration of e-commerce-based entrepreneurship training in community empowerment contributes both theoretically and practically. Theoretically, this study proves that the e-commerce-based training model is a strategic model and instrument for improving digital literacy, strengthening economic capacity, reducing the digital divide, and supporting inclusive and sustainable community development. The resulting training model is not only empirically effective but also relevant to the real needs of the community, easily adaptable, and has a long-term impact on community economic empowerment. The e-commerce-based entrepreneurship training model is designed through basic elements, namely, comprehensive training through the identification of entrepreneurial potential, digital capability barriers, and market access capabilities. The e-commerce-based entrepreneurship training design consists of modules

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covering market account creation, product photography, copywriting, digital branding, order management, and digital marketing strategies. The practical implications of this research are effectively used in entrepreneurship programs in non-formal education.

The results of this study provide recommendations: (1) strengthening e-commerce-based entrepreneurship programs in CLCs requires integrating this training model as a routine and ongoing program, rather than a one-off activity, and developing a modular curriculum based on competency levels so that participants can learn gradually according to their initial abilities; (2) increasing the capacity building of CLC tutors so that they receive further training related to digital marketing, marketplace management, and new technologies such as AI tools for digital marketing; (3) Improving the digital marketing infrastructure in the implementation of entrepreneurship training. Local governments need to strengthen internet access and provide digital learning facilities at CLCs to support the training process; (4) Continuous business assistance through a 3-6 month mentoring program after training is necessary to maintain the sustainability of participants' digital businesses; (5) Multi-stakeholder collaboration so that CLCs partner with marketplaces, microfinance institutions, local MSMEs, and universities to expand access to training and business opportunities; (6) The training model can be replicated in other CLCs, especially in rural areas to overcome economic access limitations; (7) Further research needs to be conducted in longitudinal studies to see the long-term impact on income, business sustainability, and social transformation. A hybrid model can also be developed by utilizing AI, big data, and interactive learning media.

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