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INTEGRATING ONLINE AND OFFLINE LEARNING IN ENTREPRENEURSHIP EDUCATION: AI'S ROLE IN REDUCING REGIONAL DISPARITIES

Muhammad Ahmi Husein[1], Lavinia Disa W. Araminta[2], Nur Hilal A. Syahrir[3]
[1] Faculty of Economics and Business, UPN Veteran Jawa Timur
[2] Faculty of Education, Monash University
[3] Faculty of Science, Universitas Sulawesi Barat
email: m.ahmi.h.kwu@upnjatim.ac.id

ABSTRACT

This study aims to describe the impact of learning methods in online and offline entrepreneurship learning for Indonesian students with the constraint of regional disparities in accessing learning. Many online learning platforms have been widely used in recent years due to its benefits such as flexibility and accessibility. However, offline learning is more preferable for hands on skills development in entrepreneurship learning. In this study, we use quantitative methods approach by applying Chi-Square Analysis and the Wilcoxon Signed-Rank Test to analyse the data of the experiment which has been conducted by collecting the data of 172 students in 4 development regions of Indonesia. Although the learning methods in online have been increasingly popular, the result of this study shows that most of the students more prefer offline learning methods because of its interactive and hands on experience. The result of this study can be a reference for policymakers and educational institutes about the importance of both learning methods even how we can overcome the problem of connectivity in offline learning in various regions so that the entrepreneurial learning can be equally accessed by Indonesian students. In addition, this study also discusses the opportunity of Generative Artificial Intelligence (Gen-AI) in entrepreneurship education for achieving the learning environment which is inclusive and promote equality among students.

Keywords: *Entrepreneurship education, higher education, online learning, regional development*

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INTRODUCTION

The application of technology in educational institutions has changed the conventional learning environment, which offers many new opportunities in improving learning, especially in developing countries such as Indonesia, which has regional disparities in the availability of educational facilities. Research has shown a significant socio-economic and educational disparity between the Eastern and Western regions of Indonesia (Achmad & Prayitno, 2020; Azzizah, 2015). This study shows how important it is to pay attention to these disparities and take corrective measures. Entrepreneurship education is one of the important educations in order to get the skills needed for the growth of the regional economy (Coomans, 2022). However, the impact of learning with different learning modalities, in this case online and offline learning, is still questionable (J. Zhang & Price, 2020).

The recent development of online learning platforms opens up greater access to various learning resources, which means students can now access entrepreneurship-related content through online methods such as the use of social media and online courses (Z. Zhang, 2021). The number of students in Indonesia who access these learning resources is on the rise and this trend has increased students' interest in online learning (Rohaetin, 2020; Shabrina et al., 2019). Although the learning method in online has gained increasing popularity, offline learning method is still very much needed due to its interactive and hands on experience especially in entrepreneurship field (Gibb, 2002; Maspaeni et al., 2022).

Artificial intelligence (AI) is emerging as a transformative technology in entrepreneurship education, offering new opportunities and challenges. Artificial intelligence (AI) copilots have the potential to play various learning roles for instructors, students, and AI tutors themselves in entrepreneurship education (Fox et al., 2025). It has shown positive impacts on diverse components of entrepreneurship education, including entrepreneurial cognition, competence, and innovation spirit (Alqahtani, 2023). AI development, along with entrepreneurship education, influences entrepreneurial intentions through perceived behavioral control (Dabbous & Boustani, 2023). The introduction of generative AI tools represents a paradigm shift in entrepreneurship education, pushing educators to embrace this innovation and reshape their classrooms (Winkler et al., 2023). The advancement of AI usage in education is urging the need for more studies to understand AI better and its impact on entrepreneurship education.

This study aims to examine quantitatively the impact of online and offline learning in entrepreneurship education among Indonesian students. The study uses statistical analyses, Chi-Square Analysis, and Wilcoxon Signed-Rank Test to see the increasing interest of students Indonesia HEIs in online entrepreneurial learning and effectiveness perspectives about these two learning channels. The result of this study will be the input for the argumentation of the effectiveness of online learning or offline learning.

LITERATURE REVIEW

Entrepreneurship Education and Learning Methods

Entrepreneurship education is one of the most important drivers of economic development in developing countries. Entrepreneurship education programs have been proven successful in developing students' entrepreneurial skills, knowledge, creativity, and critical thinking to prepare them for their business endeavour (Mets et al., 2023; Nabi et al., 2017). The learning methods in entrepreneurship education can have different impacts on students, particularly from offline and online learning methods. Learning methods in entrepreneurship education have received attention in educational research (Gabrielsson et al., 2020).

Offline learning in entrepreneurship education is a learning method that uses traditional learning in which learning occurs through face to face interactions with mentors, students, and the subject matter. In this case learning is carried out by applying constructivist learning theory which states that learning is a process of constructing new knowledge by experiencing directly or actively (Mintzes, 2020). In this context, Offline learning provides feedback quickly and easily and can be used to develop better understanding in entrepreneurship education (Hägg & Kurczewska, 2020).

Conversely, the rise of online learning has provided flexibility and scalability to entrepreneurship education, enabling students to benefit from educational offerings regardless of location (Xhafa, 2021). Online learning can improve access for students in remote areas with limited facilities compared to traditional schools (Liguori & Winkler, 2020a; Schou et al., 2022). However, there is a risk, however, that learning online may be less interactive and practical (Gibbings et al., 2015). That is, while online platforms may enable access to information, they may not provide similar hands-on experiences which are important in entrepreneurship education (Abou-Khalil et al., 2021; Chen et al., 2021).

Growing of Online Entrepreneurship Learning Sources

In the last 10 years, the tremendous increase of learning platforms online such as Coursera, Udemy, and EdX have increased entrepreneurship learning content availability for Indonesian students to be able to access a wider variety of learning content (McCrea, 2013; Z. Zhang, 2021). Furthermore, content creator platforms such as YouTube and Instagram as entrepreneurship learning content availability in the form of entrepreneurship learning content on the internet have increased and gained popularity as a source of learning content by students (Qalati et al., 2022; Susanto et al., 2021). The availability of online entrepreneurship learning content has increased the interest of Indonesian students, especially university students, to use these learning contents, as students want to increase their knowledge and improve their entrepreneurship skills outside the scope of the education system (Ikmal et al., 2021; Karjo, 2020).

Effectiveness Between Online and Offline Learning in Entrepreneurship Education

Whether the effectiveness of online and offline learning in entrepreneurship education is effective or not, recently there have been several studies that state that online learning can increase the effectiveness of learning that is more accessible and flexible, while offline learning is more effective in cultivating hands on skills needed in entrepreneurship success (McCrea, 2013). A self-directed learning study with a combination of online and offline learning was conducted by Cooney & Brophy (2023) with the aim to improve university students' entrepreneurial competencies in an online fundraising activity. Similarly, previous research studies in the context of Malaysia have also stated that learning theories in the classroom must be accompanied by learning activities outside the classroom to support students' entrepreneurial intentions (Yusoff et al., 2014).

While online learning can solve the problem of equal learning opportunities for students in remote areas through distance learning (Turan & Karabey, 2023). Interaction and communication to support the learning process are considered inefficient. Because it is expected that the online platform can provide information but cannot provide hands on experience (Liguori & Winkler, 2020b; Vecchiarini et al., 2024). Furthermore, offline learning which is a type of learning that is experienced through interaction between students and lecturers face to face, mentoring, and applying in practice is considered more effective in cultivating practical hands on skills needed in entrepreneurship success (Scott et al., 2016).

Regional Disparities of Entrepreneurship Education in Indonesia HEIs

Significant regional disparities exist in the development of entrepreneurship education in Indonesia. Although several programs and entrepreneurship initiatives have emerged in the Java and Bali regions, other regions in the Indonesian archipelago still lag behind in terms of access to entrepreneurship education and entrepreneurship support tools (Amalia & von Korflesch, 2021). The evidence of educational disparities between different regions in Indonesia is not just alarming; it is a clarion call for action. Studies by Azzizah (2015) and Achmad & Prayitno (2020) found that enrollment ratios (Net Enrollment Rate, in this case) in the Eastern provinces are much lower. There is a strong relationship between poverty and enrollment ratios: 1 additional point in poverty is correlated with a decrease of 0.420 points in NER for the East, as compared to 0.097 points for the West. Furthermore, the research reveals a brutal reality that 1 additional point in the Gini index causes a catastrophic decline in NER for the Eastern provinces (31%) as compared to only 22% for the West. Even worse, if GDP in regional areas were to be doubled, the NER in Eastern Indonesia would only increase by 2.3 points, whereas in the West, it would increase by 4.0 points.

The research shows this imbalance, suggesting that the educational institutions' policymakers, related position in the government, and educators should empower other HEIs in underdeveloped regions and communities by being flexible in the

planning and selection of facilities based on the regional conditions. As a result, the benefits of entrepreneurship education can be more widely disseminated throughout the country and benefit students from various regions and backgrounds, so they can join as entrepreneurs in the Indonesia ecosystem (Saptono et al., 2020). Online sources may be the solution for this issue. So, the policymakers and the educational institutions should apply holistic ways by utilizing the strengths of online and offline learning to provide more comprehensive entrepreneurship education for Indonesian students. So, in this research, the perceptions of Indonesia HEIs students on the effect of online and offline entrepreneurship education have been studied to increase the knowledge about the implementation of the optimal strategy in increasing entrepreneurship education in Indonesia.

RESEARCH METHOD

This study employs a quantitative, cross-sectional, descriptive approach to examine the effectiveness of online and offline learning methods in entrepreneurship education among Indonesian students. Male and female undergraduate students, ages 19 to 24, who were enrolled in business-related courses at various Indonesian universities, participated in the study. Cluster sampling was used to divide the participants into four Indonesian development regions in order to guarantee representation from various regions. This strategy was chosen in order to get a fair representation of viewpoints from every area. In the context of entrepreneurship education, this focus made sure that the participants were exposed to both online and offline learning environments in a relevant way.

The purpose of the study was to evaluate the relationship between students' opinions of entrepreneurial online learning and how frequently they use the internet. It also looked at how well students thought both online and offline learning approaches taught entrepreneurship. Key elements like internet engagement, using the internet to teach entrepreneurial skills, and general satisfaction with both learning modalities were captured by a structured survey that included multiple-choice and Likert-scale questions. In order to facilitate a comparative evaluation, participants were asked to rate their experiences with both online and offline learning.

The survey instruments were adapted from the work of Colombelli et al. (2022), who collected perspectives pre-and post-course experience before an entrepreneurship program, and Kashinath & Raju (2023)'s work, who analyzed students' perceptions of online and offline learning experience using descriptive statistics. To ensure the clarity and reliability of the survey items, a pilot survey was conducted among students from one of the entrepreneurship classes at UPN Veteran Jawa Timur. Content validity was established through a literature review of the studies mentioned above.

Quantitative data analysis was performed using SPSS Version 29. The analysis consisted of two primary statistical tests: *Chi-Square Test*: This test examined the

relationship between internet usage frequency and students' perceptions of entrepreneurial online learning. It aimed to determine whether students with more frequent internet access had significantly different views on online learning effectiveness compared to those with limited access. *Wilcoxon Signed-Rank Test*: Considering the non-normal distribution of the data, this non-parametric test compared students' preferences for offline versus online learning. It was chosen for its suitability in analyzing related samples without assuming normality

RESULTS AND DISCUSSION

RESULTS

Participants' Demographics

The study collected a total of 172 students, consisted of 71 male and 101 female students, enrolled in business-related courses across various higher education institutions in Indonesia. The distribution of the respondents can be seen from Table 1. This demographic diversity provided a comprehensive perspective on the effectiveness of offline and online learning methods.

Table 1.
Respondents Distribution Based on Indonesia's Four Main Development

Main Development Region	N	Percentage
A: Aceh, North Sumatra, Riau, the Riau Islands, and West Sumatra	4	2.32%
B: The Bangka Belitung Islands, Bengkulu, Jambi, South Sumatra, Lampung, Banten, Central Java, the Special Capital Region of Jakarta, the Special Region of Yogyakarta, West Java, and West Kalimantan	13	7.55%
C: East Java, Bali, Central Kalimantan, East Kalimantan, North Kalimantan, and South Kalimantan	95	55.23%
D: East Nusa Tenggara, West Nusa Tenggara, South Sulawesi, Southeast Sulawesi, West Sulawesi, Central Sulawesi, Gorontalo, North Sulawesi, Maluku, North Maluku, Central Papua, Highland Papua, Papua, South Papua, Southwest Papua, and West Papua	60	34.88%
Total	172	100%

Source: Primary Data Collection

Chi-Square Analysis: Internet Access and Entrepreneurial Online Learning

A Chi-Square Test was conducted to examine the relationship between internet usage frequency and students' perceptions of entrepreneurial online learning. The analysis revealed a significant relationship ($\chi^2 = 34.848$, $p < 0.01$), indicating that students who reported frequent access to the internet had a more favourable perception of accessing entrepreneurial online learning than those with limited access.

Wilcoxon Signed-Rank Test: Preference for Learning Methods

Subsequently, the Wilcoxon Signed-Rank Test was performed to compare students' perspectives on effectiveness over offline and online learning methods in learning entrepreneurial skills. The results indicated a significant preference for offline learning, with a Mean Rank of 36.37 for offline learning compared to a Mean Rank of 28.50 for online learning. The Wilcoxon test yielded a Z value of -5.556 with a significance level of $p < .001$. This statistically significant difference highlights that, despite the growing interest in online learning, students still perceive offline methods as more effective for entrepreneurship education.

DISCUSSION

The findings of this study show interesting outcomes for the effectiveness of offline and online learning for entrepreneurship education for Indonesian students. The initial Chi-Square analysis shows there is a significant relationship between students' access to the internet frequency and their perception on entrepreneurial online learning. The relationship shows the role of reliable internet connectivity available for students as it plays a crucial factor in the students' attitudes toward online education (Rahman, 2020). In addition, as the trend of education is increasingly becoming digital, it is important to have consistent internet access so that the benefits of online learning can be maximized (Luaran et al., 2013).

Although there is a positive correlation between frequent access to the internet and perceptions of entrepreneurship online learning, the results from the Wilcoxon Signed-Rank Test in Chapter 5 showed a significant preference for offline learning. The strong preference for offline learning (Mean Rank = 36.37) over online learning (Mean Rank = 28.50) demonstrates the value of face-to-face learning in entrepreneurship education. The paradoxical perception of offline learning may be due to the ability to interact, receive immediate feedback, and apply entrepreneurship knowledge and skills through hands-on learning (Kassean et al., 2015). Therefore, students still think that offline learning is more effective than online learning in entrepreneurship education, which is fit for developing an entrepreneurial mindset (realistic problem solving and collaborative learning).

Additionally, with the increasing popularity of entrepreneurial online learning among Indonesia students, the results of this study reject the claim that online learning can entirely replace offline learning in entrepreneurship education, especially in disciplines that require practical experience (Konak et al., 2019). Online platforms offer flexible and easily available education; but, a lack of interpersonal interaction and few chances for experiential learning make it challenging to develop necessary entrepreneurial skills (Hamburg, 2021). Students' choices for offline learning suggest that educational institutions should exercise caution on the way digital tools are included into their offerings.

The findings imply, among other things, the possibility of enhancing entrepreneurship education by means of Generative Artificial Intelligence (Gen-AI). By means of interactive, adaptive, and personalized learning, AI-driven tools can

help close gap between online and offline learning (Chen et al., 2020). Online mentors and AI-powered chatbots, for instance, can offer instant comments and direction, much as in-person interactions (Hooda et al., 2022). Moreover, by means of simulations and virtual reality, artificial intelligence can offer immersive learning, so helping to build entrepreneurial skills including critical thinking, decision-making, and creativity (Chen et al., 2024; Giuggioli & Pellegrini, 2023).

Apart from the aforementioned, artificial intelligence can also offer the benefit of enhancing online learning for students living in underprivileged or far-off locations. Through improved online learning experiences, artificial intelligence can give pupils in these fields better results. AI can personalize lessons depending on student needs by means of Natural language processing (NLP) and tailored learning algorithms, so increasing engagement and learning results (Maghsudi et al., 2021; Renz & Hilbig, 2020). By means of artificial intelligence, optimizing online learning experiences will help close the learning disparity and foster a more inclusive and fair learning environment.

The substantial regional differences in access to education in Indonesia make the situation even more complex. Students in cities are more likely to benefit from online and offline learning, while students in remote areas, where there is often limited internet access, face challenges that affect their ability to access quality education (Cooney & Brophy, 2023; Palvia et al., 2018). This situation highlights the need for focused attention on educational policies to address these disparities. Policymakers and educators should work towards providing infrastructure and technology so that students can take advantage of effective learning methods (Warschauer & Xu, 2018).

Finally, incorporating Generative Artificial Intelligence (Gen-AI) in entrepreneurship education can solve the issues gap between online and offline entrepreneurship learning. Although this study discusses online and offline learning, it is not about Gen-AI. However, the implications of the results of this study, it is believed that, in the future, with the help of AI, there will be a platform that serves learning that is personalized by AI. Therefore, learning online with the help of AI is expected to be more effective and engaging (Magomadov, 2020). The flexibility of online learning compared to offline learning, combined with the interaction and experience of Gen-AI solutions, may be a good start to entrepreneurship learning that meets the geographical preferences of students (Surya et al., 2023). With the help of AI, learning in various students can be accommodated by the appearance of educational institutions that are able to adjust and provide learning according to the needs of each student.

CONCLUSION

This study showed the different preferences of Indonesian students to use offline learning methods than online learning methods in entrepreneurship education. The results of the Wilcoxon Signed-Rank Test statistics significantly indicate that students are very much inclined to use offline learning methods

because they think that offline learning is better than online learning, because offline learning can provide interaction and are more practical. Although online learning is very flexible and can be accessed easily by students, especially those who have internet access, it cannot provide interaction and practical learning for students to develop their entrepreneurial abilities.

The results of this study show that the regional differences in access to education in Indonesia should be paid attention to, so that the benefits of online and offline together can be realized. Because students in remote areas have difficulty overcoming learning. So that the learning process can run well, infrastructure needs to be improved so that students can access learning.

Therefore, it is necessary for relevant educational agencies to prioritize initiatives that provide access to quality educational amenities for all students, regardless of their geographical location. For example, instead of depending on personal mobile phones, educational agencies, whether owned by the government or run independently, should provide a well-equipped entrepreneurship physical hub in each municipality, so students can pay attention to this entrepreneurship hub and visit to get learning contents both at the same time and asynchronously, meet up and discuss with their friends about the materials, and do suggested activities together. With this entrepreneurship learning, self directed learning can be achieved and the establishment of local entrepreneurial communities can be realized. This does not require substantial spending on broadband development for the entire dweller.

Moreover, the potential integration of Generative Artificial Intelligence (Gen-AI) into entrepreneurship education represents a promising avenue for future research and development. AI-driven learning platforms can offer enhanced learning experiences by providing tailored, interactive content personalized to diverse individual student needs. However, it is essential to ensure that these technologies are employed to complement, rather than replace, the invaluable benefits of traditional offline learning. For example, students can be assisted in analyzing their learning needs by inputting their future hopes and present concerns and getting feedback from Gen-AI platforms so that they can dig into more relevant topics, rather than being sporadic in their learning. AI can also be valuable in project-based assignments, such as business proposal writing, as students can independently identify areas for improvement in their proposal, while entrepreneurship educators can complement the AI-generated comments with recommendations from theoretical lenses.

While offering insights into students' preferred modality of learning about entrepreneurship, this study is limited in terms of design, as a purely quantitative approach was taken. Further studies can be conducted to elicit students' perspectives on their learning goals and difficulties in a qualitative manner through open-ended questionnaires or focused group discussions to enrich the current understanding on their preferred modality of learning.

In conclusion, this study emphasizes the need for a balanced approach that recognizes the advantages of both offline and online learning methods in entrepreneurship education. By leveraging the advantages of each modality and addressing the underlying challenges, educational leaders can create a more effective and equitable learning environment that fosters the development of entrepreneurial skills across Indonesia.

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