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How Entrepreneurship Education Can Help Student Thrive in the Digital Age? : The Implications of Creative and Innovative Learning

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Abstract: This study aims to identify the essential entrepreneurial skills required for students to tackle challenges and capitalize on opportunities in the present circumstances. Additionally, it provides information on how educators can utilize technology to create conducive learning environments that enhance students' entrepreneurial skills. This study employed a systematic literature review method adapted from PRISMA 2020 guidelines. Qualitative data collection techniques were employed, followed by thematic analysis for data interpretation. Studies were retrieved from the Scopus database that published between 2018 and 2023. The findings revealed three key aspects to enhance students' skills: personal, interpersonal, and digital aspects. The personal aspect encompassed creativity and innovation, initiative, self-efficacy, and resilience, as well as risk-taking. The interpersonal aspect included leadership, effective communication, collaboration, networking, and a positive attitude. The digital aspect comprised digital awareness, digital literacy, digital content, digital communication, digital creativity, and digital critical thinking. The study also found that experiential learning and project-based learning have been widely used in entrepreneurship education. This indicated that the effectiveness of entrepreneurship education for students can be achieved through learning experiences, problem-solving, and practical applications in an entrepreneurial environment. By employing various creative, innovative, and technology-based teaching techniques, educators can capture students' engagement and provide added value to their learning experience.

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Introduction

The rapid development of science and technology is transforming various aspects of life, including communication, mobility, work, and learning. The Fourth Industrial Revolution is driving advancements in the manufacturing sector through the utilization of advanced technologies such as AI, Internet of Things (IoT), Virtual Reality, and others (Obschonka et al., 2017). World Manufacturing Forum (2019) urging nations and stakeholders to engage in critical thinking regarding their education and skills platforms, and to strategize on how to effectively develop the current and future workforce.

In this digital era, the skills, character, and behavior of individuals hold significant meaning in shaping the success of students after graduation (Clarke, 2018; Griffiths et al., 2018). A student's character is demonstrated through their behavior, which is also evident in their career decision-making for the future (Luzzo, 1993). Students with such vision can enhance their cognitive abilities and skills, thereby providing better opportunities for achieving success in the future.

Entrepreneurship is widely recognized as a powerful catalyst for generating new employment opportunities, fostering novel ideas and business models, and delivering

Vol. 10, No. 1 : March 2024
E-ISSN: 2442-7667
pp. 218-229
Email: jklppm@undikma.ac.id

significant social and economic advantages (Akhter et al., 2022). Several studies have indicated that entrepreneurial skills can drive graduates to have work readiness or entrepreneurial intentions (Kassean et al., 2015). Obschonka et al. (2017) found that entrepreneurial competencies are necessary for preparing adolescents for adulthood. Meanwhile, in the research conducted by González-López et al. (2021) it was found that entrepreneurial competencies have a positive influence in moderating intention to action. In the 21st century, entrepreneurial skills and digital competence are considered fundamental competencies in people's education (Prendes-Espinosa et al., 2021).

Entrepreneurial knowledge can be acquired through various means, one of which is through entrepreneurship education. Recent studies confirm that entrepreneurship education can promote entrepreneurial intentions and develop entrepreneurial competencies (Hahn et al., 2020; Lv et al., 2021; Piperopoulos & Dimov, 2015; Shahab et al., 2019). However, Hoang et al. (2020) found mixed results regarding the positive impact of entrepreneurship education on entrepreneurial intentions. The fact that an individual's background, such as their education and family, can influence entrepreneurial behavior is undeniable. Nevertheless, formal and non-formal entrepreneurship education is necessary to impart knowledge, foster creativity, and enhance the self-reliance of students. Entrepreneurship education plays a vital role in connecting individuals within society, fostering new relationships, and addressing the demands of the labor market and environmental needs (Marin & Chitimiea, 2020).

The economic conditions are inextricably linked to technological advancements. The progression of knowledge and technology significantly influences the structure of current employment and businesses. It poses a challenge for everyone, including students and educators. Entrepreneurship education serves as a conduit for students to acquire new knowledge that can benefit them when they engage with the wider community. Nevertheless, traditional education models are being tested to adapt and equip students with the skills required to navigate the rapidly evolving digital technology landscape, one that has never been witnessed before. The presence of Information and Communication Technologies (ICT) in education has become increasingly prevalent, leading to extensive debates and discussions (Silva et al., 2020). Entrepreneurship education must leverage suitable pedagogic digital tools that promote entrepreneurship and engage students effectively. Moreover, digital and entrepreneurial skills empower students to create new and valuable products and services (Androutsos & Brinia, 2019).

Considering the post-COVID-19 era, marked by significant disruptions in various sectors and the acceleration of digital transformation, there is a heightened urgency to address the evolving economic landscape and the demand for advanced competencies in the workforce (OECD, 2019). Consequently, there arises a critical need for a competency framework tailored to navigate these challenges through entrepreneurial education. Therefore, the novelty of this study lies in providing insights into the teaching of entrepreneurial education integrated with technology.

This study aims to explore the necessary set of skills that students need to navigate challenges and seize opportunities in the digital era. Furthermore, the study will provide information on how educators can leverage technology as a tool to foster effective learning environments that enhance students' entrepreneurial competencies. By integrating technology into the educational process, practitioners can create engaging and interactive experiences that promote skill development and prepare students for success in an evolving entrepreneurial landscape.

Vol. 10, No. 1 : March 2024
E-ISSN: 2442-7667
pp. 218-229
Email: jklppm@undikma.ac.id

Research Method

This study used qualitative approach with a systematic literature review adopted from PRISMA 2020 (Page et al., 2021) and followed the approach outlined by Xiao & Watson (2019), which involved four stages: (1) determining the inclusion criteria; (2) identifying relevant literature; (3) screening for inclusion; and (4) assessing quality and eligibility (see Figure 1).

Determining the inclusion criteria. Multiple criteria were utilized in conducting the literature review. The studies were screened based on inclusion and exclusion criteria to ensure that only studies aligned with required framework were selected for the review.

Table 1. Literature searching criteria

Inclusion criteria	Exclusion criteria
- Journal articles & review - Articles published between 2018 – 2023 - Published in English	- Book chapters, book, and proceedings

Identifying relevant literature. The Scopus database was utilized for the literature review, including studies published between 2018 and 2023. The search was conducted on 22 June 2023 using the keywords: TITLE-ABS-KEY((“entrepreneur* education”) and (“digital* skill” or “digital competence*” or ICT or “Information and Communication Technology” or “digital literacy” or “digital transform*”)). This initial process resulted in a total of ninety-two studies. The next step involved applying the inclusion and exclusion criteria, resulting in thirty-four studies that met the specified criteria.

Screening for inclusion. The authors reviewed the titles and abstracts of the thirty-four identified studies to determine their relevance to the research topic. After the abstract screening process, thirty studies were found and will be read in full-text to assess their quality. Other six studies were excluded because the journal publishers have been discontinued from Scopus.

Assessing quality and eligibility. The full-text screening was conducted to evaluate and determine the suitability of the obtained studies. It was found that four studies were not relevant to the topic being discussed. Therefore, overall, twenty studies were identified that can be used in the discussion.

This study utilized thematic analysis to examine selected subset of studies representative of the research field. Through this approach, the study aimed to uncover the key principles and characteristics present in the literature (Booth et al., 2016). Furthermore, the analysis helped identify preferred methodologies and challenges within the field**.**

Results and Discussion

Based on the findings of the systematic literature review, a total of twenty studies (Table 2) from the Scopus database that met the criteria were obtained. These studies were subsequently selected and categorized according to their relevance to two themes: entrepreneurial skill and entrepreneurship education in the digital age. The focus of this study revolves around the discussion of entrepreneurial skills required by students and the role of entrepreneurship education in cultivating these skills in the digital era.

Table 2. Grouping Literature Based on Themes

Themes	Literature research
Entrepreneurial Skill (ES)	Jardim (2021), McPhillips & Licznerska (2021), Akhter et al. (2022), Mir et al. (2022), Triyono et al. (2023), Ho & Chen (2023)
Entrepreneurship Education (EE)	Ratten & Usmanij (2021), Ratten & Jones (2021), Núñez-Canal et al. (2022), Wu et al. (2018), Bandera et al. (2018), Teymurova et al.

Vol. 10, No. 1 : March 2024
E-ISSN: 2442-7667
pp. 218-229
Email: jklppm@undikma.ac.id

(2020), Pal'Ová et al. (2020), Ho & Chen (2023), Tóth-Pajor et al. (2023), Oliver & Oliver (2022), Marin & Chitimiea (2020), Secundo, Rippa, & Cerchione (2020), Secundo, Rippa, & Meoli (2020), Mavlutova et al. (2020)

1) Entrepreneurial Skills in the Digital Age

From the selection process, there were six studies related to the discussion of entrepreneurial skill indicators. These indicators were extracted and categorized into three key aspects: personal, interpersonal, and digital (Table 3).

Table 3. Key Aspect of Entrepreneurial Skill

Key aspect	Definition	References
Personal	The abilities possessed as an individual.	Jardim (2021), McPhillips & Licznerska (2021), Akhter et al. (2022), Triyono et al. (2023)
Interpersonal	The abilities possessed to interact with others.	Jardim (2021), McPhillips & Licznerska (2021), Akhter et al. (2022), Triyono et al. (2023)
Digital	The abilities to use digital technology effectively and efficiently.	Akhter et al. (2022), Mir et al. (2022), Triyono et al. (2023), Ho & Chen (2023)

Personal Aspect. Individuals with entrepreneurial skills possess a strong sense of self-character, which aids them in navigating various situations. Several studies have been conducted to elucidate personal capabilities in entrepreneurship. The research conducted by Jardim (2021) focuses on the skills required in entrepreneurship education, such as creativity and innovation, initiative, self-efficacy, and resilience. Subsequently, the research conducted by (McPhillips & Licznerska, 2021) compared the profiles of open innovation competencies among four European universities. In the study, competencies related to personal aspects such as creativity, risk-taking, and flexibility were mentioned. Furthermore, other research has indicated that aspects like creativity, innovation, risk-taking, and proactivity/initiative can significantly enhance an individual's entrepreneurial intention (Akhter et al., 2022; Triyono et al., 2023).

Based on these findings, in terms of personal aspects, students should focus on developing attributes such as creativity and innovation, initiative, self-efficacy and resilience, as well as the courage to take risks. Creativity plays a pivotal role in the process of translating innovative solutions into products that are highly likely to thrive in a dynamic and unpredictable environment. Cultivating a creative culture is necessary for students to develop innovative solutions to problems (Jardim, 2021; McPhillips & Licznerska, 2021). Initiative is the ability to transform an idea into action. Without being instructed or told, someone with initiative will take the necessary actions to address problems and seize opportunities. Furthermore, students must have the belief in their abilities to achieve goals and adapt to various conditions, known as self-efficacy and resilience. In the current era, being adaptable and flexible is more crucial than persistence, given the constant emergence of changes and challenges. Self-efficacy and resilience are identified as essential skills for achieving success (Jardim, 2021). Lastly, the courage to make decisions, known as risk taking, is vital for personal growth, even if it requires sacrificing something. By nurturing all these skills in the personal domain, students can become resilient and capable of facing the global changes marked by technological advancements.

Interpersonal Aspect. Based on the review findings, three studies discuss interpersonal skills. Jardim (2021) suggests that transformational leadership, clear and visual

Vol. 10, No. 1 : March 2024
E-ISSN: 2442-7667
pp. 218-229
Email: jklppm@undikma.ac.id

communication, teamwork, and networking should be further developed in entrepreneurship education. On the other hand, McPhillips & Licznerska (2021) measured indicators such as collaboration, effective communication, networking, and a positive attitude. Additionally, Triyono et al. (2023) discovered that social capital indicators such as interaction intensity and social network have a direct relationship with entrepreneurial intentions.

Based on these findings, there are five interpersonal aspects to consider: leadership, effective communication, collaboration, networking, and a positive attitude. Entrepreneurship requires strong leadership skills to guide teams in creating unique and valuable solutions. It also involves managing relationships, acquiring specialized knowledge, and driving exponential organizational transformation (Jardim, 2021). Effective communicators can convey information through compelling storytelling. They can articulate a coherent narrative by linking and presenting a series of interconnected ideas, thereby allowing the audience to follow a distinct and well-structured storyline (Jardim, 2021; McPhillips & Licznerska, 2021; Triyono et al., 2023). Positive attitude refers to finding resolutions to conflicts and engaging in positive interactions with competitors (McPhillips & Licznerska, 2021). Mastery of these interpersonal skills cannot be solely obtained from reading books; instead, they can be fostered through tailored learning approaches intended to nurture these abilities. Within the educational setting, interactions and mentorship from educators can act as vehicles for fostering leadership, proficient communication, teamwork, networking, and a constructive mindset in students. By honing these proficiencies, students will be adequately equipped to navigate the realms of business and social scenarios with confidence.

Digital Aspect. According to the review findings, five studies delve into the digital aspect. Some digital skills discussed include digital awareness, digital literacy, digital communication, digital creativity, and digital critical thinking (Akhter et al., 2022; Ho & Chen, 2023; Jardim, 2021; Mir et al., 2022; Triyono et al., 2023). Fostering these competencies is of utmost importance for students in today's digital age, especially for those aspiring to become entrepreneurs. It is due to the fact that these competencies have a strong correlation with entrepreneurial intention (Akhter et al., 2022; Mir et al., 2022; Triyono et al., 2023).

The rapid advancement of digital technology demands that we constantly seek knowledge. It is referred to as digital awareness, and by possessing this competency, we become aware of the need to continuously enhance our understanding of digital technology. (Triyono et al., 2023). In the present era, students require not only improved reading and mathematical literacy but also digital literacy competencies. In general, digital literacy is described as the ability to use digital media. Students need to understand the fundamentals of using digital tools in their daily activities. Using digital tools effectively will help them enhance productivity, and one of these digital tools is social media. As the use of social media becomes more widespread and diversified, it leads to various user attitudes and behaviors. The purposes of using social media also vary, from sharing daily life to conducting business. Proficiency in using and creating content on social media also impacts one's inclination toward entrepreneurship (Mir et al., 2022; Triyono et al., 2023). According to Jardim (2021), it is emphasized that digital communication, alongside technical skills, is deemed highly important for the establishment of networks and the reaching of a broader audience. Having the ability in digital communication allows someone to disseminate their ideas to a specific audience, thereby enhancing effectiveness and efficiency, especially in promotional matters. Digital creativity is also essential for applying different and unique approaches in various activities. The use of digital tools is key to researching and implementing innovative ideas, including the development of new and innovative products

Vol. 10, No. 1 : March 2024
E-ISSN: 2442-7667
pp. 218-229
Email: jklppm@undikma.ac.id

and services (Triyono et al., 2023). The final, equally important competency is digital critical thinking. Digitalization leads to an incredibly rapid and vast exchange of information. Amid the onslaught of information acquired, much of it may be unverifiable in terms of its accuracy. Therefore, students must be capable of evaluating and analyzing information obtained from various digital media sources.

2) Entrepreneurship Education in Today's Challenges

In this subtopic, the search results have identified fourteen studies to be discussed. These fourteen studies cover various themes, including learning methods, learning techniques, the utilization of digital tools and current trend & challenge in entrepreneurship education (Table 4).

Table 4. Grouping literature based on theme

Themes	Literature
Learning method	Bandera et al. (2018), Pal'Ová et al. (2020), Oliver & Oliver (2022)
Learning technique	Pal'Ová et al. (2020), Ho & Chen (2023), Tóth-Pajor et al. (2023), Oliver & Oliver (2022)
Digital tool utilization	Wu et al. (2018), Bandera et al. (2018), Teymurova, et al. (2020), Pal'Ová et al. (2020), Ho & Chen (2023), Tóth-Pajor et al. (2023), Oliver & Oliver (2022), Secundo, Rippa, & Cerchione (2020), Secundo, Rippa, & Meoli (2020), Mavlutova et al. (2020)
Current trend & Challenge in EE	Ratten & Usmanij (2021), (Ratten & Jones, 2021), Núñez-Canal et al. (2022), Marin & Chitimiea (2020)

Learning Method. Teaching methods are the approaches educators employ in the learning process to enable students to achieve their intended goals. Several gathered studies indicate that experiential learning and project-based learning are considered effective in entrepreneurship education. (Bandera et al., 2018; Oliver & Oliver, 2022; Pal'Ová et al., 2020). Bandera et al. (2018) found that experiential entrepreneurship education supported by technology has a positive influence on students' inclination to take risks. Similarly, research conducted by Pal'Ová et al. (2020) indicates that project-based learning supported by technology enhances students' motivation and engagement in the learning process. Furthermore, in a case study conducted by Oliver & Oliver (2022), experiential learning activities were found to enhance the understanding of one's role and responsibilities in a business simulation. Interventions such as online experiential learning activities were introduced to enhance the entrepreneurship learning experience and improve student performance.

Experiential learning and project-based learning are student-centered instructional approaches that have been recognized for their importance in entrepreneurship education. Experiential learning in entrepreneurship focuses on acquiring competences that are essential for engaging in entrepreneurial activities (Ratten & Usmanij, 2021). These competences encompass the ability to assess opportunities and identify potential avenues for future involvement. This learning model prioritizes a "learn by doing" approach, placing emphasis on reflective learning and encouraging practical application in situations characterized by uncertainty (Bandera et al., 2018). On the other hand, project-based learning focuses on problem-solving and product creation (Teymurova et al., 2020). Project-based learning is widely recognized as a suitable method for teaching the new generation of digitally native students (Pal'Ová et al., 2020). Learning through experience and direct student engagement in entrepreneurial activities enables them to analyze, enhance problem-solving skills, and become more courageous in making and implementing decisions.

Vol. 10, No. 1 : March 2024
E-ISSN: 2442-7667
pp. 218-229
Email: jklppm@undikma.ac.id

Learning Technique. In the process of experiential and project-based learning, various techniques can be employed, including business simulations, role-playing, entrepreneurship competitions (such as business plans), and entrepreneurship incubators (Ho & Chen, 2023; Oliver & Oliver, 2022; Pal'Ová et al., 2020; Tóth-Pajor et al., 2023). These methods can enhance student engagement and foster problem-solving skills. Educators can provide clear guidance in the learning process to enable students to execute their assigned tasks effectively (Pal'Ová et al., 2020). These learner-centered learning activities will provide a better experience and help shape an entrepreneurial culture (Oliver & Oliver, 2022; Tóth-Pajor et al., 2023). It is important for educators to understand so that they can strike a balance between creativity and innovation in teaching, thereby meeting the current needs of students. By actively involving students, they can gain valuable experience and entrepreneurial values beyond mere theory.

Digital Tool Utilization. In several studies, various digital tools have been identified and utilized as mediums in entrepreneurship education. Digital media that have been employed include PowToon, MOOCs (Massive Open Online Courses), 3D printing, mobile devices, digital laboratories, gamification, incubation platforms, virtual learning environments (VLE), and AI-based automation software (Bandera et al., 2018; Ho & Chen, 2023; Mavlutova et al., 2020; Oliver & Oliver, 2022; Secundo, Rippa, & Cerchione, 2020; Secundo, Rippa, & Meoli, 2020; Teymurova et al., 2020; Tóth-Pajor et al., 2023; Wu et al., 2018). These digital media are used to enhance the learning experience and provide students with interactive and immersive environments to develop their entrepreneurial skills. Entrepreneurship education practices at various levels have integrated experiential or project-based learning methods with the use of technology. The COVID-19 pandemic has underscored the importance of adopting, enhancing, or adapting technology during times of crisis, and educational approaches should incorporate the latest knowledge about emerging technologies (Ratten & Jones, 2021; Ratten & Usmanij, 2021). Contemporary learning is expected to be innovative to capture students' attention and provide added value to their learning experiences. Innovative learning can be facilitated through digital technology such as animated presentations, websites, Learning Management Systems (LMS), Virtual Learning Environments (VLE), marketing tools, interactive games, and mobile-based learning (Bandera et al., 2018; Oliver & Oliver, 2022; Pal'Ová et al., 2020; Teymurova et al., 2020; Wu et al., 2018). Bandera et al. (2018) demonstrated the importance of integrating ICT (Information and Communication Technology), experiential learning, and exposure to startup companies in entrepreneurship education. Teymurova et al. (2020) found positive factors in the use of project-based learning in the context of mobile-based learning, particularly emphasizing task completion through various creative activities and research.

The importance of effectively incorporating ICT in education has progressed from being a simple tool to becoming a critical component of teaching at all educational levels (Núñez-Canal et al., 2022; Ratten & Usmanij, 2021). Research conducted by Núñez-Canal et al. (2022) has demonstrated that educators' digital competence, their attitude toward the pedagogical use of technology, and the promotion of students' digital skills can enhance the learning process. Therefore, it is crucial for teachers to stay abreast of technological advancements and employ creative approaches to facilitate effective and meaningful learning. The integration of learning methods, technology, and learning techniques brings benefits such as increased engagement, a deeper understanding of concepts, and enhanced collaboration skills.

Current Trend and Challenge in Entrepreneurship Education. The study conducted by Ratten & Usmanij (2021) highlights the use of outside environments, such as

Vol. 10, No. 1 : March 2024
E-ISSN: 2442-7667
pp. 218-229
Email: jklppm@undikma.ac.id

living labs and site visits, to reinforce classroom learning and the importance of extracurricular activities in vocational courses. Many aspects of entrepreneurship education can be explored, including the role of incubators, individual behaviors and self-efficacy, mentoring, competency development, progressive teaching techniques, community education, student consultancy projects, specific industry contexts, interdisciplinary connections, extracurricular activities, teacher-student perceptions, and teachable entrepreneurial competencies. Additionally, there is a need to place greater emphasis on social entrepreneurship so that students are encouraged to think about creating businesses that not only generate profit but also have a positive social or environmental impact.

Several challenges in entrepreneurship education have been identified in various studies (Marin & Chitimiea, 2020; Núñez-Canal et al., 2022; Ratten & Jones, 2021). Many students encountered difficulties in comprehending new entrepreneurial concepts as a result of conventional teaching methods. Some challenges that happened such as teachers lacking ICT skills, insufficient implementation of team learning principles, and ineffective communication within groups. The level of a teacher's digital competency and their attitude towards the use of technology is considered vital in the student learning process (Núñez-Canal et al., 2022). For students to use technology correctly, teachers, as the frontlines of education, need to possess strong technological competencies. Knowledge and technology will never stop evolving, so educators must continually seek knowledge, broaden their expertise in their field, enhance their pedagogical skills, and apply the evolving technologies in the realm of education. The rapid development of technology necessitates ongoing research in digitization within entrepreneurial education. Teaching analytical skills is crucial for nurturing students' intuition and creative thinking abilities, which are vital for enhancing their entrepreneurial mindset. By recognizing the significance of intuition, educators can better prepare students to tackle the complexities of the entrepreneurial world.

The conceptual implication of this study is to provide insights into entrepreneurial education related to the concept of soft skills and learning. Previous studies were primarily focused on personal and interpersonal aspects (eg. Chatterjee & Das, 2016) and they did not elaborate enough about the digital aspect which is crucial for students in the current landscape. On the same side, digitalization provides support for the concept of lifelong learning. By including digital aspects, students can enhance their value, gain easier access to future labor markets, and promote inclusivity (Vuorikari et al., 2022). Moreover, this research enriches our understanding of the role of digitalization in learning. Collaborating with various teaching methods, techniques, and digital tools can aid in enhancing student engagement (Bandera et al., 2018; Teymurova et al., 2020).

The practical implications of this study encourage educators to apply the three aspects of entrepreneurial skills (personal, interpersonal, and digital) in designing lesson plans, which encompass learning activities and accommodate assessment of knowledge, skills, and attitudes. Possessing skills in personal and interpersonal aspects will assist students in navigating various social situations, identifying opportunities, and realizing their potential, both within themselves and in their surroundings. Therefore, teachers can develop creative and innovative entrepreneurship learning experiences by integrating suitable technology and effective learning techniques into experiential and project-based learning.

Conclusion

Based on the review conducted, three key aspects were identified to enhance students' skills: personal, interpersonal, and digital aspects. The personal aspect encompasses creativity and innovation, initiative, self-efficacy, and resilience, as well as risk-taking. The

Vol. 10, No. 1 : March 2024
E-ISSN: 2442-7667
pp. 218-229
Email: jklppm@undikma.ac.id

interpersonal aspect includes leadership, effective communication, collaboration, networking, and a positive attitude. The digital aspect comprises digital awareness, digital literacy, digital content, digital communication, digital creativity, and digital critical thinking.

Additionally, the study found that experiential learning and project-based learning have been widely used in entrepreneurship education. It indicates that the effectiveness of entrepreneurship education for students can be achieved through learning experiences, problem-solving, and practical applications in an entrepreneurial environment. By employing various creative, innovative, and technology-based teaching techniques, educators can capture students' engagement and provide added value to their learning experience.

Recommendation

This study recommends that teachers shift from their traditional role to a more proactive role as designers of learning experiences. As designers, teachers can create and select activities and resources for learning that are integrated with technology. Therefore, regular training sessions aimed at enhancing teachers' knowledge and digital competencies are necessary. It is also important to develop a teacher mindset focused on continues development. Teachers and policymakers can collaborate to design learning experiences that aim to enhance students' entrepreneurial skills.

Future research can focus on the digital competencies of teachers, particularly in the context of secondary education. Furthermore, researchers can concentrate on identifying best practices by integrating various technologies in the classroom to enhance student learning. Cross-cultural research could also be conducted to compare the digital competencies of educators across different countries or regions. This comparative analysis may provide insights into cultural disparities in the adoption of technology and teaching methodologies.

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Vol. 10, No. 1 : March 2024
E-ISSN: 2442-7667
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