

Digital Entrepreneurship Education: Review Of Literature

Keumala Hayati¹ and Indra Caniago²
(keumala.hayati@feb.unila.ac.id¹, igo@ darmajaya.ac.id²)

Management Department, Faculty of Economic and Business, Lampung University¹ Accounting Department, Faculty of Economic and Business, IIB Darmajaya²

Abstract. This paper is a literature review of digital entrepreneurship education based on the emergence of digital technology. The huge public interest in digital entrepreneurship, contrasted with very little research on digital entrepreneurship education, makes it both an opportunity and a challenge in developing digital entrepreneurship. This paper provides an overview of the state of research and outlines a future research agenda on digital Entrepreneurship education. A literature search through Scopus showed very little data, so the search was extended to the Google Scholar search engine. In the last ten years, 154 articles were initially found. These were then filtered, extracted and analyzed for the journal selection process. Twenty-three articles were found that discussed digital entrepreneurship education in depth. The content analysis results show that the literature on digital entrepreneurship education is scant and dominated by unrelated research. Furthermore, this paper describes the antecedent, consequence and mediation variables used in digital entrepreneurship education research. Although the literature on digital entrepreneurship education is scant and will continue to grow, this area of research remains fragmented and under-theorized. Future research is needed, focusing on the antecedent variables of digital entrepreneurship education as the basis for shaping such education and development towards the consequence variables.

Keywords: Digital Entrepreneurship, Education, Digital Entrepreneurship Education, Literature Review

1 Introduction

Digital entrepreneurship is receiving significant attention today. Digital entrepreneurship enables businesses to access global markets, transcending geographical boundaries [1]. Digital entrepreneurs often lead the way in innovation and disrupt traditional industries with new business models and technologies [2], are a significant source of job creation, contributing to economic growth [3], and are recognized by governments around the world for driving economic growth and innovation [4]. Digital entrepreneurs leverage data to make informed business decisions, optimize operations and improve customer experience [5].

In the rapidly evolving digital landscape of the 21st century, digital entrepreneurship education is crucial. Individuals and businesses must adapt to this new reality as the world digitizes. Digital entrepreneurship education equips aspiring entrepreneurs and business professionals with the knowledge and skills necessary to thrive in the digital economy [6].

Digital entrepreneurship education is essential as it empowers individuals to start and grow businesses in the digital age. It provides them with the technical knowledge, strategic

thinking

and problem-solving skills needed to navigate the complexities of the digital business environment. Constant technological advancements characterize the digital landscape. Entrepreneurs who understand and can leverage these technologies are better positioned to create innovative solutions and capitalize on opportunities impossible in the analog world. Digital entrepreneurship opens up the global marketplace to businesses of all sizes. Through e-commerce, social media and digital advertising, entrepreneurs can reach a global customer base without the need to be physically present in different countries [6].

The urgency of digital entrepreneurship education stems from the huge impact digitalization has had on the business landscape. As with Technological Progress, rapid technological advances reshape industries and create new business opportunities. Entrepreneurs need to understand and utilize these technologies to remain competitive. Digital platforms also enable businesses to operate globally from day one. Entrepreneurs must navigate international markets, regulations, and customer preferences, which requires a broader skill set. The proliferation of digital startups has increased competition. Digital entrepreneurship education helps entrepreneurs to differentiate their ventures and succeed in a crowded marketplace. Digital entrepreneurs are at the forefront of innovation and disruption, driving economic growth and changing how industries work. However, digital entrepreneurship leads to job creation, especially in technology-related fields. It contributes to employment opportunities and economic development.

Based on this, this paper explores how the study of digital entrepreneurship education has evolved over the last ten years. It will provide usefulness in digital entrepreneurship education to develop digital entrepreneurs.

2 Method

The results of a literature search using Publish or Perish software using the keywords "digital entrepreneurship education." The initial search was specialized in Scopus-indexed journals, but very few articles were found. Furthermore, the search was expanded on the Google Scholar search engine, so 154 articles were found in the last ten years. Further selection and filtering were conducted, and 23 relevant articles were found. Based on data analysis, it was found that the publication of digital entrepreneurship education began in 2019. Publications continued to increase until 2022 and are ongoing (Fig. 1). The largest number of citations was in 2019 (Fig. 2).

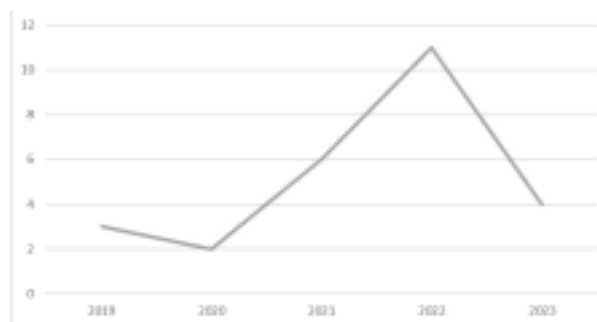


Fig. 1: Number of Publications



Fig. 2: Number of Citations

The analysis shows five theories used in digital entrepreneurship education studies: the Theory of Planned Behavior, Task-Technology Fit, Social Cognitive Theory, Self Determination Theory, Interactive Participation, and The Entrepreneurial Event Model. However, most publications did not use a theoretical basis (Fig. 3).

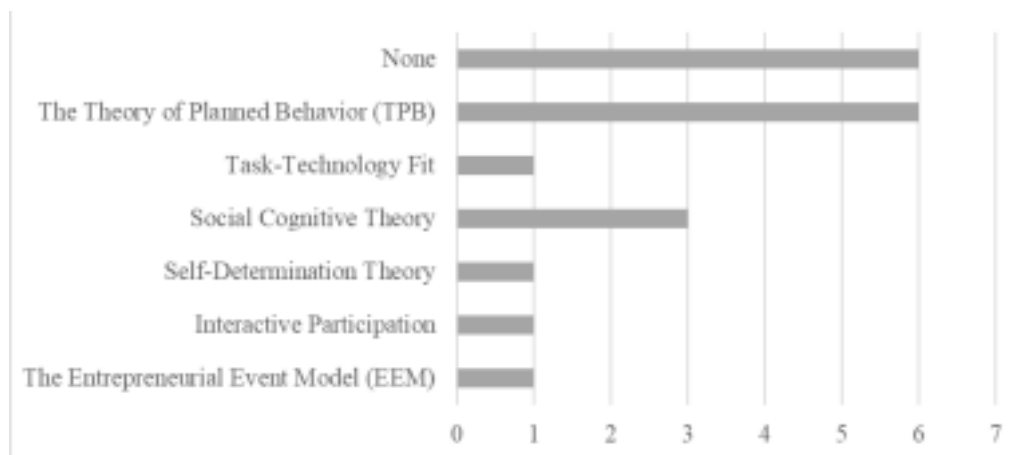


Fig. 3: Theories Used

The literature study results then found various variables used in digital entrepreneurship education research. The results of quantitative research analysis found antecedent, mediation, moderation and consequence variables in Fig. 4. Various variables used in qualitative research are discussed next.

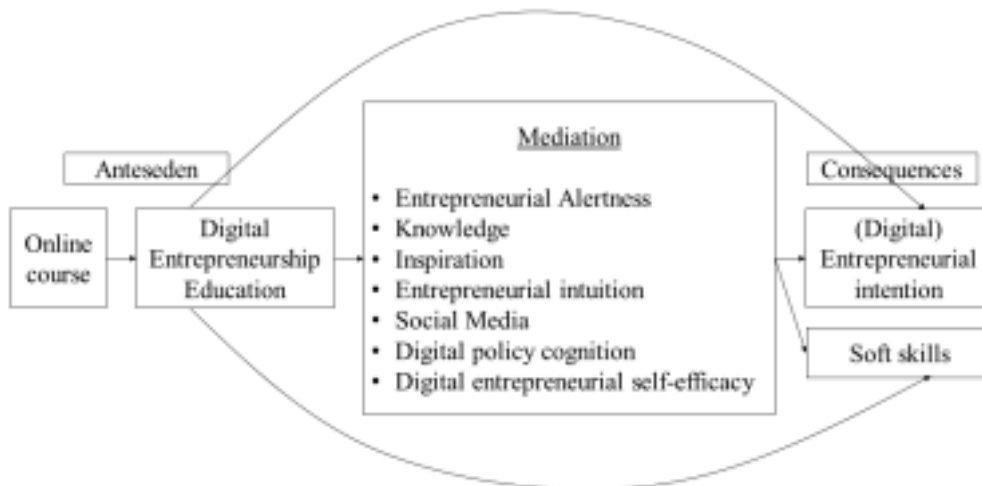


Fig. 4: Digital Entrepreneurship Education Study

3 Result

This section will discuss the constructs studied in the digital entrepreneurship education research. In the initial part, the various constructs studied in the antecedent variable will be discussed, as the various constructs studied in the consequent variable and the various constructs studied in the mediating variable.

3.1 Antecedent Constructs

The antecedent constructs of digital entrepreneurship education have several online teaching methods: digital learning aptitude, MOOC, digital library marketing, gamification, and UOTF.

Young et al. (2020) highlighted the importance of digital learning aptitude in developing digital literacy and mindset. Individuals can optimize digital information processing capabilities by developing digital learning aptitude and pursuing new opportunities more confidently. Digital literacy can determine the success of digital entrepreneurship. Individuals can leverage digital technologies and optimize their entrepreneurial efforts by improving digital literacy skills. Given the growing demand for digital competencies to drive innovation, this paper underscores the importance of digital entrepreneurship education in the digital economy. Digital learning aptitude drives cognition and metacognition in entrepreneurial learning, focusing on digital literacy as a success factor for digital entrepreneurship. Both of these are important factors that shape the digital mindset. The digital mindset model serves as a framework for understanding digital cognition in the context of entrepreneurship. This article emphasizes the importance of education in strengthening the digital mindset and developing digital literacy skills [7].

Online learning can use Massive Open Online Courses (MOOCs) in digital entrepreneurship education. Vorbach et al. (2019) stated that MOOCs can be used to teach digital entrepreneurship. MOOCs serve as an effective platform to provide digital entrepreneurship education. The results of a survey of students who have participated in MOOCs

in the field of entrepreneurship found that most respondents think MOOCs are instrumental in developing important entrepreneurial competencies, such as recognizing opportunities and obtaining resources. The advantages of using MOOCs for entrepreneurship education include adaptability, accessibility, and cost-effectiveness, thus allowing a wider audience to participate in entrepreneurship education. Nevertheless, there are certain barriers related to MOOCs, such as low completion rates and the need for effective pedagogical design, which must be overcome to utilize the potential of MOOCs for entrepreneurship education. MOOCs have the potential to take on an important role in digital entrepreneurship education and foster the democratization of entrepreneurship education by making it more accessible and affordable to a wider audience [8].

Vorbach et al. (2019) suggested further investigations on the application of MOOCs in entrepreneurship education, especially concerning longitudinal studies that can monitor the impact of MOOCs on learners over a long period. This paper also recommends further research on the pedagogical design of MOOCs for entrepreneurship education, including the utilization of collaborative learning, gamification, and other techniques that can enhance learner engagement and motivation. In addition, this paper encourages additional research on the effectiveness of MOOCs in teaching specific entrepreneurial competencies, for example, opportunity recognition and resource acquisition. More research is needed on the function of MOOCs in promoting social entrepreneurship and other forms of entrepreneurship that have a positive social impact.

Games and gamification have positively impacted learning, motivation, and engagement, but systemic studies do not incorporate digital games in entrepreneurship education [9]. Xin & Ma (2023) investigated the efficacy of gamification in online entrepreneurship education through various perspectives and examined the relationship between gamification of online entrepreneurship education, digital policy cognition, digital entrepreneurial self-efficacy, and students' intention to become digital entrepreneurs. Implementing gamification in online entrepreneurship education significantly impacts students' intention to pursue digital entrepreneurship. Furthermore, developing digital policy cognition and entrepreneurial self-efficacy mediates the relationship between gamification and digital entrepreneurial intention [10].

Gamification of online entrepreneurship education has a favorable impact on student's intention to become digital entrepreneurs, thus demonstrating its efficacy as a pedagogical technique. The mediating role of digital policy cognition and digital entrepreneurial self-efficacy is an important factor in the correlation between gamification and digital entrepreneurial intention. The results show that combining gamification techniques and addressing the importance of digital policy cognition and entrepreneurial self-efficacy can strengthen digital entrepreneurial intentions among university students. This research provides valuable insights for educators and policymakers to enhance digital entrepreneurship education programs to promote digital economy development and alleviate employment pressures [10].

The practical implication of the research by Xin & Ma (2023) is that the utilization of gamification in online entrepreneurship education can serve as an effective pedagogical approach to foster digital entrepreneurial intentions among college students. Incorporating elements that enhance digital policy cognition and entrepreneurial self-efficacy into the design of gamified educational experiences is critical, as these factors mediate the relationship between gamification and digital entrepreneurial intentions. Educators and policymakers can utilize the results from this study to improve digital entrepreneurship education programs by emphasizing the integration of gamification strategies and addressing the importance of digital policy cognition and entrepreneurial self-efficacy. This study underscores the potential of gamification in alleviating job stress and stimulating the development of the digital economy by fostering an entrepreneurial culture among students. Moreover, the affirmative impact of gamification in

online entrepreneurship education on digital entrepreneurial intentions suggests that educational institutions and policymakers should consider integrating gamification into their entrepreneurship curriculum to strengthen students' curiosity and drive to pursue digital entrepreneurship.

Xin & Ma (2023) stated the need for further investigation to investigate the long-term consequences of gamification of online entrepreneurship education concerning students' digital entrepreneurial intentions beyond the immediate impact observed in this study. Some researchers have noted that the "dark side" of gamification necessitates the exploration of its potential drawbacks and negative effects in entrepreneurship education. Further investigation is needed to expand and refine the understanding of gamification in entrepreneurship education, addressing the gaps and limitations identified in this study. There is a need for further research into the impact of digital policy on digital entrepreneurship, particularly in exploring the role of digital policy cognition in promoting and supporting digital entrepreneurial activities. Considering individual differences and learning preferences, additional research could examine the efficacy of different gamification strategies and their effect on digital entrepreneurial intentions.

Alsousi & Dahlan (2021) stated that the University of the Future (UotF) emphasizes the participation and contribution of the international community in its Digital Entrepreneurship Education Program. This program promotes welfare and provides the necessary skills for underprivileged youth in Palestine. Digital entrepreneurship education is important in addressing the unemployment problem plaguing Palestinian society. Moreover, this paper underlines the importance of utilizing digital platforms such as e-learning, MOOCs, and e-market tools to facilitate learning and gain practical experience [11].

Furthermore, this study reveals that Palestinian youth must develop innovation and creative thinking skills. Incorporating digital platforms such as e-learning, MOOCs, e-market tools, and modern methods into the curriculum can facilitate learning and provide students with valuable experience. Ultimately, by producing graduates with a strong entrepreneurial mindset, the public and private sectors can increase employment opportunities, and young people can establish their businesses and contribute to the country's economic growth.

Furthermore, Rohaya et al. (2022) studied the utilization of digital entrepreneurship education in the context of the Digital Library Marketing course. The results showed that the application of digital entrepreneurship education in the Digital Library Marketing course had an important impact on student's ability to design professional weblogs, create content writing copywriting, and generate ideas for delivery and promotion [12].

This paper highlights ways students can acquire the skills needed to design professional weblogs, produce engaging content, write effective copy, and generate ideas for delivery and promotion that are essential for digital marketing in the library and information field. The Digital Library Marketing course is designed to foster student's ability to develop a professional blog as an information medium, improve content writing skills, and promote products through the dissemination of written content. This study emphasizes the practical implications of integrating digital entrepreneurship education into the library and information field, providing valuable guidance for educators and practitioners in designing courses and workshops that equip students with the necessary skills for digital marketing and entrepreneurship [12].

The study underscores the importance of aligning entrepreneurship education with the rapidly changing technological landscape. The study argues that digital entrepreneurship education and digital business models can have far-reaching impacts on the economy and job creation. The results of this study can benefit the entrepreneurship education literature in library and information science as it explores the intersection of digital technology and entrepreneurship.

The application of digital entrepreneurship education in the Digital Library Marketing

course significantly impacts students in developing skills related to web design, content writing, copywriting, and promotion. Incorporating digital entrepreneurship education in the library and information field equips students with the necessary skills for digital marketing and entrepreneurship. Digital business models, supported by digital entrepreneurship education, can impact the economy and job creation long term.

3.2 Consequences Constructs

The consequences construct of digital entrepreneurship education are entrepreneurship intention and soft skills. Wibowo et al. (2023) surveyed 270 university students in Indonesia to test the correlation between digital entrepreneurship education and digital entrepreneurship intention. The data were analyzed using partial least squares structural equation modeling (PLS SEM). The findings showed that digital entrepreneurship education favors digital entrepreneurship intention among Indonesian university students. The results of this study add to the understanding of the role of digital entrepreneurship education, social media, and entrepreneurial intuition in promoting entrepreneurial intentions among Indonesian university students [13].

El-Sisi (2022) conducted a study to determine the determinants influencing tourism students' tendency to engage in digital entrepreneurship. The results revealed that various factors, namely digital literacy, academic excellence, personal traits, and attitudes towards digital entrepreneurship, significantly influence the intention to implement digital entrepreneurship among tourism students in Egypt. Analysis of students' profiles showed their proficiency in digital literacy and familiarity with internet tools. However, a small percentage of students can create web pages that serve as digital tools [14].

Many students showed a high level of readiness to engage in digital entrepreneurship and indicated a desire to start digital projects in the future. Meanwhile, some students have implemented digital projects. The students faced various obstacles, such as the high cost of training courses, insufficient financial resources, and the scarcity of digital entrepreneurship courses, which hindered them from pursuing digital entrepreneurship.

Research by Wibowo & Narmaditya (2022) also shows that digital entrepreneurship education directly and positively impacts digital entrepreneurship intention. Entrepreneurial knowledge and inspiration mediate the relationship between digital entrepreneurship education and digital entrepreneurship intention. It is crucial to provide students with comprehensive knowledge of the complexities of digital entrepreneurship to emphasize its importance. In addition, digital entrepreneurship education should also inspire students through teaching lecturers or inviting practitioners from outside the campus. Ensuring a conducive entrepreneurial ecosystem, multiplying campus entrepreneurship units, and establishing collaborations with various initiatives and SMEs are essential to support entrepreneurship education. To gain a more comprehensive understanding of how digital entrepreneurship education affects digital entrepreneurial intentions [15].

Furthermore, Wibowo et al (2023) found that digital entrepreneurship education is a valid predictor of increased digital entrepreneurship knowledge, digital entrepreneurship alertness, and digital entrepreneurship intention among university students in Indonesia. A substantial relationship has been established between digital entrepreneurial alertness and digital entrepreneurial intentions among university students in Indonesia. The findings of this study generate theoretical implications regarding the role of human capital theory, entrepreneurship and social cognitive theory in increasing the quantity and quality of university students entering digital platform-based business ventures. This research advocates elaborate digital entrepreneurship education that utilizes diverse approaches, including various technological means, artificial intelligence, highway data, and several supports in digital-based business

activities [13].

Online entrepreneurship education using gamification directly influences students' intention to become digital entrepreneurs [10]. Gamification of online entrepreneurship education has the potential to be a potent pedagogical approach in cultivating students' intention to become digital entrepreneurs, easing the burden of work, and contributing to the development of the digital economy. In the design of gamified entrepreneurship education, it is crucial to consider digital policy cognition and entrepreneurial self-efficacy, as they mediate in influencing students' digital entrepreneurial intentions. Incorporating gamification techniques into entrepreneurship education programs can increase student interest, engagement and motivation in digital entrepreneurship in universities and educational institutions. Educators and policymakers should focus on developing and improving digital entrepreneurship education to equip students better to face the digital economy and foster a culture of entrepreneurship. The positive impact of gamified online entrepreneurship education on digital entrepreneurial intentions requires further research and exploration of innovative pedagogical methods in entrepreneurship education.

An interesting study by Yu et al. (2022) examined the factors influencing teachers' intention to teach digital entrepreneurship. The study showed that three dimensions, namely, teachers' positive emotional attitudes, task-technology fit, and interactive participation, influence teachers' intention to teach digital entrepreneurship education. Positive psychological motivators can stimulate teachers' desire to learn more about digital entrepreneurship education and strengthen their desire to teach digital entrepreneurship. The convergence of teachers' digital skills and business expertise can accelerate the pace of digital entrepreneurship teaching implementation. The enthusiastic engagement of individual teachers in digital entrepreneurship education can be triggered through engagement and encouragement from the community. Digital entrepreneurship education can be characterized by its novelty and complexity, combining information and communication technology tools and entrepreneurial exercises [16].

A study conducted by Zainal & Yong (2020) in a public higher education institution in East Malaysia revealed that integrating digital entrepreneurship education impacts students' soft skills. Integrating digital entrepreneurship education into pre-existing entrepreneurship courses was shown to have improved students' soft skills in a public higher education institution in East Malaysia. Soft skills were evaluated and ranked based on mean scores, as entrepreneurial, communication, teamwork, and lifelong learning and information management skills received the highest mean scores. However, leadership skills received the lowest mean scores in both academic years, suggesting that digital entrepreneurship education may not have the same impact on leadership skills as on other skills. Overall, the results show that digital entrepreneurship education is important in improving students' soft skills. However, teaching and learning methods must be improved to enhance all soft skills, including leadership skills, equally [17].

3.3 Mediation Constructs

Among the mediating constructs is digital entrepreneurial alertness. Research Wibowo et al. (2023) proves that digital entrepreneurial alertness mediates the influence of digital entrepreneurship education and digital entrepreneurship knowledge on digital entrepreneurial intentions among university students in Indonesia. There is a strong correlation between digital entrepreneurial alertness and digital entrepreneurial intentions in Indonesian university students [13].

Digital entrepreneurial alertness relates to an individual's capacity to recognize and distinguish entrepreneurial prospects in the digital landscape. It involves showing heightened perception and attention to changes, shifts and information within the environment that may indicate potential business opportunities. Digital entrepreneurial alertness is characterized by

scanning and searching for information, connecting prior knowledge, and evaluating potential opportunities. It is recognized as a dimension of the entrepreneurial mindset and includes cognitive processes such as pattern recognition, information processing, and prior knowledge. Individuals with high digital entrepreneurial alertness consistently scan their environment and are better equipped to identify and capitalize on opportunities. Digital entrepreneurship education fosters and enriches entrepreneurial alertness by providing the knowledge and soft skills necessary to recognize and exploit opportunities in the digital world [18].

Other mediating constructs are entrepreneurial knowledge and inspiration. Wibowo & Narmaditya (2022) found that entrepreneurial knowledge and inspiration mediate the correlation between digital entrepreneurship education and entrepreneurial intention. This study proposes three important steps to increase students' digital entrepreneurship intention. These steps include providing comprehensive knowledge, stimulating students through lectures delivered by experienced lecturers and practitioners, and building a conducive entrepreneurial environment within the campus.

In the context of this study, the term "knowledge" relates to the understanding and information gained by students through digital entrepreneurship education. It assumes a mediating function between digital entrepreneurship education and digital entrepreneurship intention, which implies that a greater level of knowledge results in an increased intention to engage in digital entrepreneurship. The term "inspiration" in this study indicates the motivational influence of various factors on students to become digital entrepreneurs. These factors include digital entrepreneurship lecturers, labs, coworkers, entrepreneurship activities on campus, and invited digital entrepreneurship motivators. The presence of these inspiring components has a positive impact on students' intention to pursue digital entrepreneurship.

Knowledge and inspiration are considered significant psychological aspects that contribute to developing digital entrepreneurship intention among students. Both are predictors and mediators in the relationship between digital entrepreneurship education and students' intention to start a digital business.

Another study by Wibowo et al. (2023) found that social media usage and intuition for entrepreneurship mediate the correlation between entrepreneurship education and entrepreneurial intention. This study underscores the importance of social media and entrepreneurial intuition in furthering digital entrepreneurial tendencies among students, underscoring the importance of including these aspects in entrepreneurship education initiatives.

Xin & Ma (2023) found that digital policy cognition and entrepreneurial self-efficacy mediate the relationship between gamified online entrepreneurship education and digital entrepreneurial intention. Digital policy cognition relates to an individual's understanding and acumen concerning policies and regulations involved in the digital environment, especially in the context of entrepreneurship. It includes understanding the legal frameworks, government initiatives and industry standards that govern digital entrepreneurship.

Digital entrepreneurial self-efficacy refers to an individual's perception of competence in successfully engaging in digital entrepreneurship. This notion encompasses their confidence in their skills, knowledge and ability to navigate the digital landscape, identify opportunities and overcome challenges required in starting and running a digital business.

Incorporating digital policy cognition and fostering digital entrepreneurial self-efficacy are important concepts in gamification online entrepreneurship education. In doing so, educators are better positioned to prepare students for the intricacies of the digital entrepreneurial landscape, thus ensuring that they have the knowledge and confidence needed to succeed in their entrepreneurial endeavors.

4 Conclusion

The literature study shows that there are antecedents of digital entrepreneurship education, namely online courses, teaching digital entrepreneurship education using online learning such as MOOCs and gamification. Digital entrepreneurship education affects entrepreneurial alertness, knowledge, inspiration, entrepreneurial intuition, social media, digital policy cognition and entrepreneurial self-efficacy, thus impacting digital entrepreneurship intention. Digital entrepreneurship education also affects the improvement of soft skills. The study of digital entrepreneurship education is still lacking, while the potential for digital entrepreneurship to develop is very large. Hence, the study of digital entrepreneurship education is still open to opportunities to continue to be investigated. This research area is still fragmented and less theorized. Future research is needed to focus on the antecedent variables of digital entrepreneurship education as the basis for forming such education and development towards the consequences variables.

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