

Article

Entrepreneurship education and digital transformation, opportunities and challenges in Indonesia

Rusdiaman Rauf^{1,*}, Cahyaning Raheni², Tovan³, Mardia⁴, Lukman Setiawan⁵, Mushbihah Rodliyatun⁶

¹ Management, Sekolah Tinggi Ilmu Ekonomi Tri Dharma Nusantara, Makassar 90224, Indonesia

² Faculty of Economy and Business, Universitas Muhammadiyah Palu, Palu 94118 Indonesia

³ Faculty of Economy and Business, Universitas Tadulako, Palu 94973 Indonesia

⁴ Magister of Management, Universitas Indonesia Timur, Makassar 90126, Indonesia

⁵ Faculty of Economy and Business, Universitas Bosowa, Makassar 90231, Indonesia

⁶ Faculty of Education and Teacher Training, Universitas Islam Negeri Salatiga, Salatiga 50716, Indonesia

* Corresponding author: Rusdiaman Rauf, rusdiaman@yahoo.com

CITATION

Rauf R, Raheni C, Tovan, et al. (2024). Entrepreneurship education and digital transformation, opportunities and challenges in Indonesia. Journal of Infrastructure, Policy and Development. 8(12): 7740. https://doi.org/10.24294/jipd.v8i12.7740

ARTICLE INFO

Received: 2 July 2024 Accepted: 25 September 2024 Available online: 31 October 2024

COPYRIGHT



Copyright © 2024 by author(s). Journal of Infrastructure, Policy and Development is published by EnPress Publisher, LLC. This work is licensed under the Creative Commons Attribution (CC BY) license. https://creativecommons.org/licenses/ by/4.0/ **Abstract:** This article explores the landscape of entrepreneurship education in Indonesia amid the wave of digital transformation. The research method uses Systematic Literature Review (SLR) to review research results sourced from journals indexed in Sinta or nationally accredited journals in Indonesia which can be accessed on Google Scholar. The conclusion, (i) Digital transformation-based entrepreneurship education creates a new learning model in colleges with the aim of developing entrepreneurial attitudes and values among young people, especially students, so as to produce entrepreneurial intentions. (ii) Higher education as an entrepreneur education provider must follow the progress of digital transformation in the teaching process of entrepreneurship education so that digital literacy among lecturers and students is getting better. (iii) The participation of stakeholders, the Government, college and the business world, is expected to provide support in policy making, especially curriculum changes in accordance with current circumstances in creating new business actors or entrepreneurial intentions.

Keywords: entrepreneurship education, digital transformation, digital literacy, entrepreneurial intentions, curriculum

1. Introduction

Entrepreneurship education stands at the forefront of shaping individuals to thrive in the dynamic landscape of the digital age. The rapid advancement of technology that affects the global economy has resulted in major changes in all aspects including content changes in the entrepreneurship education curriculum in Indonesia (Widiyanti, 2021; Wardhani and Nastiti, 2023). The Indonesian government has introduced various programs and policies to improve entrepreneurship education in schools and universities (Kusmulyono, 2017; Sari, 2023). However, there are still several obstacles that need to be overcome, such as the lack of clear standards in the entrepreneurship education curriculum, limited quality human resources in entrepreneurship teaching materials, and access to funding and networking for young business people. Entrepreneurship education and digital transformation present a myriad of opportunities and challenges for Indonesia, especially utilizing the potential of digital innovation in supporting sustainable economic development (Zhao et al., 2010).

In recent years, Indonesia has experienced a tremendous digital revolution due to increasing internet penetration, widespread smartphone adoption, and various digital platforms. The advancement of digital transformation has transformed traditional

business models into modern businesses by utilizing technology in their activities, creating new market opportunities, and redefining the notion of the market in general. Utilizing the digital economy, it is an urgent need to equip prospective entrepreneurs to improve knowledge, skills, and mindset through entrepreneurship education (Fayolle and Gailly, 2015; Muafi et al., 2021). However, on the other hand, there is still a significant digital literacy gap between urban and rural areas, as well as between people with good economic backgrounds and among people with poor backgrounds, especially those who have graduated from higher education (Guha and Mukerji, 2021; Saad and Fahim, 2021). This situation creates challenges in ensuring that the benefits of digital transformation cannot be felt equally in Indonesia.

This journal article aims to explore the interaction between entrepreneurship education and digital transformation in Indonesia, explaining the emerging opportunities and challenges to be overcome. By studying the current landscape of entrepreneurship education, it is imperative to integrate digital literacy, technological proficiency, and innovative thinking into the entrepreneurship education curriculum. For this reason, it is necessary to examine the role of various stakeholders, including government, industry, and educational institutions, in fostering a conducive environment for entrepreneurship education in today's digital era (Haqqi, 2023).

The digital revolution can make a huge contribution to economic growth and prosperity in Indonesia, thus presenting severe challenges (Hermiyetti, 2024; Supriadi et al., 2023). Issues such as unequal access to digital infrastructure, gaps in digital literacy rates, and widening socio-economic disparities require comprehensive strategies to ensure inclusive participation in the digital economy (Cohendet, 2003; Vartanova and Gladkova, 2019). In addition, navigating regulatory frameworks, fostering collaboration between different sectors, and nurturing a vibrant entrepreneurial ecosystem are critical to harnessing the potential of digital transformation (Carree and Thurik, 2010; Lubis, 2019).

This article, provides an overview of the role of entrepreneurship education and digital transformation, for policymakers, educators, entrepreneurs, and other stakeholders. By understanding the evolving dynamics of the digital economy and the role of entrepreneurship education, Indonesia can embark on a transformative journey towards sustainable growth, innovation, and prosperity in the digital era (Maria and Widayati, 2020; Mugiono et al., 2021). The formulation of the problem in this writing is how entrepreneurship education can integrate with the era of digital transformation in creating new entrepreneurs

2. Literature review

2.1. Entrepreneurship education

Entrepreneurship education has come to the attention of governments in various countries as a means of cultivating entrepreneurial intentions among individuals, and contributing to economic growth, innovation, and community development (Fejes et al., 2019; Huang et al., 2022; Isma et al., 2023; Ramos et al., 2020). Entrepreneurship education deals with learning for entrepreneurship, learning through entrepreneurship, and learning about entrepreneurship. Entrepreneurship is an ongoing process that requires a myriad of talents, skills, and knowledge that lead to a unique pedagogy

capable of stimulating and conveying knowledge simultaneously (Solomon, 2008).

Entrepreneurship education will affect entrepreneurial intentions, either directly or indirectly through other variables. Entrepreneurial intention is entrepreneurial behavior to make a new business (Roxas et al., 2008), caused by intermediate variables, such as individual character such as attitude factors, subjective norms and behavioral control (Solesvik, 2013). In another study, entrepreneurial intentions were caused by university environmental factors and attitudes towards risk-taking and self-efficacy (Moraes et al., 2018).

The conceptual foundation of this review draws on an interdisciplinary perspective, covering theories from psychology, education, and entrepreneurial studies. Through entrepreneurship education influences individual attitudes, motivations, and intentions towards entrepreneurship (Souitaris et al., 2007). This review investigates the impact of entrepreneurship education interventions on the rapid development of digital transformation that has an impact on entrepreneurship education learning materials that must be accompanied by knowledge of information technology so as to strengthen the digital literacy of students who take part in entrepreneurship education.

2.2. Digital transformation

Economic development is very often the product of several social changes. Digital transformation is one of the most recent manifestations of such change (Zaoui and Souissi, 2020). Digital transformation, as a new trend of organizational development, changes the way work is being done from the technological and operational point of view (Furjan et al., 2018). Digital transformation is an emerging paradigm, which introduces strategy-oriented and customer-centric changes in infrastructure and processes in modern organizations relying on contemporary information and communication technologies (Pihir et al., 2018).

So, it can be concluded that digital transformation is the process of integrating digital technology into all aspects of a business or organization, which fundamentally changes the way it operates, delivers services, and creates value for customers. This transformation involves the use of technologies such as cloud computing, artificial intelligence (AI), big data, Internet of Things (IoT), and automation to increase efficiency, flexibility, and innovation (Kanungo, 2020; Kolasani, 2023). Digital transformation also includes changes in work culture, organizational structure, and ways of interacting with customers (Hanelt et al., 2021; He et al., 2023). The goal is to be more responsive to market changes, improve the user experience, and utilize data more effectively for better decision-making. This process also encourages organizations to adapt to digital trends and increase competitiveness in an increasingly connected and technology-driven era.

3. Research methods

3.1. Research design

This article uses qualitative methods with a Systematic Literature Review (SLR) approach (Crișan et al., 2021). Qualitative data analysis is illustrative of the indicators

of the theme of this article, namely entrepreneurship education and digital transformation and the results of the discussion. SLR is the latest approach adopted by researchers/experts to analyze research results from various well-known journals with different themes. SLR aims to collect and analyze various data sources, which are then synthesized to get a comprehensive picture of economic education and digital transformation in Indonesia. The synthesis process in SLR research also allows researchers to see the effectiveness of interventions, identify knowledge gaps that require further study, and pay attention to the consistency and variation found in the field (Acton, 2019; Tan et al., 2016).

SLR aims to collect the latest research relevant to this research theme to answer the problem formulation. This article begins with a thorough review of the existing literature on entrepreneurship education, digital transformation, and its intersection in the Indonesian context. This review serves to build a theoretical framework, identify key concepts, and explain the current state of knowledge in the field (Rauf et al., 2021).

3.2. Search methods and criteria

Data collection techniques are sourced from journals indexed in Sinta or nationally accredited journals in Indonesia which can be accessed on Google Scholar. Sinta provides information for those who need quality journals, especially among academics or researchers, can also be used as information in any academic institution or other research institution, and also used as information on cooperation between researchers or research institutions. The authors limit the publication year to between 2020 and 2023 or the last 5 years, as research is dynamic and changes rapidly. The keywords used are entrepreneurship education and digital transformation." The number of journals reviewed was 50 journals and produced eleven manuscript journals that were relevant to the idea of this paper (Sirelkhatim and Gangi, 2015).

3.3. Data analysis

Researchers select all selected journals based on determination and through several stages, namely 1) journal identification, 2) designing research/methodological approaches; 3) theoretical/conceptual framework, 4) main findings (Okoli and Schabram, 2012; Rauf et al., 2021). Researchers analyzed eleven journals, both theoretically and conceptually related to entrepreneurship education and digital transformation. Based on the analysis of eleven accredited national journals, the results of the eleven research journals are summarized to build a theory of entrepreneurship education and digital transformation and aspects related to the theory.

4. Results of research and discussion

4.1. Journal classification based on journal title, author and year published, journal name, publisher and journal ranking in Sinta

After selecting journals based on the theme of economic education (EE) and digital transformation as well as indicators directly related to these themes whose research locations are in Indonesia, the authors determine eleven journals that represent accredited journals in Sinta. The eleven journals related to the theme of

entrepreneurship education and digital transformation in Table 1.

Table 1. Journal identity analysis.

Journal title	Author and year of publication	Journal name	Publisher	Journal ranking in Sinta
The effect of digital literacy and entrepreneurship education toward online entrepreneurship intention through online business learning and creativity at marketing department in Batang Regency (A1)	Mugiono. Sucihatiningsih Dian Wisika Prajanti. Wahyono. (2020)	Journal of Economic Education	Universitas Negeri Semarang	4
Entrepreneurship Education for Church Citizens in the Digital Age (A2)	Talizaro Tafonao (2020)	Jurnal Teologi Kristen	Sekolah Tinggi Teologi Star's Lub	4
Entrepreneurship Education Policy in Fostering National Defense Awareness for the Young Generation (A3)	Susetya Herawaty (2020)	Sukma Jurnal Pendidikan	Yayasan Sukma	4
Analysis of the Urgency of Technology- Based Entrepreneurship (Technopreneurship) and the Role of Society 5.0 in the Perspective of Entrepreneurship Education (A4)		Jurnal Sains Manajemen dan Akuntansi	STIE STAN IM	5
The Influence of Entrepreneurship Education, Marketplace, Adversity Intelligence on the Entrepreneurial Intentions of Unesa Accounting Education Students through Self-Efficacy (A5)	Indah kalara Naiborhu. (2021)	Jurnal Ekonomi Pendidikan dan Kewirausahaan	Negeri	2
Analysis of the Role and Opportunities of Technopreneurship in the Industrial Revolution Era 4.0 in the Perspective of Entrepreneurship Education Science (A6)	Sri Mulyati (2022)	Journal on Education	Universitas Pahlawan Tuanku Tambusai	5
The Importance of Entrepreneurship Education in Higher Education (A7)	Padrie Payung Siregar. Regina Julmasita. Syahla Ananda. Nurbaiti. (2023)	Asatiza: Jurnal Pendidikan	STAI Auliaur Rasyidin	4
Digital Entrepreneurship Development in Indonesia (A8)	Nurul Aini. Dian Martha Nurrul Amanah. Novinda Krisma Putri. (2023)	Coopetition; Jurnal Ilmiah Manajemen	Universitas Ikopin	4
Entrepreneurial Opportunities in Education in the Industrial Revolution 4.0 (A9)	Putu Gede Subhaktiyasa. (2023)	Publik: Jurnal Manajemen Sumber Daya Manusia, Administrasi dan Pelayanan Publik	Universitas Bina Taruna Gorontalo	4
Transformation of Entrepreneurship and Digital Technology Students in The Era of Revolution 4.0 (A10)	Chandra Lukita. Marviola Hardini. Sudadi Pranata. Dwi Julianingsih (2023)	Aptisi Transaction on Technopreneurs hip	Pandawan Sejahtera Indonesia	3
Entrepreneurship in the Digital Age (A11)	Yusuf Suhardi. Meita Pragiwani. Zulkarnaini. Arya Darmawan. Sri Handoko Sakti (2023)	Berdaya: Jurnal Pendidikan dan Pengabdian Kepada Masyarakat	LPMP Imperium	5

The summary of eleven journals in **Table 1** shows how entrepreneurship education can integrate with the era of digital transformation in creating new entrepreneurs or entrepreneurial intentions. This article can be used as a policy for the Indonesian government in creating an entrepreneurship education curriculum in

refining the curriculum content to overcome the imbalance between the growth of the productive age population and the availability of job opportunities in creating entrepreneurial intentions or new entrepreneurs, especially among young people (A4, A6) (Mulyati., 2022; Rukmana et al., 2021).

Education is an important aspect of life, because through education a person can become a more qualified individual. The higher the level of education that has been completed, the higher the quality of the output or graduates produced. One thing that can be used as a measure of output quality is how this output is able to compete in the world of work (Arrozi and Sutrisna, 2018; Maryati, 2015). But in many cases, graduates of the Faculty of Economics and Business prefer to work with others who should be able to create new jobs. This obstacle is often faced by graduates in economics because they are unable to compete due to the low quality of their graduates due to the lack of digital literacy. For this reason, curriculum improvements and learning activities are needed that facilitate graduates' opportunities to learn business practices (Suyanto and Ariadi, 2015).

Entrepreneurship education will increase interest in online entrepreneurship among the younger generation, especially for students in universities (A1, A2, A3, A4, A6) (Herawati, 2020; Mugiono et al., 2021; Tafonao, 2020), So a quality curriculum is needed that is supported by the quality of lecturers who teach, especially entrepreneurship education courses in universities, especially in technology skills or digital literacy. In advancing education in a country lies the role of universities through the provision of entrepreneurial education (Amalia and von Korflesch, 2021; Sari, 2023; Wardhani and Nastiti, 2023). Entrepreneurship education has an influence on entrepreneurial intentions (A5) (Naiborhu, 2021). Lecturers are the main factor in the implementation of entrepreneurship education in higher education (A11) (Suhardi et al., 2023), Especially in developing discovery, reasoning and practical skills to face curriculum changes according to the demands of the development of digital transformation in the educational environment.

The objectives of entrepreneurship education must be aligned with the terms of reference for economic policies that have been made by the Government (Chrismardani, 2016; Khairuddin et al., 2023), So that the government can make rules that require every university to make entrepreneurship education a compulsory subject that must be carried out in every educational institution, especially universities (A7) (Siregar et al., 2023).

Strengthening the entrepreneurship education curriculum must be supported by the use of digital transformation, especially the digital literacy of lecturers who teach this course, so that students have the same digital literacy as their lecturers (A1, A4, A5, A9, A10, A11) (Suhardi et al., 2023). Curriculum development is a solution to meet the needs of students who are faced with the use of digital transformation (A2, A6, A8) (Aini et al., 2023). The entrepreneurship education curriculum is designed to change the mindset and skills of entrepreneurship tailored to the needs of students (A1, A3, A5, A7, A8, A9, A10) (Lukita et al., 2023; Subhaktiyasa, 2023)

Entrepreneurship education is helpful in developing digital entrepreneurship through strong cooperation and creating relationships with stakeholders, such as the government, the business world, academia and mass media in order to improve the quality of education. (A3, A7, A8) (Aini et al., 2023; Herawati, 2020; Siregar et al.,

2023). In addition, cooperation between stakeholders (stakeholders) the role of the government is needed as the highest authority in policy making, the community as the controller, and schools as implementers (Damayanti, 2019; Sulthani and Thoifah, 2022).

4.2. Entrepreneurship education theory and digital transformation

In this section, the author explains the indicators of entrepreneurship education and digital transformation based on journals that are systematically selected by synthesizing important indicators and the results of their discussion. Furthermore, the author provides the results of the analysis in **Table 2**.

Artikel	Indikator
A1	Digital literacy is needed in learning entrepreneurship education
A2	Digital transformation provides opportunities and challenges in creating jobs.
A3	Entrepreneurship education influences the entrepreneurial intentions of the younger generation.
A4	Entrepreneurship is one of the answers to answer the disparity between the growth of the productive age population and the availability of employment.
A5	Entrepreneurship education as mederating in entrepreneurial intentions.
A6	Entrepreneurship that uses digital transformation will create jobs.
A7	Colleges must design curricula that are relevant to changing business trends
A8	Digital-based entrepreneurship development involves stakeholders, namely the government, the business world, academia, communities and mass media
A9	Digital transformation is a learning tool for entrepreneurship education.
A10	Digital transformation is very influential on the learning process of students in entrepreneurship.
A11	The role of lecturers is needed in increasing entrepreneurial creativity by using information technology.

Table 2. Theory of entrepreneurship education and digital transformation.

In this section, we present journals whose indicators are related to entrepreneurship education and digital transformation. Each journal is systematically reviewed by synthesizing significant indicators and reviewing the results of its discussion. Based on the findings that the competence of lecturers in entrepreneurship education has a significant effect on student interest in taking entrepreneurship education courses. The competence of lecturers is to master information technology to transfer entrepreneurial knowledge and skills to students who take entrepreneurship education courses. Entrepreneurial competence must be considered in designing an entrepreneurship education curriculum with a student digital literacy competency approach.

Entrepreneurship education material is not just theory in class, but must be expanded by adding material on the use of information technology, especially related to the business world. In the learning process of entrepreneurship education, digital transformation must be more dominant by learning theory in class. The goal is to facilitate the delivery of material in the learning process and follow the development of information technology-based businesses. Lecturer digital literacy is the mastery of information technology and the use of online learning media to transfer entrepreneurial knowledge and skills (Meyers et al., 2013; Rauf et al., 2021).

Digital literacy affects students' interest in the online business world (Moorthy and Sahid, 2022; Maudina et al., 2020). Entrepreneurship education is able to create students' thoughts, actions and personalities to be interested in becoming entrepreneurs so that their enthusiasm, behavior and abilities can lead them to choose a career as an entrepreneur after graduating from their studies (Trihudiyatmanto, 2019). When students receive high-intensity entrepreneurship education, students' entrepreneurial intentions become high. The entrepreneurship education received by students will increase students' understanding of entrepreneurship and it is expected that students are more interested in entrepreneurship than looking for job opportunities that are currently limited (Hasan, 2020; Naiborhu, 2021).

Advances in information technology are very useful in entrepreneurship, because changes in consumer behavior patterns that initially make sales transactions directly to buyers but take a long time to become practical online transactions, can directly affect the company's business model significantly (Oktavenus, 2019; Sima et al., 2020; Tao et al., 2022). Changes in the definition of the market as a meeting place between buyers and sellers have changed, namely there is no longer a direct meeting between buyers and sellers, but can now be done through social media with the help of increasingly advanced digital technology. Buying and selling goods through social media, often called e-commerce. E-commerce is the process of buying and selling between two parties in a business field by exchanging goods, services or information through social media using internet facilities or information technology (Gupta, 2014; Suhardi et al., 2023; Wigand, 1997).

Digital transformation is a radical evolution that occurs by involving existing resources, including utilizing existing digital technologies. When the situation changes to one that focuses more on the use of digital technology, digital transformation is an unavoidable phenomenon especially in keeping up with current business developments (Kraus et al., 2021; Udovita, 2020). Ready or not, the business world must respond well to digital transformation in order to survive and compete (Hadiono and Santi, 2020). Digital transformation is a buzzword in academic and business environments (Verina and Titko, 2019).

4.3. How entrepreneurship education integrates in the era of digital transformation

Entrepreneurship education in the era of digital transformation should focus on developing skills and knowledge relevant to the latest trends and technologies. Entrepreneurship education in Indonesia has become the focus of attention in an effort to prepare the younger generation to become successful entrepreneurs (Razi, 2017; Wardhani and Nastiti, 2023). The Indonesian government has introduced various programs and policies to improve entrepreneurship education in schools and universities. The policy of the Indonesian government is to make entrepreneurship education lessons a core lesson in higher education with the aim of creating new entrepreneurs through higher education who have superior characters who are able to compete in the business arena and can create jobs (Kaharudin and Djohan, 2022;

Mulyati, 2022; Rukmana, et al., 2021). However, there are still several obstacles that need to be overcome, such as the lack of clear standards in the entrepreneurship education curriculum, limited quality human resources in entrepreneurship teaching materials, and lack of access to funding and networking for young business people.

Entrepreneurship education is an important aspect in developing business potential in Indonesia (Siregar et al., 2023). However, with the development of digital technology, there has been a massive transformation in the way business is conducted. This digital transformation provides a great opportunity for businesses to thrive and compete in an increasingly connected global marketplace. However, along with these opportunities, there are also a number of challenges that need to be overcome, such as low digital literacy among productive age groups, such as the quality of school output, especially universities.

In the Indonesian context, there are several specific characteristics that need to be considered in facing challenges and taking advantage of opportunities related to entrepreneurship education and digital transformation. Rapid economic growth, cultural diversity, quality of human resources, income level of the community and wealth of natural resources are factors that need to be considered in designing strategies to strengthen the business ecosystem in Indonesia.

In Indonesia, the gap in access and use of digital technology is still a significant problem (Haniko et al., 2023; Oktavianoor, 2020). Many business actors, especially those operating in the informal sector or micro, small and medium enterprises, not fully understand or be able to utilize digital technology effectively to improve their business performance. In addition, the lack of integration between entrepreneurship education and digital technology is also an obstacle in preparing the younger generation to face the changing demands of the market (Zahra et al., 2024). The existence of this gap causes low digital literacy, as a result of which entrepreneurial intentions are low. Entrepreneurial intention is entrepreneurial behavior in establishing a new business venture (Roxas et al., 2008)

The integration of entrepreneurship education in the era of digital transformation requires a holistic and sustainable approach to prepare future generations to become successful and innovative entrepreneurs in an ever-evolving business environment. Perubahan kurikulum Entrepreneurship education will help prepare college students or graduates to succeed in a variety of business contexts in this era of digital transformation. In identifying opportunities and challenges in integrating entrepreneurship education with digital transformation in Indonesia (Aji et al., 2023; Aini et al., 2023), It is necessary to increase the understanding and application of digital technology in the business context supported by relevant curricula and stakeholder cooperation, namely the government as policy makers, the business world, and academia so as to create a strong foundation for sustainable and competitive entrepreneurial development in today's digital era.

Indonesia has witnessed rapid growth in digital technology adoption in recent years (Lukita et al., 2023). The increasing penetration of the internet and the penetration of mobile devices has opened up new opportunities for business people to engage in the digital ecosystem. However, on the other hand, there is still a significant digital divide between urban and rural areas, as well as between more affluent and less affluent segments of the population. This creates challenges in ensuring that the

benefits of digital transformation can be felt equally across the country (Rachmi et al., 2024).

The integration between entrepreneurship education and digital transformation has great potential to strengthen the business ecosystem in Indonesia. Through this approach, young business people can be well prepared to utilize digital technology in developing their business ideas (Fachrurazi et al., 2023). However, to realize this potential, close collaboration between educational institutions, government and private sector is needed (Siregar et al., 2023). The entrepreneurship education curriculum needs to be enriched with knowledge and skills in utilizing digital technology, while business people need to be supported by adequate training and access to digital infrastructure. Adding digital content and creating inclusive, technology-driven learning environments is critical to preparing students for an increasingly technology-centric future (Subroto et al., 2023).

Although digital transformation brings various opportunities, it also comes with a number of challenges that need to be overcome. Therefore, a deep understanding of digital dynamics is the key to success for those in the world of entrepreneurship (Ainun et al., 2019). Of course, this understanding must be known in advance about the concepts, characteristics and benefits that the digitalization era can provide for entrepreneurship and new businesses, especially for MSMEs (Jamalulael and Aulia, 2023).

The integration of entrepreneurship education with digital transformation, especially learning materials, makes students better prepared to face the challenges of the modern business world, and is better able to create innovative business solutions in the digital era. Thus, bridging the gap between entrepreneurship education and digital transformation and addressing related challenges is an important step in ensuring that Indonesia can take full advantage of the ongoing digital era. With the right effort, Indonesia can build a young generation that is creative, innovative and ready to compete in an increasingly connected and technology-based global economy.

Below are some points that can be a foundation for entrepreneurship education in the face of such rapid digital transformation changes:

- An understanding of digital transformation that is integrated in entrepreneurship education curricula such as e-commerce, big data and so on.
- Technical skills, especially lecturers in teaching entrepreneurship material, especially understanding of digital transformation and technical skills of students.
- In teaching, entrepreneurship education should encourage innovation and creativity. This can involve learning design thinking, branstorming techniques, and product experimentation.
- Collaboration with stakeholders such as the government, educational institutions in this case lecturers and students, and the business world as a partner in the practice of entrepreneurship education courses.
- Social and sustainable entrepreneurship, this means that entrepreneurship education must consider the social and environmental impact of digital business
- Mental readiness and toughness. Entrepreneurship education should help students develop mental readiness and resilience to face challenges and failures that may occur in their entrepreneurship.

Based on the results of a literature search with the theme of entrepreneurship education and digital transformation, so we get a relationship with other factors that can be seen in **Figure 1**.

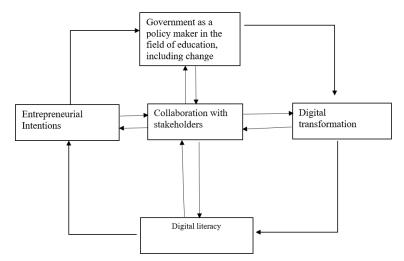


Figure 1. Factors influencing entrepreneurship education in creating entrepreneurial intentions in the digital transformation era.

5. Conclusion

- Digital transformation-based entrepreneurship education creates a new learning model in schools or colleges with the aim of developing entrepreneurial attitudes and values among young people, especially students, so as to produce entrepreneurial intentions.
- 2) Higher education as an entrepreneur education provider must follow the progress of digital transformation in the teaching process of entrepreneurship education so that digital literacy among lecturers and students is getting better.
- 3) The participation of stakeholders, namely the Government, universities and the business world, is expected to provide support in policy making, especially curriculum changes that are in accordance with current circumstances in creating new business people or entrepreneurial intentions.

Author contributions: Conceptualization, methodology, software, validation, formal analysis, investigation, resources, data curation, writing—original draft preparation, writing—review and editing, visualization, supervision, project administration, funding acquisition, RR, CR, T, M, LS and MR. All authors have read and agreed to the published version of the manuscript.

Conflict of interest: The authors declare no conflict of interest.

References

- Acton, R. (2019). Mapping the Evaluation of Problem-Oriented Pedagogies in Higher Education: A Systematic Literature Review. Education Sciences, 9(4), 269. https://doi.org/10.3390/educsci9040269
- Aini, N., Amanah, D. M. N., & Putri, N. K. (2023). Development of Digital Heritage in Indonesia (Indonesia). Coopetition: Jurnal Ilmiah Manajemen, 14(2), 243–252. https://doi.org/10.32670/coopetition.v14i2.3264
- Ainun, F. P., Mawarni, H. S., Sakinah, L., Lestari, N. A., & Purna, T. H. (2019). Identifying Digital Transformation in a World of

Education on Opportunities and Challenges in the Era of Disruption (Indonesia). Teachin. Id, 6(1), 1570-1580.

- Aji, B., Kartika, I., Putri, C., et al. (2023). Mendekonstruksi Pendidikan Digital: Kurikulum the Output of Renewable Innovation is Progressing (OERIP) Sebagai Katalisator Transformasi Pendidikan Berbasis Riset dan Inovasi. Proceedings of Unimbone, 23-30.
- Amalia, R. T., & von Korflesch, H. F. O. (2021). Entrepreneurship education in Indonesian higher education: mapping literature from the Country's perspective. Entrepreneurship Education, 4(3), 291–333. https://doi.org/10.1007/s41959-021-00053-9
- Andika. I., Muhammad, R., Rusni, A., et al. (2023). Creativity and Heritage Education Teachers Against Heritage Demands Heritage Through Heritage Motivation at Santri and Santriwati Pondok Ad-Daraaen Makassar (Indonesia). Journal of Economics, Entrepreneurship, Management Business and Accounting, 1(1), 1–11. https://doi.org/10.61255/jeemba.v1i1.17
- Arief, Y. R., Budi, H., & Hendra, G. (2021). Analysis Urgent Analysis of Technology-Based Heritage (Technopreneurship) and Gender Society 5.0 in the Perspective of Heritage Education Science (Indonesia). JSMA (Jurnal Sains Manajemen Dan Akuntansi), 13(1), 8–23. https://doi.org/10.37151/jsma.v13i1.65
- Arrozi, F., & Sutrisna, K. (2018). Analysis of long-term labour-intensive factors in Denpasar (Indonesia). E-Jurnal Ekonomi Pembangunan Universitas Udayana, 7(12), 2732-2763.
- Carree, M. A., & Thurik, A. R. (2010). The impact of entrepreneurship on economic growth. Springer.
- Chrismardani, Y. (2016). Continuous entrepreneurial learning model (Indonesia). Eco-Entrepreneur, 2(1), 106-119.
- Cohendet, P. P. (2003). The Digital Divide in the European enlarged Economic Scenario: An Assessment of the socio-economic Effects. International Journal of Knowledge Management Studies, 1-121.
- Crișan, E. L., Salanță, I. I., Beleiu, I. N., et al. (2019). A systematic literature review on accelerators. The Journal of Technology Transfer, 46(1), 62–89. https://doi.org/10.1007/s10961-019-09754-9
- Damayanti, N. (2019). It's important to cooperate for Mutual Education Enhancement (Indonesia). Pendidikan, 1(2), 1-7.
- Fachrurazi, Rukmana, A. Y., Supriyanto, Syamsulbahri, & Iskandar. (2023). The Business Revolution in the Digital Era: Strategies and Impacts of Technology Process Transformation against Competitiveness and Organizational Growth (Indonesia). Jurnal Bisnis Dan Manajemen West Science, 2(03), 297–305. https://doi.org/10.58812/jbmws.v2i03.563
- Fayolle, A., & Gailly, B. (2013). The Impact of Entrepreneurship Education on Entrepreneurial Attitudes and Intention: Hysteresis and Persistence. Journal of Small Business Management, 53(1), 75–93. https://doi.org/10.1111/jsbm.12065
- Fejes, A., Nylund, M., & Wallin, J. (2018). How do teachers interpret and transform entrepreneurship education? Journal of Curriculum Studies, 51(4), 554–566. https://doi.org/10.1080/00220272.2018.1488998
- Furjan, M. T., Strahonja, V., & Tomičić-Pupek, K. (2018). Framing the Digital Transformation of Educational Institutions. The Central European Conference on Information and Intelligent Systems, 19-21.
- Guha, A., & Mukerji, M. (2021). Determinants of Digital Divide using Demand-Supply Framework. Australasian Journal of Information Systems, 25. https://doi.org/10.3127/ajis.v25i0.3029
- Gupta, A. (2014). E-Commerce: Role of E-Commerce in Today's Business. International Journal of Computing and Corporate Research, 4(1).
- Hadiono, K., & Noor Santi, R. C. (2020). Encouraging Digital Transformation (Indonesia). Available online: https://www.researchgate.net/publication/343135526_MENYONGSONG_TRANSFORMASI_DIGITAL (accessed on 13 May 2024).
- Hanelt, A., Bohnsack, R., Marz, D., et al. (2020). A Systematic Review of the Literature on Digital Transformation: Insights and Implications for Strategy and Organizational Change. Journal of Management Studies, 58(5), 1159–1197. Portico. https://doi.org/10.1111/joms.12639
- Haniko, P., Sappaile, B. I., Gani, I. P., et al. (2023). Digital Exclusion Bridge: Providing Access to Technology, Training, Support, and Opportunities for Digital Inclusion (Indonesia). Jurnal Pengabdian West Science, 2(05), 306–315. https://doi.org/10.58812/jpws.v2i5.371
- Hao, Z., Seibert, S. E., & Lumpkin, G. T. (2009). The Relationship of Personality to Entrepreneurial Intentions and Performance: A Meta-Analytic Review. Journal of Management, 36(2), 381–404. https://doi.org/10.1177/0149206309335187
- Haqqi, H. (2023). The Government's Policy in Encouraging the Global Competitiveness of Indonesian MSMEs through the Digital Ecosystem. Journal of Economics, Management and Trade, 29(8), 66–76. https://doi.org/10.9734/jemt/2023/v29i81115
- Hasan, H. A. (2020). Heritage Education: Concept, Characteristics, and Implications in Young Generations (Indonesia). Jurnal Kajian Islam Kontemporer, 11(1), 99-111.

- He, Z., Huang, H., Choi, H., et al. (2022). Building organizational resilience with digital transformation. Journal of Service Management, 34(1), 147–171. https://doi.org/10.1108/josm-06-2021-0216
- Herawati, S. (2020). Heritage Education Policy in Raising Belarusian Awareness for Young Generations (Indonesia). Sukma: Jurnal Pendidikan, 4(2), 161–178. https://doi.org/10.32533/04204.2020
- Hermiyetti. (2024). Towards the Future: Digital Transformation in Indonesian Banking and Its Implications for Economic Growth and Public Prosperity. International Journal of Economic Literature (INJOLE), 2(2), 505-520.
- Huang, Y., Bu, Y., Liu, L., et al. (2022). Relationship Between Entrepreneurship Education Curriculum and Agricultural Students' Satisfaction in China. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.884565
- Jamalulael, D., & Aulia, N. A. (2023). Analysis In Understanding Heroes and New Efforts On (Indonesia). Available online: https://www.researchgate.net/profile/Nurul-Aulia-14/publication/375998660_ANALISA_DALAM_MEMAHAMI_KEWIRAUSAHAAN_DAN_USAHA_BARU_PADA_U MKM_DI_ERA_DIGITAL/links/6566d941ce88b870311d1107/ANALISA-DALAM-MEMAHAMI-KEWIRAUSAHAAN-

DAN-USAHA-BARU-PADA-UMKM-DI-ERA-DIGI (accessed on 12 May 2024).

- Kaharudin, E., & Djohan, H. A. (2022). Student Wireless Education (Indonesia). Jurnal Ekonomi Bisnis, Manajemen Dan Akuntansi (JEBMAK), 1(3), 285-294.
- Kanungo, S. (2020). Revolutionizing Data Processing: Advanced Cloud Computing and Ai Synergy for Iot Innovation. International Research Journal of Modernization in Engineering Technology and Science. https://doi.org/10.56726/irjmets4578
- Khairuddin, Z. N., Mohd Sauh, S., & Asmaai, M. (2023). Entrepreneurship Education at Higher Learning Institutions (HLI): Policy Mismatch and Recommendations. Malaysian Journal of Business, Economics and Management, 27–33. https://doi.org/10.56532/mjbem.v2i1.8
- Kolasani, S. (2023). Innovations in digital, enterprise, cloud, data transformation, and organizational change management using agile, lean, and data-driven methodologies. Open Journal Systems, 4(4), 1-18.
- Kraus, S., Jones, P., Kailer, N., et al. (2021). Digital Transformation: An Overview of the Current State of the Art of Research. Sage Open, 11(3). https://doi.org/10.1177/21582440211047576
- Kusmulyono, M. S. (2017). The role of parental entrepreneurship and support for high school students (Indonesia). Asian Journal of Entrepreneurship and Family Business, 01(01), 25–38. https://doi.org/10.21632/ajefb.1.1.25-38
- Lubis, R. L. (2019). Digital entrepreneurship in academic environment: are we there yet. Journal of Teaching and Education, 9(01), 167-193.
- Lukita, C., Hardini, M., Pranata, S., et al. (2023). Transformation of Entrepreneurship and Digital Technology Students in the Era of Revolution 4.0. Aptisi Transactions on Technopreneurship (ATT), 5(3), 291–304. https://doi.org/10.34306/att.v5i3.356
- Maria, N. S. B., & Widayati, T. (2020). Impact of Digital Economic Development on Social Media User Behaviour in Transaction Economics (Indonesia). JKBM (Jurnal Konsep Bisnis Dan Manajemen), 6(2), 234-239. https://doi.org/10.31289/jkbm.v6i2.3801
- Maryati, S. (2015). Educated Budget Dynamics: Challenges to Demographic Bonuses in Indonesia Global Voices (Indonesia). Economica: Journal of Economic and Economic Education, 3(2), 124–136. https://doi.org/10.1111/j.1475-4932.1945.tb01164.x
- Maudina, A., Saptono, A., & Pratama, A. (2020). The Effect of Digital Literacy and Entrepreneurs Learning on Students' Entrepreneurial Intention. Jurnal Pendidikan Ekonomi, Perkantoran, Dan Akuntansi, 7(4), 120-128.
- Meyers, E. M., Erickson, I., & Small, R. V. (2013). Digital literacy and informal learning environments: an introduction. Learning, Media and Technology, 38(4), 355–367. https://doi.org/10.1080/17439884.2013.783597
- Moorthy, T., & Sahid, S. (2022). The Influence of Digital Marketing Literacy on Entrepreneurship Behavior among Public University Students in Malaysia. International Journal of Academic Research in Business and Social Sciences, 12(1). https://doi.org/10.6007/ijarbss/v12-i1/11837
- Moraes, G. H. S. M. de, Iizuka, E. S., & Pedro, M. (2018). Effects of Entrepreneurial Characteristics and University Environment on Entrepreneurial Intention. Revista de Administração Contemporânea, 22(2), 226–248. https://doi.org/10.1590/1982-7849rac2018170133
- Muafi, M., Syafri, W., Prabowo, H., et al. (2021). Digital entrepreneurship in Indonesia: A human capital perspective. The Journal of Asian Finance, Economics and Business, 8(3), 351-359.
- Mugiono, M., Dian, S., Prajanti, W., et al. (2021). The Effect of Digital Literacy and Entrepreneurship Education Towards Online

Entrepreneurship Intention Through Online Business Learning and Creativity at Marketing Department in Batang Regency. Journal of Economic Education, 10(1), 21-27.

- Mugiono, M., Prajanti, S. D. W., & Wahyono, W. (2021). The effect of digital literacy and entrepreneurship education towards online entrepreneurship intention through online business learning and creativity at marketing department in Batang regency. Journal of Economic Education, 10(1), 21-27.
- Mulyati, S. (2022). Analysis of the Role and Opportunities of Technopreneurship in the Industrial Revolution Era 4.0 in the Perspective of Heritage Education Science (Indonesia). Journal on Education, 04(04), 1911-1919.
- Naiborhu, I. K., & Susanti, S. (2021). Heritage Education Manager, Marketplace, Adverse Intelligence Against Intensive Heritage Student Union Account Education Through Self-Efficiency (Indonesia). Jurnal Ekonomi Pendidikan Dan Kewirausahaan, 9(2), 107–124. https://doi.org/10.26740/jepk.v9n2.p107-124
- Okoli, C., & Schabram, K. (2010). A Guide to Conducting a Systematic Literature Review of Information Systems Research. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.1954824
- Oktavenus, R. (2019). Analysis of Digital Transformation Managers and Consumer Behavior Against Business Model Change in Indonesia (Indonesia). Jurnal Manajemen Bisnis Dan Kewirausahaan, 3(5), 44. https://doi.org/10.24912/jmbk.v3i5.6080
- Oktavianoor, R. (2020). Digital Exclusion of Demographic Conditions in Rural Society Branches (Indonesia). Palimpsest: Jurnal Ilmu Informasi Dan Perpustakaan, 11(1), 9–19. https://doi.org/10.20473/pjil.v11i1.21888
- Pihir, I., Tomičić-Pupek, K., & Furjan, M. T. (2018). Digital Transformation Insights and Trends. Central European Conference on Information and Intelligent Systems, 141-149.
- Rachmi, Surachman A., Eka Putri D., et al. (2024). Education Transformation in the Digital Era, Challenges and Opportunities (Indonesia). Jurnal of International Multidisciplinary Research, 2, 52-63.
- Ramos, D., Madeira, M. J., & Duarte, F. A. P. (2020). Entepreneurship Education and Entrepreneurial Intention: The Case of Portugal. Economy of Region, 157–170. https://doi.org/10.17059/2020-1-12
- Rauf, R., Wijaya, H., & Tari, E. (2021). Entrepreneurship education based on environmental insight: Opportunities and challenges in the new normal era. Cogent Arts & Humanities, 8(1). https://doi.org/10.1080/23311983.2021.1945756
- Razi, M. F. (2017). Wireless Education Manager Facing the Implementation of Wireless Activities in the Student Environment (Indonesia). Kewirausahaan-AULM1451, 1(1), 1-14. https://osf.io/q4ean/download
- Roxas, B. G., Cayoca-Panizales, R., & De Jesus, R. M. (2009). Entrepreneurial Knowledge and its Effects on Entrepreneurial Intentions: Development of a Conceptual Framework. Asia-Pacific Social Science Review, 8(2). https://doi.org/10.3860/apssr.v8i2.784
- Saad, A., & Fahim, A. (2021). Access Digital Divide in the Kingdom of Saudi Arabia (KSA): Current State and Measures for Improvement. International Journal of Information Engineering and Electronic Business, 13(3), 13–21. https://doi.org/10.5815/ijieeb.2021.03.02
- Sari, L. K. (2023). Higher Education Heritage Ecosystem (Indonesia). Pramana: Jurnal Hasil Penelitian, 3(1), 1. https://doi.org/10.55115/jp.v3i1.3197
- Sima, V., Gheorghe, I. G., Subić, J., et al. (2020). Influences of the Industry 4.0 Revolution on the Human Capital Development and Consumer Behavior: A Systematic Review. Sustainability, 12(10), 4035. https://doi.org/10.3390/su12104035
- Siregar, P. P., Julmasita, R., Ananda, S., et al. (2023). It's important to educate heroics in higher education (Indonesia). Asatiza: Jurnal Pendidikan, 4(1), 43–50. https://doi.org/10.46963/asatiza.v4i1.805
- Sirelkhatim, F., & Gangi, Y. (2015). Entrepreneurship education: A systematic literature review of curricula contents and teaching methods. Cogent Business & Management, 2(1). https://doi.org/10.1080/23311975.2015.1052034
- Solesvik, M. Z. (2013). Entrepreneurial motivations and intentions: investigating the role of education major. Education + Training, 55(3), 253–271. https://doi.org/10.1108/00400911311309314
- Solomon, G. (2008). Entrepreneurship Education in the United States. Entrepreneurship and Higher Education, 95–118. https://doi.org/10.1787/9789264044104-6-en
- Souitaris, V., Zerbinati, S., & Al-Laham, A. (2007). Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. Journal of Business Venturing, 22(4), 566–591. https://doi.org/10.1016/j.jbusvent.2006.05.002
- Subhaktiyasa, P. G. (2023). Entrepreneurship Opportunities in Education during Industrial Revolution 4.0. PUBLIK: Jurnal Manajemen Sumber Daya Manusia, Adminsitrasi Dan Pelayanan Publik, 10(3), 793-800.
- Subroto, D. E., Wirawan, R., Rukmana, A. Y., et al. (2023). Implementation of Technology in Digital Era Learning: Challenges

and Opportunities for the Education World in Indonesia (Indonesia). Jurnal Pendidikan West Science, 1(07), 473–480. https://doi.org/10.58812/jpdws.v1i07.542

- Suhardi, Y., Pragiwani, M., Zulkarnaini, Z., et al. (2023). Kewirausahaan Di Era Digital. BERDAYA: Jurnal Pendidikan Dan Pengabdian Kepada Masyarakat, 5(3), 229–236. https://doi.org/10.36407/berdaya.v5i3.1143
- Sulthani, D. A., & Thoifah, I. (2022). Urgency of Stakeholders in Improving the Quality of Education. Riwayat: Educational Journal of History and Humanities, 5(2), 443–451. https://doi.org/10.24815/jr.v5i2.27600
- Supriadi, A., Judijanto, L., Rizani, A., & Amin, A. (2023). Economic Transformation of Indonesia in The Era of Digital 5.0: Challenges and Opportunities. International Journal of Economic Literature, 1, 122-135.
- Suyanto, B., & Ariadi, S. (2015). Self-employed development efforts among unemployed people in the East Jawa (Indonesia). Masyarakat, Kebudayaan Dan Politik, 28(3), 115. https://doi.org/10.20473/mkp.v28i32015.115-124
- Tafonao, T. (2020). Education of Heroes for Citizens of the Church in the Digital Era (Indonesia). Visio Dei: Jurnal Teologi Kristen, 2(1), 127–146. https://doi.org/10.35909/visiodei.v2i1.81
- Tan, A. H. T., Muskat, B., & Zehrer, A. (2016). A systematic review of quality of student experience in higher education. International Journal of Quality and Service Sciences, 8(2), 209–228. https://doi.org/10.1108/ijqss-08-2015-0058
- Tao, H., Sun, X., Liu, X., et al. (2022). The Impact of Consumer Purchase Behavior Changes on the Business Model Design of Consumer Services Companies Over the Course of COVID-19. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.818845
- Trihudiyatmanto, M. (2019). Building Student Emotional Mines with E-Commerce Factor Builders, Emotional Knowledge and Gender (Indonesia). Jurnal Penelitian Dan Pengabdian Kepada Masyarakat UNSIQ, 6(2), 93–103. https://doi.org/10.32699/ppkm.v6i2.678
- Udovita, P. V. M. V. D. (2020). Conceptual Review on Dimensions of Digital Transformation in Modern Era. International Journal of Scientific and Research Publications (IJSRP), 10(2), 9873. https://doi.org/10.29322/ijsrp.10.02.2020.p9873
- Vartanova, E., & Gladkova, A. (2019). New forms of the digital divide. Available online: https://www.divaportal.org/smash/get/diva2:1535724/FULLTEXT01.pdf (accessed on 12 May 2024).
- Verina, N., & Titko, J. (2019). Digital transformation: conceptual framework. In: Proceedings of 6th International Scientific Conference Contemporary Issues in Business, Management and Economics Engineering 2019; https://doi.org/10.3846/cibmee.2019.073
- Wardhani, P. S. N., & Nastiti, D. (2023). Implementation of Heritage Education In Growing Student Heritage Mines (Indonesia). Prima Magistra: Jurnal Ilmiah Kependidikan, 4(2), 177–191. https://doi.org/10.37478/jpm.v4i2.2622
- Widiyanti, R. (2021). Execution of heroic learning at vocal college (Indonesia). Prosiding The 12th Industrial Research Workshop and National Seminar Bandung, 4-5.
- Wigand, R. T. (1997). Electronic Commerce: Definition, Theory, and Context. The Information Society, 13(1), 1–16. https://doi.org/10.1080/019722497129241
- Zahra, S., Risty Andini, Z., Putri, L. S., & Keling, M. (2024). Digital Era Hero Potential Digital: Challenges and Opportunities (Indonesia). Jurnal Riset Ilmu Manajemen Dan Kewirausahaan, 2(1), 54-63. https://doi.org/10.61132/maeswara.v1i6.592
- Zaoui, F., & Souissi, N. (2020). Roadmap for digital transformation: A literature review. Procedia Computer Science, 175, 621– 628. https://doi.org/10.1016/j.procs.2020.07.090