

Research trends in digital entrepreneurship education: A bibliometric analysis

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Suggested Citation:

Rahmanto, A.A. & Yuliyanto, R. (2024). Research trends in digital entrepreneurship education: A bibliometric analysis. *Global Journal of Business, Economics, and Management: Current Issues*, 14(3), 158-170. <https://doi.org/10.18844/gjbem.v14i3.9517>

Received from April 12, 2024; revised from June 13, 2024; accepted from November 01, 2024.

Selection and peer review under the responsibility of Prof. Dr. Andreea Claudia Serban, Bucharest Academy of Economic Studies, Romania

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Abstract

Digital entrepreneurship learning is an essential approach to equipping students with knowledge and skills for entrepreneurial behaviour in a digital landscape. This study presents a comprehensive bibliometric analysis of the literature on digital entrepreneurship learning. A total of 359 articles were initially retrieved from the Scopus database, focusing on publications from 2018 to 2022, and 121 relevant articles were selected for in-depth analysis. References were organized using Mendeley, and VOSviewer software was employed for the classification and visualization of trends, key themes, and research networks within the field. This review serves as a foundational resource for future research, highlighting prevalent topics and gaps in digital entrepreneurship education. By mapping the evolution and focus areas of current studies, this paper provides valuable insights for educators, researchers, and policymakers to support the development of effective digital entrepreneurship learning frameworks.

Keywords: Bibliometric analysis; digital; entrepreneurship.

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1. INTRODUCTION

Over the past decade, the rapid evolution of technology has accelerated the proliferation of digital entrepreneurship worldwide (Lamba & Jain, 2022; Abenov et al., 2019). The development of Information Technology and the internet has changed how we interact, shop and work. In addition, this has also created new opportunities to become an entrepreneur in the digital age (Olsson & Bernhard, 2021; Solarte et al., 2021; Laptev & Shaytan, 2022; Li et al., 2023). The presence of digital technology significantly impacts the economy's growth (Muafi et al., 2021; Wang et al., 2024). This is triggered by a combination of entrepreneurial orientation and digital technology (Sariwulan et al., 2020; Zarrouk et al., 2020) and then gave birth to a new concept called digital entrepreneurship.

Digital entrepreneurship is an entrepreneurial activity arising from the extensive use of digital technology to create and deliver service offerings (Chae & Goh, 2020; Kreiterling, 2023). Learning digital entrepreneurship is an approach to teach the knowledge and skills necessary to start and organize a business in the digital world (Secundo et al., 2021), which includes strategy (Amjad, 2022), management (Rusgowanto, 2020; Guerrero et al., 2021), and the use of e-commerce platforms (Fan et al., 2021).

In this digital age, technology is important in education, including in entrepreneurial learning (Holzmann et al., 2018; Attuquayefio et al., 2024). Awareness of digital entrepreneurship learning should be introduced early so the environment understands entrepreneurship (Rahman et al., 2021). It can begin by introducing concepts such as digital competence, digital literacy, digital skills, and entrepreneurship (Núñez-Canal et al., 2022). Most students learn about digital entrepreneurship in school (Núñez-Canal et al., 2022), so schools have a responsibility to provide a good learning environment (leading to improved behavior and good character) (Ratten, 2020) as well as good environmental literacy (Amin et al., 2019).

Learning digital entrepreneurship can increase entrepreneurial intentions in the digital era (Darmanto et al., 2022). Learning digital entrepreneurship enables individuals to be able to start and manage online businesses (Kraus et al., 2023) as a result of having learned various kinds of knowledge and skills that have been given before, and can provide access to the necessary resources such as mentors and business networks (Nurhayati & Lestari, 2022; Fayolle & Gailly, 2015)

Entrepreneurship learning currently applied in digital technology education still needs to be utilized, especially in entrepreneurial practice (Prastyaningtyas & Arifin, 2019; Susilo et al., 2019; Ha et al., 2024). Other research states that the ability of teachers to utilize digital technology still needs to be improved (Manurung et al., 2022) and have yet to develop entrepreneurial competencies (Solarte et al., 2021). Entrepreneurship is a matter that has an impact on economic life (Mardikaningsih & Putra, 2021; Lyu et al., 2019). Thus, awareness of digital entrepreneurship learning must be increased immediately (Jaenudin et al., 2019).

The concept of digital entrepreneurship itself has already been discussed (Browder et al., 2019; Gentile et al., 2020; Reis et al., 2021). In the existing literature, several concepts relevant to digital entrepreneurship learning are those of digital learning for educators (Ratten, 2020; Núñez-Canal et al., 2022), an early concept for encouraging entrepreneurship (Browder et al., 2019), how digital technologies can be used to reconfigure the design, delivery of learning processes (Secundo et al., 2021), methods in Entrepreneurship (An et al., 2018; Guerrero et al., 2021; Kwilinski et al., 2021), digitization and entrepreneurship (Prüfer & Prüfer, 2020), strategic and its impact on digital models (Gupta & Bose, 2019; Islam & Can 2024). However, studies that discuss digital entrepreneurship in education are minimal; until now, there has never been a bibliometric analysis of the term digital entrepreneurship learning.

1.1. Purpose of study

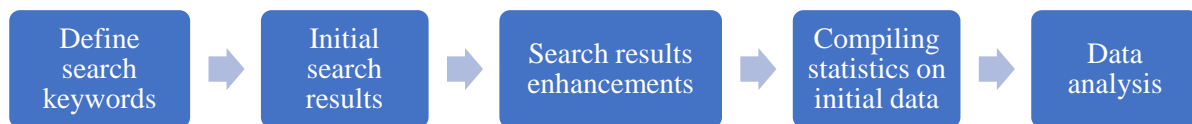
Based on the abovementioned gaps, this article aims to close the knowledge gap by offering a thorough bibliometric analysis of the literature about learning digital entrepreneurship. The results will then be displayed using VOSviewer, followed by a discussion session and findings from library research using bibliometric analysis that has been done before.

2. METHOD AND MATERIALS

The method used is bibliometric by summarizing several articles on a particular topic. This method refers to five stages (Setyaningsih et al., 2018) as seen in figure 1:

Figure 1

Bibliometric analysis of the five-step method



2.1. Stop keyword searches

A literature search was conducted in May 2023 on "Digital Entrepreneur Learning" using the Scopus indexing engine. As it is one of the largest published indexers in the world, the Scopus indexing engine was chosen. The database also covers almost all articles that have been published in international journals in the world (Busro et al., 2021).

2.2. Initial search results

This search is specific to journals, title words only, and the years '2018-2022'. The initial search yielded 359 items. The results are organized in the Research Information System (RIS) format, which contains all the important article details such as research title, author and co-author names, abstract, keywords, and references.

2.3. Search results enhancements

Data sorting is done on eligible articles and entered in the Scopus database. This information does not include proceedings, publications, books, book reviews, and book chapters. So, the total number of articles obtained is 121 articles. The file is then saved as a CSV file after making the necessary adjustments. Further data analysis is performed on the resulting CSV file. The application used in this study is called VOSviewer.

2.4. Compiling statistics on initial data

The collected data is stored in CSV form. The initial stage is to check the article's completeness, such as the year of publication, volume, number, page, etc. After that, if the data is not complete, the necessary information can be added. This data analysis aims to classify articles according to year, source, and publisher.

2.5. Data analysis

This study uses the VOSviewer application to perform bibliometric analysis. VOSviewer is used to create and display bibliometric networks. These networks, which can be created by citations, bibliographic mergers, joint citations, or relationships between co-authors, can include specific journals, scholars, or publications. (Effendy et al., 2021).

3. RESULT

The output is checked using the VOSviewer program to identify the most common terms. The number of frequently repeated keywords is provided to meet the needs of data collection and analysis. To view bibliometric maps, use VOSviewer. This software provides three alternative visuals, including network visualization, overlay visualization, and density visualization, to display bibliometric trends.

Table 1
Comparison matrix

Metric Data	Search	Repair Search
Sources	Digital Entrepreneurship Learning	Digital Entrepreneurship Learning
Year of issue	2018-2022	2018-2022
Documents	359	121
Citation	1802	1221
Citation/year	360,4	244,2
Citation/articles	71,8	24

Using the Scopus search engine, collecting entrepreneurship research metadata with the keyword "Digital entrepreneurship learning" produced 359 documents. This metadata has never been the subject of research. To reduce the number of articles to be researched to only 121 (table 1), article metadata was retrieved and reselected by category, especially completeness of name, extension, year, and publisher. Figure 2 shows the varying growth in the number of articles containing the keyword over five years, starting in 2018 and ending in 2022.

Figure 2
Fluctuations In the Number of Publications In 2018-2022

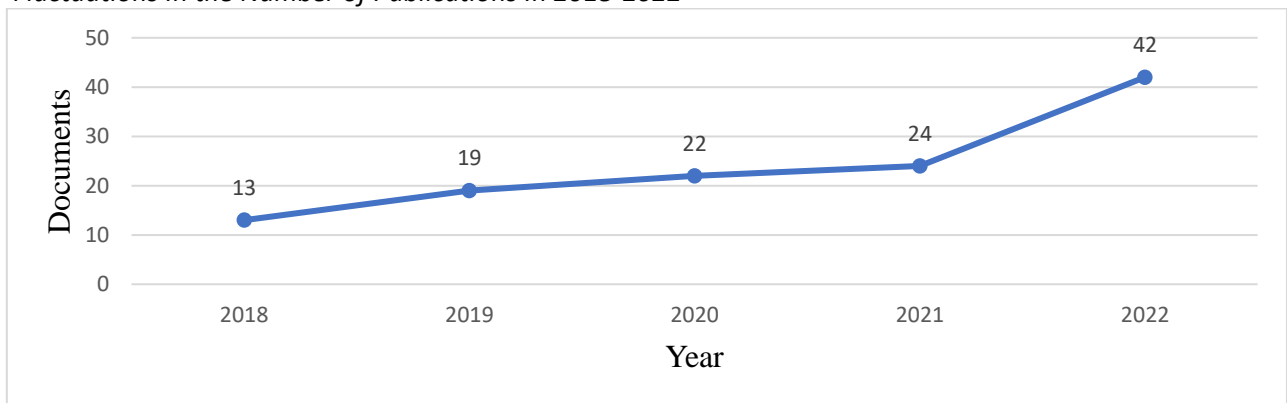
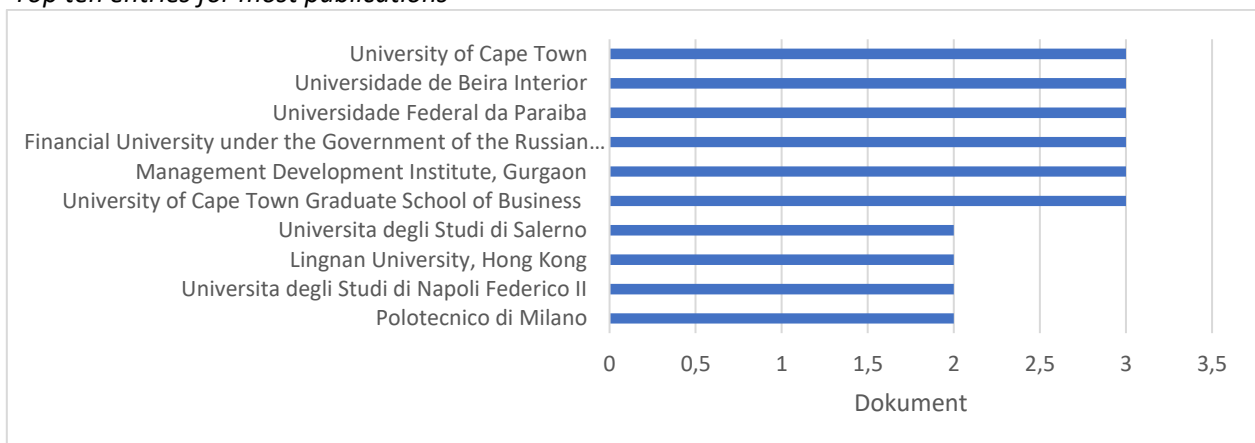


Figure 2 shows the highest number of publications in 2022, with 42 publications related to "digital entrepreneurship learning". Followed in 2021 with 24 publications, in 2020 as many as 22, and finally in 2018 as many as 13. Top-ranked for publications related to this "digital entrepreneurship learning" are the University of Cape Town, Universidade de Beira Interior, Universidade Federal da Paraiba, Financial University Under the Government of the Russian Federation, Management Development Institute, Gurgaon, and lastly, the University of Cape Town Graduate School of Business shown in Figure 3 Below has three publications.

Figure 1
Top ten entries for most publications



In the tables (tables 2, 3, 4) below are the most relevant contributions to this study. The stage is to take the 121 articles with the highest score (top 10 article citations) results, as shown in Table 2.

Table 2
Top ten cited articles

No	Year Of Issue	Author	Title	Journal	Citation	Publisher
1.	2020	Ratten V.	Coronavirus (Covid-19) and the entrepreneurship education community	Journal of Enterprising Communities	104	Emerald Group Holdings Ltd.
2.	2019	Browder R.E., Aldrich H.E., Bradley S.W.,	The emergence of the maker movement: Implications for entrepreneurship research	Journal of Business Venturing	97	Elsevier Inc.
3.	2021	SECUNDO G., MELE G., VECCHIO P.D., ELIA G., MARGHERITA A., NDOU V.,	Threat or opportunity? A case study of the digital-enabled redesign of entrepreneurship education in the COVID-19 emergency	Technological Forecasting and Social Change	81	Elsevier Inc.
4.	2018	An W., Zhao X., Cao Z., Zhang J., Liu H.,	How Bricolage Drives Corporate Entrepreneurship: The Roles of Opportunity Identification and Learning Orientation	Journal of Product Innovation Management	77	Blackwell Publishing Ltd
5.	2022	Núñez-Canal M., de Obesso M.D.L.M., Pérez-Rivero C.A.,	New challenges in higher education: A study of the digital competence of educators in Covid times	Technological Forecasting and Social Change	50	Elsevier Inc.
6.	2019	Balocco R., Cavallo A., Ghezzi A., Berbegal-Mirabent J.,	Lean business models change processes in digital entrepreneurship	Business Process Management Journal	50	Emerald Group Holdings Ltd.
7.	2020	Prüfer J., Prüfer P.,	Data science for entrepreneurship research: studying demand dynamics for entrepreneurial skills in the Netherlands	Small Business Economics	39	Springer
8.	2021	Guerrero M., Heaton S., Urbano D.,	Building universities' intrapreneurial capabilities in the digital era: The role and impacts of Massive Open Online Courses (MOOCs)	Technovation	37	Elsevier Ltd
9.	2019	Gupta G., Bose I.,	Strategic learning for digital market pioneering: Examining the transformation of Wishberry's crowdfunding model	Technological Forecasting and Social Change	34	Elsevier Inc.
10	2021	Kwilinski A., Litvin V., Kamchatova E., Polusmiak	Information support of the entrepreneurship model complex with the application of cloud technologies	International Journal of Entrepreneurship	31	Allied Business Academies

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Table 3

Top 7 publishers publishing Digital Entrepreneurship Learning topics

No	Publisher	Total articles
1.	Emerald Publishing	39
2.	Elsevier	12
3.	Springer	10
4.	Allied Business Academies	9
5.	MDPI	6
6.	SAGE Publications Ltd	5
7.	Routledge	5

Table 4

Top 7 journals that have articles relevant to the topic of digital entrepreneurship learning

No	Journal	Total Articles	Total Citation
1	Emerald Emerging Markets Case Studies	21	23
2	Technological Forecasting and Social Change	6	196
3.	Journal of Entrepreneurship Education	5	40
4.	International Journal of Entrepreneurial Behaviour and Research	4	64
5.	Small Business Economics	3	74
6.	Entrepreneurship Education and Pedagogy	3	15
7.	Education Sciences	3	36

Network visualization display of data processing results using the VOSviewer application can be seen in Figure 4, overlay visualization in Figure 5, and density visualization in Figure 6.

Figure 2

Network visualization in Scopus database

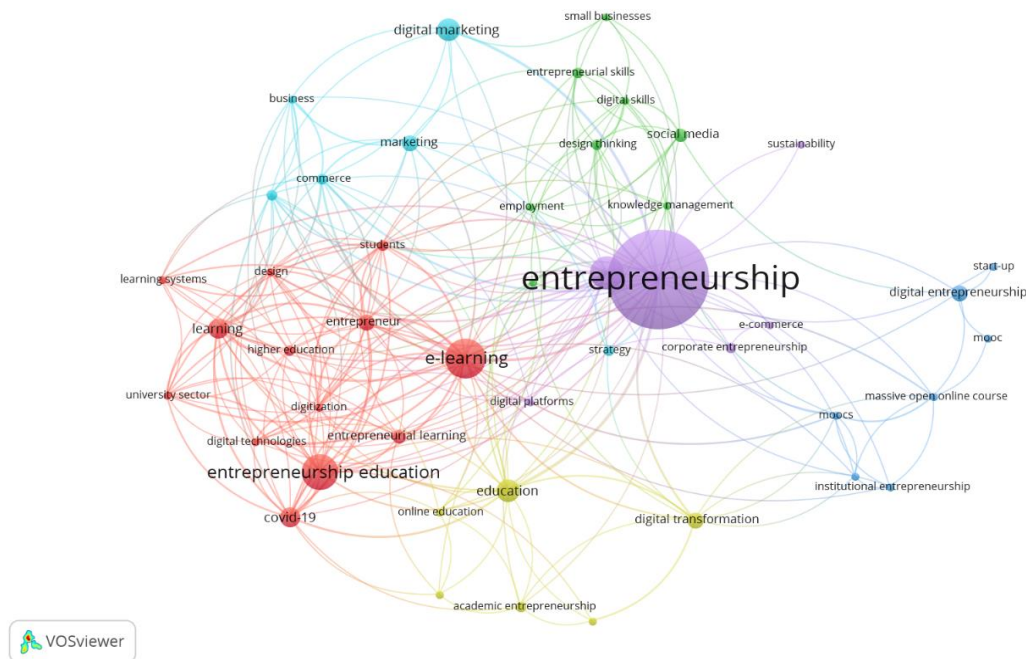


Figure 3
Overlay visualization in Scopus database

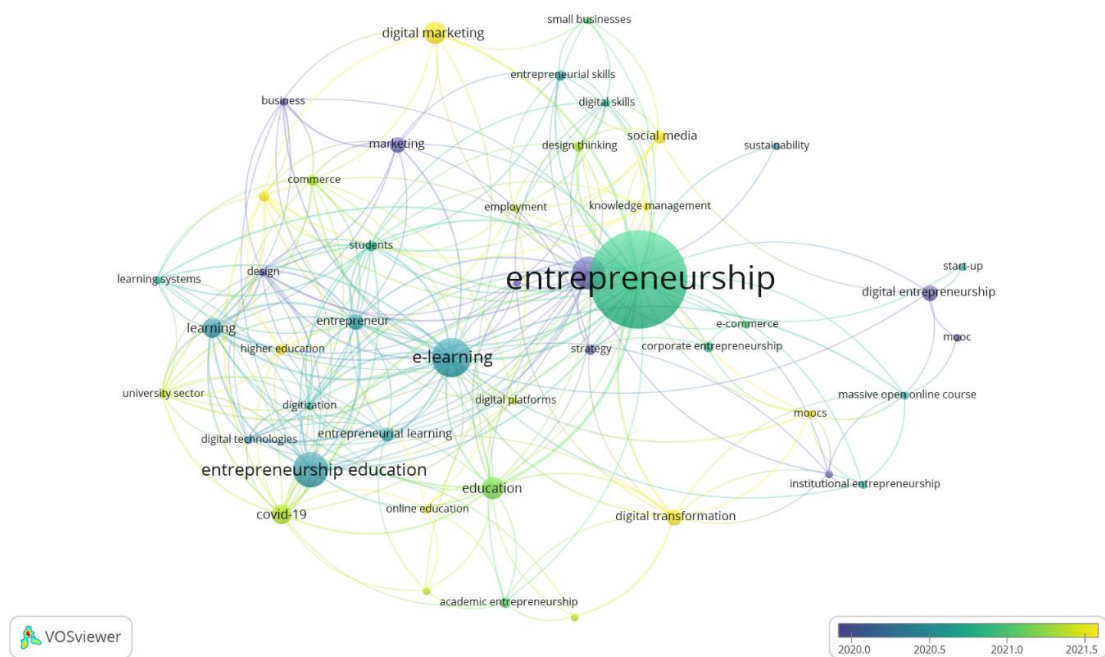
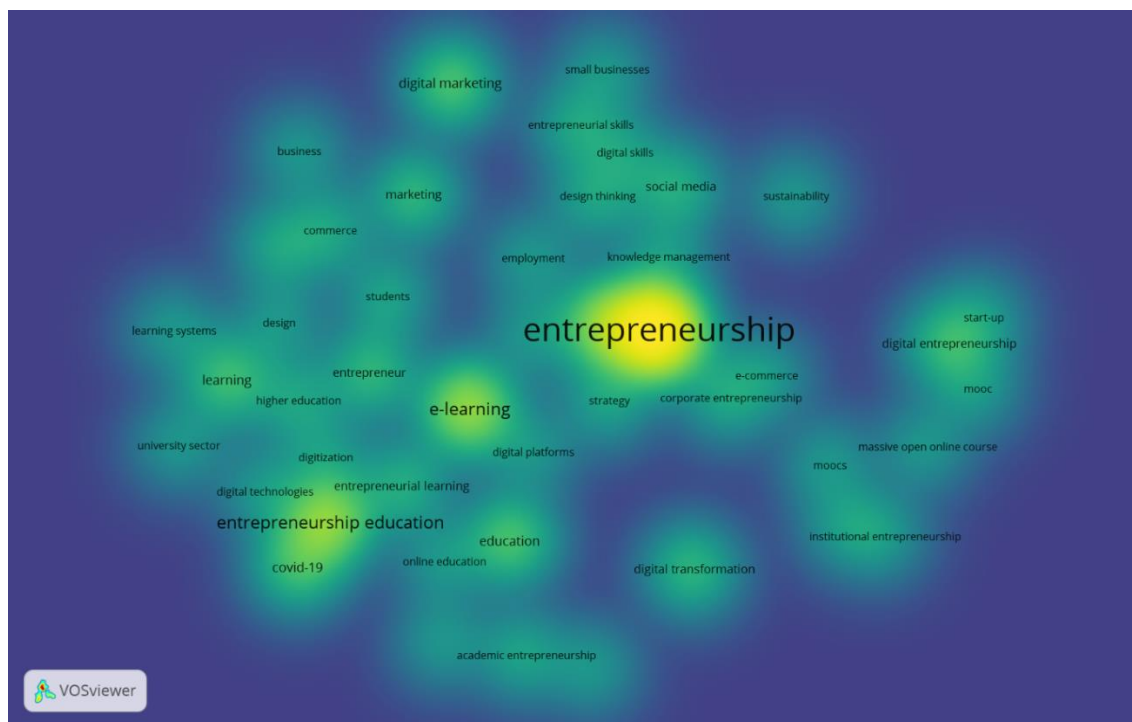


Figure 4
Density visualization in scopus data base



The findings come from the title, abstract, and keywords, with the minimum number of occurrences fully counted and set to 3. The 604-item criteria were met by 46 p. The term " general " is not used in this sentence. The node's size indicates the addition of each item, indicating the keyword. Thus, these nodes represent the

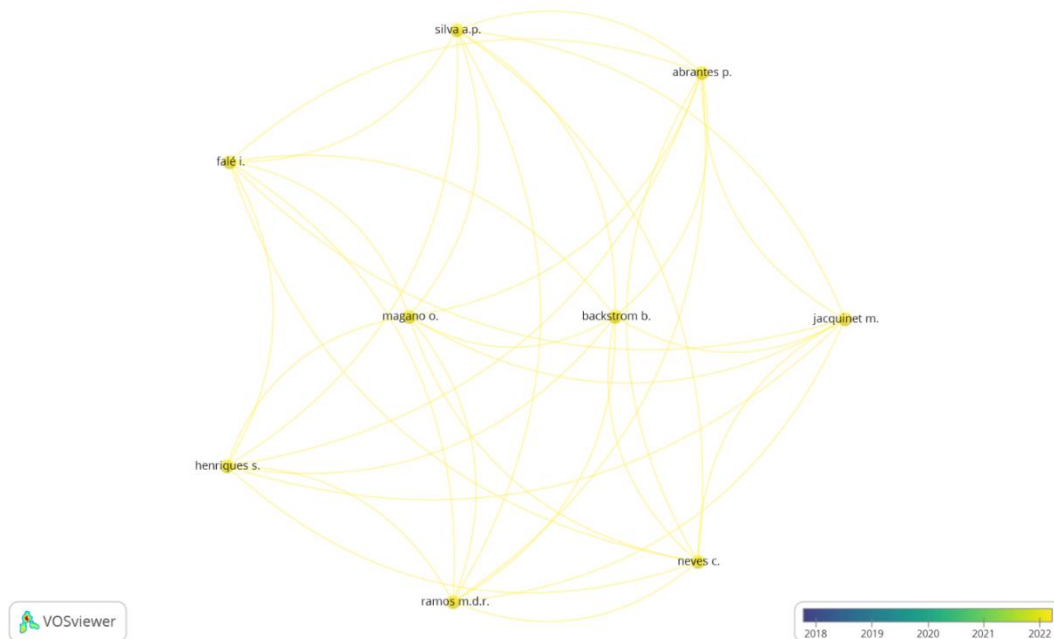
number of occurrences of the same keyword. Here, six groups are recorded. Table 5 shows the study flow for learning about digital entrepreneurship represented by terms that appear in each cluster.

Table 5
Keywords representing each cluster

No	Cluster	Element
1.	First cluster (red)	covid-19 [32] design [20] digital technologies [20] digitalization [20] e-learning [59] entrepreneur [37] entrepreneurial learning [14] entrepreneurship education 25 [31] higher education [11] learning [36] learning systems [14] students [30] university sector [22]
2.	Second cluster (green)	collaboration [12] design thinking [13] digital skills [14] employment [9] entrepreneurial skills [10] knowledge management [12] small businesses [6] social media [11]
3.	Third cluster (dark blue)	digital entrepreneurship [6] institutional entrepreneurship [6] lifelong learning [7] massive open online course [10] mooc [2] MOOCs [10] start-up [2]
4.	Fourth cluster (yellow)	academic entrepreneurship [8] digital academic entrepreneurship [5] digital transformation [17] education [31] entrepreneurial self-efficacy [6] online education [8]
5.	Fifth cluster (purple)	corporate entrepreneurship [5] digital platforms [9] e-commerce [4] entrepreneurship [73] innovation [34] sustainability [2]
6.	Fifth cluster (light blue)	business [13] commerce [21] digital marketing [12] engineering education [19] marketing [14] strategy [5]

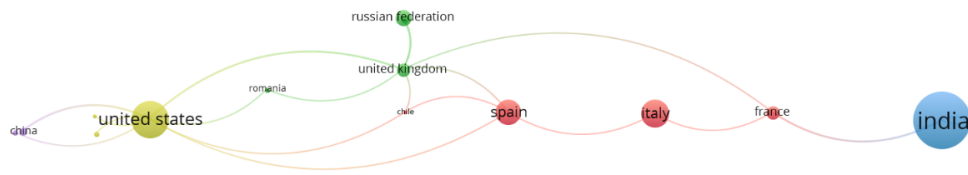
An author linkage analysis, along with collaboration patterns between authors, is presented in Figure 7. On this network, each node represents the author in its writing connection. Thus, the author's relationship can be classified as their annual relationship.

Figure 7
Visualization of overlay writing and co-author relationships on the Scopus database



Author affiliation extracted from CSV file in Vosviewer. States are extracted from each affiliate to analyze this. Figure 8 shows the location of the authors who contributed to the Digital Entrepreneurship Learning article.

Figure 8
Geographical location of contributing authors



The most relevant contribution to this study is the number of citations. Based on Table 2, the highest citations indexed by Scopus are articles from Ratten (2020). This article discusses COVID-19 making a change in the world of entrepreneurship education. So, technology such as AI is needed to simulate the real environment. This allows for a more community-oriented approach to the study and practice of entrepreneurship (Ratten, 2020). This article is cited in more than 100 research articles. Meanwhile, there is one publisher with the highest citation frequency based on these data, Emerald Publishing.

In addition, the publishers who contributed the most articles to the study were also analyzed. Of the 121 articles, 39 were published by major publishers Emerald Publishing, followed by Elsevier with 12 articles, Springer with 10 articles, Allied Business Academies with 9 articles, MDPI with 6 articles, SAGE Publications Ltd, and Routledge with 5 articles. For other publishers, on average, 1 and 2 articles.

In addition, an analysis is carried out based on the article's relevance. Results were obtained in the top 7 journals that contain this theme. There are 196 journals with the most citations, namely Technological Forecasting and Social Change. This shows that the distribution of articles with keywords related to Digital Entrepreneurship Learning is only in certain journals, although there are also some in other journals.

Identification of key themes in the scope of the study can be seen through overlay visualization analysis and density visualization. This result was done by measuring the co-occurrence of keyword pairs (Nagy, 2018). The application used to perform this analysis is Vosviewer. With the application can be identified that each cluster has a relationship with other keywords. So, the development of research on this topic is likely related. Network analysis also allows the identification of author authority. Co-author analysis investigates authors conducting joint research from a specific field.

The density of authors contributing to articles on Digital Entrepreneurship Learning can be found in Spain, Russia, the United States, India, France, China, the United Kingdom, Romania, Chile, and Italy. The geographical distribution of this author shows that the United States and India still dominate research on Digital Entrepreneurship Learning. The overall data allows this paper to answer the research trends in Digital Entrepreneurship Learning in the last 5 years. Some words that are not used can be connected and examined in subsequent studies.

The current study reviewed journal articles whose themes were related to the keyword Digital Entrepreneurship Learning. Articles are collected from the Scopus database. Then, these 121 articles were selected from a larger original pool of 359 articles published in Vulnerable from 2018 to 2022. To fulfill the purpose of this study, all articles found are classified by author, year of publication, Journal publisher name, cite author and co-author relationship, and affiliation statistics. In the context of this study, the United States

and India still dominate the distribution of authors who study related to Digital Entrepreneurship Learning. The gap in this study shows the direction of the agenda going forward that Digital Entrepreneurship Learning is very important to be studied. Learning the concept of Digital Entrepreneurship Learning tends to increase yearly. It is also necessary for more inter-regional research cooperation involving researchers from Asia and other developing countries in certain areas.

4. DISCUSSION

The digital revolution has had a huge impact on education. The evolution of the use of technology in education has been gradual and differentiated, including in entrepreneurial learning (Núñez-Canal et al., 2022). Learning digital entrepreneurship is a process that involves mastering concepts and skills and understanding how to start, manage, and grow a business in the digital age. Learning digital entrepreneurship is very important, considering the significant role of digital entrepreneurship in the era of digitalization (Muafi et al., 2021; Kwakye et al., 2024). Research by Rusmana et al., (2019) proved that digital skills affect entrepreneurial effectiveness and academic competence.

The use of digital technology in entrepreneurship is very suitable to be applied in the academic environment (Cavallo et al., 2019). This entrepreneurial learning can also lead to the discovery of new methods and technologies (Ghezzi & Cavallo, 2020). Digital entrepreneurship for academics will provide more excellent job opportunities to reduce unemployment (Sahut et al., 2019). The application of digital entrepreneurship is comprehensive and can be adopted in every branch of science and into business (Bowen & Morris, 2019).

Digital entrepreneurship learning utilizes digital technology as a learning tool and platform. Using various digital tools and applications, participants can learn interactively, access rich learning resources, and collaborate with fellow participants. This is in line with Schou et al., (2022), which proves that digitalization in entrepreneurial learning can provide a multi-faceted and accessible environment in real-time. Technology also enables business simulations, case studies, and experiments to enhance the learning experience and understanding of digital entrepreneurship concepts.

The learning transformation of digital entrepreneurship can provide significant opportunities for faculty and students to enrich their learning experience by designing more engaging, interactive, student-centered learning practices that improve student motivation and learning outcomes (Secundo et al., 2021). Because digital-based entrepreneurship learning allows more knowledge and experience to be gained (Ratten, 2020). Other studies mention that learning digital entrepreneurship using MOOC models by universities can shape the pursuit of entrepreneurship in the digital economy (Guerrero et al., 2021). According to Erdisna et al., (2022) digital entrepreneurship model encourages students to open businesses by utilizing information technology.

5. CONCLUSION

This study has two primary limitations. First, the analysis is based on a narrow set of keywords and relies solely on articles indexed in the Scopus database, which may limit the comprehensiveness of the findings. Relying on Scopus alone could exclude relevant studies from other databases, potentially affecting the scope of bibliometric insights. Second, despite the use of formal tools like VOSviewer and Microsoft Excel for data analysis, the authors' subjective evaluations remain part of the study, posing a risk of bias or error in interpreting results.

For future research, expanding keyword criteria and incorporating multiple databases could provide a more holistic view. Additionally, employing other bibliometric analysis tools, such as BibExcel and HistCite, may yield comparative insights and increase result validity. Given the limited research on digital entrepreneurship learning specifically in Indonesia, future studies should aim to explore this context in more depth, providing culturally relevant insights and addressing region-specific gaps in the literature.

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

Ethical Approval: The study adheres to the ethical guidelines for conducting research.

Funding: This research received no external funding

REFERENCES

- Abenov, Y. M., Kirdasinova, K. A., Tulaganov, A. B., Zhumataeva, B. A., Mutalyieva, L. M., & Issayeva, B. K. (2019). Entrepreneurship education: Teaching and learning modern mechanisms of entrepreneurship development based on public-private partnership. *Journal of Entrepreneurship Education*, 22(5), 2651.
- Amin, M. S., Permanasari, A., & Setiabudi, A. (2019). The pattern of environmental education practice at schools and its impact on the level of environmental literacy of school-age students. *IOP Conference Series: Earth and Environmental Science*, 245(1). <https://iopscience.iop.org/article/10.1088/1755-1315/245/1/012029/meta>
- Amjad, T. (2022). Digital entrepreneurial marketing: A bibliometric analysis reveals an inescapable need of business schools. *International Journal of Management Education*, 20(2), 100655. <https://doi.org/10.1016/j.ijme.2022.100655>
- An, W., Zhao, X., Cao, Z., Zhang, J., & Liu, H. (2018). How Bricolage Drives Corporate Entrepreneurship: The Roles of Opportunity Identification and Learning Orientation. *Journal of Product Innovation Management*, 35(1), 49–65. <https://doi.org/10.1111/jpim.12377>
- Attuquayefio, S., Aboagye-Darko, D., & Okronipa, A. Q. (2024). Digital academic entrepreneurship in emerging economies: Antecedents of social media adoption for academic entrepreneurship. *Education and Information Technologies*, 29(10), 11765-11791. <https://link.springer.com/article/10.1007/s10639-023-12286-3>
- Balocco, R., Cavallo, A., Ghezzi, A., & Berbegal-Mirabent, J. (2019). Lean business models change process in digital entrepreneurship. *Business Process Management Journal*, 25(7), 1520-1542. <https://www.emerald.com/insight/content/doi/10.1108/BPMJ-07-2018-0194/full/html>
- Bowen, R., & Morris, W. (2019). The digital divide : Implications for agribusiness and entrepreneurship. Lessons from Wales. *Journal of Rural Studies*, 72(October), 75–84. <https://doi.org/10.1016/j.jrurstud.2019.10.031>
- Browder, R. E., Aldrich, H. E., & Bradley, S. W. (2019). The emergence of the maker movement: Implications for entrepreneurship research. *Journal of Business Venturing*, 34(3), 459–476. <https://doi.org/10.1016/j.jbusvent.2019.01.005>
- Busro, B., Mailana, A., & Sarifudin, A. (2021). Pendidikan Islam dalam Publikasi Internasional: Analisis Bibliometrik pada Database Scopus. *Edukasi Islami: Jurnal Pendidikan Islam*, 10(01), 413–426. <http://jurnal.staialhidayahbogor.ac.id/index.php/ei/article/view/1591/800>
- Cavallo, A., Ghezzi, A., Dell’Era, C., & Pellizzoni, E. (2019). Fostering digital entrepreneurship from startup to scaleup: The role of venture capital funds and angel groups. *Technological Forecasting and Social Change*, 145(April), 24–35. <https://doi.org/10.1016/j.techfore.2019.04.022>
- Chae, B. (Kevin), & Goh, G. (2020). Digital entrepreneurs in artificial intelligence and data analytics: Who are they? *Journal of Open Innovation: Technology, Market, and Complexity*, 6(3), 56. <https://doi.org/10.3390/JOITMC6030056>
- Darmanto, S., Darmawan, D., Ekopriyono, A., & Dhani, A. U. (2022). Development of digital entrepreneurial intention model in Uncertain Era. *Uncertain Supply Chain Management*, 10(3), 1091–1102. <https://doi.org/10.5267/j.uscm.2022.7.050>
- Effendy, F., Gaffar, V., Hurriyati, R., & Hendrayati, H. (2021). Analisis Bibliometrik Perkembangan Penelitian Penggunaan Pembayaran Seluler Dengan Vosviewer. *Jurnal Interkom: Jurnal Publikasi Ilmiah Bidang Teknologi Informasi Dan Komunikasi*, 16(1), 10–17. <https://doi.org/10.35969/interkom.v16i1.83>
- Erdisna, E., Ridwan, M., & Syahputra, H. (2022). Developing Digital Entrepreneurship Learning Model: 4-D Competencies-Based for Millennial Generation in Higher Education. *Utamax : Journal of Ultimate Research and Trends in Education*, 4(2), 84–100. <https://doi.org/10.31849/utamax.v4i2.10081>
- Fan, T., Schwab, A., & Geng, X. (2021). Habitual entrepreneurship in digital platform ecosystems: A time-contingent model of learning from prior software project experiences. *Journal of Business Venturing*, 36(5), 106140. <https://doi.org/10.1016/j.jbusvent.2021.106140>
- Fayolle, A., & Gailly, B. (2015). 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>
- Gentile, T. A. R., Reina, R., De Nito, E., Bizjak, D., & Canonico, P. (2020). E-learning design and entrepreneurship in three European universities. *International Journal of Entrepreneurial Behaviour and Research*, 26(7), 1547–1566. <https://doi.org/10.1108/IJEBR-06-2019-0407>

- Ghezzi, A., & Cavallo, A. (2020). Agile Business Model Innovation in Digital Entrepreneurship: Lean Startup Approaches. *Journal of Business Research*, 110(February 2017), 519–537. <https://doi.org/10.1016/j.jbusres.2018.06.013>
- Guerrero, M., Heaton, S., & Urbano, D. (2021). Building universities' intrapreneurial capabilities in the digital era: The role and impacts of Massive Open Online Courses (MOOCs). *Technovation*, 99(March 2020), 102139. <https://doi.org/10.1016/j.technovation.2020.102139>
- Gupta, G., & Bose, I. (2019). Strategic learning for digital market pioneering: Examining the transformation of Wishberry's crowdfunding model. *Technological Forecasting and Social Change*, 146(April 2018), 865–876. <https://doi.org/10.1016/j.techfore.2018.06.020>
- Ha, L. T., Hanh, P. T. N., Hang, N. T. T., Khanh, H. D., Phuong, L. L., & Van Hop, H. (2024). Is digital business an enabler of enhanced entrepreneurship? An empirical investigation of European countries. *Journal of International Entrepreneurship*, 1-23. <https://link.springer.com/article/10.1007/s10843-024-00350-z>
- Holzmann, P., Hartlieb, E., & Roth, M. (2018). From engineer to entrepreneur – Entrepreneurship education for engineering students: The case of the entrepreneurial Campus Villach. *International Journal of Engineering Pedagogy*, 8(3), 28–39. <https://doi.org/10.3991/ijep.v8i3.7942>
- Islam, M. F., & Can, O. (2024). Integrating digital and sustainable entrepreneurship through business models: a bibliometric analysis. *Journal of Global Entrepreneurship Research*, 14(1), 20. <https://link.springer.com/article/10.1007/s40497-024-00386-4>
- Jaenudin, A., Suroto, S., & Astuti, D. P. (2019). Menumbuhkan Minat Berwirausaha Melalui teknologi Digital Pada Pembelajaran Kewirausahaan Mahasiswa Di Era Industri 4.0. *Economic Education and Entrepreneurship Journal*, 2(2), 84–95. <http://jurnal.fkip.unila.ac.id/index.php/E3J/article/view/19903/0>
- Kraus, S., Vonmetz, K., Bullini Orlandi, L., Zardini, A., & Rossignoli, C. (2023). Digital entrepreneurship: The role of entrepreneurial orientation and digitalization for disruptive innovation. *Technological Forecasting and Social Change*, 193(May), 122638. <https://doi.org/10.1016/j.techfore.2023.122638>
- Kreiterling, C. (2023). Digital innovation and entrepreneurship: a review of challenges in competitive markets. *Journal of Innovation and Entrepreneurship*, 12(1), 49. <https://link.springer.com/article/10.1186/s13731-023-00320-0>
- Kwakye, S., Ertugan, A., & Tashtoush, L. (2024). Navigating Purchase Intentions: The Influence of Reviewers' Comments Moderated by Risk and Trust. *Behavioral Sciences*, 14(7), 552. <https://www.mdpi.com/2076-328X/14/7/552>
- Kwilinski, A., Litvin, V., Kamchatova, E., Polusmiak, J., & Mironova, D. (2021). Information support of the entrepreneurship model complex with the application of cloud technologies. *International Journal of Entrepreneurship*, 25(1), 1–8.
- Lamba, P. S., & Jain, N. (2022). Overcoming challenges faced by digital entrepreneurs: a design thinking approach. *Development and Learning in Organizations*, 36(6), 12–14. <https://doi.org/10.1108/DLO-11-2021-0195>
- Laptev, G., & Shaytan, D. (2022). Co-design-based learning for entrepreneurs in the digital age. *Measuring Business Excellence*, 26(1), 93–105. <https://doi.org/10.1108/MBE-11-2020-0158>
- Li, W., Chen, W., Pang, Q., & Song, J. (2023). How to mitigate the inhibitory effect of organizational inertia on corporate digital entrepreneurship? *Frontiers in Psychology*, 14, 1130801. <https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1130801/full>
- Lyu, P. hui, Ngai, E. W. T., & Wu, P. yi. (2019). Scientific data-driven evaluation on academic articles of a low-carbon economy. *Energy Policy*, 125(April 2018), 358–367. <https://doi.org/10.1016/j.enpol.2018.11.004>
- Manurung, E. M., Purwadi, Y. S., & Sugiharto, I. B. (2022). Digital Learning Process: Challenges for Specific Creativity. *Electronic Journal of E-Learning*, 20(2), 112–119. <https://doi.org/10.34190/ejel.20.2.2107>
- Mardikaningsih, R., & Putra, A. R. (2021). Minat Berwirausaha Mahasiswa Ditinjau dari Konsep Diri Rahayu. *Jurnal Pendidikan, Sosial Dan Budaya*, 7(3), 173–18. <https://doi.org/10.32884/ideas.v7i3.423>
- Muafi, M., Syafri, W., Prabowo, H., & Nur, S. A. (2021). Digital Entrepreneurship in Indonesia: A Human Capital Perspective. *Journal of Asian Finance, Economics and Business*, 8(3), 351–359. <https://doi.org/10.13106/jafeb.2021.vol8.no3.0351>
- Nagy, G. (2018). Text Mining-based Scientometric Analysis in Educational Research Gyula. *The European Conference on Education*, 129–142. <https://doi.org/10.4324/9781003013686-2>
- Núñez-Canal, M., de Obesso, M. de las M., & Pérez-Rivero, C. A. (2022). New challenges in higher education: A study of the digital competence of educators in Covid times. *Technological Forecasting and Social Change*, 174(September 2021). <https://doi.org/10.1016/j.techfore.2021.121270>
- Nurhayati, D., & Lestari, N. S. (2022). Peran Digital Entrepreneurial Learning dan Entrepreneurial Orientation Sebagai Moderasi Pengaruh ICT Self-Efficacy terhadap Digital Entrepreneurial Intention Mahasiswa. *Jurnal Wacana Ekonomi*, 22(1), 86–97.

- Rahmanto, A.A. & Yuliyanto, R. (2024). Research trends in digital entrepreneurship education: A bibliometric analysis. *Global Journal of Business, Economics, and Management: Current Issues*, 14(3), 158-170. <https://doi.org/10.18844/gjbem.v14i3.9517>
- Olsson, A. K., & Bernhard, I. (2021). Keeping up the pace of digitalization in small businesses—Women entrepreneurs' knowledge and use of social media. *International Journal of Entrepreneurial Behaviour and Research*, 27(2), 378–396. <https://doi.org/10.1108/IJEBR-10-2019-0615>
- Prastyaningtyas, E. W., & Arifin, Z. (2019). Pentingnya Pendidikan Kewirausahaan pada Mahasiswa dengan Memanfaatkan Teknologi Digital Sebagai Upaya Menghadapi Revolusi 4.0. *Proceedings of The ICECRS*, 2(1), 281–285. <https://doi.org/10.21070/picecrs.v2i1.2382>
- Prüfer, J., & Prüfer, P. (2020). Data science for entrepreneurship research: studying demand dynamics for entrepreneurial skills in the Netherlands. *Small Business Economics*, 55(3), 651–672. <https://doi.org/10.1007/s11187-019-00208-y>
- Rahman, A. S., Sembodo, C., Kurnianingsih, R., Razak, F., & Amin, M. N. K. A. (2021). Participatory Action Research Dalam Pengembangan Kewirausahaan Digital Di Pesantren Perkotaan. *Jurnal Ilmu-Ilmu Keislaman*, 11(1), 85–98.
- Ratten, V. (2020). Coronavirus (Covid-19) and the entrepreneurship education community. *Journal of Enterprising Communities*, 14(5), 753–764. <https://doi.org/10.1108/JEC-06-2020-0121>
- Reis, D. A., Fleury, A. L., & Carvalho, M. M. (2021). Consolidating core entrepreneurial competencies: toward a meta-competence framework. *International Journal of Entrepreneurial Behaviour and Research*, 27(1), 179–204. <https://doi.org/10.1108/IJEBR-02-2020-0079>
- Rusgowanto, F. H. (2020). ICT implementation in Android applications for entrepreneurship learning: A high school case study in Jakarta. *International Journal of Innovation, Creativity and Change*, 10(11), 68–82.
- Rusmana, D., Murtini, W., & Harini. (2019). Pengaruh Keterampilan Digital Abad 21 Pada Pendidikan Kewirausahaan Untuk Meningkatkan Kompetensi Kewirausahaan Peserta Didik Smk. *Jurnal Ekonomi Pendidikan Dan Kewirausahaan*, 8(1), 1731. <https://doi.org/10.26740/jepk.v8n1.p17-32>
- Sahut, J. M., Iandoli, L., & Teulon, F. (2019). The age of digital entrepreneurship. *Small Business Economics*, 56(3), 1159–1169. <https://doi.org/10.1007/s11187-019-00260-8>
- Sariwulan, T., Suparno, S., Disman, D., Ahman, E., & Suwatno, S. (2020). Entrepreneurial Performance: The Role of Literacy and Skills. *Journal of Asian Finance, Economics and Business*, 7(11), 269–280. <https://doi.org/10.13106/jafeb.2020.vol7.no11.269>
- Schou, P. K., Bucher, E., & Waldkirch, M. (2022). Entrepreneurial learning in online communities. *Small Business Economics*, 58(4), 2087–2108. <https://doi.org/10.1007/s11187-021-00502-8>
- Secundo, G., Mele, G., Vecchio, P. Del, Eelia, G., Margherita, A., & Ndou, V. (2021). Threat or opportunity? A case study of the digital-enabled redesign of entrepreneurship education in the COVID-19 emergency. *Technological Forecasting and Social Change*, 166(December 2020), 120565. <https://doi.org/10.1016/j.techfore.2020.120565>
- Setyaningsih, I., Indarti, N., & Jie, F. (2018). Bibliometric analysis of the term “green manufacturing.” *International Journal of Management Concepts and Philosophy*, 11(3), 315. <https://doi.org/10.1504/ijmcp.2018.093500>
- Solarte, H. A., Tobar, H. F., Mesa, J. H., Trefftz, H., & Osorio, D. M. (2021). Changing perceptions about entrepreneurship and industry-related aspects and fostering innovation skills using a video game. *Interactive Technology and Smart Education*, 18(1), 104–118. <https://doi.org/10.1108/ITSE-10-2020-0220>
- Susilo, A., Djatmika, E. T., Mintarti, S. U., & Wahyono, H. (2019). The entrepreneurial learning of Generation Z students in Industrial Revolution Era 4.0 (a case study in tertiary education of Yogyakarta and Surakarta, Indonesia). *International Journal of Learning, Teaching and Educational Research*, 18(9), 96–113. <https://doi.org/10.26803/ijlter.18.9.5>
- Wang, X. W., Umar, M., Khaddage-Soboh, N., & Safi, A. (2024). From innovation to impact: unraveling the complexities of entrepreneurship in the digital age. *International Entrepreneurship and Management Journal*, 1-15. <https://link.springer.com/article/10.1007/s11365-024-00999-x>
- Zarrouk, H., Sherif, M., Galloway, L., & El Ghak, T. (2020). Entrepreneurial Orientation, Access to Financial Resources and SMEs' Business Performance: The Case of the United Arab Emirates. *Journal of Asian Finance, Economics and Business*, 7(12), 465–474. <https://doi.org/10.13106/JAFEB.2020.VOL7.NO12.465>