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ARTÍCULO DE INVESTIGACIÓN

Emprendimiento digital: ¿qué hemos aprendido de 20 años de investigación?

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Resumen. En las últimas dos décadas, el Emprendimiento Digital (ED) ha surgido rápidamente como un área de estudio significativa, influenciada por los avances en tecnologías digitales e inteligencia artificial, junto con las transformaciones en las prácticas empresariales a nivel mundial. A medida que el campo continúa expandiéndose, el creciente volumen de investigaciones requiere una evaluación estructurada para sintetizar los desarrollos clave y las tendencias emergentes. Atendiendo a esta necesidad, este estudio realiza un análisis bibliométrico integral del campo, revisando 20 años de investigación (2006–2025) a través de datos extraídos de Scopus. Los resultados proporcionan un mapeo estructurado de las tendencias de investigación, ilustrando cómo los estudios sobre ED han evolucionado en diferentes países. Además, el estudio examina las publicaciones, autores y revistas más influyentes que han dado forma al discurso, arrojando luz sobre las contribuciones académicas que impulsan el campo. Asimismo, el análisis identifica seis clústeres emergentes de investigación que han ganado prominencia en los últimos años: Competencias digitales y comportamiento emprendedor, innovación tecnológica, ecosistemas emprendedores digitales, la influencia de la pandemia y el comercio electrónico, modelos de negocio en emprendimiento digital y el papel de las plataformas digitales y el emprendimiento femenino. Estos hallazgos destacan la naturaleza dinámica y en constante evolución de la investigación en ED, ofreciendo una comprensión más clara de su trayectoria académica y abriendo nuevas vías para futuras exploraciones.

Palabras clave: emprendimiento digital, Análisis bibliométrico, Comportamiento emprendedor, Revisión de la literatura.

Digital entrepreneurship: what do we learn from 20 years of research

Abstract. Over the last two decades, Digital Entrepreneurship (DE) has rapidly emerged as a significant area of study, shaped by advancements in digital technologies and artificial intelligence, alongside transformations in entrepreneurial practices globally. As the field continues to expand, the growing volume of research necessitates a structured evaluation to synthesize key developments and emerging trends. Addressing this need, this study conducts a comprehensive bibliometric analysis of the field, reviewing 20 years of research (2006–2025) through data extracted from Scopus. The findings provide a structured mapping of research trends, illustrating how DE studies have evolved across different countries. Additionally, the study examines the most influential publications, authors, and journals that have shaped the discourse, shedding light on the academic contributions that drive the field forward. Furthermore, the analysis identifies six emerging research clusters that have gained prominence in recent years: Digital competencies and entrepreneurial behavior, technological innovation, digital entrepreneurial ecosystems, the influence of the pandemic and e-commerce, business models in digital entrepreneurship, and the role of digital platforms & women entrepreneurship. These insights underscore the dynamic and evolving nature of DE research, offering a clearer understanding of its scholarly trajectory and opening new avenues for future exploration.

Keywords: digital entrepreneurship, Bibliometric analysis, Entrepreneurial behavior, Literature review.

INTRODUCTION

Technological advancements and the impact of pandemics have altered human behavior in many areas, from working and consuming to entrepreneurship. DE has become popular today by leveraging technology, differing from traditional entrepreneurship that requires physical presence and significant resources (Darmanto et al., 2023) digital knowledge, digital competence, and nascent digital entrepreneurs. The population comprises nascent digital entrepreneurs who previously participated in an entrepreneurial skills program in digital technology field to gain digital competence and received digital start-up funds in Central Java (2020). It is a crucial field of study, combining technology and entrepreneurial spirit to create new business models in the digital economy (Zhai et al., 2023).

Although DE has garnered research interest, there are still many questions about trends, influencing factors, and gaps that need deeper exploration. Bibliometric analysis helps aggregate research data, identify major trends, authors, journals, and influential countries, and explore the knowledge structure of the field (Lungu et al., 2024). While some reviews have been conducted, they may not fully update or exploit the rich potential of academic data. Hence, this study aims to provide a comprehensive and up-to-date view of DE. By bibliometrics analysis, this study reveals research trends on the topic from 2006 to early 2025, identify key themes, and clarify research gaps, thereby proposing future research directions to add value to the literature.

LITERATURE REVIEW

DE is a research field related to using digital technology to create and manage businesses (Keyhani et al., 2022) defines it as the process of establishing new businesses with innovative ideas in the digital economy, utilizing electronic platforms and data networks to provide products or services based on digital value (Paul et al., 2023) expand this definition, describing DE as a business development method through technological advancements, and it involves pursuing business opportunities based on communication technology and digital media. Nambisan (2017) emphasize the role of digital infrastructure and the digital business ecosystem in shaping entrepreneurial activities.

The combination of digitalization and entrepreneurship is not only involves digitizing traditional business activities but also creates entirely new business models, promoting innovation and expanding customer reach through digital technology (Zhai et al., 2023). With the development of the internet and artificial intelligence, big data analytics, and blockchain, DE offers significant opportunities in various fields, from e-commerce to financial services and online education (Sartika & Santosa, 2023).

Research on this topic has rapidly developed over the past two decades, especially after 2013. Initially, research focused on how businesses leverage digital technology to improve operational efficiency (Zhai et al., 2023). Later, studies expanded to aspects such as digital business models, DE processes, DE ecosystems, and the impact of digital technology on business innovation. The significant increase in the number of research studies in this field reflects the growing importance of DE in the global economy, particularly in the context of digital transformation and the rapid development of e-commerce. Research on this topic is rapidly evolving with thousands of articles published annually. However, there is fragmentation and a lack of coherence in research approaches (Paul et al., 2023). Bibliometrics helps systematize academic literature, identify research gaps, and propose new research directions, while also providing an overview of the field’s evolution over time.

TABLE 1. Previous studies using bibliometric methods on the same topic

Author(s)	Data	Findings of research clusters of DE	Publication Timeframe of Surveyed Works
Antara et al. (2024)	1690 papers from Web of Science	Five research clusters: digital economy, impact and social media, technology, performance, innovation, and digital technology.	2003-2023
Lungu et al. (2024)	3366 papers from Web of Science	Six research clusters: information technology, sharing economy, performance, digital entrepreneurship, digital instruments, and digital entrepreneurial ecosystem.	2000-2023
Zhai et al. (2023)	704 papers from Web of Science	Three research clusters: empowerment, evolution, and ecosystem.	1999-2021
Maulana et al. (2023)	1659 papers from Scopus	Five research clusters: literature, adoption, digital economy, student and outcome.	2012-2021
Scornavacca et al. (2022)	107 papers from Scopus and EBSCO	No research clusters, but presented the most co-occurrence keywords: startups, digital innovation, platforms, e-entrepreneurship and information technology.	2006-2020
Purnomo et al. (2020)	115 papers from Scopus	Seven research clusters: innovation, digitalization, entrepreneurship, business development, business model, e-commerce, and social media.	1993-2019

From the comparison table above, it can be seen that studies on DE using bibliometric methods have continuously increased in recent years. This indicates that this topic is rapidly developing and has many new aspects that need further research. Specifically, the number of scientific works on DE has increased significantly since 2010, especially after 2015, while most reviews on DE survey studies up to 2019-2023. The number of research works in 2024 has surged compared to previous years. Notably, while entrepreneurship is strongly impacted by the effects of pandemics, this impact has a lag, often appearing in the years 2022 to the present, thus requiring updates with the latest research data. Due to the rapid changes in the field, a bibliometric study after about 3-5 years can become outdated. For example, the study by Zhai et al. (2023) only considered data up to 2021, but Antara et al. (2024) updated data from the recent two years of 2022 and 2023, showing significant changes in research trends. Additionally, there is a lack of consistency in previous studies, with large discrepancies in research data sets, data sources, and keyword usage for collecting research works, leading to different analysis results. Therefore, Lungu et al. (2024) proposed expanding the analysis to multiple data sources for a more comprehensive view. These research gaps highlight the necessity and significance of this study.

RESEARCH METHODOLOGY

Bibliometric analysis is a popular method for synthesizing and evaluating research data to identify trends in the development of a scientific field (Donthu et al., 2021). To gain a comprehensive understanding of the evolution of research on DE, this study performs a bibliometric analysis based on the Scopus database, applying search strategies and scientific analysis methods to identify key research topics, collaborative networks, and the academic impact of research works.

Previous review studies have used datasets from Web of Science up to 2023 (Antara et al., 2024; Lungu et al., 2024), or from Scopus but only up to 2021 (Maulana et al., 2023; Scornavacca et al., 2022). However, these studies do not fully reflect the latest developments in DE. Therefore, this study expands the data scope to ensure more up-to-date and comprehensive coverage.

Data is collected from Scopus, one of the largest academic databases, containing peer-reviewed research documents across various scientific fields. To ensure the accuracy and scientific value of the data, only published articles, conference proceedings, and book chapters are included. Given that DE has only been systematically studied in the past 20 years, this study does not limit the publication year to ensure the inclusion of all relevant documents, including pioneering works that laid the foundation for the field. However, search results show the first work on this topic (according to the keyword “Digital Entrepreneur*”) was in 2006.

To optimize search results and ensure the collection of rich yet accurate data, the study uses the keyword “Digital Entrepreneur*,” where the asterisk (*) expands the search scope to include all variations such as Digital Entrepreneurial, Digital Entrepreneurship, Digital Entrepreneur... Through testing various keyword combinations, this approach proved to yield the richest and most accurate results. The selected works are within fields related to DE, including Business, Management, Finance, Psychology, and Social Science. Limiting to these fields helps focus on important aspects of DE, avoiding noise from unrelated works. The final dataset includes 935 papers which has been published since 2006 to early 2025.

After data collection, the study employs bibliometric analysis methods to evaluate the development of DE over time, including performance analysis, science mapping, and temporal analysis to explore changes in the topic through different development stages. Combining these methods helps the study provide not only an overview of DE but also identify key trends and research gaps to explore in the future.

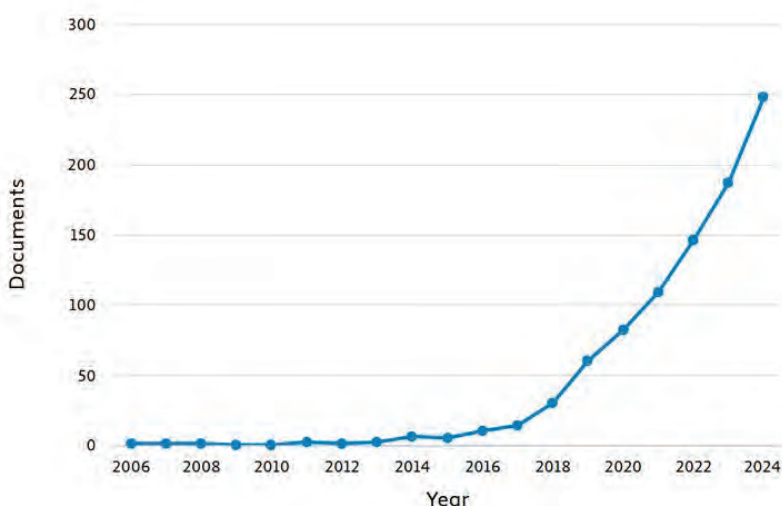
ANALYSIS RESULTS

Research trends over time

Over the past two decades, research on DE has experienced significant growth, particularly since 2019. As the below chart in Figure 1, there has been a notable increase in the number of published articles. Between 2006 and 2015, the annual publication rate did not exceed six articles. However, this trend began to shift in 2016, with the number of articles rising to ten, and by 2019, reaching sixty. The field has expanded even more rapidly from 2020 onwards, with 82 articles published in 2020, 109 in 2021, 146 in 2022, 187 in 2023, and an impressive 248 articles in early 2024.

This remarkable growth can be attributed to several factors, including technological advancements in artificial intelligence (AI) and big data, the acceleration of digital transformation due to the Covid-19 pandemic, and supportive policies for startups. This upward trend not only highlights the development of DE but also presents new research opportunities in areas such as digital business model innovation, the impact of technology, and financial strategies within digital enterprises.

Figure 1. Number of published papers by year



Research map by country

Research on DE has significant geographical distribution, with notable contributions from various countries globally. The United Kingdom leads with 111 research outputs, followed by the United States with 99, China with 86, Germany with 82, and Italy with 63. The United Kingdom and the United States are the most influential in DE research, likely

due to strong startup ecosystems and substantial investments in digital technology. China and Germany also contribute significantly, reflecting the growing importance of the topic in these economies. Countries in Asia, such as India, Indonesia, and Malaysia, have a notable presence, indicating the rising significance of DE in emerging economies. This trend is driven by rapid digital transformation and the development of digital business models. Other countries such as Canada (26 papers), Spain (25 papers), Portugal (24 papers), and Saudi Arabia (24 papers) also show considerable interest in this field. Vietnam ranks 18th with 18 research outputs, highlighting the country's growing focus on Digital Entrepreneurship.

National collaboration analysis has the same result as geographical, except China. The best collaborated country is the UK (112 papers, total link strength = 82) and the US (100 papers, total link strength = 87), with significant contributions from Germany, Italy, and France. Australia, Canada, and Spain also have extensive networks, especially with English-speaking countries. Asian countries like China, Malaysia, and Vietnam have notable participation but limited international collaboration, highlighting regional differences and potential for future expansion.

Figure 2. Research map by country

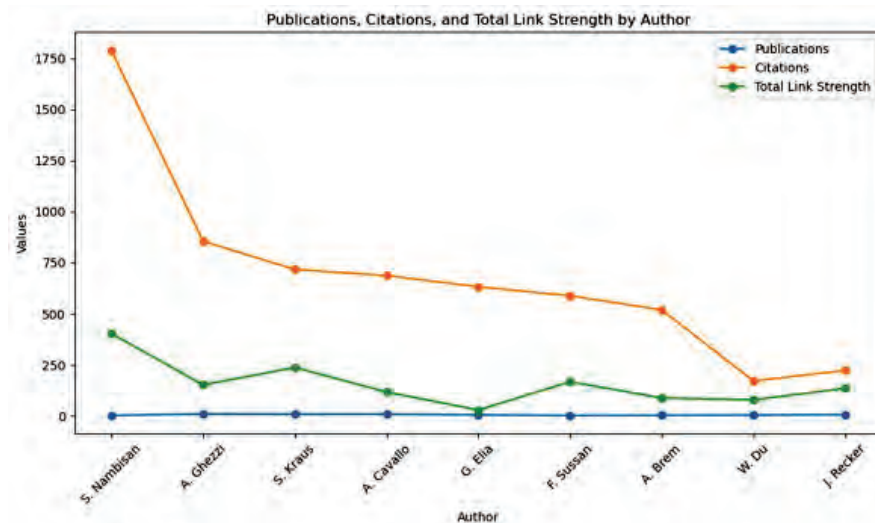


Most influential authors

The below figure highlights the varying influence of authors in DE research. Firstly, Nambisan exhibits the highest number of citations (1789) and total link strength (403), despite having only two publications (Nambisan, 2017; Nambisan & Baron, 2021). This indicates that Nambisan's work is highly influential and widely recognized within the academic community, suggesting a significant impact on the field. In contrast, A. Ghezzi, with the highest number of publications (10), has a relatively lower citation count (855) and total link strength (152) compared to Nambisan. This disparity suggests that while Ghezzi is prolific, the individual impact of each publication may be less pronounced than that of Nambisan.

In addition, S. Kraus and A. Cavallo, both with nine publications, show differing influence levels, with Kraus being more interconnected. G. Elia, with five publications, has high citations (632) but low link strength (29), indicating frequent citations but less central influence. F. Sus-san, with two publications, also shows notable impact. A. Brem, W. Du, and J. Recker contribute variably, highlighting the importance of both publication quantity and quality in DE research. By author collaboration analysis, the data shows that there is a vast research network in Digital Entrepreneurship. Key contributors like Antonio Ghezzi, Tobias Kollmann, Sascha Kraus, and Jan Recker have high publication counts and significant citations.

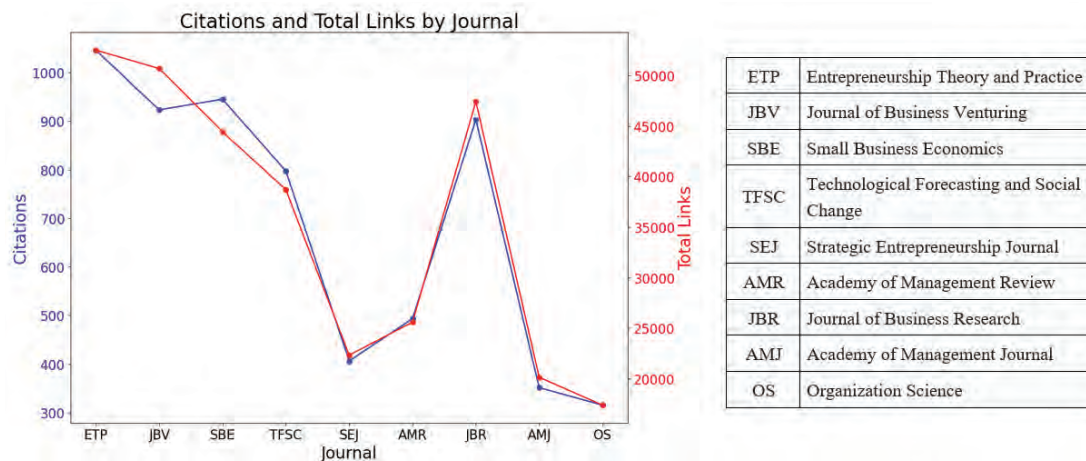
Figure 3. Most influential authors



Influential journals

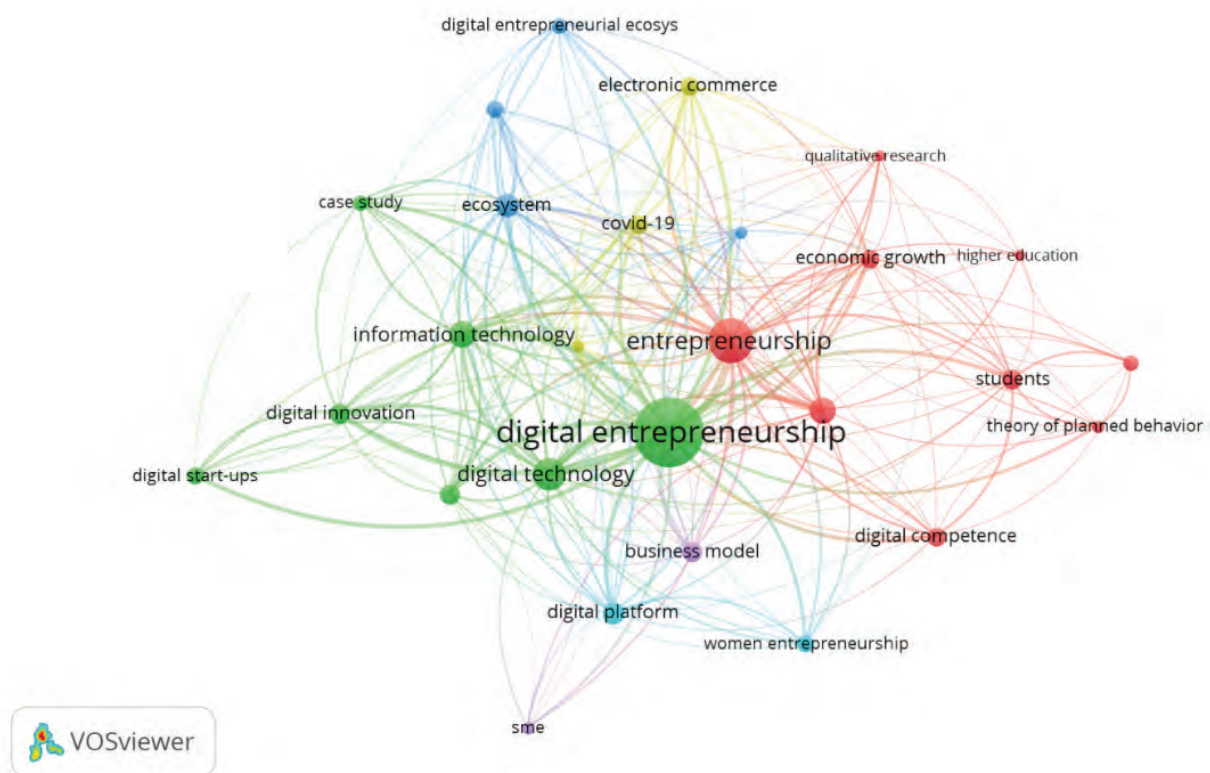
Identifying influential journals in DE helps evaluate the academic environment where significant research is published. This section analyzes the relationship between citations and total links for various business and management journals. The ten most influential journals in the field of digital entrepreneurship research are all leading publications in management and business. This indicates that the research topic is recognized by top editors and reviewers at the most prestigious journals worldwide.

First, Entrepreneurship Theory and Practice leads with the highest total links (52,522) and significant citations (1,046), indicating its strong influence and connectivity. Journal of Business Venturing and Small Business Economics also show high impact with substantial total links and citations. Following these two journals are four leading journal in business and management field. Technological Forecasting and Social Change, Strategic Entrepreneurship Journal, Academy of Management Review, and Journal of Business Research demonstrate varying degrees of influence, with notable total links and citations reflecting their importance in their respective fields. In the contrary, Academy of Management Journal and Organization Science still show significant total links, highlighting their roles in advancing management and organizational studies, while having fewer citations. Overall, journals with higher total links and citations are more influential and central to academic discourse in business and management.

Figure 4. Most influential journals.

Main research clusters

The bibliometric analysis of research clusters in digital entrepreneurship reveals six distinct clusters, each highlighting different aspects of the field, as showed in the Figure 5 below. With a threshold of a minimum of five occurrences per keyword, 27 out of 3,419 keywords meet this criterion.

Figure 5. DE research clusters

Cluster 1 is about Human factors and entrepreneurial behavior. In this cluster, key concepts are digital competence (32 occurrences, 53 links), digital entrepreneurial intention (22 occurrences, 20 links), economic growth (31 occurrences, 76 links), and higher education (13 occurrences, 14 links). The research emphasizes the importance of digital skills, the intentions behind digital entrepreneurship, the role of higher education, and the broader economic impacts on entrepreneurial behavior.

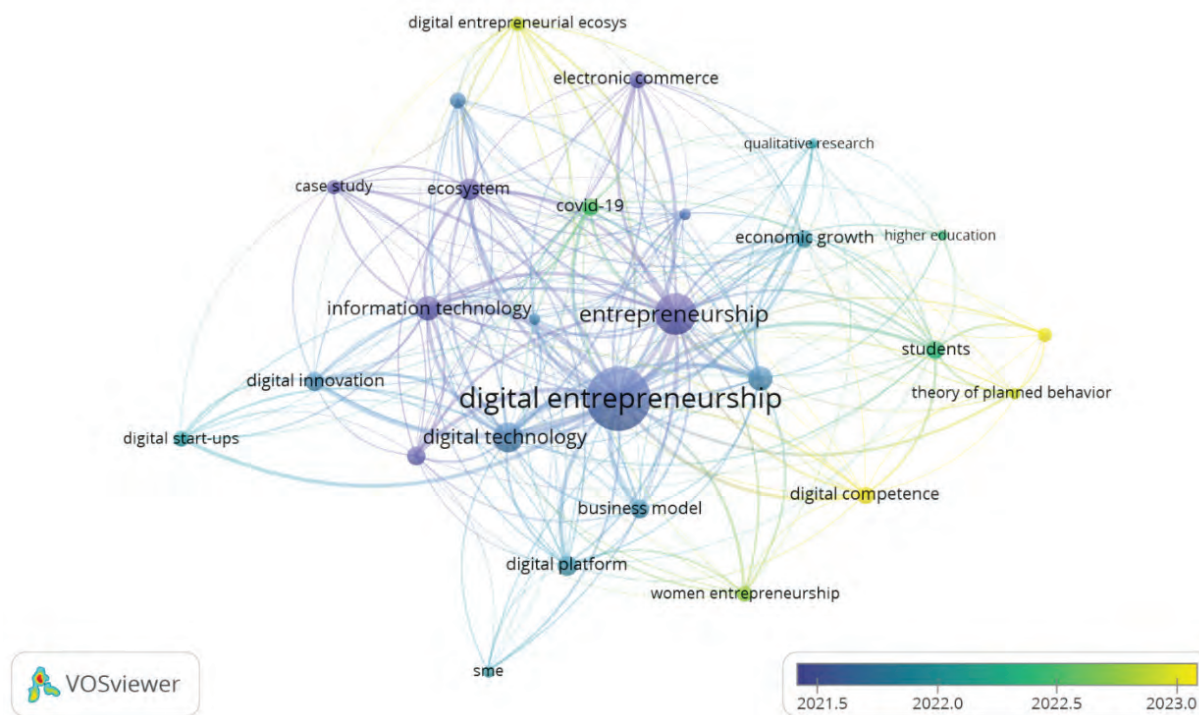
Similarly, cluster 2 is about technology and innovation which employed by human beings. This includes topics like digital technology (98 occurrences, 220 links), digital innovation (41 occurrences, 95 links), information technology (66 occurrences, 161 links), and start-ups (39 occurrences, 80 links). This cluster investigates how digital technologies facilitate entrepreneurship, the critical role of innovation within digital business environments, and the technological trends that shape entrepreneurial models.

In the other hand, cluster 3 and 4 are about entrepreneurial environment. Cluster 3 - Digital entrepreneurial ecosystem - includes themes such as digital entrepreneurial ecosystem (22 occurrences, 41 links), ecosystem (49 occurrences, 121 links), and entrepreneurial ecosystem (26 occurrences, 57 links). And cluster 4 - Impact of the Pandemic and e-commerce - addresses the significant effects of the pandemic on digital entrepreneurship and the expansion of e-commerce. In this cluster, key topics include Covid-19 (31 occurrences, 60 links) and electronic commerce (31 occurrences, 69 links).

Another DE research direction is business models and small enterprises which is mentioned in cluster 5. Important keywords in this cluster are business model (37 occurrences, 68 links) and SME (17 occurrences, 23 links). And the last cluster included digital platform (42 occurrences, 80 links) and women entrepreneurship (27 occurrences, 39 links). This cluster underscores the significance of digital platforms in empowering women and promoting gender equality in the entrepreneurial landscape.

In general, the bibliometric analysis identifies key research areas and trends in digital entrepreneurship, providing valuable insights into the factors driving the field's development. Each cluster highlights different dimensions of digital entrepreneurship, from human factors and technological innovation to the impact of the pandemic and the role of digital platforms in supporting diverse entrepreneurial activities.

Moreover, as illustrated in Figure 6 below, research topics have shown a tendency to evolve over time. Prior to 2020, studies predominantly focused on digital entrepreneurial ecosystems, technology and innovation, and digital business models. However, during the period from 2020 to 2022, the advent of the COVID-19 pandemic spurred research into e-commerce, changes in digital business behavior, and crisis adaptation strategies. Most recently, from 2022 to the present, research trends have shifted towards topics such as digital competence of entrepreneurs, women's entrepreneurship in the digital economy, and the role of digital platforms in business development.

Figure 6. DE research clusters by year

CONCLUSION

Based on the comprehensive analysis of 20 years of research on DE, this study provides valuable insights into the evolution and current state of the field. The findings highlight six core research clusters: digital competencies and entrepreneurial behavior, technological innovation, digital entrepreneurial ecosystems, the influence of the pandemic and e-commerce, business models in digital entrepreneurship, and the role of digital platforms and women entrepreneurship. These clusters not only reflect the diverse aspects of DE but also underscore the dynamic nature of the field, driven by technological advancements and global events such as the Covid-19 pandemic.

The dataset of this research is collected from Scopus, covering publications from 2006 to 2025, ensures a comprehensive and up-to-date perspective on DE. This approach contrasts with previous bibliometric studies, which often had narrower scopes and outdated data. By identifying emerging research themes and trends, this study contributes to a deeper understanding of DE and provides a foundation for future research.

In conclusion, the study emphasizes the importance of continuous monitoring and updating of research data to capture the evolving trends in DE. The identified research clusters offer a roadmap for scholars and practitioners to explore new opportunities and address existing gaps in the literature. As DE continues to grow and transform, ongoing research will be crucial in understanding its impact on the global economy and guiding the development of innovative digital business models.

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