Mapping of E-Entrepreneurship Research: Bibliometric Review

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Abstract. E-entrepreneurship has gotten more attention. E-entrepreneurship is the harmonization of electronic business elements with entrepreneurial activities and the use of information technology in entrepreneurship. E-entrepreneurship roles have fundamentally altered economic growth, industrial progress, and societal sustainability. This study aims to map e-entrepreneurship research at the global level. To achieve this, 182 relevant international publications from 1995 to 2021 were mapped using bibliometric analysis with Scopus and VOSviewer. The results show an increasing trend and evolution of literature related to e-entrepreneurship. This research study indicates that Kollmann, T., and Universität Duisburg-Essen were the most productive individual researcher and research institutions in e-entrepreneurship. The most prolific researcher in the entrepreneurship area was usually from UK affiliates. The United States was a leading research country on e-entrepreneurship. This study proposes a conceptual framework from the IBEEE research theme for the e-entrepreneurship topic based on the keyword cluster categorization of innovation and policy, business, entrepreneurship, entrepreneurial process, and e-business. The IBEEE research theme can be used to develop e-entrepreneurship studies in the future.

1 Introduction

Entrepreneurship has gotten more attention. Entrepreneurial plans diversify a nation’s financial services and manufacturing sectors, boosting revenues and enabling rapid growth and development [1], [2]. The elements of combining electronic business with entrepreneurial activity and information technology utilization in international entrepreneurship are identified. The importance of the mobile industry as a focus for the growth of e-entrepreneurship is established [3], [4].

A significant trend is the development of e-entrepreneurship for expanding and strengthening businesses. The goal of the e-entrepreneurship approach must be to develop and improve commercial relationships [5]. E-entrepreneurship, or electronic entrepreneurship, is developing, running, and continuously upgrading an online business, e-firm, or web-based to make money using online communication and information tech [6], [7], [8]. E-entrepreneurship is valuable because it works to orient business in the era of the digital economy [9], [10], [11]. Through the availability of resources, entrepreneurial self-efficacy and mindset are strongly correlated with e-entrepreneurship [12]. E-entrepreneurship has benefits from psychosocial factors [1]. People’s attitudes toward e-entrepreneurship, subjective norms, and perceived behavior control were all precede by e-entrepreneurship learning [13].

E-entrepreneurship roles have fundamentally altered economic growth, industrial progress, and societal sustainability [14]. E-entrepreneurship is essential to economic growth since it fosters innovation and new company opportunities [13], [15]. The appropriate personality attributes determine the e-entrepreneurship failure or success in digital entrepreneurship [16], [17], [18]. Studying and looking at the numerous e-entrepreneurship viewpoints is essential [6]. However, not many scholars have studied e-entrepreneurship using the bibliometric approach.

A bibliometric is a research technique that deals with the quantitative assessment of scholarly publications and other works that have been published [19]. This study poses a research question, what is map e-entrepreneurship research at the global level? Regarding a bibliometric review, this study aims to map e-entrepreneurship research globally.

2 Methods

This study has used a bibliometric approach. This research subjected an extensive publication database to an exhaustive literature search [18]. For this research, we linked appropriate keywords related to e-entrepreneurship research to find and connect to relevant documents in the Scopus database worldwide. The Scopus database was used as the primary source of information because scholars consider it a reliable source of academic research.

This study uses the keywords e-entrepreneurship in the title, abstract, and author’s keywords to retrieve
relevant data from the Scopus database. Data mining was limited to annual data because it collects one year of fully published data. The search query options used in data mining were TITLE-ABS-KEY (e-entrepreneur* OR "electronic entrepreneur*") AND PUBYEAR <2022 as of October 2022. We discovered 182 articles in this stage. The analysis has used publication data published over 26 years, from 1995 to 2021. Analyze annual publications, authors, geographical contexts, and affiliations using Scopus' analyze search results feature. VOSviewer has been used for co-occurrence thematic analysis [20].

3 Result and Discussion

In e-entrepreneurship research, we have mapped the existing literature and research status based on analysis of annual publications, authors, geographical contexts, affiliations, and thematic research.

3.1 Annual Publications

Figure 1 shows the dynamics of 182 documents published each year since 1995. Based on these data, it can be seen that the number of publications related to e-entrepreneurship has increased trends—the publication with an ever-increasing and high growth rate between 2017 and 2021. The peak of annual publication occurs in 2021.

![Fig. 1. The e-entrepreneurship annual publications.](image)

Studies on e-entrepreneurship show that the trend continues to grow due to several factors, including the growth of digital technology, considerable market potential, low costs, consumer demand, flexibility, and scalability. In recent years, digital technology has developed rapidly. The internet, social media, mobile devices, and other digital platforms have changed how people interact, communicate, and do business. This allows entrepreneurs to reach global markets and grow their businesses worldwide. E-entrepreneurship can be run relatively cheaply compared to traditional businesses [21], [22].

Entrepreneurs can often start businesses with little capital and avoid high overhead costs. E-entrepreneurship also offers increased flexibility and scalability. Entrepreneurs can work from anywhere and at any time and have the ability to grow their businesses quickly and easily. Consumers are increasingly doing online transactions and looking for products or services via the internet. This creates opportunities for businesses to provide products and services online and meet growing consumer demands [23].

3.2 Authors

Three hundred eighty-seven authors studied e-entrepreneurship (shown in Figure 2). Kollmann, Tobias from Universität Duisburg-Essen, Germany, was the top researcher for publications on e-entrepreneurship (n = 10). Next followed by Matlay, Harry Z. from Global Independent Research, UK (n = 5); and Lewis, Anthony from the University of South Wales, UK (n = 4). Each author with three publications, Razak, Norizan Abdul (Universiti Kebangsaan Malaysia, Malaysia); Sanders, Gwennlian Marged (South Wales Business School, UK); Shepherd, Dean A. (University of Notre Dame, US); Thomas, Brychan Celfyn (South Wales Business School, UK); Westhead, Paul (Durham University Business School, UK); Zhao, Fang (Staffordshire University, UK); and van Alphen, Klaas (University of Wollongong, Australia) were the following authors to join.

![Fig. 2. Top authors of E-Entrepreneurship research.](image)

The most productive researchers in the e-entrepreneurship area come from country affiliations, UK (n=6), Germany (n=1), US (n=1), Malaysia (n=1), and Australia (n=1). Several factors may explain why individual researchers from affiliated European countries such as the UK predominate in e-entrepreneurship studies: focus on innovation, robust infrastructure, economic strength, government support, and quality higher education. The UK is known as a country that is very focused on innovation. The UK has a solid digital infrastructure, fast internet access, and constantly evolving technology. This makes the UK's online business environment attractive to entrepreneurs and researchers. The UK is one of the world's most considerable economic powers, with many large and small companies operating there. The UK government provides a lot of support for developing digital technology and innovation in business. This creates many opportunities for research on e-entrepreneurship as companies seek ways to leverage digital technologies in their business. The UK has an excellent higher education system, with many well-known universities and colleges worldwide. Many researchers from UK affiliates have received quality tertiary education in technology and business, enabling them to become experts in e-entrepreneurship [24], [25], [26].
3.3 Geographical Contexts

Forty-four countries studied e-entrepreneurship (can be seen in Figure 3). The United States was the top research country for publications on e-entrepreneurship (n = 38). Next followed by the United Kingdom (n = 24), Germany (n = 23), China (n = 13), Australia (n = 12), Italy (n = 10), India (n = 9), Spain (n = 9), Malaysia (n = 8) and Poland (n = 7) were the following countries to join. The United States, the United Kingdom, and Germany were the most active countries in e-entrepreneurship research.

Fig. 3. Nation number of annual publications of E-Entrepreneurship.

Developed countries dominate most productive countries in e-entrepreneurship research. The dominance of e-entrepreneurship is due to several factors, such as advanced infrastructure and technology, access to resources and capital, a supportive legal and regulatory environment, advanced education and research, and the availability of a large market [23], [27].

Developed countries generally have good innovative technological infrastructure and broad access to the internet and other technical resources. This creates a conducive environment for development and innovation in e-entrepreneurship [28]. Developed countries have better access to the resources and capital needed to start a digital business. They have a mature startup ecosystem with access to venture capital, public and private funding, government support programs, and more advanced financial institutions. This gives entrepreneurs in developed countries a significant advantage in growing and developing e-entrepreneurship businesses [29].

Developed countries generally have clear and stable legal and regulatory frameworks for digital businesses. Reasonable regulations and solid legal protections give employers the confidence to operate in a clean and reliable environment. This can drive innovation, investment, and growth in the e-entrepreneurship sector [30]. Developed countries often have vital education and research systems in technology and business. Universities and research institutions in developed countries often become research and development centers in e-entrepreneurship [31], [32].

Developed countries often have more prominent and more developed digital product and service markets. High demand, strong purchasing power, and consumers more accustomed to digital technology provide excellent opportunities for e-entrepreneurship to succeed. A large market also means a higher potential for business scalability [33].

3.4 Affiliation

Three hundred thirty-one research institutions studied e-entrepreneurship (can be seen in Figure 4). Universität Duisburg-Essen, Germany, was the top research institution for publications on e-entrepreneurship (n = 10). It was followed by RMIT University, Australia; University of South Wales, UK; and Birmingham City Business School, UK (n = 4). Universiti Kebangsaan Malaysia, Malaysia; Universiteit Utrecht, Netherlands; Częstochowa University of Technology, Poland; University of Nottingham, UK; Copernicus Institute of Sustainable Development, Netherlands; Technical University of Munich, Germany; Birmingham City University, UK; Nottingham University Business School, UK; and Kelley School of Business, US (n = 3) were the following countries to join.

Fig. 4. Affiliation number of annual publications of E-Entrepreneurship.

Institutions from the most productive countries were the most active countries in terms of e-entrepreneurship research, the UK (n=5), Germany (n=2), Netherlands (n=2), Malaysia (n=1), US (n=1), and Poland (n=1).

3.5 Themes

The research uses the VOSviewer tool for co-occurrence analysis to get the theme of e-entrepreneurship research. There were 853 keywords available related to e-entrepreneurship. Only a minimum of two repetitions were used. So 121 keywords meet the minimum threshold. The minimum cluster size used in the analysis was 15 keywords. The treatment resulted in five research clusters, as shown in Figure 5. Each research cluster was then given a name according to the dominating topic. The researcher summarized five research clusters into e-entrepreneurship research themes based on five cluster topics: innovation and policy, business, entrepreneurship, entrepreneurial process, and e-business, abbreviated as IBEEE research theme. Then, the five clusters were proposed by researchers as research themes of conceptual framework in e-entrepreneurship studies.

Innovation and policy cluster (blue). This cluster was dominated by the keywords of decision-making, entrepreneur, entrepreneur activity, functions of innovation, innovation, innovation policy, innovation system, knowledge based system, open system, policy initiatives, policy makers, policy strategy, and strategic planning. Innovation and entrepreneurship have a favorable relationship and work together to boost the achievement of a company [34].
E-entrepreneurs must make quick business decisions to take advantage of market opportunities. E-entrepreneurship studies aim to understand entrepreneurship in an online or digital environment. In e-entrepreneurship, entrepreneurs must master these functions to create relevant and high-quality innovations. Innovation is an essential element in the study of e-entrepreneurship because online entrepreneurs must continue to innovate to keep up with developments in digital technology and meet the changing needs of consumers. Studying innovation systems can provide insight into how entrepreneurs can participate in such networks and use available resources. Also, studies on innovation policy can provide important insights into how governments can support online entrepreneurs. In e-entrepreneurship, entrepreneurs can use various procedures and initiative programs to increase opportunities and accessibility in starting and developing entrepreneurship. Policies and regulations made by policymakers can influence the opportunities and constraints in creating and developing entrepreneurship in the digital environment [35], [36].

Business cluster (green). Keywords such as business, competition, complexity, corporate social responsibility, digital strategies, economics, human capital, market orientation, marketing, resources, risk, social capital, sustainability, and sustainable development were widely used in e-entrepreneurship research in this business cluster [37].

E-entrepreneurship is about creating, developing, and sustaining businesses that operate in a digital environment, so the study of business is very relevant to e-entrepreneurship. Competition and market orientation are closely related to marketing strategy and product development in digital business, which are critical factors for success in e-entrepreneurship. Complexity and risk are significant factors in digital business, where entrepreneurs must consider many technological, financial, and market factors to achieve digital business success. Digital strategies refer to entrepreneurs using digital technology to strengthen business excellence. Economics and resources are important factors that influence the success of e-entrepreneurship. Corporate social responsibility, social capital, sustainability, and sustainable development help e-entrepreneurship to promote socially and environmentally responsible business practices [38].

Entrepreneurship cluster (red). This cluster was dominated by the keywords of entrepreneurship, human, industry, intention, self-efficacy, social entrepreneurship, venture capital, and women entrepreneurs.

Entrepreneurship is a central concept in e-entrepreneurship, as it is about creating, developing, and operating new businesses in a digital environment. Human and self-efficacy refer to the individual’s role in the entrepreneurial process. The study of self-efficacy can help understand how individuals feel confident in taking risks and starting new entrepreneurs in a digital environment. Research on human capital can help understand the role of individual skills and competencies in the success of digital entrepreneurs. Industry and venture capital can help support and finance new entrepreneurs in digital environments. Studies on social entrepreneurship can help understand how digital entrepreneurs can create positive social impacts. In contrast, studies on women entrepreneurs can help understand the challenges and opportunities faced by women entrepreneurs in a digital environment [10], [16], [39].

Entrepreneurial process cluster (yellow). Keywords such as business model, emerging technologies, entrepreneurial behavior, entrepreneurial culture, entrepreneurial education, entrepreneurial intention, entrepreneurial process, entrepreneurial skills, entrepreneurship education, and unemployment were widely used in e-entrepreneurship research in this entrepreneurial process cluster.

Digital entrepreneurs must develop business models to generate revenue and sustain their business in a digital environment. Entrepreneurial behavior refers to the characteristics and traits possessed by successful entrepreneurs. Studying these traits and features can help understand what factors influence the success of e-entrepreneurship. Also, research on entrepreneurial culture can help understand the factors that influence the success of e-entrepreneurship and the development of a flourishing startup ecosystem. Entrepreneurial intention refers to someone’s desire to become a digital entrepreneur. An understanding of entrepreneurial education can help identify what factors influence the success of entrepreneurs in the digital environment and help develop the skills and knowledge necessary to start and create new businesses in the digital age [40], [41].

E-business cluster (purple). This cluster was dominated by the keywords of e-business, e-commerce, e-entrepreneurship, electronic commerce, electronic entrepreneurship, ICT, industrial economics, information technology, internet, net economy, new ventures, telecommunication networks, virtual teams, and the world wide web.

E-business and e-commerce are business models and activities closely related to e-entrepreneurship. An e-entrepreneur can start and develop entrepreneurship in a digital environment through e-business and e-commerce. Information and communication technology (ICT) and the internet are essential for e-entrepreneurship. ICT and the internet enable entrepreneurs to create new business models, develop products and services, and reach a broader market. The net economy is a concept related to e-entrepreneurship, which describes an economy based on the internet and digital technology. E-entrepreneurship studies often focus on developing and growing new
ventures in digital environments. The field of telecommunication networks and virtual teams refers to technology and ways of working that enable entrepreneurs to collaborate online and work remotely, which is much needed to implement e-entrepreneurship [6], [42].

4 Conclusion

E-entrepreneurship roles have fundamentally altered economic growth, industrial progress, and societal sustainability. This study focuses on disseminating research findings related to e-entrepreneurship by providing bibliometric analysis in the related literature. Annual publications show that research in the e-entrepreneurship area has increased trends.

This research study shows that Kollmann, T., and Universität Duisburg-Essen were the most productive researcher and research institutions on e-entrepreneurship research. The most productive researchers in the e-entrepreneurship area usually come from UK affiliation. The United States was a leading research country with 38 articles on e-entrepreneurship. In addition, this study proposes a conceptual framework from the IBEERE research theme for the e-entrepreneurship topic based on the keyword cluster categorization of innovation and policy, business, entrepreneurship, entrepreneurial process, and e-business.

This study has limitations using only data from the Scopus database. There may be several publications related to e-entrepreneurship that Scopus does not index. Based on the research that has been done, there are several recommendations for future research in e-entrepreneurship. The e-entrepreneurship bibliometric study uses combined data from Scopus and Web of Science. The bibliometric e-entrepreneurship study uses an approach in the form of knowledge structure analysis, such as intellectual structure and social structure, as well as domain levels of analysis, such as sources and documents. Comparative analysis between regions or countries to understand the differences and similarities in e-entrepreneurship research. In-depth case studies of successful e-entrepreneurship entrepreneurs or successful innovations in the real world. In-depth analysis of the role of social and environmental factors in e-entrepreneurship. Examination of the implications of new technologies such as artificial intelligence (AI), blockchain, Internet of Things (IoT), and mixed reality (MR) in the context of e-entrepreneurship.

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