

## How to Develop of Digital Entrepreneurship Publication Using Brief Bibliometric Analysis?



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**ABSTRACT:** This article identifies related research developments related to Digital Entrepreneurship. It is hoped that this article will pave the way for future studies. Bibliometric analysis is used to determine research developments related to Digital Entrepreneurship. Digital entrepreneurship is a new research area. The first article related to "Digital Entrepreneurship" was published in 2000. Many articles with this theme were published only in 2019. The results of the Overlay Visualization analysis show that almost all of the keywords that become nodes are new themes or variables. This is reinforced by the results of the Density visualization, showing that all the keywords that make up the node are basically still very feasible to be used as research themes.

**KEYWORDS:** Entrepreneurship, Publication, Bibliometric, Digital.

### 1. INTRODUCTION

Digital entrepreneurship is conceived as a new research field, given its unique characteristics (1,2). The existence of internet technology, which is supported by the rapid development of digital technology, triggers disruption in business management activities. It takes much research to be able to provide guidance or guidance to be able to create digital entrepreneurship. For this reason, a mapping analysis is needed to determine what extent to research developments related to Digital entrepreneurship are required to pave the way for future studies.

### 2. LITERATURE STUDY

In this section, the theoretical basis that supports this research is presented. The focus theme is Digital Entrepreneurship. Entrepreneurs are currently facing the challenges of environmental changes that require them to have knowledge, skills, and insights related to digital technology. Knowledge, skill, and understanding of digital technology will increase their survival ability during increasingly accelerated environmental changes. Digital entrepreneurship is needed to be able to increase agility in capturing business opportunities and continue to maintain the sustainability of the businesses they have.

In general, digital entrepreneurship is an entrepreneurial activity in digitally offering assets, services, or most business activity processes (3). Digital entrepreneurship can also be interpreted as selling digital products or services using internet network technology.

Digital entrepreneurship can also be said as the ability to seize business opportunities with innovative and radical offers using digital technology (4,5). Digital entrepreneurship is different from traditional entrepreneurship. Digital entrepreneurs can take advantage of digital technology in producing digital products and marketing activities by utilizing digital technology and their ability to work remotely.

Large companies utilize business applications to support their business activity processes. These applications are applied in various fields of business activities such as sales and marketing, data analysis, manufacturing movements, and risk assessment (6–8). On the other hand, SMEs use typical applications such as social media for promotional and marketing activities and e-commerce applications such as Tokopedia, Bukalapak, and others for trading activities. They also use online forums to increase their knowledge, skills, and insights to innovate and transform in this digital era. The goals of large companies and SMEs are the same, namely how they can quickly innovate and maintain a competitive advantage (9).

## How to Develop of Digital Entrepreneurship Publication Using Brief Bibliometric Analysis?

Knowledge, skills, and insights related to the use of digital technology are considered necessary by both individuals and companies (10). Through good competence in utilizing digital technology, they hope to apply digital entrepreneurship in carrying out work activities, managing business, increasing their ability to solve problems, and seizing opportunities in this digital era (11–13).

### 3. METHODOLOGY

The research methodology in this article uses qualitative methods. The approach used is historical. Refers to research activities carried out through a series of "systematic collection and evaluation of objective data related to past events to find trends from current events. So that it can help explain current events and anticipate future events.

This research has an approach that focuses on analyzing published research articles related to "Digital Entrepreneurship". The results of this analysis can be used to find out how to research future development trends related to "Digital Entrepreneurship". The methodology in this article uses two stages. The first stage collecting research data relevant to "Digital Entrepreneurship". The second stage is the bibliometric analysis of research data pertinent to "Digital Entrepreneurship".

#### 3.1. Collecting Data Method

The data from this study are articles that have been published by reputable journal publishers. Data search using the *Publish or Perish application* (software). This software helps find relevant research related to the research title ["**Digital Entrepreneurship**"]. The stages of data collection are as follows:

1. Initial-year searches are not limited, while end-year searches are limited to 2022. The goal for the early year is not limited to finding information about when an article with the title "**Digital Entrepreneurship**" was first published.
2. The title word used as the keyword ["**Digital Entrepreneurship**"].
3. The keywords used as composed words ["**Ecosystem; Creativity; Education; Skills**"].
4. Articles submitted are limited to those that use English and source articles from reputable journals ( *Scopus, Emerald, Springer, ProQuest, Web of Science, and Science Direct* ).

#### 3.2. Data Analysis Method

The analysis tool uses VOSviewer. VOSviewer is software that visualizes maps and bibliometric networks. VOSviewer analyzes trends and patterns of scientific research developments related to existing fields of study.

The output of VOSviewer displays maps and networks based on co-citation data or keyword maps based on very detailed co-occurrence and keyword relevance data. The map and keyword network visualizations have different colors for each data cluster (14–17). The VOSviewer application displays an overlay network that shows the development of articles from time to time. An overlay network presents the period (years) in which the linkages of each keyword are presented in the form of a network. Based on the visualization of the overlay network, it is known how far the development of related studies is in Digital Entrepreneurship. Furthermore, there is density visualization. The density visualization display shows the high or low frequency of the concept or constructs used as research.

## 4. RESULTS

### 4.1. Numbers of Publication Years

Search for published articles using the Publish or Perish application. The search start time is not specified. The goal is to increase browsing search periods. The search results show that the first article related to "**Digital Entrepreneurship**" was published in 2000. Most articles with this theme were only published from 2019 to 2022.

The article search results only yielded 365 published articles. But only 163 came from *Scopus, Emerald, Springer, ProQuest, Web of Science, and Science Direct*. So only 163 of the data to be analyzed using bibliometrics came from reputable publishers.

2019 was the start of a significant increase in research with the theme of Digital Entrepreneurship. Where in that year the world faced the Covid 19 pandemic, forcing everyone around the world to be able to optimally use digital technology. Whether it's for daily activities, learning activities, work activities, and business activities. This situation has encouraged more and more research related to Digital Entrepreneurship.

## How to Develop of Digital Entrepreneurship Publication Using Brief Bibliometric Analysis?

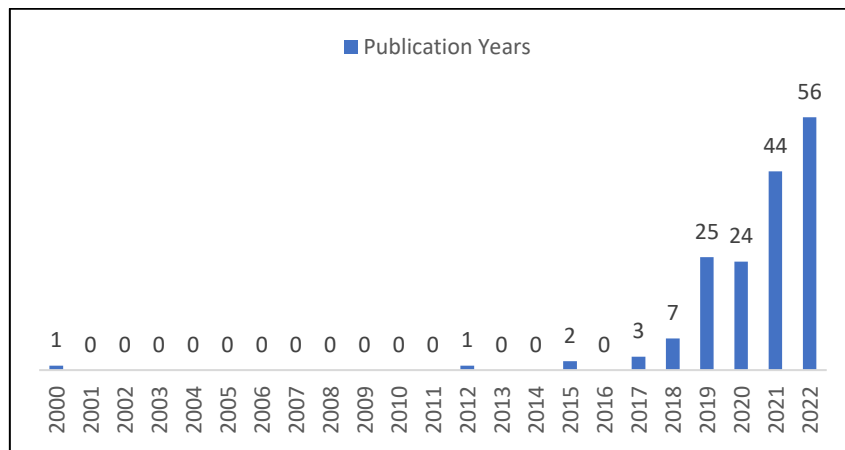


Figure 1 Number of "Digital Entrepreneurship" articles published between 2000-2022

### 4.2. Author Analysis

Author analysis using Google Scholar (GS) ratings. The GS rating has the same function as the annual *Journal Impact Factors* (JIF), which evaluates the impact factor of articles (18). GS has the opportunity to be used as a research reference from various parties because it can be downloaded for free. Table 1 shows the authors who contributed articles each year according to their GS rating (19).

Table 1 Active Publication Per Year From 2000-2022.

No.	Author	title	GSRank
1	S Nambisan, M Wright, M Feldman (2019)	The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes	183
2	S Kraus, C Palmer, N Kailer, FL Kallinger, Jonathan Spitzer (2018)	Digital entrepreneurship: A research agenda on new business models for the twenty-first century	15
3	G Elijah, A Margherita, G Passiante (2020)	Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process	1
4	P Rippa, G Secundo (2019)	Digital academic entrepreneurship: The potential of digital technologies on academic entrepreneurship	28
5	JM Sahut , L Iandoli , F Teulon (2021)	The age of digital entrepreneurship	2
6	YJ Hsieh, YJ Wu (2019)	Entrepreneurship through the platform strategy in the digital era: Insights and research opportunities	156
7	H Zaheer, Y Breyer, J Dumay (2019)	Digital entrepreneurship: An interdisciplinary structured literature review and research agenda	68
8	R Bouncken , M Ratzmann , R Barwinski , et. al (2020)	Coworking spaces: Empowerment for entrepreneurship and innovation in the digital and sharing economy	301
9	A Geissinger, C Laurell, C Sandström, et. al (2019)	Digital entrepreneurship and field conditions for institutional change—Investigating the enabling role of cities	92
10	T Le Dinh, MC Vu, A Ayayi (2018)	Towards a living lab for promoting the digital entrepreneurship process	39
11	V Jafari-Sadeghi, A Garcia-Perez, E Canelo, et. al (2021)	Exploring the impact of digital transformation on technology entrepreneurship and	193

## How to Develop of Digital Entrepreneurship Publication Using Brief Bibliometric Analysis?

No.	Author	title	GSRank
		technological market expansion: The role of technology readiness, exploration and, et. al	
12	G Secundo, M Gioconda, P Del Vecchio, et. al (2021)	Threat or opportunity? A case study of the digital-enabled redesign of entrepreneurship education in the COVID-19 emergency	20
13	R Balocco , A Cavallo, A Ghezzi, et. al (2019)	Lean business models change the process of digital entrepreneurship	116
14	T Beliaeva , M Ferasso , S Kraus, et. al (2019)	Dynamics of digital entrepreneurship and the innovation ecosystem: A multilevel perspective	18
15	M McAdam, C Crowley, RT Harrison (2019)	"To boldly go where no [man] has gone before"-institutional voids and the development of women's digital entrepreneurship	96
16	G Secundo , P Rippa , R Cerchione (2020)	Digital Academic Entrepreneurship: A structured literature review and avenue for a research agenda	29
17	W Li, W Du, J Yin (2017)	Digital entrepreneurship ecosystem as a new form of organizing: the case of Zhongguancun	10
18	JQ Dong (2019)	Moving a mountain with a teaspoon: Towards a theory of digital entrepreneurship in the regulatory environment	151
19	B Paek, H Lee (2018)	Strategic entrepreneurship and competitive advantage of established firms: evidence from the digital TV industry	213
20	M McAdam, C Crowley, RT Harrison (2020)	Digital girl: Cyberfeminism and the emancipatory potential of digital entrepreneurship in emerging economies	226
21	G Quinones, B Nicholson, R Heeks (2015)	A literature review of E-entrepreneurship in emerging economies: Positioning research on Latin American digital startups	133
22	W Ben Arfi , L Hikkerova (2021)	Corporate entrepreneurship, product innovation, and knowledge conversion: the role of digital platforms	285

### 4.3. Citation Analysis

Based on the results of the citation analysis, it is known that the research by S Nambisan, M Wright, and M Feldman in 2019 with the title " The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes " was the most referenced article, until November 2022. The journal is referenced up to 854. The second most referenced articles are those written by S Kraus, C Palmer, N Kailer, FL Kallinger, et. Al in 2017. The journals whose articles are often referred to based on data are Technological Forecasting and Social Change. Table 2 shows data on the 22 most frequently referred articles up to November 2022.

**Table 2 Top 22 Authors and Articles Cited In Digital Entrepreneurship Publication**

Authors	title	year	Cites	Publishers
S Nambisan, M Wright, M Feldman	The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes	2019	854	Research Policy

## How to Develop of Digital Entrepreneurship Publication Using Brief Bibliometric Analysis?

Authors	title	year	Cites	Publishers
S Kraus, C Palmer, N Kailer, FL Kallinger , et. al	Digital entrepreneurship: A research agenda on new business models for the twenty-first century	2018	403	International Journal of Entrepreneurial Behavior & Research
G Elijah, A Margherita, G Passiante	Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process	2020	385	Technological Forecasting and Social Change
P Rippa, G Secundo	Digital academic entrepreneurship: The potential of digital technologies on academic entrepreneurship	2019	244	Technological Forecasting and Social Change
JM Sahut , L landoli , F Teulon	The age of digital entrepreneurship	2021	158	Small Business Economics
YJ Hsieh, YJ Wu	Entrepreneurship through the platform strategy in the digital era: Insights and research opportunities	2019	156	Computers in Human Behavior
H Zaheer, Y Breyer, J Dumay	Digital entrepreneurship: An interdisciplinary structured literature review and research agenda	2019	155	Technological Forecasting and Social Change
R Bouncken , M Ratzmann , R Barwinski , et. al	Coworking spaces: Empowerment for entrepreneurship and innovation in the digital and sharing economy	2020	120	Journal of Business Research
A Geissinger, C Laurell, C Sandström, et. al	Digital entrepreneurship and field conditions for institutional change– Investigating the enabling role of cities	2019	114	Technological Forecasting and Social Change
T Le Dinh, MC Vu, A Ayayi	Towards a living lab for promoting the digital entrepreneurship process	2018	113	International Journal of Entrepreneurship
V Jafari-Sadeghi, A Garcia-Perez, E Candelo, et. al	Exploring the impact of digital transformation on technology entrepreneurship and technological market expansion: The role of technology readiness, exploration and, et. al	2021	113	Journal of Business Research
G Secundo, M Gioconda, P Del Vecchio, et. al	Threat or opportunity? A case study of the digital-enabled redesign of entrepreneurship education in the COVID-19 emergency	2021	100	Technological Forecasting and Social Change
R Balocco , A Cavallo, A Ghezzi, et. al	Lean business models change the process of digital entrepreneurship	2019	87	Business Process Management Journal
T Beliaeva , M Ferasso , S Kraus, et. al	Dynamics of digital entrepreneurship and the innovation ecosystem: A multilevel perspective	2019	86	International Journal of Entrepreneurial Behavior & Research

## How to Develop of Digital Entrepreneurship Publication Using Brief Bibliometric Analysis?

Authors	title	year	Cites	Publishers
M McAdam, C Crowley, RT Harrison	"To boldly go where no [man] has gone before"-institutional voids and the development of women's digital entrepreneurship	2019	71	Technological Forecasting and Social Change
G Secundo , P Rippa , R Cerchione	Digital Academic Entrepreneurship: A structured literature review and avenue for a research agenda	2020	70	Technological Forecasting and Social Change
W Li, W Du, J Yin	Digital entrepreneurship ecosystem as a new form of organizing: the case of Zhongguancun	2017	65	Frontiers of Business Research in China
J Q Dong	Moving a mountain with a teaspoon: Towards a theory of digital entrepreneurship in the regulatory environment	2019	54	Technological Forecasting and Social Change
B Paek, H Lee	Strategic entrepreneurship and competitive advantage of established firms: evidence from the digital TV industry	2018	51	International Entrepreneurship and Management Journal
M McAdam, C Crowley, RT Harrison	Digital girl: Cyberfeminism and the emancipatory potential of digital entrepreneurship in emerging economies	2020	48	Small Business Economics
G Quinones, B Nicholson, R Heeks	A literature review of E-entrepreneurship in emerging economies: Positioning research on Latin American digital startups	2015	45	Entrepreneurship in BRICS
W Ben Arfi , L Hikkerova	Corporate entrepreneurship, product innovation, and knowledge conversion: the role of digital platforms	2021	39	Small Business Economics

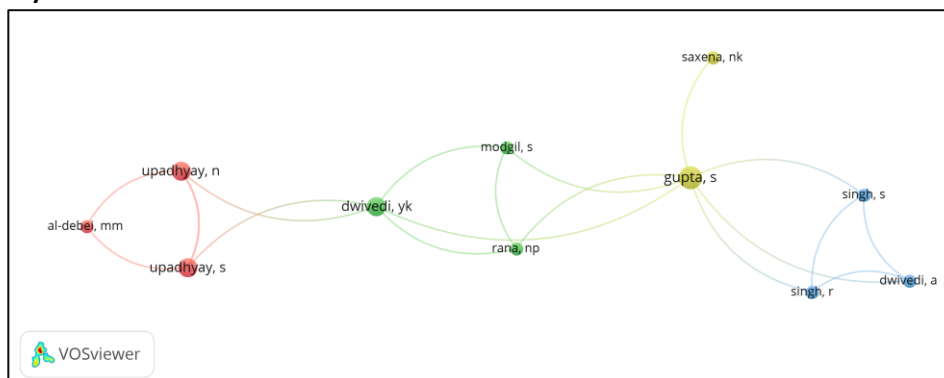
### 4.4. Bibliometric Analysis

Bibliometric analysis was carried out using the VOSviewer application. Through this application, it will be known how the co-occurrence and interrelationships of each keyword are contained in the title and research abstract, as well as the author of the published article.

The results of Bibliometric analysis using VOSviewer help researchers to identify relevant and up-to-date research themes or variables, thus clarifying the potential for future research development (20).

## How to Develop of Digital Entrepreneurship Publication Using Brief Bibliometric Analysis?

### 4.4.1. Co-authorship Analysis



**Figure 2** Author network digital entrepreneurship

Co-authorship analysis shows the collaboration of 11 authors in research with the theme of Digital Entrepreneurship. Gupta, S, who has collaborated most with other authors. Based on the visualization Author Network Gupta has 3 articles. The first is the result of collaboration with Saxena, the second is the result of collaboration with Modgli, Rana, and Dwivedi, and the third collaboration is with Singh S, Singh R, and Dwivedi A. The Author Network can also show the high commitment of researchers to continue conducting studies related to digital entrepreneurship.

### 4.4.2. Network Visualization Analysis Bibliometric

The analysis results with VOSviewer conducting co-occurrence analysis found 1,037 keywords related to digital transformation. To produce more specific keywords in the keyword analysis of titles and abstracts, keyword occurrences are limited to 3 circumstances. From the limitation of nine events, 55 keywords were obtained, divided into 7 clusters.

**Figure 3** Keywords clustering

Clusters	Keyword
cluster 1	culture, digital academic entrepreneurship, digital ecosystem, dynamics, entrepreneurship skills, influence, innovation ecosystem, relation, student, <b>transformation</b> , value
cluster 2	case study, conceptual model, country, digital entrepreneur, higher education, practice, service, success, theory, communication
cluster 3	communication, <b>development</b> , digital innovation, sustainable digital entrepreneurship, infrastructure, school, sustainability, sustainable entrepreneurship
cluster 4	artificial intelligence, case, covid, digital entrepreneurial ecosystem, <b>digital platform</b> , entrepreneur, machine learning, use
cluster 5	<b>age</b> , digital era, effect, gender, importance, technology entrepreneurship, trend
cluster 6	analysis, collective intelligence, creative destruction, digital entrepreneurship education, <b>entrepreneurship ecosystem</b> , open data ecosystem
cluster 7	digital marketing, digital world, paper, social entrepreneurship, <b>university</b> , venture

The larger keyword node indicates the number of keyword nodes associated with that node. The largest cluster 1 node is transformation, the second cluster of nodes is almost evenly distributed, the three node's largest cluster is development, the four nodes' largest digital platform cluster, the 5th node's largest cluster is Age, and the 6th node's largest cluster is entrepreneurship ecosystem. The 7th node is the largest university cluster. . These nodes have far more links between nodes in their cluster and with other clusters.

## How to Develop of Digital Entrepreneurship Publication Using Brief Bibliometric Analysis?

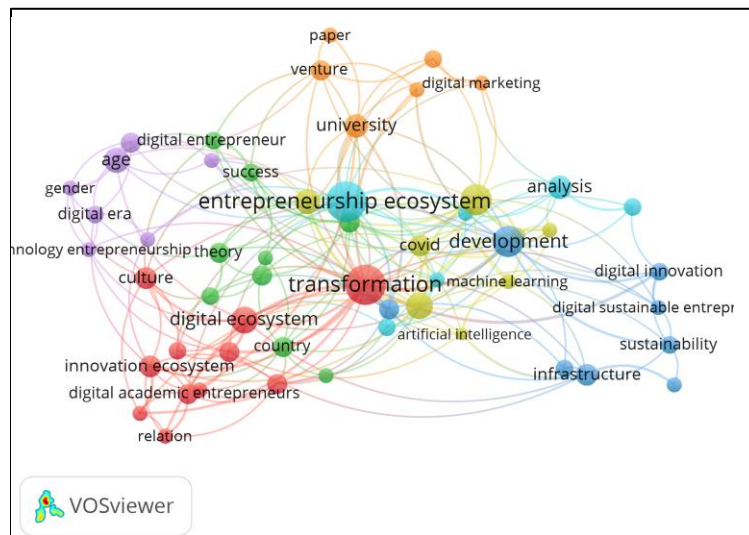


Figure 4 Network visualization in digital entrepreneurship publications.

### 4.4. 3. Overlay Visualization Analysis

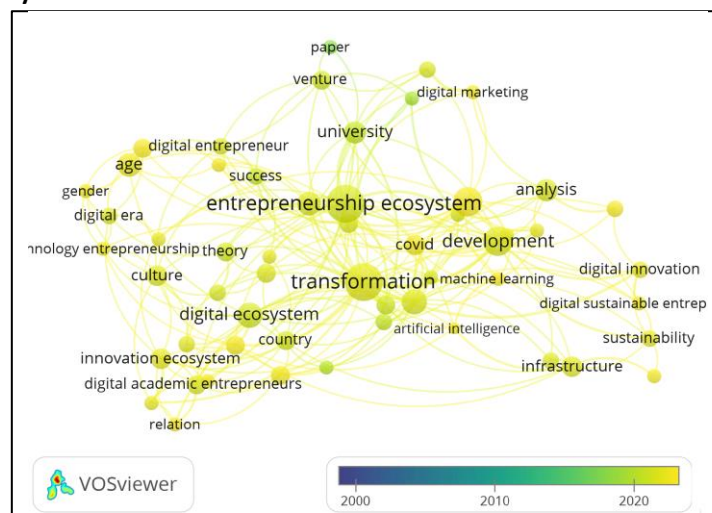


Figure 5 Overlay Visualization In digital entrepreneurship Publications

Based on the overlay analysis, it can be seen that almost all keywords have a high level of novelty. Each node in yellow indicates this condition. While only a few nodes are greenish-yellow. Yellow and greenish-yellow nodes indicate keywords taken from 2020 to 2022.



## How to Develop of Digital Entrepreneurship Publication Using Brief Bibliometric Analysis?

### 4.4.4. Density Visualization Analysis

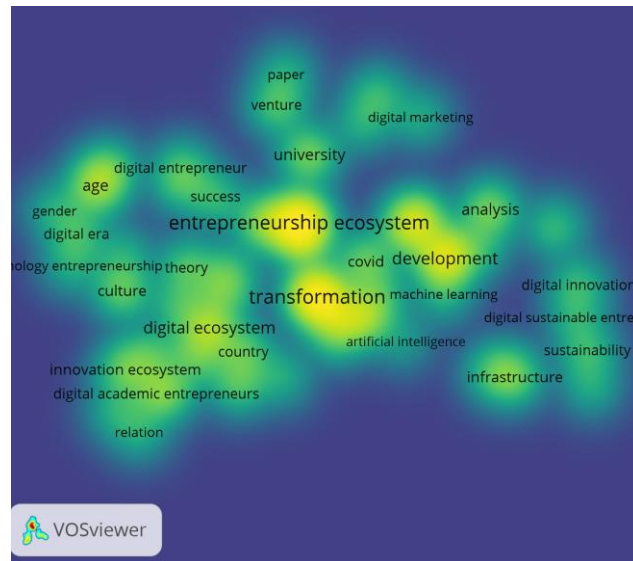


Figure 6 Density visualization in digital entrepreneurship publications.

Keywords that are in the yellow area fade to a darker color, indicating that there are still few researchers whose articles discuss this theme. Meanwhile, the thick yellow suggests that many researchers have taken the research theme with this word. As with discussions related to digital entrepreneurship, there are still a few researchers who discuss this. At the same time, the debate about entrepreneurship ecosystem and transformation is more extensive than digital entrepreneurship. But overall, the research using the themes in each cluster still needs to be saturated. Further research can still conduct studies related to these themes.

## 5. CONCLUSIONS

Bibliometric research helps understand the mapping of the results of scientific publications and research developments related to the theme of digital entrepreneurship. The results of this study can help further researchers develop research related to the music of digital entrepreneurship. The results of this study can also help practitioners to find guidelines for implementing digital entrepreneurship based on scientific knowledge derived from currently available research articles so that practitioners can implement digital entrepreneurship better.

Bibliometric analysis using VOSviewer is carried out for quantitative analysis and to visualize the mapping of the results of scientific publications and the development of scientific knowledge related to digital entrepreneurship. Network visualization refers to forming themes based on the keywords that appear in the VOSviewer output. At the same time, the existing clusters show a sequence of network formation based on keywords that become nodes. Larger nodes indicate that the theme has more links than smaller nodes.

Overlay Visualization shows when these keywords often appear in the article being analyzed. Looking at the results of the Overlay Visualization, almost all of the keywords that become nodes are new themes or variables in research related to digital entrepreneurship. This is understandable because the theme of digital entrepreneurship was only recently published in 2019.

The results of the Density visualization show that all the keywords that become nodes are still very feasible to be used as research themes. Research related to the music of digital entrepreneurship still has to be studied to produce scientific knowledge.

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