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Bibliometric Analysis: Research Trends on Deliberative Models in Learning Approaches in the Digital Era

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ABSTRACT

This study aims to examine the development and trends of research related to deliberative models in learning approaches in the digital era. Research data were obtained using the Publish or Perish 8 application by taking references from journals indexed by Google Scholar. A total of 1000 articles relevant to the keywords "deliberative model" AND "digital era" from 2018 to 2025 were successfully collected. The data was then analyzed and visualized using the VOSviewer application. The results provide insight into the development of deliberative model research in the digital technology era. Bibliometric analysis reveals research trends from year to year, the main contribution of the number of citations, and the development of key concepts in the literature. The results of this study can provide a foundation for future research to understand better the deliberative model in the education approach in the digital technology era.

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Introduction

The deliberative model is a framework for democratic decision-making that emphasizes reasoned discussion and consensus among participants. It aims to enhance the legitimacy of decisions by ensuring that all voices are heard and considered in order to

promote democratic practices and address societal challenges [1]. The model has its roots in modern democratic theory and has been applied in a variety of contexts, including governance and organizational decision-making. The deliberative model, as articulated by theorists such as Jurgen Habermas, seeks to reconstruct the normative aspects of democracy, with a focus on rational discourse and collective decision-making [2]-[4].

One of the deliberative bases is political equality, which emphasizes formal political equality, ensuring that the judgment of every citizen is respected, although it has been criticized for inadequately addressing dissent and the problem of majority voice. In the organizational context, the deliberative model has been adapted to manage complex decision-making processes, especially in high-stakes environments such as technology development and the peaceful resolution of sociopolitical conflicts [5] [6].

Next is cultural integration; the model can be enhanced through the integration of information and communication technology (ICT), which facilitates broader participation and inclusivity in decision-making [7]. While the deliberative model offers a powerful framework for enhancing democratic processes, it faces challenges in practical implementation, especially in addressing diverse stakeholder perspectives and ensuring effective participation across different social strata [8].

The deliberative model is also a pedagogical approach that aims to foster multidimensional citizenship by integrating deliberative practices into education; even more so, multidimensional citizenship is considered a skill needed in the 21st century, which has four dimensions, namely personal, social, spatial, and temporal dimensions [9][10]. This model emphasizes the development of skills needed for active participation in democratic processes, such as critical thinking, argumentation, and cooperative learning. By engaging students in deliberative activities, educators can foster inclusive citizenship and prepare students to navigate complex social and political landscapes [11]. The following section explores key aspects of the deliberative learning model and its role in developing multidimensional citizenship.

In addition to Cogan's idea that emphasizes that deliberative perspective is an attribute of multidimensional citizenship, there is a journal article that recommends a deliberative learning model in an effort to develop multidimensional citizenship character, this study is believed to be able to explore how deliberative argumentation fosters critical thinking, civic engagement, and the ability to navigate socio-political conflict, which ultimately promotes more active and knowledgeable citizens [5][12][13].

Research shows that the deliberative learning model aims to foster citizens who are educated and skilled in dialogue from different backgrounds [14]. This emphasizes the importance of deliberative communication in Education, which refers to the theories of Dewey

and Habermas [15]. By fostering critical reflection and intercultural trust, the deliberative approach aims to develop multidimensional citizenship that accommodates diverse identities and promotes belonging in a multicultural society, which ultimately contributes to a just political order [16].

In addition, deliberative learning can integrate these cooperative skills, encouraging students to engage in critical reflection and respectful dialogue about multiple perspectives [17]. By promoting communicative capacities and actions, this model aligns with students' need to work collaboratively in a variety of contexts, ultimately preparing them to navigate and contribute positively to pluralistic societies. This approach supports the development of informed and engaged citizens [18]. Research suggests that deliberative learning models in citizenship education emphasize the engagement of dialogue and the performative nature of citizenship, fostering responsibilities and capacities that are essential for inclusive citizenship [19].

Open classroom discussions positively influence students' political attitudes and behaviors and foster civic engagement by deliberately examining controversial issues and contemporary problems, leading to the development of action plans and decision-making, but this must be supported by a school environment that respects human rights and is responsive to encourage student participation in discussions [11] [20]. This positive experience has been carried out in Sweden, where teachers emphasize a more open deliberative approach so that they can overcome racism that respects equal rights, and focus on their reflection and decision-making processes in the classroom [13].

Previous studies have attempted to understand the relationship between deliberative models and learning in the technological era. These studies cover various aspects, such as digital citizen empowerment, citizen participation in the internet, digital era governance, polarization and social media, innovation in government, and organizational resilience. Although there are several studies that have revealed important findings, this field is still evolving along with technological changes and changing social dynamics. Therefore, this bibliometric review aims to review the existing literature to provide a more comprehensive understanding of the relationship between deliberative models in the technological era in the current context. Detailed information on bibliometrics is shown in Table 1.

To explore and study more deeply the latest developments in the relationship between deliberative models and digital technology, as studied by Robertson on social media and civic engagement, and how the deliberative model is an approach in learning Political education, such as research from Bennion, Laughlin, so that bibliometric analysis is needed. Thus, bibliometric research is needed, which is intended to observe the direction of research trends and contributions that have been made in this field [21][22]. For example, bibliometric

research conducted by Umek, Todorovski, and Aristovnik, which studies the model of government in the digital era, and research conducted by Mulyono on citizen involvement in the context of politics in cyberspace [23][24].

Table 1. Previous Bibliometric Research

No.	Author	Tittle	Ref.
1.	S Sharma	Digital citizen empowerment: A systematic literature review of theories and development models	[25]
2	M Deseriis	Digital movement parties: a comparative analysis of the technopolitical cultures and the participation platforms of the Movimento 5 Stelle and the Piratenpartei	[26]
3	C Neuberger	The digital transformation of knowledge order: A model for the analysis of the epistemic crisis	[27]
4	SS Ho	Science literacy or value predisposition? A meta-analysis of factors predicting public perceptions of benefits, risks, and acceptance of nuclear energy	[28]
5	J Saldivar	Civic technology for social innovation: A systematic literature review	[29]
6.	Shaikh, A. K.	E-Participation within E-government: a bibliometric-based systematic literature review.	[30]
7.	Umek	A review of digital era governance research in the first two decades: a bibliometric study	[23]
8.	A Nanz	Democratic consequences of incidental exposure to political information: A meta-analysis	[31]
9.	M Wasiq	Adoption and applications of blockchain technology in marketing: A retrospective overview and bibliometric analysis	[32]
10.	N Bindu	From conventional governance to e-democracy: Tracing the evolution of e-governance research trends using network analysis tools	[33]
11.	H Pallett	Mapping participation: a systematic analysis of diverse public participation in the UK energy system	[34]
12.	SD Arora	Polarization and social media: A systematic review and research agenda	[35]
13.	MQ Sum	The use of technology in higher education teaching by academics during the COVID-19 emergency remote teaching period: a systematic review	[36]
14.	E Alieto	Teaching inside a digital classroom: A quantitative analysis of attitude, technological competence, and access among teachers across subject disciplines	[37]
15.	MC Monroe	Identifying effective climate change education strategies: A systematic review of the research	[38]
16.	H Zhang	Redefining qualitative analysis in the AI era: Utilizing ChatGPT for efficient thematic analysis	[39]
17.	A Leavy	The prevalence and use of emerging technologies in STEAM education: A systematic review of the literature	[40]
18.	LG Elkjær	Identities, innovation, and governance: a systematic review of co-creation in wind energy transitions	[41]
19.	E Barasa	What is resilience, and how can it be nurtured? A systematic review of empirical literature on organizational resilience	[42]
20.	K Gerritse	Moral challenges in transgender care: A thematic analysis based on a focused ethnography	[43]
21.	K Donders	The politics of pleasing: A critical analysis of multistakeholderism in public service media policies in Flanders	[44]
22.	J Chilvers	A systemic approach to mapping participation with low-carbon energy transitions	[45]

Material and Methods

This study uses a literature study approach through bibliometric analysis [46]. The object of the study is to see research trends on the Deliberative Model in the technological era. This study also wants to map how the deliberative model is in the 2018-2025 Learning Approach. The use of bibliometric methods is based on the consideration that bibliometric analysis is an effort to describe changes and developments in the research domain, including themes and authors based on scientific disciplines and keywords in the studies that have been conducted. This bibliometric method emphasizes quantitative studies with sources of material obtained from journals, books, and other internet documents [47].

In this bibliometric method, researchers draw data from the Publish or Perish software drawn from Google Scholar data using 2 keywords, namely "deliberative model" and "digital era," which brings up 1000 articles in the period 2018-2025, which then identifies the relationship between "Education" and "deliberative model" which is always associated with the context of democracy. Furthermore, researchers use the VOSviewer application with 3 types of displays, namely network visualization, overlay visualization, and density visualization, to help researchers analyze and create visual data, as well as disseminate information related to research in the field of deliberative models in learning approaches.

Results and Discussions

A. Publication Data Search Results

Based on a data search through the Publish or Perish 8 application on the Google Scholar database, 1000 articles were collected that met the research criteria. The data obtained included article metadata, including author name, title, year of publication, journal name, publisher, number of citations, article links, and related URLs. Table 2 shows examples of some data that were the objects of VOSviewer analysis in this study. The sample data consisted of the top 20 articles with the highest number of citations.

B. Publication Data Search Results

Table 3 illustrates the development of research on deliberative models and digital technology published in publications indexed by Google Scholar. According to the statistics in Table 3, there were 1000 research publications published in this domain between 2018 and 2025. A total of 206 articles were published in 2018. The number of publications then fluctuated, with 223 published in 2019, 183 published in 2020, 169 published in 2021, 105 published in 2022, 71 published in 2023, 29 published in 2024, and there were 14 published in 2025. According to these data, research on radicalism and digital technology was still less explorative in 2018-2020. However, as seen in Fig. 1 and Table 3, there has been significant growth in 2019, although there has been fluctuation in the following years.

Table 2. Research with the Most Citations

Cites	Authors	Title	Year
16879	Freire [48]	Education for critical consciousness	2021
3829	Habermas [49]	Inclusion of the other: Studies in political theory	2018
3150	Benhabib [50]	Democracy and difference: Contesting the boundaries of the political	2021
3029	Rapanta [51]	Online university teaching during and after the Covid-19 crisis: Refocusing teacher presence and learning activity	2020
2332	Schot and Steinmueller [52]	Three frames for innovation policy: R&D, systems of innovation, and transformative change	2018
2325	Owen [53]	Responsible research and innovation: From science in society to science for society, with society	2020
2216	Murphy [54]	Introduction to AI robotics	2019
1885	Taherdoost [55]	A review of technology acceptance and adoption models and theories	2018
1547	Tucker et al. [56]	Social media, political polarization, and political disinformation: A review of the scientific literature	2018
1422	Monroe et al. [38]	Identifying effective climate change education strategies: A systematic review of the research	2019
1184	Watermeyer et al. [57]	COVID-19 and digital disruption in UK universities: Afflictions and affordances of emergency online migration	2021
1133	Peters [58]	American public policy: Promise and performance	2018
937	Barasa et al. [42]	What is resilience, and how can it be nurtured? A systematic review of empirical literature on organizational resilience	2018
877	Torfing et al. [59]	Transforming the public sector into an arena for co-creation: Barriers, drivers, benefits, and ways forward	2019
866	Bossetta [60]	The digital architectures of social media: Comparing political campaigning on Facebook, Twitter, Instagram, and Snapchat in the 2016 US election	2018
863	Sloman and Fernbach [61]	The knowledge illusion: Why we never think alone	2018
842	Daniels and Sabin [62]	Limits to health care: fair procedures, democratic deliberation, and the legitimacy problem for insurers	2018
781	Landemore [63]	Open democracy: Reinventing popular rule for the twenty-first century	2020
761	Rose [64]	Agriculture 4.0: Broadening responsible innovation in an era of smart farming	2018

Table 3. Publication Data for the 2018-2025

Number	Publication Year	Number of Publication Data
1	2018	206
2	2019	223
3	2020	183
4	2021	169
5	2022	105
6	2023	71
7	2024	29
8	2025	14
	Average	125

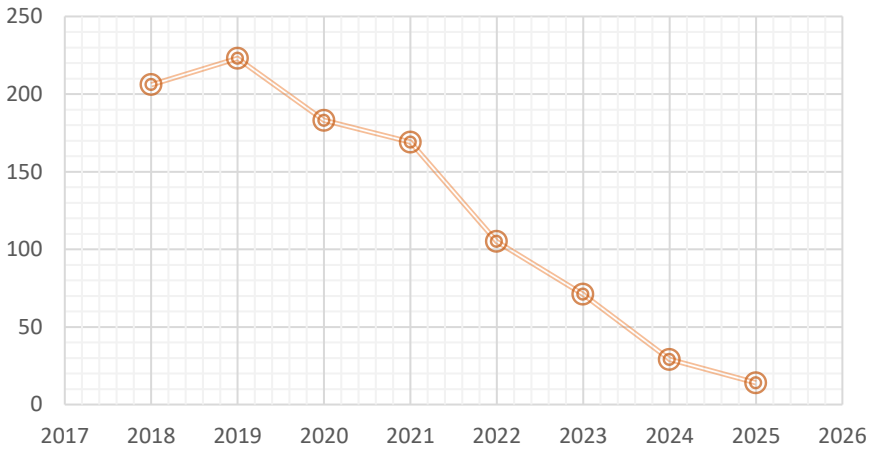

Fig. 1. The Number of Publication Data in the Period 2018-2025

C. Visualization of Deliberative Model Research Topics in the Technology Era Using VOSviewer Software

Computational mapping has been performed on the collected article data using the VOSviewer analysis tool. From this mapping, 112 items were found related to deliberative model research in the technology era. The results of this computational mapping describe the categorization of mapping data into 5 different clusters, where each cluster shows the relationship between one term and another. Each cluster includes articles that have a close relationship with this research topic. The clusters that can be identified are as follows:

1. Cluster 1 (17 items): age, article, book, data, disinformation, fact, fake news, future, idea, impact, policy, political deliberation, post-truth era, problem, public sphere, quality, scholar.
2. Cluster 2 (14 items): application, case, community, COVID, deliberative process, democratic deliberation, digital medium, digitalization, industry, innovation, opportunity, organization, paper, part
3. Cluster 3 (13 items): Context, decision, deliberative model, digital transformation, example, higher education, importance, Indonesia, need, strategy, student, time, value.
4. Cluster 4 (14 items): big data, chapter, digital era governance, digital technology, field, new era, news, rise, shift, term, trust, way, work
5. Cluster v (10 items): China, citizen participation, digital democracy, digital platform, governance, government, participatory, power, question, state.

In each cluster above, there is a relationship between the "words" or terms used, which are then visualized with an image. In each cluster, these terms are labeled, which can be identified through colored circles. The size of the labeled circle of each word or term varies greatly depending on the extent to which the term appears in the title or abstract of the article in

question. If the word or term appears frequently, the larger the size of the label circle. The size of the circle label shows a positive correlation with the occurrence of the term in the title and abstract. The mapping visualization consists of three main parts, namely network visualization (see Fig. 2), overlay visualization (see Fig. 3), and density visualization (see Fig. 4).

Each part of the visualization has a different meaning about the correlation between terms in the research. By using the three parts of the visualization, namely network, overlay, and density, it will provide a more comprehensive and detailed picture of the relationship between "words" and terms in the research of deliberative model mapping and digital technology. Each key concept (keyword) is labeled through a colored circle. The size of the circle is positively correlated with the appearance of keywords in the abstract or title of a research article.

Fig. 2 shows the relationships between words or terms. These relationships are visualized as a network of lines connecting one term to another. Figure 2 confirms that the deliberative model, particularly in Indonesia, is applied as a learning approach for students, yet very few people connect it. Cluster 1 contains the keywords from this study, consisting of 17 items.

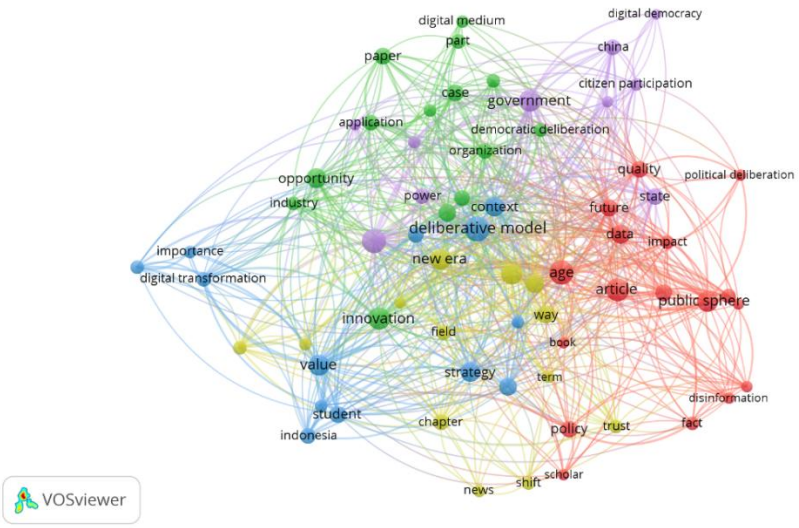

Fig. 2. Network Visualization Deliberation Model in the Digital Era

Overlay visualization shows the relationship between a term juxtaposed with the research time that is continuously updated from year to year. This visualization presentation shows research trends related to deliberative models in the digital era from 2018 to 2025. Based on the visualization, research trends related to deliberative models from 2022 to the present are in the Higher Education domain, with several main keywords represented in yellow, namely, students, value education, digital transformation, needs, and impacts.

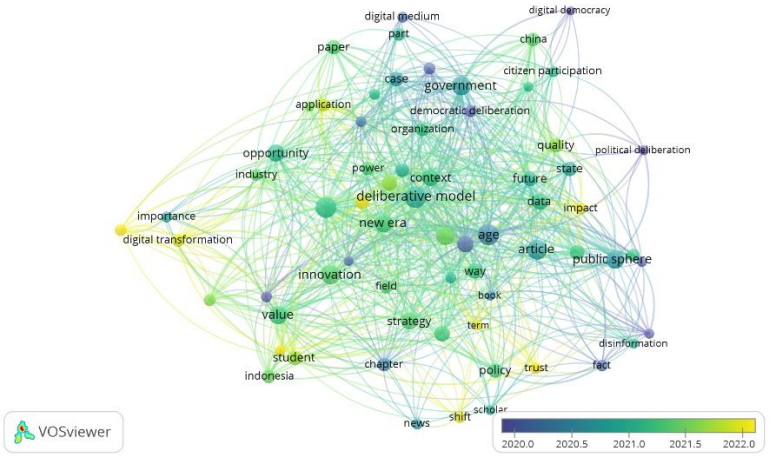

Fig. 3. Overlay Visualization Deliberation Model in the Digital Era

Fig. 4 illustrates the density visualization, which explains that the darker the yellow color and the larger the diameter of the circle, the denser the keyword is, meaning that the keyword is more frequently researched. If the color fades and blends more with the green background, this indicates less research. Based on the visualization in Figure 4, the term deliberative model has the highest number of studies on several key concepts, including innovation, digital technology, context, future, and articles.

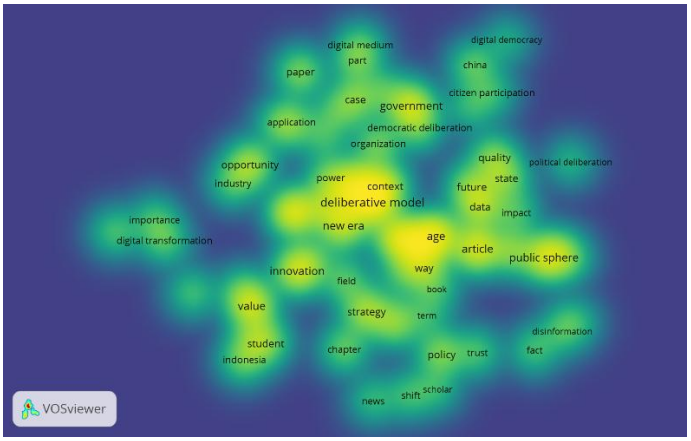

Fig. 4. Density Visualization Deliberation Model in the Digital Era

Fig. 5 shows that the public sphere is included in the keywords that are widely researched and studied by various groups. Based on the image visualization, the keywords of the new era are related to the following terms: disinformation, facts, impact news, data, political deliberation, quality, future, age, and articles. Based on this, we can map other studies related to deliberative models that have not been or are still rarely studied, such as deliberative models in schools, deliberative democracy in cyberspace, and digital literacy.

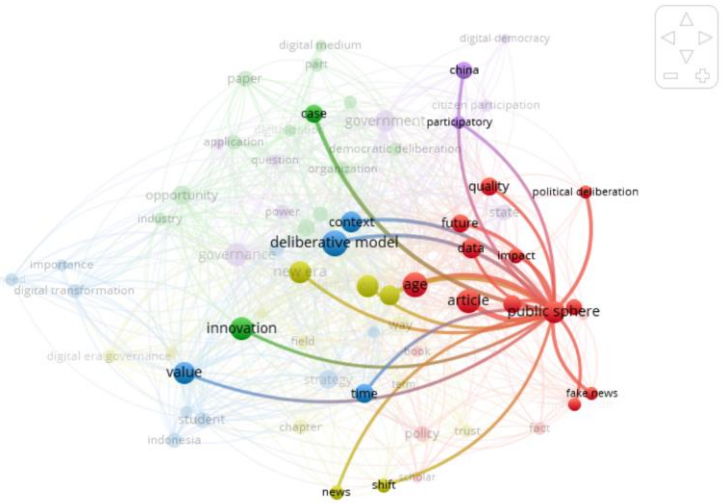

Fig. 5. Network Visualization of the Public Sphere

The analysis of Publish or Perish and VOSviewer shows that the deliberation model is always associated with the context of politics and democracy. However, the deliberative model can be studied from the perspective of Education, especially in Higher Education, to become an approach in learning. A study written by Håkansson, Kronlid examines how the political dimension in Education for Sustainable Education emphasizes the approach of social learning and radical democracy [65]. Even in a study, Gordon emphasized the connection between Civic Education and deliberative democracy in an effort to counter dirty politics. This study emphasizes the role of Civic Education learning as learning that fosters participation based on ethical values [66] [67].

This is also reinforced by research from Barton and Ho, which emphasizes Civic Education as a curriculum that builds harmony between deliberative values, knowledge, and action [68]. This shows that there is a dimension that leads to how politics is integrated into the world of Education in the digital era, as written by Middaugh, that promoting civic literacy aims to balance citizens in emotional and factual contexts in the participation of young citizens in citizenship discourse online [69]. Thus, deliberative practices in the current technological era provide a challenge to the world of Education in an effort to grow a democratic world to maintain ethical values, including avoiding fake news that can trigger global problems.

Deliberative pedagogy is closely related to the character of democratic engagement. A similar article explains that deliberative pedagogy has great potential to advance the mission of higher education through a more collaborative approach to teaching and learning that responds to important and rapidly changing contextual trends, increasing diversity, and the strong desire of young people to “make a difference” through concrete social action [15] [70]. Thus, deliberative pedagogy offers an example of the scientific innovation that colleges and

universities need to respond to the complex challenges facing society, so that research is needed in developing the syntax of deliberative pedagogy models.

Conclusion

In this bibliometric study, we have uncovered important insights into deliberative models in the digital technology era. Although the research trend has decreased, especially in 2023 and 2024, it provides insight into the research gap in studying deliberative models in the Education approach. Based on the search process using the keywords "deliberative model" and "digital era" through the basis of abstract sources, keywords, and titles, key concepts that are often studied, such as public space, deliberative politics, and governance. With the advancement of technology and social dynamics that occur in this digital era, it gives us an understanding of the very rapid development known as digital transformation, digital era government, deliberative democracy, online citizenship participation so that it is important to increase digital literacy in the current technological era, especially in the context of citizenship to maintain digital citizens to continue to act based on universal values. Thus, the findings of the visualization of networks, overlays, and densities have described the opportunities and challenges for research on deliberative models in the current digital era, especially opportunities where deliberative models become a value or approach in the context of learning about citizenship, politics, and democracy.

Limitations and Suggestions

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Conflict of Interest

The authors declare that there is no conflict of interest.

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