The Phenomenon of E-Participation: Bibliometric Analysis of Studies Published in the Web of Science Database

Seda ÇANKAYA KURNAZ[1], **Önder Aytaç AFŞAR**[2]

[1] Lecturer, Dr.., Selçuk University, FEAS, sedacankaya@selcuk.edu.tr, ORCID: 0000-0001-6977-300X
[2] Assoc. Prof. Dr. Selçuk University, FEAS, onder.afsar@selcuk.edu.tr, ORCID: 0000-0003-1394-3975

Abstract: The aim of this study is to present bibliometric analyses and trends of 783 articles published between 1991 and January 30, 2024, in the Web of Science Core Collection Database regarding the concept of "e-participation," focusing on quantitative data and numerical measurement indicators, and providing researchers with a holistic perspective using VOSviewer software. As a result of the analyses, it was found that the highest number of publications on the concept of e-participation was in 2010 (n=80), the leadership in the distribution of publications by countries was held by the United States (n=143), the journal that has the highest publication count in the field was Government Information Quarterly (n=43), Sonia Roya from the University of Zaragoza was both the most prolific author (n=11) and the most cited author (n=916), the most connected authors were Zahir Irani (n=27) and Muhammad Kamal (n=24), and apart from the e-participation (n=298) the most frequently used keywords in publications   e-government with 115 repetitions, and e-democracy with 52 repetitions. These analyses on the concept of e-participation will raise awareness of the use of bibliometric analyses in the field of social sciences and provide researchers working on this topic with a theoretical foundation and a comprehensive roadmap.

Key Words: E-Government, E-Participation, Digital Transformation, Web of Science
Jel Codes: D78, J11, H83

E-Katılım Olgusu: Web of Science Veri Tabanında Yayınlanan Çalışmaların Bibliometrik Analizi

Öz: Bu çalışmanın amacı, 1991 ile 30 Ocak 2024 yılları arasında Web of Science Core Collection veri tabanında "e-participation" kavramına ilişkin yayımlanan 783 makalenin nicel veriler ve sayısal ölçüm göstergelerini ele alan bibliyometrik analizlerini ve trendlerini VOSviewer yazılımı ile holistik bir bakış açısı ile ele alarak araştırmacıların dikkatine sunmaktır. Yapılan analizler sonucunda "e-participation" kavramına yönelik en fazla yayının 2010 yılında yapıldığı (n=80),   yayınların ülkelere göre dağılımı konusunda liderliği Amerika'nın yürüttüğü (n=143), söz konusu alandaki çalışmalara en çok destek veren derginin Government Information Quarterly (n=43) olduğu, University of Zaragoza'dan Sonia Roya'nın hem en fazla yayın yapan (n=11) hem de en fazla atıf alan yazar olduğu (n=916), en bağlantılı yazarların Zahir Irani (n=27) ve Muhammad Kamal (n=24) olduğu, en fazla atıf alan kurumların University of Zaragoza (n=1081) ve University of Huelva (n=763) olduğu, e-katılım (n=298) kavramı dışında yayınlarda en fazla kullanılan anahtar kelimelerin 115 tekrar ile e-government, 52 tekrar ile e-demokrasi olduğu belirlenmiştir. E-participation kavramına yönelik yapılan bu analizler, bibliyometrik analizlerin sosyal bilimler alanında kullanımına yönelik bir farkındalık oluşturacak ve bu konu ile ilgili çalışacak araştırmacılara teorik bir temel ve kapsamlı bir yol haritası sunacaktır.

Anahtar Kelimeler: E-Devlet, E-Katılım, Dijital Dönüşüm, Web of Science
Jel Kodları: D78, J11, H83

1. Introduction

Participation is a phenomenon that ensures the legitimacy of decision-making and implementation procedures through governance within the political system, enables the spread of democracy and deepens the concept of citizenship (Creighton, 2005). E-participation is essentially defined as the use of information and communication technologies to ensure effective citizen participation in public processes by citizens, civil society organizations and other democratic formations (Macintosh and Whyte, 2008, p. 20). Conducting a bibliographic analysis on the concept of e-participation can provide an insight into how the concept has evolved in the literature until today.

The bibliographic, which is based on analyses manually conducted in studies by researchers such as Garfield, Small, Kessler, and Pritchard, began to be carried out through programs with the development of computer technologies and the need to analyze larger datasets (Börner, Chen, and Boyack, 2003). Mapping the development of the existing literature and determining the leading sources of information in terms of the most effective journals, authors, and articles are among the aims of bibliometric mapping (Shaikh et al., 2021). One of the widely used programs for creating maps based on raw data extracted from a specific database and presenting these maps visually is VOSviewer (Van Eck and Waltman, 2022). Bibliometric analyzes with VOSviewer, an important tool in the academic literature of computer technologies, enables the examination of the historical development of a scientific field through publications, citations, authors, countries, sources, institutions (Toker, 2021), and keywords using statistical methods. Moreover, utilizing computer-based programs such as VOSviewer allows researchers (Arslan, 2022) to evaluate the development in a specific field of science and provides a way to access prominent publications among the increasing academic studies. The fact that bibliometrics is one of the important areas of interest today has a significant impact on its use as a preliminary stage of systematic literature review (Dirik et al., 2013).

This study aims to present bibliometric analyses and trends of 783 articles published in the Web of Science Core Collection Database (WOS) regarding the concept of "e-participation," focusing on quantitative data and numerical measurement indicators, using the VOSviewer analysis program and adopting a holistic perspective. In line with these objectives, the study attempted to answer the following questions:

- How is the distribution of articles published between 1991 and January 30, 2024 by year and by the journals they were published in?
- What is the level of citations received by publications, institutions, and authors?
- Which author keywords are frequently used together in the studies?
- What is the level of collaboration among authors?
- How do the bibliographic coupling networks of texts, the bibliographic coupling networks of authors, and the co-citation network maps of authors look like?

In this context, the study will first address the conceptual framework of the e-participation phenomenon and provide a perspective on its place in the field literature. Subsequently, bibliometric analyses of 783 articles produced on the concept of e-participation between 1991 and January 30, 2024 from the WOS database will be presented using the VOSviewer program.

2. Literature Review of the Phenomenon of E-Participation

The participation of citizens in the political process is not a new phenomenon; it is a prerequisite for democracies. The stages and degree of this participation determine the nature of the democratic regime. In political science, democracies are defined as well-functioning, high-quality democracies in which each citizen's opinion can be directly conveyed to the rulers. The advancement in communication technologies has emerged as significant tools with the potential to enhance participation opportunities in democracies, enabling citizens to actively participate in decision-making processes and significantly

altering the prospects of democratic participation. The advent of new information technologies has brought forth the concepts of e-democracy and e-participation. In line with the idea of enhancing their democracies, many countries are exploring ways to make the most of e-democracy opportunities to encourage direct citizen participation in governance (Schlosberg et al., 2007, p.8). Debates in this field revolve around whether the representation crisis in liberal democracies can be overcome by using new communication and internet technologies and whether direct citizen participation in political processes can be facilitated (Dryzek, 2000, pp. 8-31).

New communication technologies fulfill many fundamental functions in democracies, such as informing and shaping public opinion, providing a forum for public debates, and acting as intermediaries between the government and the governed. According to the Council of Europe (2008, p.11-35), the concept of electronic democracy (e-democracy), brought about by the development of new communication technologies, signifies the evolution and support of democracy, democratic institutions, and democratic processes through the possibilities offered by information and communication technologies. E-democracy, as a general concept, can be defined as the use of Information Communication Technologies (ICT) by political actors such as governments, elected officials, media, political and social organizations, and citizens within political and governance processes under today's representative democracy structure (Clift, 2004, p.38). However, it is important not to view e-democracy solely as the use of opportunities provided by technology. In accordance with the fundamental principles of democracy, these technologies should also be compatible with democratic governance practices (Council of Europe, 2008). In the democratic governance process, e-democracy practices envision the use of the internet and online platforms among the governed, civil society, and governments. E-democracy, and more specifically e-participation, encourages informed and active citizenship that collaborates with governments and public officials to make decisions that are more effective, legitimate, and transparent.

According to the existing literature, the relationship between the internet and democracy is evaluated under the umbrella of e-democracy, where citizens can influence the government and participate in decision-making processes through e-participation opportunities. In its broadest sense, e-participation serves to enhance the quality of democracies by increasing communication and interaction between citizens and elected representatives/politicians in representative democracies governed by elections. A high level of citizen participation in the decision-making process is a significant goal of e-participation initiatives (Macintosh, 2004, p.2; OECD, 2003). E-participation, which refers to citizens' participation in political processes such as policymaking, decision-making, service delivery, information provision, consultation, and negotiation using ICT capabilities, is a prerequisite for e-democracy (Lironi, 2016, pp.18-30; Council of Europe, 2008, pp.13-15). The use of ICT in democratic governance facilitates a better understanding of decision-making processes and provides citizens and governments involved in the e-participation process with a facilitating opportunity for communication by overcoming time and space constraints (Council of Europe, 2008). Along with measures to increase democratic participation, e-participation tools are seen as having the potential to provide significant solutions to the ongoing debate in the European Union regarding democratic shortage or the democracy deficit, by integrating e-participation tools into political processes and fully embedding them into the European political process, citizens, governments, and representative bodies can enhance collaboration and increase democratic legitimacy (European Movement International, 2019, p.2-3). From the perspective of the European Commission's digital single market, e-participation is defined as "helping people to shape policies and facilitating the understanding of decision-making processes through ICT" (European Commission, 2015). According to the United Nations definition, e-participation encompasses three dimensions: e-information, e-consultation, and e-decision-making. Therefore, e-participation enables participation through "providing information to citizens, access to information without request," "contributing

to and negotiating public policies and services," and "empowering citizens through co-designing policy options and jointly producing service components and delivery" (United Nations, 2016, p.141).

Under the scope of e-democracy, e-participation applications consist of processes and structures encompassing all forms of electronic interaction such as informing, negotiating, and voting among public institutions, government, and citizens. E-participation applications will have a positive impact on democratic governance in the country. As citizens take a more active role in political decision-making processes, the quality of democracy will increase. In this regard, a well-functioning e-democracy system is expected to strengthen legitimacy and enhance the quality of representative democracies. E-democracy, shaped by e-participation applications, goes beyond procedural democracy and offers opportunities for active participation of citizens in the democratic governance system. Increasing participation in political processes with a governance approach responsive to citizens' demands is a significant factor in improving the quality of democracy.

In this regard, e-participation through IT is considered as a promising tool to repair the waning interest in democracy and democratic processes. Within this context, it is debated that the new opportunities provided by IT have the potential to establish a "virtual agora" on a national scale, thereby enhancing the representativeness of representative democracies. However, it would be more accurate to evaluate e-democracy and its subset, e-participation, as applications that enhance the social foundation of democratic culture through new information technologies. After all, e-democracy initiatives are not aimed at transforming an authoritarian or totalitarian regime into a democratic one.

In recent studies, the electronic forms of participation that constitute the foundation of democracy, namely e-participation tools and areas, have been examined. The main theme has been the investigation of how citizens engage in political decision-making processes through new information and communication mechanisms. Generally, these studies have evaluated the contributions of e-democracy and e-participation practices to democratic processes through digitization. Alongside these developments, recent research in democracy has focused on explaining the performance of electronic tools on democratic outcomes and elucidating the mutual influence and interaction between electronic communication logic and political logic. As a result of the increasing use of digital tools, it is observed that the interaction between governments and citizens has evolved in a way that contributes to democratic governance. Within this framework, the main debate revolves around how technology, particularly e-participation applications, can support democracy in a more responsive and responsible manner.

To emphasize the real use of social media tools by governments and citizens and their impact on government-citizen relations, analyses need to be extended beyond the application. Bonsón et al. (2015) conducted a study focusing on citizens' participation in local governments by examining Facebook, which ranks first among social media platforms. They demonstrated that the use of Facebook to facilitate communication among citizens offers excellent opportunities for more sustainable interaction between citizens and local governments.

In their study, Bonsón et al. (2015) focused on measuring the impact of Western European local governments' Facebook pages on stakeholder engagement. They examined a sample comprising 75 local governments representing four different styles of public administration across the 15 member states of the EU, analyzing 50 posts from each municipality. Measures of popularity, commitment, virality, and interaction were calculated for each post. The aim of the article is to assess the influence of Western European local governments' use of Facebook on stakeholder engagement. The study also analyzed the effect of different media and content types on citizen engagement, as well as the impact of institutional context on Facebook usage and citizen engagement. Therefore, the article examined Western European local governments' efforts to promote

transparency and citizen participation through voluntary reporting via Facebook, and explored questions such as "Does the use of different media and content types affect citizen engagement?" and "Are there any communication differences among different styles of public administration?" The study aims to provide practitioners and academics with some initial research findings on the impact of different communication strategies on citizen engagement to enhance the effectiveness of e-participation opportunities. The results indicate that marketing-related content by local governments in Western Europe is preferred; however, citizens show less interest in this content and prefer topics related to municipal management that are more closely aligned with their daily lives. Therefore, municipalities should identify the most relevant issues for citizens within their jurisdiction to meet their needs, provide them with useful information, and solicit their opinions on these sensitive matters. An important finding of this research is that citizens in environments where traditional opportunities for citizen participation are limited are now using available technology more to engage in discussions about local issues; this empowers citizens through social media and enhances democracy. Ultimately, if local governments intend to prioritize the use of social media for citizen participation, any content published should focus specifically on topics that are of interest and importance to local citizens.

In their study evaluating the use of Web 2.0 by local governments, Bonson et al. (2012) emphasized the potential contribution of the internet to enhance transparency, openness, and to promote new forms of accountability. They view the quest for new management styles that promote higher levels of transparency and citizen participation as a way to increase citizens' trust in governments. Their research aimed to determine whether local governments were using these technologies to increase transparency and e-participation and to open up a real institutional dialogue by providing a general overview of the use of Web 2.0 and social media tools in EU local governments. To achieve this goal, they analyzed the websites of seventy-five EU cities and their presence on social media platforms. The cities analyzed represent the largest cities in fifteen EU countries, accounting for more than 85% of the EU population. In their study, they sought answers to the following questions: (i) What is the level of acceptance of Web 2.0 and social media tools by European local governments? (ii) Are European local governments using these tools to promote higher levels of citizen participation and institutional dialogue, or merely to increase transparency? (iii) Does the style of public administration affect the approach adopted by EU local governments in the use of Web 2.0 tools? (iv) What are the factors supporting the development of these tools at the local level? The results indicate that while most local governments use Web 2.0 and social media tools to increase transparency, the use of Web 2.0 at the local level to promote the concept of institutional dialogue and e-participation is still in its infancy. They also note that the internet, Web 2.0 tools, and social media are constantly evolving, so the findings of this study may not remain valid indefinitely. Most local governments utilize Web 2.0 and social media tools to enhance transparency, yet the use of Web 2.0 for promoting the concepts of corporate dialogue and e-participation at the local level is still relatively nascent. E-participation encapsulates the central theme of Web 2.0 in a single word. European Union (EU) local governments have acknowledged that they lag behind their citizens in Web 2.0 usage. According to them, local administrations should be an integral part of the network, rather than passive observers on the periphery, and should contribute to discussions as peers rather than outsiders. For local governments, abstaining from interaction now poses a greater risk than engaging in it. Web 2.0 has enriched socio-political discussions, diversified ideas, facilitated the free flow of information, and promoted freedom of expression by supporting the emergence of content created by citizens. These tools can be employed to foster citizen participation, facilitate exchange of opinions, stimulate debate, and share information about social and political issues.

Royo et al. (2014) conducted a study to determine the extent to which European local governments, which have signed the Aalborg Commitments, utilize the Internet to

promote e-participation in environmental issues, and to identify the driving forces behind these developments. The findings confirm that e-participation is a multifaceted concept. They observed that existing institutions are insufficient in addressing the challenges of sustainable development, indicating a need for new regulations to achieve balanced and integrated economic, environmental, and social goals. There is an urgent need at the local level for meaningful information and effective public processes to create awareness and build capacity for promoting environmental conservation. Considering the potential to inform, educate, and empower citizens, information and communication technologies, particularly the Internet, can play a significant role in this regard. Therefore, the use of e-participation could be a cost-effective tool to actively involve citizens in environmental protection efforts. A citizen who is well-informed about environmental policies and initiatives can become part of the global effort to preserve the environment. It is important to determine to what extent local governments, assumed to be committed to this cause, benefit from the Internet to promote environmentally friendly behaviors among citizens and to provide opportunities to strengthen democracy by creating e-participation tools for them. In this context, particular attention has been paid to types of citizen participation encouraged, such as information dissemination, consultation, and active engagement. The authors point out two main contributions of e-participation in their study. First, e-participation serves as a control function for public administrators to evaluate and compare environmental proposals. Second, it enables legislators and environmental organizations to understand their motivations for disclosing environmental information and developing e-participation, allowing for further improvements in existing environmental agreements at the local government level. As a result, local governments have adopted a narrow approach to implementing environmental e-participation initiatives primarily by using their websites as a public relations tool. The authors argue that local governments should utilize the opportunities provided by the Internet more effectively to promote e-participation in environmental protection and citizen engagement.

Muñoz and Bolivar (2015) argue in their article that the e-government field is generating an increasing amount of research literature, yet it is a broad area of study, and researchers should engage in more research projects in this field. They note the significant heterogeneity in the literature on e-government and the absence of a comprehensive bibliographic overview in the interdisciplinary field of information science, suggesting the need to analyze the main contributions made to this issue to establish a framework. In their study, they examine research gaps and opportunities for improvement in the context of e-government research. To conclude, this article adopts various bibliometric approaches to analyze articles published in leading international journals listed in the SSCI index for the year 2014 in the fields of information science and library science. The authors found that despite the increasing research in e-participation in recent years, future research on social issues should focus on accessibility policies and the motivations, abilities, and perceptions of disabled and elderly individuals to benefit from e-government initiatives. The study indicated the need for further research on e-participation to understand the real dimensions of social networks and participation in e-democracy. Additionally, they emphasized the necessity of designing and evaluating tools to enable service automation and allow citizens to vote in local initiatives.

In their study, the authors aimed to address the following questions to raise awareness about e-participation and e-democracy: (i) How many research articles were published in high-impact journals between 2000 and 2014? Which journals were the top publishers of e-government articles? (ii) What are the primary research topics that attract the interest of ISI journals? (iii) What methodologies are utilized to analyze the phenomenon of e-government? Do journals exhibit any preference for articles employing specific methodologies? Furthermore, according to the authors, the evidence obtained from this study indicates the need for reinforcement of e-government research using quantitative research methodologies, which represents the greatest research opportunity

for the future in terms of implementing new technologies in a country. In this context, the analysis of e-government in e-participation research can enhance the strength of e-government projects and contribute to understanding them.

The modernization and reform process, broadly referred to as e-Government, has also provided increased accessibility to information and transparency. The use of Information and Communication Technology (ICT) helps society develop democratic models (Harder and Jordan, 2013; Puron-Cid, 2014), increases trust in governments (Armstrong, 2011; Michener and Bersch, 2013), and facilitates citizen participation. However, previous studies (Alcaide Muñoz, Rodríguez Bolívar and Garde Sánchez, 2014; Grönlund, 2004; Rodríguez Bolívar, Alcaide Muñoz and López Hernández, 2016) have emphasized that e-Government is a multidisciplinary field of knowledge. These studies have attempted to analyze the limitations of previous research in the e-Government field and provide a critical evaluation of e-Government research (Alcaide Muñoza and Rodríguez Bolívar, 2015; Andersen and Henriksen, 2005; Bélanger and Carter, 2012; Heeks and Bailur, 2007; Sannarnes, Henrinken and Andersen, 2006). However, to understand the dynamics of evolution in e-Democracy over different years, performance analysis has not been conducted to quantitatively and qualitatively measure the contribution of e-Government and the impact of specific research themes on the knowledge domain. It is necessary to identify the most prominent, productive, and impactful subfields of e-Government research (Alcaide-Muñoz vd., 2017).

In this context, Alcaide Muñoza et al. (2017) present a scientific mapping approach to analyze the thematic development of the e-Government field. They examine research areas such as smart cities and the provision of public services, which are continuously evolving and have not yet reached maturity, as well as e-Participation and the use of technological tools by citizens. According to them, scientific mapping provides a new perspective for visualizing scientific boundaries and dynamic structures through visualization methods. The implementation of ICT in public organizations has become a central part of political agendas and government strategic programs aimed at modernizing public administration. Here, scientific mapping provides a new perspective for visualizing scientific boundaries and dynamic structures through visualization methods. Therefore, the article states its aim as providing a general approach to analyzing the thematic development of the e-Government research field. In this sense, conceptual mapping is useful for identifying, visualizing, and analyzing conceptual subfields. This approach allows for measuring and visualizing the thematic development of e-Government research.

In their study, Ferreira and Coelho (2023) aimed to identify the key elements contributing to citizen participation and engagement in e-participation processes in a smart city. The main findings of the study indicate the presence of a range of factors that affect citizen participation and interaction in e-participation processes. These factors were identified within the scope of the study as informational, institutional, motivational, technological, and cultural factors. The research contributes to understanding the importance of e-participation and citizen participation in e-participation platforms in a smart city context, while also emphasizing the potential to support future comparative studies and expanded research with different focuses.

In conclusion, the e-Government field has gained significant importance over the past decade (Muñoz and Bolívar, 2015). The gradual increase in the number of studies published in international journals, especially during the period from 2009 to 2014, reflects this trend. Initially, studies analyzed how ICTs play a crucial role in democratic politics and governance processes. However, new technologies should not only provide information about public policies but also offer citizens the opportunity to co-create. Hence, many government agencies worldwide have adopted platforms, applications, and tools to encourage informed citizenry, enhance information transparency, increase public trust in government, and monitor the behaviors of public officials and politicians (Chen and Redner, 2010). In other words, e-Participation provides advantages and benefits such

as democratic and legitimacy gains, social inclusion, improvement of public policies and service quality, and contributions to education (Granier and Kudo, 2016). In this regard, participation is considered as a policy tool aimed at securing the acceptance of a measure or project without considering the contribution of citizens.

3. Method

This section of the study presents the exploration of the concept of "e-participation" in the WOS database, along with the bibliometric analyses conducted using the VOSviewer program and their findings. Due to the high number of publications on e-participation, the analysis was carried out using data obtained from WOS database. The study is conducted with systematic review methodoly. The study focuses on mapping the data retrieved from the WOS database; therefore, data from platforms such as Scopus, TR Index, or YÖK Thesis Center have not been considered. This limitation constitutes a constraint of study.

3.1. Aim of the Study

The aim of this study is to provide researchers with a holistic perspective on bibliometric analyses and trends of 783 articles published on the concept of "e-participation" in the Web of Science (WOS) database, focusing on quantitative data and numerical measurement indicators. The intention is to offer researchers fundamental information about various aspects of the concept, such as the fields and countries where "e-participation" is predominantly studied, which authors receive more citations related to the concept, and in which years the studies are concentrated. Thus, this study seeks to provide detailed data on research conducted on the concept of "e-participation," aiming to deepen understanding of the topic and serve as a guide for researchers who are initiating studies in this area or aiming to enhance their existing work.

3.2. Data and Analysis

In recent years, various software programs such as Cytoscape, Pajek, Bibexcel, Gephi, CiteSpace II, CoPalRed, IN-SPIRE, VantagePoint, and VOSviewer (Cobo et al., 2012) have been used for scientific mapping in literature. In processing the raw data obtained in this study, VOSviewer 1.6.20 program was utilized due to its reliability, capability to provide advanced level analyses, user-friendliness, and functionality. VOSviewer, a software tool used to construct and visualize bibliometric networks, also offers text mining functions that can visualize co-occurrence networks of significant terms extracted from scientific literature (Van Eck and Waltman, 2023). The data for this study, where bibliometric mapping was conducted using VOSviewer, was obtained from the Web of Science (WOS), which provides data on scientific articles from approximately 22,000 peer-reviewed journals worldwide. The WOS platform offers advanced search, citation analysis, and bibliometric tools (EUI, 2024).

4. Findings (Description of the Dataset)

This section presents the findings obtained from the Web of Science (WOS) database and the results of the raw data analyzed using the VOSviewer analysis program (Cobo et al., 2012). In addition to providing an overview of the publications retrieved from the WOS database (distribution of publications by year and index information, distribution of publications by country, and most prolific authors), the study also includes maps generated using the VOSviewer program related to the concept of "e-participation." These maps include co-authorship networks, citation networks of authors, citation networks of countries, citation networks of institutions, keyword networks, bibliographic coupling networks of texts, bibliographic coupling networks of authors, and co-citation networks of authors.

4.1. Overview of Publications

In the scope of the study, a search was conducted in the Web of Science (WOS) database on January 30, 2024, using the keyword "e-participation" across all fields. This search yielded a total of 783 articles, 428 proceeding papers, 156 book chapters, 24 review articles, 21 early access articles, 18 editorial materials, 3 books, 2 book reviews, 1 note, and 1 retracted publication published between 1991 and January 30, 2024 from various disciplines. These 783 journal articles were thoroughly examined using the VOSviewer program, revealing 117 interdisciplinary areas related to the concept of "e-participation." As shown in Figure 1, the majority of studies were found in the field of Public Administration (175), followed by Library and Information Science (162), Political Science (146), Communication (72), Computer Science Information Systems (57), Management (49), Urban and Regional Planning (37), and Environmental Studies (33). Table 2 provides the index information of the 783 articles published in WOS, indicating that the majority of publications are indexed in SSCI (325).

Figure 1. Distribution of Publications Across Interdisciplinary Fields

Table 1 provides the index information of the 783 articles published in WOS, indicating that most publications are indexed in SSCI (325).

Table 1. Index Information of the Publications in WOS

|	
Social Sciences Citation Index (SSCI)	325
Emerging Sources Citation Index (ESCI)	252
Science Citation Index Expanded (SCI-EXPANDED)	128
Book Citation Index – Social Sciences & Humanities (BKCI-SSH)	142
Book Citation Index – Science (BKCI-S)	26
Conference Proceedings Citation Index – Science (CPCI-S)	9
Arts & Humanities Citation Index (A&HCI)	7
Conference Proceedings Citation Index – Social Science & Humanities (CPCI-SSH)	2

In Graph 1, the number of articles published in all fields related to the keyword "e-participation" in the WOS database is displayed. As observed in Graph 1, there is an increasing trend in the number of publications starting from 2008, with the highest number of publications recorded in 2010 within the period of 1991- January 30, 2024.

Undoubtedly, the growing interest in the concept of "e-participation" since the 2000s can be attributed to advancements in technology and their impact on the understanding of e-government.
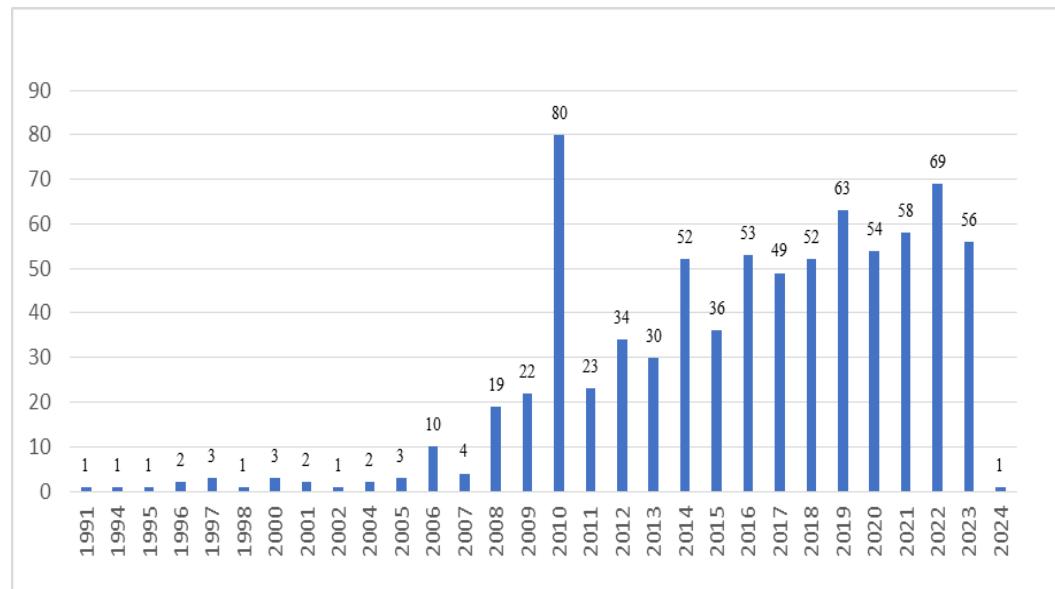
Graph 1. Distribution of Publications by Year

In Graph 2, the distribution of publications among the top 23 countries with the highest number of publications is presented. Within this scope, it is observed that the highest number of publications is from the United States (140). The articles were produced in English (744), Russian (11), Portuguese (9), and Spanish (8) languages, respectively.
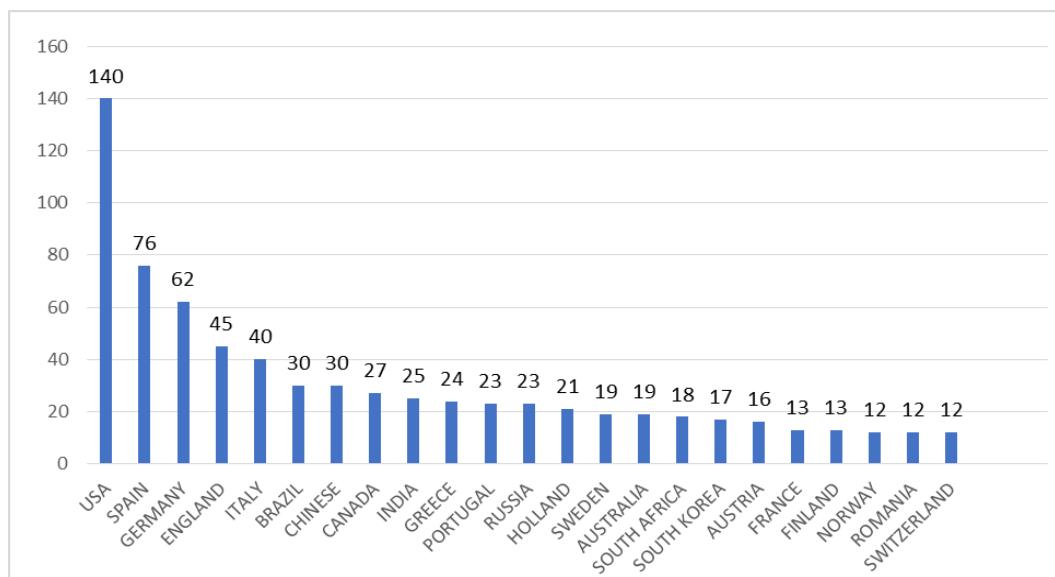
Graph 2. Distribution of Publications by Country

Table 2 provides information on the authors who have contributed the most to the studies related to "e-participation" in the WOS database. It is noted that Sonia Roya from Zaragoza University and Manuel Pedro Rodríguez Bolivar from Granada University have made the most significant contributions to the concept.

Table 2. Authors with the Most Publications Related to E-Participation Concept

	Author	Publications	University
1	Royo, Sonia	11	University of Zaragoza
2	Bolívar, Manuel Pedro Rodríguez	8	University of Granada
3	Muñoz, Laura Alcaide	7	University of Granada
4	Kassen, Maxat	6	Astana IT University
5	Yetano, Ana	6	University of Zaragoza
6	Charalabidis, Yannis	6	University of Aegean
7	Aichholzer, Georg	6	Austrian Academy of Sciences
8	Moreno, José María	6	University of Zaragoza
9	Naranjo-Zolotov, Mijail	5	NOVA Information Management School
10	Loukis, Euripides	5	University of Aegean
11	Ojo, Adegboyega	5	National University of Ireland Galway
12	Zheng, Yueping	5	Sun Yat-sen University

Table 3 provides a list of journals that have made the most contributions to the literature on "e-participation" in the Web of Science (WOS) database. According to this, Government Information Quarterly, indexed in the SSCI, has taken the lead in e-participation research with 43 research articles published. The journal Transforming Government: People, Process, and Policy, indexed in Scopus, follows with 27 articles, while the International Journal of E-Planning Research, indexed in ESCI, has contributed the most with 19 articles.

Table 3. Journals Making the Most Contributions to the Literature on E-Participation

Journals	Publications
Government Information Quarterly	43
Transforming Government People Process And Policy	27
International Journal of E Planning Research	19
International Journal of Electronic Government Research	15
Evaluating E-participation Frameworks Practice Evidence	14
Journal Of Information Technology Politics	12
Sustainability	12
International Journal of Public Administration	11
E-participation In Smart Cities Technologies And Models of Governance For Citizen Engagement	10
Advances In Electronic Government Digital Divide And Regional Development	9
International Journal Of E Politics	8

4.2. Co-authorship Analysis

The analysis of co-authorship among the 783 articles retrieved from the WOS database provides insights into researchers' collaborations and connections. In this context, a network map created with at least 1 publication and 1 citation criterion using VOSViewer to identify authors with the most connections and collaborations in terms of co-authorship analysis is presented in Figure 2. The analysis identified 38 names clustered into 3 groups, with a total of 630 unit connections: 483 connections among 21 authors in

the 1st cluster, 63 connections among 11 authors in the 2nd cluster, and 84 connections among 6 authors in the 3rd cluster. The most connected authors within the clusters are Zahir Irani (27) and Muhammad Kamal (24) in the 3rd cluster. The thickness of connection lines in Figure 2 indicates the proximity of collaboration between authors, while the color of nodes and lines represents the collaboration status among authors (Cao et al., 2023). In the network visualization, elements are represented by circles, where the size of the label and circle of an element is determined by its weight. A higher weight of an element implies a larger label and circle size, while the color of the element is determined by the cluster it belongs to. Lines between elements represent connections, and the closer the distance between two elements in the visualization, the stronger the relationship between them (Van Eck and Waltman, 2023).

At this point, it is observed that Zahir Irani from the University of Bradford collaborates with Tiago Oliveira from Universidad Jaime and Mijail Naranjo-Zolotov from Universidade Nova de Lisboa, being among the most connected authors. In the analysis, it is noted that the authors receiving the most citations are Bonson, E; Torres, L; Royo, S; Flores, F with 499 citations, and Gown, AM with 267 citations. However, it is interesting to observe that the most prolific authors in terms of publications (Sonia Royo - 11 publications; Manuel Pedro Rodríguez Bolivar - 8 publications; Laura Alcaide Muñoz, - 7 publications) are not among the most connected authors.
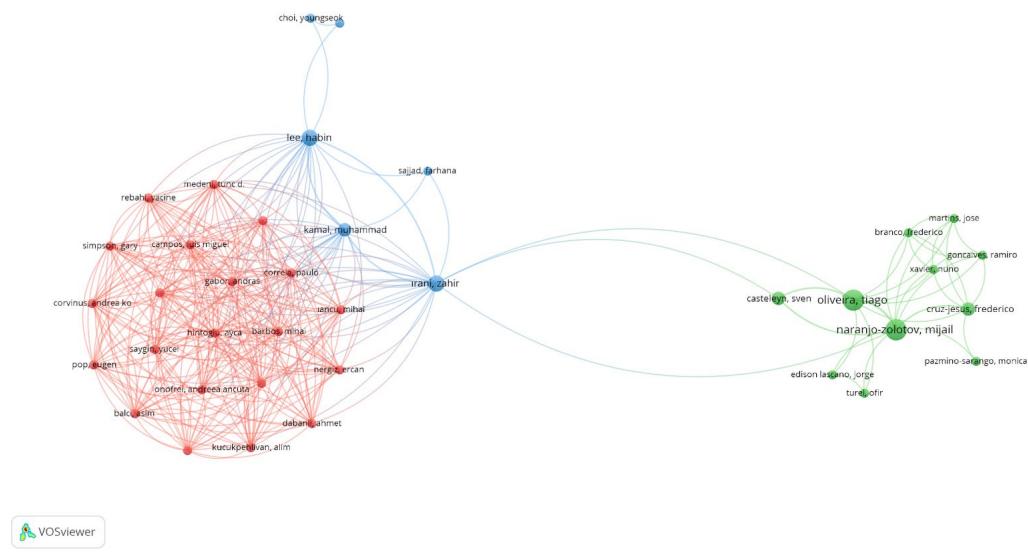

Figure 2. Co-authorship Networks

4.3. Citation Analysis of Authors

Citation analysis is a way of measuring the relative importance or impact of an author, article, or publication by counting how many times it has been cited by other works. Citation analysis is utilized to see the impact of a specific study, to identify quality works in a field, and to determine the influence of an author within their discipline and beyond, by examining the total number of citations divided by discipline and country (Ohio State University Library, 2022; University of Michigan Library, 2023). In this context, VOSviewer software allows for the identification of citation networks to sources, authors, publications, institutions, and countries.

In the scope of the study, an author citation analysis was conducted using VOSviewer with the aim of mapping the citation networks of authors who have published on the concept of "e-participation", with a criterion of at least 2 publications and at least 2 citations selected. The analysis revealed a network map of authors with a total of 156 authors identified to be interconnected, resulting in 12 clusters and 1618 connections. As

seen in Figure 3, the areas of concentration of colors indicate the frequency of citations received by authors.
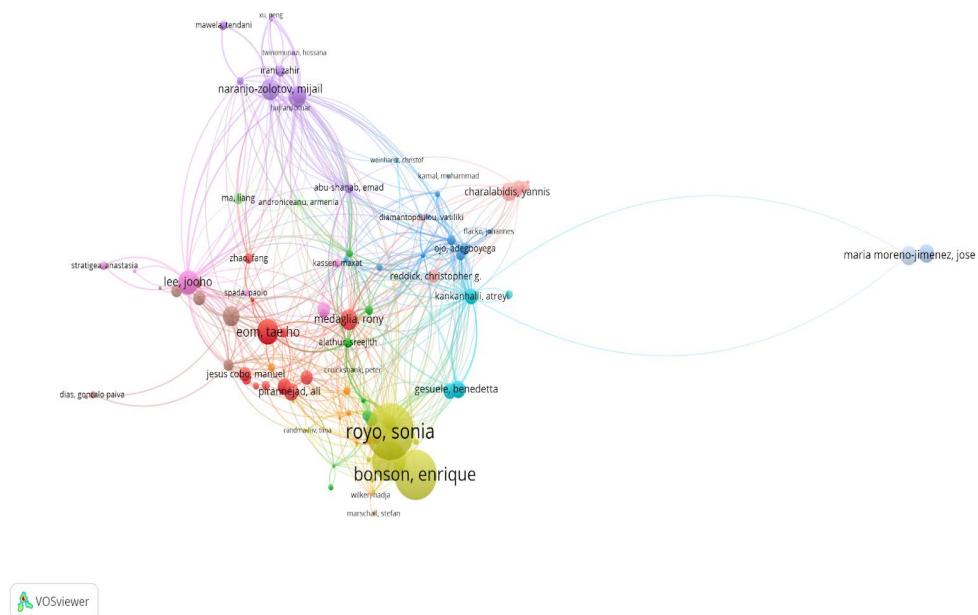
Figure 3. Authors' Citation Networks

Detailed information regarding the most cited authors is provided in Table 4. According to the analysis, Sonia Royo, Mijail Naranjo-Zolotov, and Rony Medaglia rank in the top three in terms of total connection strength, while Sonia Royo, Enrique Bonson, and Lourdes Tores rank in the top three based on citation count. Sonia Royo ranks first in all categories, being the author with the highest number of publications, citations received, and connection strength.

Citation analysis and co-citation analysis are often confused with each other. While citation analyses are considered as a measure of scientific impact, co-citation analysis is used to identify the most influential authors, works, and references in the literature (Allam, Sharifi, Giurco, and Sharpe, 2021, p. 7).

Table 4. View of Most Cited Authors

	Author	Number of publications	Number of Citations	Total Link Strength
1	Royo, Sonia	11	916	72
2	Bonson, Enrique	2	763	3
3	Tores, Lourdes	5	523	22
4	Eom, Tae Ho	2	245	17
5	Shim, Dong Chul	2	245	17
6	Lee, Jooho	4	224	42
7	Kim, Soonhee	3	221	41
8	Naranjo-Zolotov, Mijail	5	183	69
9	Medaglia, Rony	2	179	71
10	Oliveira, Tiago	5	177	59

4.4. Citation of Countries

The network map derived from bibliometric analyses of countries' citations provides an analysis of citations received by countries where research on a specific topic is conducted. In this context, an analysis was conducted based on 84 units with established relationships that meet the criteria of having at least 1 publication and 1 citation related to the "e-participation" concept. The analysis revealed 12 clusters, 563 connections, and a

total link strength of 1571. The countries receiving the most citations are identified as the United States (3638), Spain (1945), the United Kingdom (952), Germany (613), and China (504). In terms of total link strength, the top five countries are the United States, Spain, Germany, China, and Portugal.
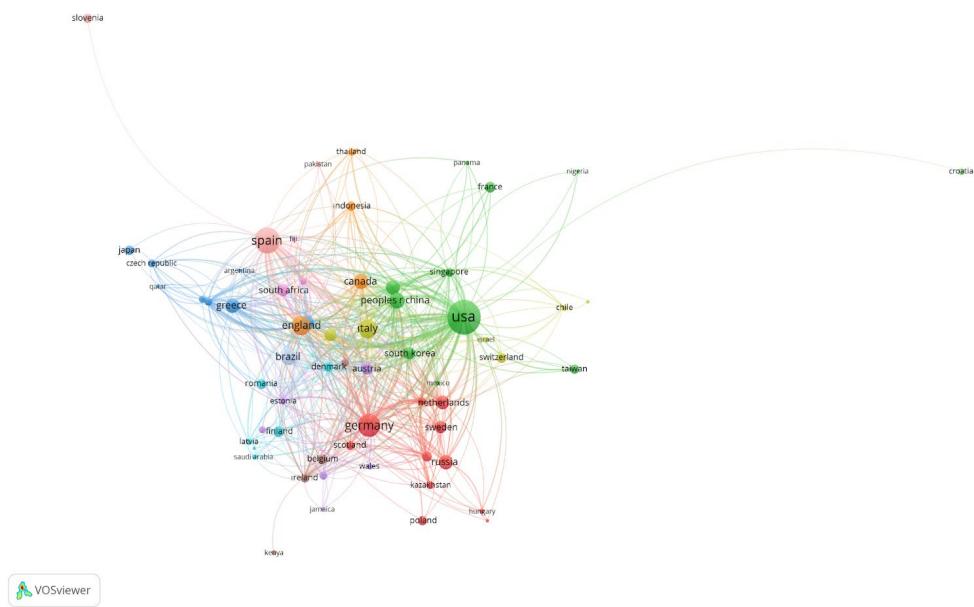
Figure 4. Citation Networks of Countries

4.5. Citation of Organizations

Within the scope of the study, a network map was created for inter-institutional citations with the aim of having at least 2 publications and receiving 2 citations from one institution. An analysis was conducted based on 206 observation units with established relationships. The analysis revealed 18 clusters, 850 connections, and a link strength of 1090. As depicted in Figure 5, areas dominated by yellow indicate institutions with a high number of citations. Accordingly, the institutions receiving the most citations were identified as the University of Zaragoza (1081), University of Huelva (763), University at Albany (449), University of North Carolina (301), and Yonsei University (293).
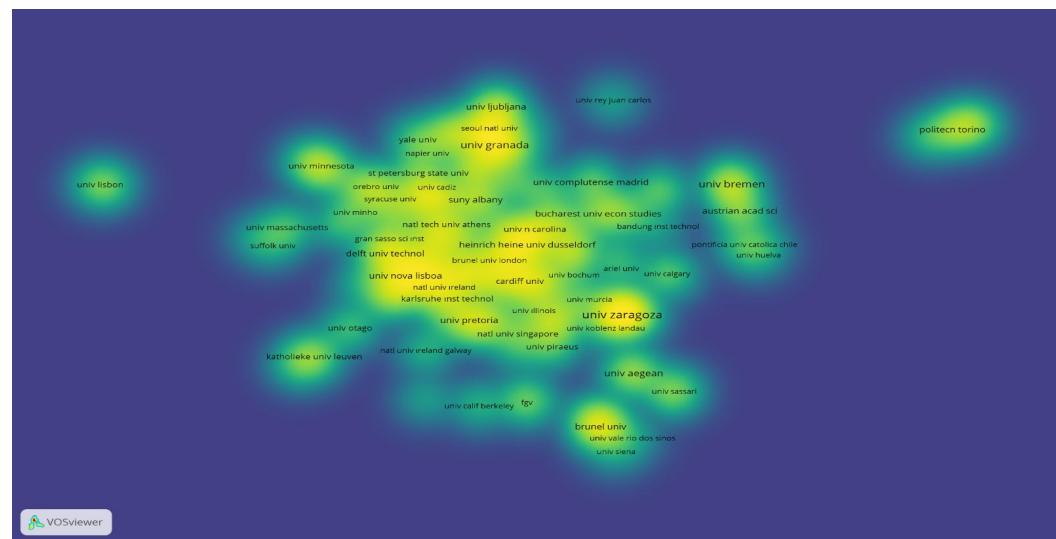
Figure 5. Citation Networks of Institution

4.6. Keyword Analysis (Co-occurrence of All Keywords)

Keyword analysis involves categorizing studies in literature into clusters that represent various research focuses in the field (Lis, 2018), thus providing researchers with insights into the details of these studies (Rejeb et al., 2022, p.4). In keyword analysis, the terms used in the titles, abstracts, and keywords of the studies under review are considered the key concepts of those studies (Rejeb et al., 2022, p.4). To illustrate, the co-occurrence of terms a, b, and c in different publications indicates a strong conceptual relationship among them.

In the analysis of keywords related to the concept of "e-participation" within the scope of the study, conducted with 151 observations that appeared at least 3 times and had relationships among them, a total of 15 clusters, 946 connections, and 1722 link strengths were reached. When examining the most frequently used keywords in publications related to the "e-participation" concept, "e-participation" stands out with 298 occurrences, followed by "e-government" with 115 occurrences, "e-democracy" with 52 occurrences, "social media" with 48 occurrences, "citizen participation" with 31 occurrences, "e-governance" with 25 occurrences, and "public participation" with 24 occurrences. Looking at the total link strength, it is observed that the strongest connections are again between the same concepts.
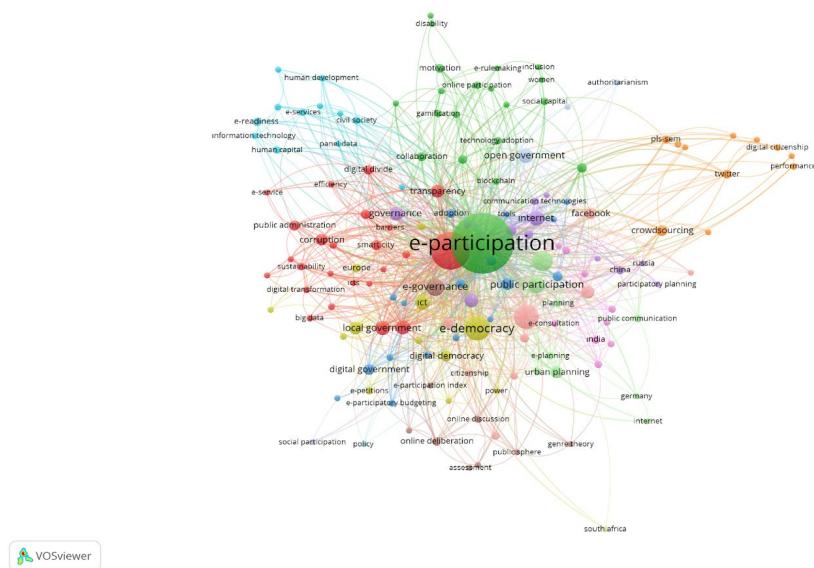
Figure 6. The Most Frequently Used Keyword Networks

Figure 7 illustrates the distribution of keyword usage over the years. This network map can provide insights into how the publications related to the "e-participation" concept have evolved in recent years
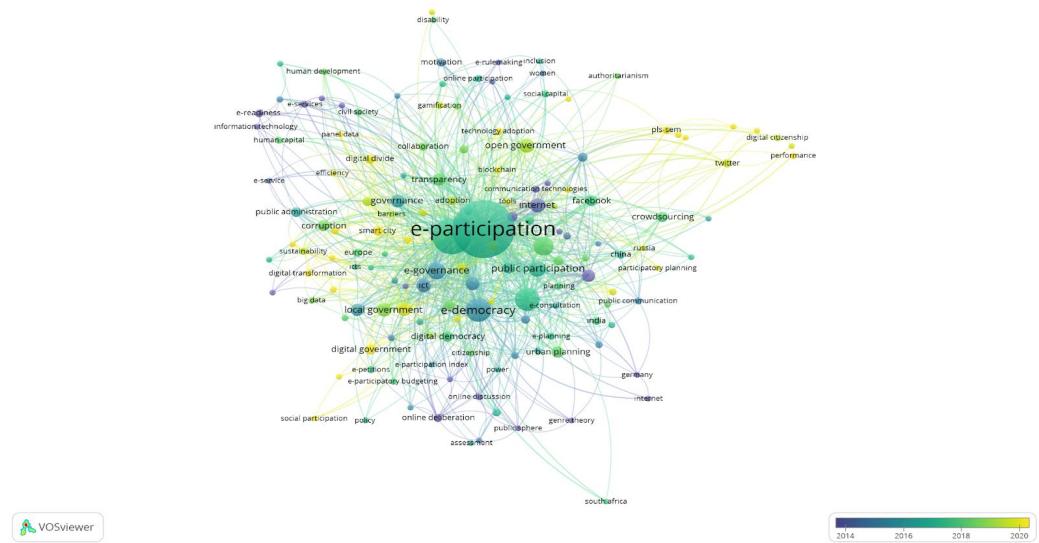
Figure 7. Distribution of the Most Frequently Used Keyword Networks by Year

According to the analysis, between 2014 and 2016, alongside the "e-participation" concept, terms such as "internet," "social media," "web 2.0," "e-readiness," and "e-services" were commonly used. However, between 2016 and 2018, terms such as "public participation," "e-government," "local government," "transparency," "Facebook," and "citizen participation" became prevalent. From 2020 onwards, terms such as "Twitter," "digital citizenship," "performance," "COVID-19," "smart cities," "smart governance," "digital transformation," "digital governance," "electronic government," "blockchain," "performance," and "digital transformation" began to be used intensively. It can be argued that the conceptual diversity, which is believed to increase with the use of the "digital government" concept in the literature, stems from the umbrella nature of the concept, which opens many aspects of e-government, emphasizing aspects such as "e-participation," "e-governance," "e-democracy," and "smart government." Furthermore, it can be said that with the influence of approaches emphasizing e-participation over time and the integration of digital technologies with public administration, the diversity of concepts that blend public administration with technology will continue (Saylam, 2022, p.2141).

4.7. Bibliographic Coupling Analysis of Documents

The VOSviewer program enables bibliographic coupling analysis of publications, sources, authors, institutions, and countries. A bibliographic coupling network map in VOSviewer provides an analysis opportunity for citing a common work by two independent sources. For example, if sources X and Y both cite work Z, it indicates the presence of bibliographic coupling. In the analysis conducted using VOSviewer, among 783 publications related to the "e-participation" concept, 577 publications were identified that met the criterion of receiving at least one citation and having connections between them. Within the scope of the analysis, 13 clusters, 22117 links, and a total link strength of 38039 were reached. As visualized in Figure 8, the authors with the highest bibliographic coupling among texts are as follows: Bonson (2012) with 4499 citations, Gown (2008) with 267 citations, Bonson (2015) with 264 citations, Gibson (2013) with 200 citations, and Dowden (2004) with 197 citations. However, it was observed that the publication with the highest citation count did not necessarily have the highest link strength, leading to a considerable change in ranking. According to the ranking, Wrtz (2018) with 692 link strength, Santamaria-Philco (2019) with 647 link strength, Guillamon (2016) with 630 link

strength, Vogt (2015) with 618 link strength, and Alarabiat (2021b) with 598 link strength are among the top five in terms of total link strength.
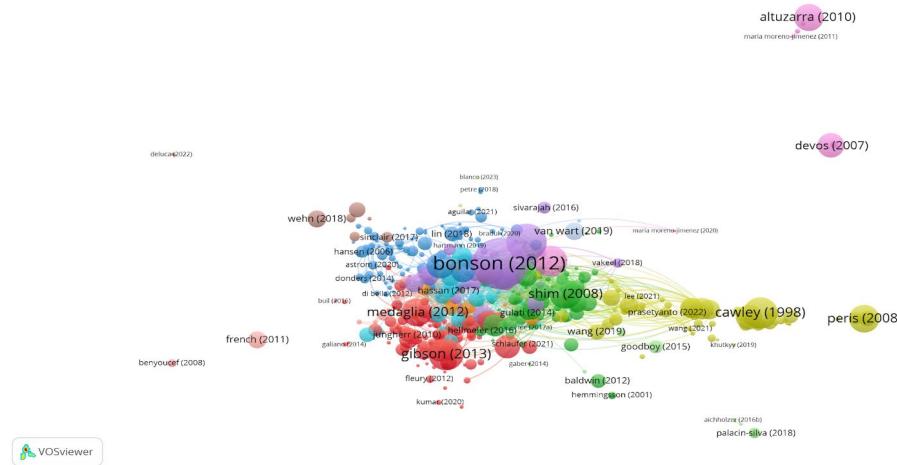
Figure 8. Bibliographic Coupling Networks of Documents

4.8. Bibliographic Coupling Analysis of Authors

The essence of bibliometric coupling lies in the assumption that a series of academic works sharing one or more common sources have a meaningful relationship with each other. The bibliography of publications is seen as a way to understand the scientific environment in which the author operates, and the presence of a similar bibliography in two articles implies a relationship between them (Kessler, 1963). For instance, if two studies, X and Y, cite the same study A and/or B, it indicates the existence of bibliographic coupling between A and B. The stronger the relationship between X and Y, indicated by the number of shared citations to the same study, the stronger the relationship between A and B (Egghe and Rousseau, 2002).

In line with the purpose of conducting bibliographic coupling analysis of authors, a detailed analysis was carried out among 1403 units selected based on the criterion of having published at least one work and receiving at least one citation out of 1745 authors. The analysis revealed 37 clusters, 116456 links, and a total link strength of 39911, as visualized in Figure 9. In the analysis, the author with the highest bibliographic coupling was Sonia Royo, with 11 publications and a total link strength of 8058. The other top authors with the highest bibliographic coupling were Enrique Bonson with 2 publications, 763 citations, and a total link strength of 1577; Lourdes Torres with 5 publications, 523 citations, and a total link strength of 2691; and Francisco Flores with 1 publication, 499 citations, and a total link strength of 490.
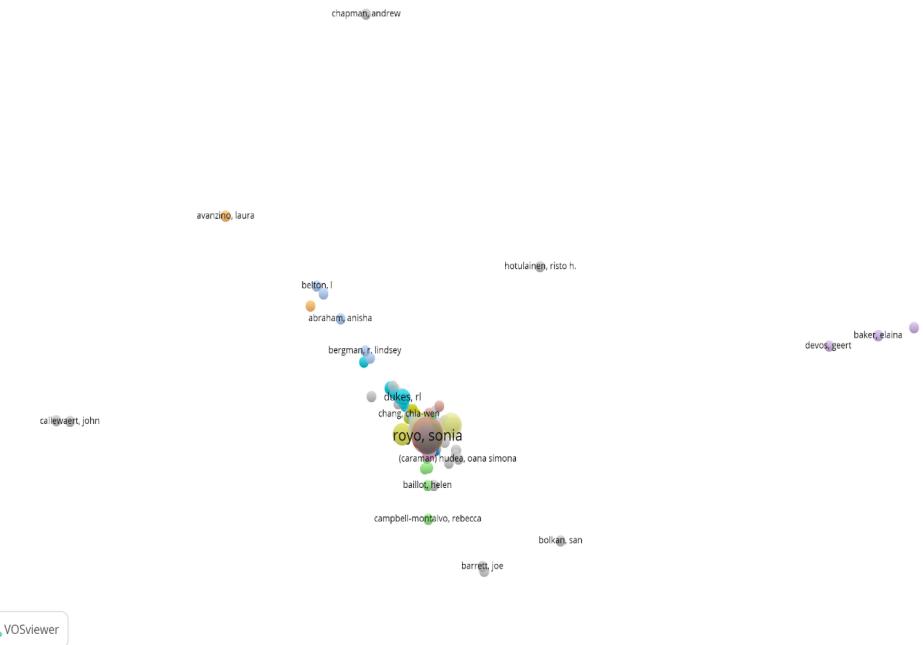
Figure 9. Authors' Bibliographic Coupling Networks

4.9. Co-Citation Analysis of Cited Authors

VOSviewer allows for the analysis of co-citation, co-reference, and co-authorship, enabling the examination of relationships between cited authors. In this context, the mapping presented here focuses on the co-citation analysis of authors as part of the bibliometric analysis and trends of publications related to the "e-participation" concept in the Web of Science database. Co-citation analysis is based on measuring the relationship between cited publications, defined as the frequency of two scientific works citing the same reference (Baker, 1990, p. 7; Small, 1973, p. 265). Citation analysis is associated with identifying primary publications in a specific field of study (Zitt and Bassecoulard, 1994). The number of source documents citing a pair of reference publications becomes a measure of the relationship between the cited pair. To have a strong co-citation measure, two publications need to be cited together in many source documents. Co-citation strength, i.e., the frequency with which two documents are cited together, may change over time as new source documents are published (Baker, 1990, p. 7). Although co-citation analysis bears similarities to bibliometric coupling, it differs because co-citation analysis can vary over time, whereas bibliometric coupling is permanent and remains unchanged over time as it is based on the shared references in the matched works (Jarneving, 2005, p. 248). For instance, when two scientific publications, X and Y, are cited by studies A and B, it indicates that X and Y share a co-citation and are related.

In the analysis conducted in VOSviewer on authors who received at least 10 citations among 19913 authors for whom co-citations were made on the topic of "e-participation," a total of 355 units with connections were analyzed. The analysis revealed 6 clusters, 25714 links, and a total link strength of 84290, as shown in Figure 10. As depicted in the figure, the author with the highest co-citation is Macintosh A, with 232 citations and a total link strength of 4675.
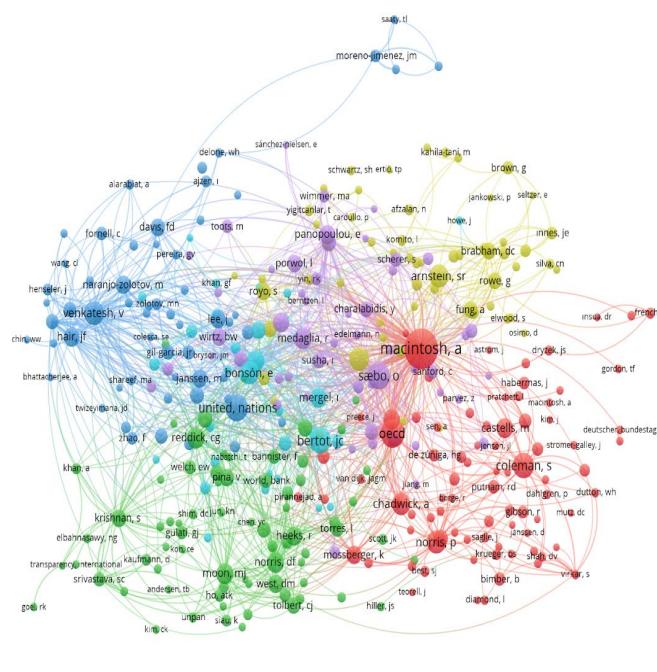
Figure 10. Links Between Co-cited Author

5. Conclusion

The aim of this study is to conduct a systematic examination of articles related to the concept of e-participation published in the Web of Science database using a bibliometric approach. The main motive behind these analyses is to map the development of the existing literature, identify the most influential journals, authors, and articles on the subject, and conduct bibliometric coupling analyses of documents and authors. The concept of e-participation, considered a prerequisite for e-democracies, signifies the citizen's more active, transparent, and easier involvement in political processes through the contribution of information and communication technology (ICT). Furthermore, e-participation through ICT is evaluated as a valuable tool for repairing waning interest in participation in democracy and democratic processes. This study sought to answer the following questions: How are the articles published between 1991 and January 30, 2024 distributed by years and journals? What is the level of citations received by publications, institutions, and authors? Which keywords are frequently used together in studies? What is the level of collaboration among authors? What are the bibliographic coupling networks of texts, the bibliographic coupling networks of authors, and the co-citation network maps of authors like?

It can be said that the concept of e-participation, which corresponds to the involvement of citizens in policy and decision-making processes through evolving information and communication technologies, has gained importance in recent years. In the research conducted within the scope of this study, it was determined that studies on the concept of e-participation intensified from the 2000s onwards compared to previous years. Undoubtedly, the increasing interest in this concept is greatly influenced by the significant role of information and communication technologies in our lives.

In the study, a search conducted on January 30, 2024, in the WOS database using the keyword "e-participation" across all fields revealed 783 articles, 428 proceeding papers, 156 book chapters, 24 review articles, 21 early access articles, 18 editorial materials, 3

books, 2 book reviews, 1 note, and 1 retracted publication published between 1991 and January 30, 2024. A summary of the results obtained from the 783 journal articles published in interdisciplinary fields is provided in Table 5 in the VOSviewer program as part of the research. The first column in the table represents the type of analysis conducted, the second column specifies the criteria set for each type of analysis, the third column presents the results obtained, and the last column provides numerical values for the results.

Table 5. Results in Bibliometric Mapping

Type of Analysis	Criteria	Results	Numerical Values
Most Published Field	-	Public Administration	175 articles
Most Indexed Field	-	SSCI	325 articles
Top Contributing Country	-	USA	140 articles
Most Published Journal	-	Government Information Quarterly	43 articles
Most Published Author	-	Sonia Roya / University of Zaragoza	11 articles
Most Cited Author	At least 2 publications and 2 citations	Sonia Royo / University of Zaragoza	916 citations
Most Cited Country	At least 1 publication and 1 citation	USA	3638 publications
Most Cited Institution	At least 2 publications and 2 citations	University of Zaragoza	1081 citations
Most Used Keyword(apart from E-participation)	Seen at least 3 times	e-government	115 repetitions
Most Bibliographic Coupling Text	Received at least 1 citation	Enrique Bonson	4499 citations
Authors with Most Bibliographic Coupling	At least 1 publication and 1 citation	Enrique Bonson	2 publications, 763 citations
Most Co-cited Author	Received at least 10 citations	Ann Macintosh	232 citations

The study conducted using VOSviewer on the concept of e-participation contributes theoretically to the literature by systematically gathering existing information and determining general trends related to the topic. Based on the inevitable increase in the influence of information technology, it can be predicted that the importance of the concept will further escalate in the future. In this regard, this study provides a snapshot of the scattered literature on e-participation, offering a roadmap to researchers working in the field.

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