

## Bibliometric analysis of studies on controversial issues<sup>1</sup>

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### Abstract

Controversial issues are complex issues where societies face dilemmas. When controversial issues come to the agenda, an environment that can cause polarization in society can be created. Therefore, controversial issues are seen as taboo topics in educational settings. However, both international non-governmental organizations and academic studies show that bringing controversial issues into the classroom environment develops higher-order thinking skills. There are many controversial topics in history, social studies, and science courses. Studies on controversial issues show changes in the perspective on controversial issues. Rather than whether or not these topics should be included in the classroom, studies on why it is important to include these topics, how they should be included, and solutions to overcome the obstacles encountered stand out today. This study aims to reveal the trends of the studies on controversial issues based on quantitative data. In addition, the study aims to provide researchers with a systematic summary of the studies on controversial issues using bibliometric analysis and to reveal the trends and gaps related to the concept. As the unit of analysis, the bibliometric data of the studies scanned in the Web of Science database and published between 1980 and 2024 were taken into consideration. Looking at the distribution of 680 studies on controversial issues according to the years of publication, it is seen that there has been an increase in the number of studies on controversial issues in recent years.



## 1 Introduction

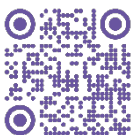
Social and political problems are diversifying and increasing day by day worldwide. These problems faced by societies lead to conflicts and harm democratic processes. Bringing controversial issues into the classroom is one of the important tools for teachers in fighting against these negative effects (Pace, 2021). Controversial issues are the ones that evoke strong emotions in people, are suitable for being addressed from different perspectives, and, as such, tend to divide society; they are dilemmatic, highly complex and have no single solution (Kerr & Huddleston, 2015). Controversial issues are those that people constantly encounter in their lives. Technological developments directly impact the status of controversial issues on the agenda.

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Online tools expose people to too much information in a very short time. We are in the information age, but serious public opinion is quickly shaped by the spread of misinformation through social media tools (Zimmerman & Robertson, 2017). By their very nature, controversial issues are conducive to creating disinformation. We often see the rapid spread of misinformation on social media about current controversial issues, which have become a hot topic. The disinformation seen during the pandemic is an example of this. In our age, it is very easy to access information, but it is difficult to access correct information; this is even more difficult for controversial issues. This is because controversial issues involve discussions on subjects generally accepted in society. With teachers' guidance, students can acquire the skills to reach the correct information and deal with controversial issues. In this way, students can also acquire the skills aimed at the curriculum.

Controversial issues provide students with many skills, such as critical thinking, problem-solving, decision-making, and empathy. However, research shows that teachers' attitudes towards bringing controversial issues into the classroom are negative (Öztürk & Kuş, 2019). The reasons for this negative attitude are fear of failing to complete the topic, complaints from parents, fear of losing control of the classroom, pressure from the school administration on the teacher, and fear of being complained about as controversial issues have a political structure (Aynuz & Memişoğlu, 2022; Yazıcı & Seçgin, 2010). However, many issues on the agenda are controversial. Being reluctant to address the issues that students encounter in their daily lives in the classroom will prevent children from talking about these issues without reservation in the future. We want children to be the future elders who follow current affairs, are sensitive to social problems, and are part of the solutions to these problems; keeping them away from controversial issues is undermining our goals. Controversial issues should be addressed in the classroom using various methods and techniques. Using different discussion methods and techniques in dealing with controversial issues increases learning sustainability. Discussion methods play an important role in creating a democratic classroom environment. Discussion is also a dialogue process that teaches students to tolerate different opinions (Hess, 2009). Teachers often prefer discussion methods because these methods teach students to respect and tolerate different opinions and actively involve students in the process (Hand & Levinson, 2012). Discussion methods are effective in teaching controversial issues but are not the only method.

Controversial issues are those that numerous people discuss without reaching a clear conclusion (Oulton et al., 2004). Issues such as migration, refugees, climate change, wars, cyber-attacks, artificial intelligence, and animal rights are controversial. However, some of these topics can be seen as taboo topics, i.e. topics that are not allowed to be discussed. The fact that controversial topics, which contribute to the development of many high-level skills in students, are also considered taboo makes the work of teachers difficult. It places them in a position of respect on the one hand and in need of protection on the other (Zimmerman & Robertson, 2017). This situation affects the tendency of the studies addressing controversial issues. It can be argued that including controversial issues in the classroom improves many high-level skills, such as critical thinking, empathy, decision-making, and problem-solving. Therefore, it is emphasized that controversial issues should not be considered taboo (Al Badri, 2015; Harwood & Hahn, n.d.; Hess, 2008, 2009; Oulton et al., 2004; Pace, 2021; Zimmerman & Robertson, 2017). In addition to academic studies on controversial issues to develop students' higher-order thinking skills, there are also important studies conducted by international non-governmental organizations. The European Association of History Educators (Euroclio) encourages teachers to develop their students' critical thinking skills and multiple perspectives, to include controversial issues in their teaching, and provides training for social sciences and history teachers (Euroclio, 2020; Mogutov & Wansink, 2023). Similarly, Oxfam supports teachers in helping students develop higher-order thinking skills, discuss their ideas freely, and raise them as active global citizens (Oxfam, 2006). The studies that support introducing controversial issues into the classroom also impact the studies on controversial issues, which are included in the literature. Determining the status of studies on controversial issues is important for understanding this situation. In addition, one of the most important contributions of bibliometric studies to the literature is that they provide solutions to researchers by revealing current practices and shortcomings related to the topic. From this point of view, this study aims to examine the studies on controversial issues in terms of different variables and to determine the

trends. To this end, the following questions were addressed: What is the distribution of studies on controversial issues in the Web of Science database according to years, document type, countries, co-authorship status of authors, frequency of use of keywords, citation of journals, and bibliometric coupling of authors?

## 2 Method

Bibliometric methods present the quantitative analysis of scientific studies in a visual network (Ellegaard & Wallin, 2015). Bibliometric analysis was born out of the need to evaluate scientific studies and share them with interested parties (Ellegaard & Wallin, 2015, p. 1812). They make an important contribution to the development of the field by identifying gaps in the field and providing researchers with new ideas (Donthu et al., 2021); they allow the accumulation of scientific studies' outputs for later scientific studies. This accumulation reveals an intellectual structure that provides a holistic and systematic understanding of any scientific field (Shafique, 2013). In this study, the bibliometric analysis technique was used. This technique reveals scientific studies' bibliometric and intellectual structure (Donthu et al., 2021). In this way, the impact of researchers, studies, and resources on each other regarding controversial issues is presented to the readers through visual mapping.

To find studies on controversial topics, "Controversial issues," "controversial topics," "teaching controversial issues," or "unplanned controversial issues" were searched in the Web of Science database. The search was performed on the "keyword," "title," and "abstract" fields of the documents. As a result of this search, 4,464 documents were found. However, as they included documents from different fields, such as medicine and engineering, the search was narrowed using "Education/Educational Research". This process resulted in 680 documents. The study is limited to the Web of Science database.

### 2.1 Data analysis

The documents retrieved from the Web of Science database were transferred to VOSviewer, and bibliometric analyses were performed. VOSviewer is a program designed for bibliometric analysis (Jan van Eck & Waltman, 2012). The data were analyzed according to years, document type, keywords most used, researchers, and countries with the most publications.

## 3 Findings

This part of the study presents bibliometric analyses of data obtained from the Web of Science database.

### 3.1 Analysis of studies on controversial issues by years

As can be seen in Figure 1, studies on controversial issues in education have been appearing in the Web of Science database since 1980.

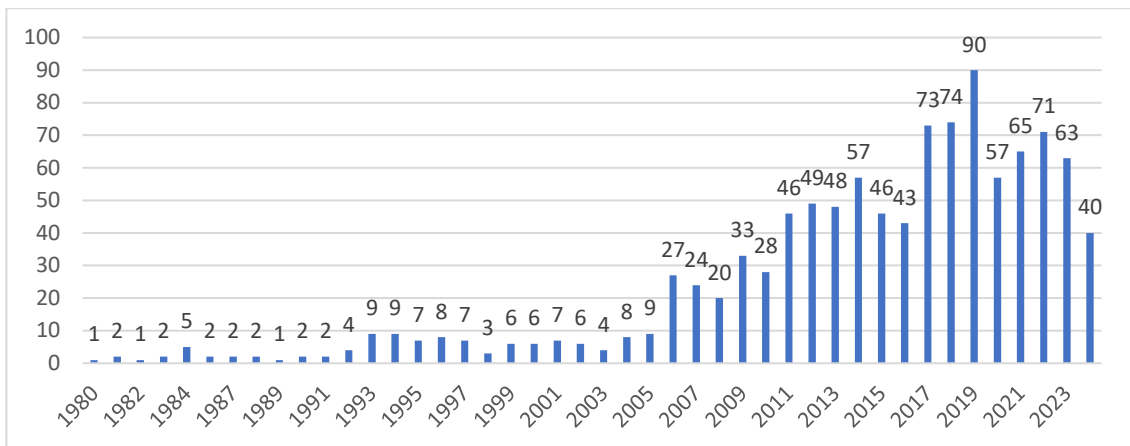


Figure 1 Analysis of studies on controversial issues by years

An increase has been observed in studies on controversial issues since 2006. The countries that are influential in this increase are the USA and the UK. In Turkey, studies on controversial topics have been carried out since 2008.

### 3.2 Analysis of studies on controversial issues by document type

The majority of the studies consist of articles (856). The Web of Science database also includes papers and book chapters on controversial issues.

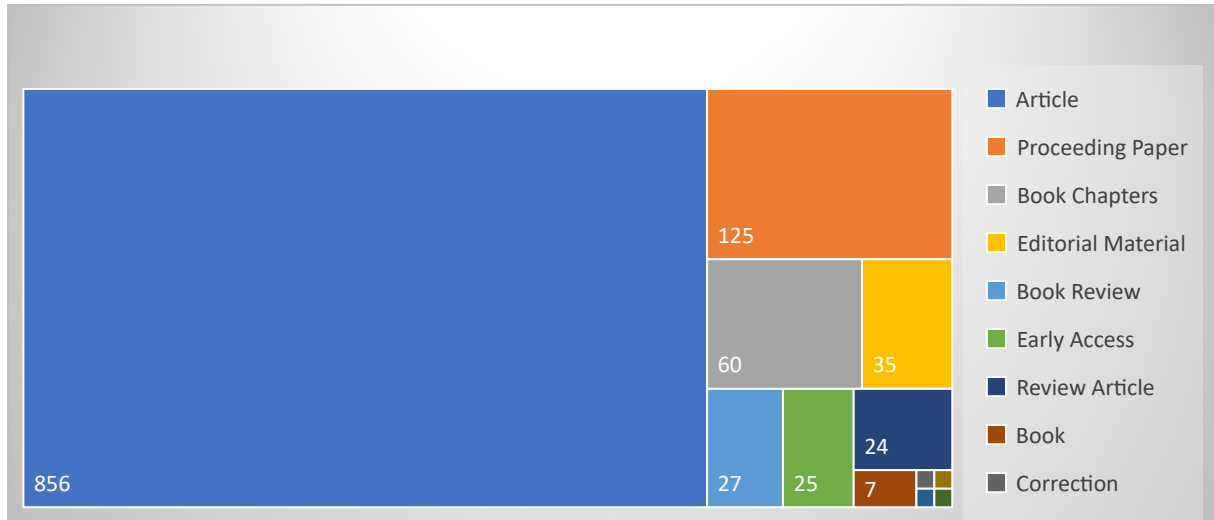


Figure 2 Analysis of studies on controversial issues by document type

### 3.2 Co-authorship analysis of studies on controversial issues by country

The analysis unit formed as having at least one document and not necessarily cited had 10 clusters and 47 items. The trend towards studies on controversial issues in education was observed to be highest in the USA (284). It is followed by Spain (88), England (83) and China (53). Regarding the cooperation between countries, the USA (39) and the UK (38) are the countries with the most cooperation. Germany (26) and Turkey (26) were also observed to attach importance to collaborative studies with other countries.

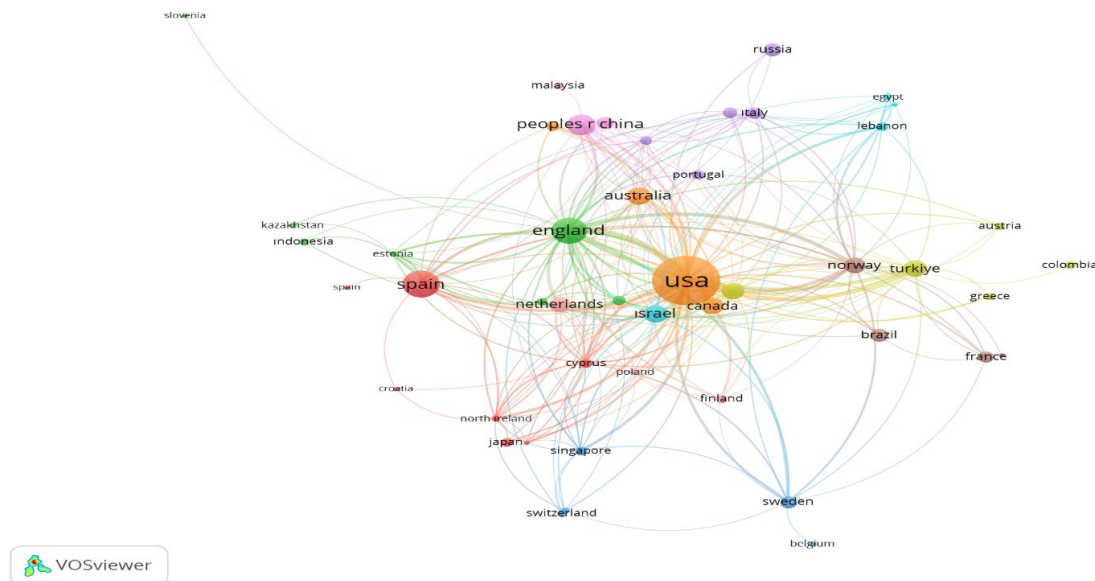


Figure 3 Co-authorship analysis of studies on controversial issues by country

### 3.4 Co-authorship analysis of studies on controversial issues by author

The analysis unit formed as having at least one document and not necessarily cited had 10 clusters and 54 items. A cluster of 10 authors appeared in the center; 10 authors co-authored with 54 authors. The author with the most co-authorship is Braten, Ivar (11). Braten Ivar is the author who collaborates the most among the studies on controversial issues. He is followed by Sinatra, Gale M. (10), Krista Muis (10), and Anderson, Richard C. (10). Of these four authors, Krista Muis has worked with three other authors except Richard Anderson.

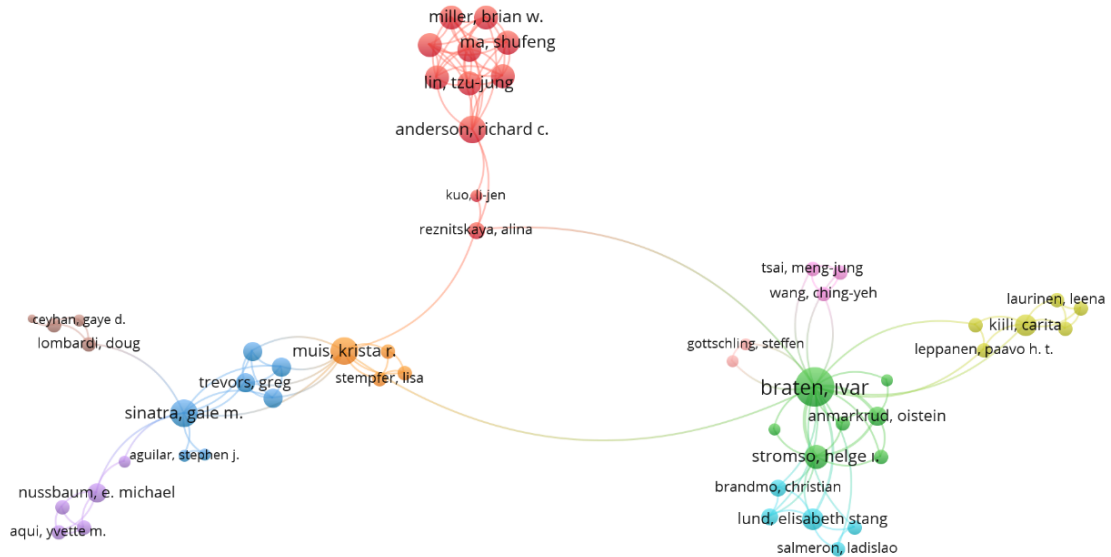


Figure 4 Co-authorship analysis of studies on controversial issues by author

### 3.5 Analyzing the studies on controversial issues according to keyword usage frequency

A total of 2,434 different keywords were used in the studies. The words repeated 5 times or more were included in the analysis to see the most repeated keywords. The relationship between the 77 most repeated words was analyzed. 77 words formed 7 clusters. The most frequent keyword in the studies on controversial issues is "Controversial Issues" (98). This keyword (Controversial issues) is also related to the 49 most used words. "Citizenship Education" (41) is the second most frequently used word in the studies. The other most frequently used keywords in the studies are "Social Science Issues" (40), "Higher Education" (28), "Argumentation" (24), and "Argumentation /Controversy" (24). It can be said that studies on controversial issues focus on citizenship education and higher education. In addition, researchers have often associated argumentation with controversial issues. Researchers also focused on controversial social science issues. Regarding the frequency of keyword associations, controversial issues are most frequently associated with social sciences, citizenship education, argumentation, and environmental education. This shows a strong tendency towards controversial issues in social sciences education. Concerning studies on controversial issues in recent years, it can be seen that issues related to social justice, teacher education, and citizenship education have been studied more.



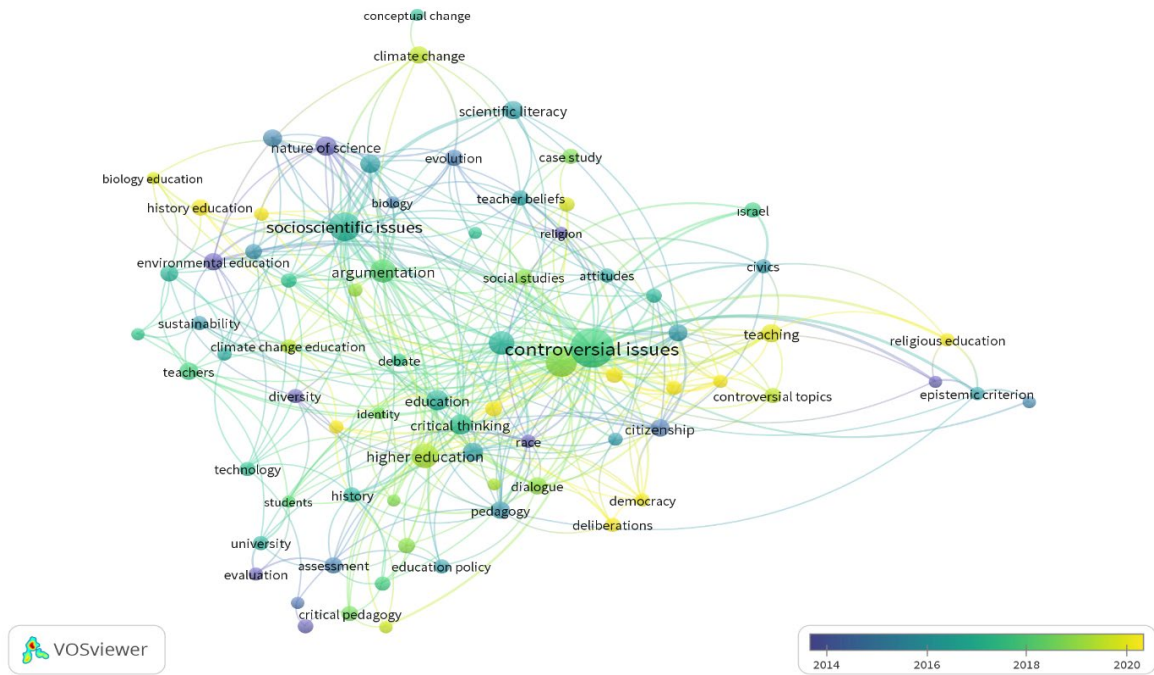


Figure 5 Analyzing the studies on controversial issues according to key words usage frequency

### 3.6 Citation analysis of the sources in which studies on controversial issues are published

The studies were published in a total of 477 journals. Journals with at least 50 citations were included in the analysis to see the citation difficulties of the journals. Thus, the analyses were based on 58 journals. The most cited Journal is the International Journal of Science Education (1,660). This journal contains 36 studies on controversial topics. The other most cited journals are Science Education (1268), with 29 studies; Journal of Research in Science Teaching (1212), with 16 studies; Educational Technology Research and Development (734), with 2 studies; and Theory and Research in Social Education (584) with 35 studies. This output can be considered when selecting journals for studies on controversial topics. Regarding the strength of the connections between the journals, the connection between the International Journal of Science Education and the Journal of Research in Science Teaching and Science Education is strong, showing that these journals are intellectually related.

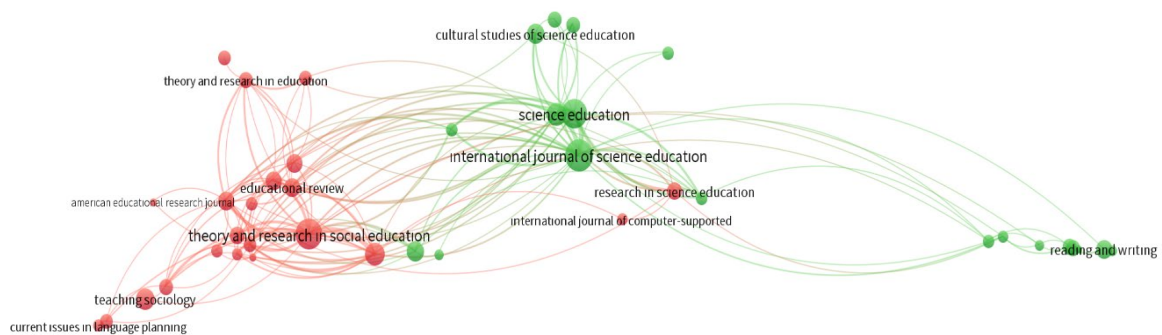


Figure 6 Citation analysis of the sources in which studies on controversial issues are published

### 3.7 Bibliometric coupling of authors of studies on controversial issues

The authors' bibliometric coupling analyses were done by creating an analysis unit including documents

with at least 50 citations. After this restriction, a total of 58 documents were analyzed. Regarding the authors' bibliometric analysis coupling, 7 clusters of 58 items were formed. The studies with the most bibliometric couplings are the two studies by the same author in the same year. These are the studies by Rola Khishfe (2012a and 2012b). The number of couplings (29) between the references of the two studies by the same author is high. The bibliometric couplings (16) of Stein Dankert Kolsto's studies (2000 and 2001a), published one year apart, are also high. Both Kolsto studies are related to citizenship, and both Khishfe studies are related to the nature of science. This similarity is because the subjects' knowledge bases and intellectual structures are similar.

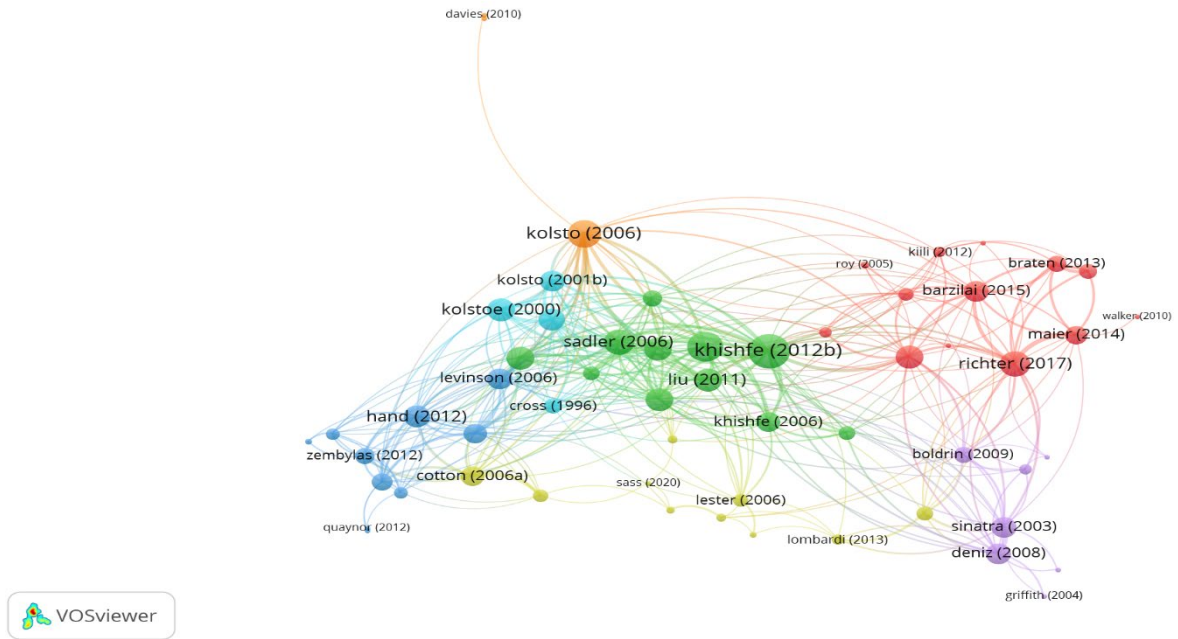


Figure 7 Bibliometric coupling of authors of studies on controversial issues

#### 4 Conclusion and discussion

Controversial issues are on almost everyone's agenda. These issues on each nation's agenda are different and can change over time. For example, in Turkey, issues such as refugees, natural disasters, multiculturalism, and animal rights were not the main controversial issues discussed 15 years ago (Yazıcı & Seçgin, 2010). However, they have become controversial issues that society prioritizes and talks about with the change in the agenda due to political, social, economic, or scientific reasons. The geographical positions, policies, forms of governance, and cultural structures of countries shape the perspective and content of controversial issues.

The trends in controversial issues have increased significantly since 2006. Many reasons are likely to affect this increase, including initiatives on climate change and environmental issues, changes in identity policies (gender equality, disability rights, freedom of religion and belief, multiculturalism), increased interaction between societies, the widespread use of social media, the economic crisis that started in the US in 2007 and spread around the world in a short time. The clusters of the studies carried out since 2011 also reflect this situation. There was no clustering around the keyword "controversial issues" until 2011; however, since 2011, clusters appeared around controversial issues with the keywords "social science issues," "democratic citizenship," and "citizenship and democracy." The keywords associated with controversial issues are changing today. Social justice, global citizenship education, religious education, climate change, democracy, and social studies have recently been the most popular topics. This situation shows a trend for teaching controversial issues, and the topics change in parallel with current issues. The researches such as global

warming, climate change; (Boss, 2018; Espeja & Lagarón, 2015; Herman et al., 2018; Kim et al., 2019; Nuangchalerm & Kwuanthong, 2010; Wang et al., 2018; Yahaya et al., 2012) homosexuality, religious education (Hammer, 2023b, 2023a; Hammer & Lenz, 2024); global citizenship (Davies, 2006; Myers, 2006; Oxfam, 2006) are examples of the reflection of this change.

Studies on controversial issues in the field of education were mostly conducted in the USA, which is also related to the fact that the tendency to study controversial issues started in the USA. In addition, the fact that the researchers who publish the most publications are also in the USA has an effect. In the first half of the 20th century, studies conducted in the USA on the teaching of controversial issues and the relationship between the inclusion of controversial issues in the classroom and democratic participation (Edgerton, 1944; Kehoe & Stephenson, 1950; Turner, 1936) are important in terms of indicating the starting point of this trend.

An analysis of the journals with the most published and cited studies on controversial topics shows that these journals are in natural sciences and social sciences. This situation is consistent with the fields of studies on controversial issues. Studies on controversial issues in education are generally carried out in natural sciences and social sciences. However, it can be said that a controversial issue (global warming, pollution, nuclear power plants) can be the subject of both natural sciences and social sciences, which is also related to the nature of the controversial issue.

This research is limited to the controversial topics retrieved from the Web of Science database.

## 5 Statement of Researchers

### 5.1 Researchers contribution rate statement:

Özlem Elvan: Introduction, methodology, review, and editing.

Durdane Öztürk: Review, editing, and editing.

### 5.2 Conflict statement

The authors of the article have no personal or financial conflicts of interest within the scope of the study.

### 5.3 Support and thanks

This study was presented as a paper at the 12th International Symposium on Social Studies Education (USBES 12) held between May 20-22, 2024.

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