

## Bibliometric Analysis of Published Articles on the Satisfaction Level of Distance Education during the Covid 19 Pandemic

Research Article

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### ABSTRACT

During the Covid 19 pandemic, which has a global impact, there has also been a great change in education systems. The level of satisfaction with the distance education applied in this process has had an important effect on the success of the students. The research aims to examine researches that deals with the satisfaction level of distance education applied in the covid 19 process (2019-2021) with bibliometric analysis. In the study, articles (n=107) obtained from the Scopus database were examined. The analysis of the data was carried out with the Vosviewer social network analysis program. At the end of the research, it was found that the articles which examined the level of satisfaction with distance education were generally carried out in the fields of medicine, computer sciences, and social sciences. It was determined that researches are mostly carried out in countries such as the USA, China, Saudi Arabia, England, and Canada. When the data were also analyzed by bibliometric analysis, it was found that the keywords are networked with words such as a pandemic, online learning, distance education, satisfaction, e-learning, higher education, online education concerning the word Covid 19. Also, it was determined that the abstracts of the articles were grouped in four clusters and the collaboration between the authors in three clusters. Since the Covid 19 pandemic continues to show its effect worldwide, it was thought that the number of researches on distance education applied during the pandemic process will increase in the coming years. In this context, it would be appropriate to focus on meta-analysis studies and literature reviews that holistically examine researches. In addition, bibliometric studies examining the quality of distance education in different disciplines, expectations, attitudes, satisfaction and successes of students, faculty members and other stakeholders in the process can also be brought into literature.

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### Keywords:

Covid 19 pandemic, distance education, satisfaction level, bibliometric analysis

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## Introduction

Before 2020, the reason for the implementation of distance education was generally the distance of the students from the education environment or the lack of education opportunities. With the year 2020, schools had to take a break from face-to-face teaching and switch to online distance learning, albeit for a while, in order to slow the spread of the Covid-19 pandemic (MacKenzie, 2020). The Covid-19 pandemic has caused us to give real liquidity to distance education. Different countries have achieved varying degrees of success in this process. Although the functioning of universities in Europe and Turkey during the Covid 19 process is different, it has been observed that the selected methods and service providers are the same. The factors that are important in the transition to the distance education process; qualified manpower, rate of technology literacy, technological infrastructure status, emergency action plan management (Dikmen & Bahçeci, 2020). Distance education, above all, has many advantages such as easy access to course resources, the ability to constantly check students' knowledge, an opportunity for students to instantly test what they have learned, enabling students to learn at their own pace, promoting collaborative learning and an unmediated communication between the lecturer and the learner (Pregowska, Masztalerz, Garlińska, & Osial, 2021). In addition, the models used in distance education impose more responsibility on learning than traditional education models. For this reason, according to the distance education model used, the distance education student can reach the goals in education by acting in accordance with the student roles (İşman, 2011). In the distance education process, which has such advantages, the satisfaction levels of my students are closely related to the quality of the education provided. However, reasons such as insufficient education given at universities in distance education, lack of knowledge about online course design, doubts about the concept of online classroom, and lack of theoretical and empirical research on course design principles for online instructors can be counted as factors that reduce the quality of distance education (McCombs & Vakili, 2005).

Distance education creates a positive effect on student satisfaction by eliminating the inequality of opportunity because the distance between the students' homes and the nearest school is too far or the fees charged by the education courses are too high. It overcomes geographical and demographic challenges and offers everyone an equal chance regardless of their culture, gender and religious background (Pregowska, Masztalerz, Garlińska, & Osial, 2021). In order to increase student satisfaction, institutions that provide distance education should follow technology closely, avoid providing a standard education service to their students and offer more effective services to satisfy students. Because the use of information technologies, which have become a part of our daily life, in distance education has also become inevitable (Eygü, & Karaman, 2015). Students studying in online distance education programs should be provided to interact with various components such as chat, discussion board, private messaging or face-to-face interaction in order to feel belong to the group and prevent social isolation. This situation reflects positively on the success and satisfaction of the student (İlgaz & Aşkar, 2009). Another factor affecting student satisfaction is the faculty member's ability to evaluate the distance education process effectively and efficiently. Distance education was seen as the most appropriate remedy to continue learning processes in epidemics, wars, and emergencies such as the Covid-19 outbreak. Resources to address technical and infrastructure deficiencies are a major shortcoming for the implementation of distance education. Therefore, for the successful implementation of distance education, technological, financial, institutional, barriers must be removed (Al-Balas., Al-Balas, Jaber, Obeidat, Al-Balas, Aborajoo, Al-Taher & Al-Balas (2020). When learners have the skills to use online devices, they can enjoy online teaching more when they perceive distance education as a helpful and responsive way of learning, communication, and cooperation. As a result, this level of satisfaction seen in students will lead to a higher level of participation, learning, and success in the distance education environment (Sahin & Shelley 2008). Similarly, studies of attitude towards distance education show that as the number of channels offered increases, students have a more positive attitude towards their experiences (Williams, Nicholas, & Gunter, 2005). The development of distance education depends on many factors such as the perception of students,

teachers, and employers, and the transformation of thought. In such cases, the openness of students to innovations, the continuous improvement of teachers' qualifications, and the willingness of employers to hire personnel who have received online training will further increase the value given to distance education (Shaytura, Minitaeva, Ordov, Gospodinov & Chulkov, 2020). Finally, Lee (2001) stated that faculty motivation and commitment to distance education are generally strong. However, he/she argues that improving teaching support in terms of student satisfaction can further increase faculty motivation and commitment.

## **Literature Review**

It is striking that distance education studies include the studies of different field experts as well as the field of educational technology. Achievement attitude and satisfaction, appear as important variables in research. Comparative studies are more prominent in studies (Horzum, Özkaya, Demirci, & Alpaslan, 2013). In their meta-analysis study, Allen, Bourhis, Burrell & Mabry (2002) stated there was no significant difference between the satisfaction levels of students towards traditional teaching and distance education methods. This situation showed that the distance education application, whose importance was increasing rapidly with the spread of technology today, is evaluated positively for students. Chang & Smith (2008) stated that in addition to the interactions between student, instructor, and content, gender, and online infrastructure characteristics also affect satisfaction in the distance education process. According to Harsasi & Sutawijaya (2018), the design of the distance education environment and the flexible planning of the course are important variables that affect the success of online learning, which can be effective in increasing the competency levels of the participants. When the satisfaction level of students towards distance education is examined, it was seen that they generally display a positive approach, including medical education (Fatani, 2020). However, the vast majority of students prefer a hybrid learning model rather than just online learning (Sindiani, Obeidat, Alshdaifat, Elsalem, Alwani, Rawashdeh, ... & Tawalbeh, 2020).

Similarly, Talib, Bettayeb & Omer (2021), who analyzed studies examining student opinions during the Covid 19 process, states that online education is found to be satisfactory, beneficial, and effective by students and teachers. However, some participants expressed concerns about the effectiveness of distance learning, the unpredictability of the future, and the long-term consequences of these technological developments in health, education, and safety. Similar to this research, Davies, Howell, & Petrie, (2010) in their study in which they reviewed distance education research conducted by graduate students between 1998 and 2007, determined that the research generally addressed the perceptions and satisfaction levels of participants with a certain distance education experience. He, Yang, Xu, Ping, Li, Sun, ... & Zhang (2021), in their meta-analysis study comparing distance education and traditional education, found that online distance education is not significantly different from traditional education and students have a higher level of satisfaction. When we look at the studies on distance education in general, it was seen that the satisfaction level of the majority of the participants is high.

During the Covid 19 pandemic, which has a global impact, there has also been a great change in education systems. The level of satisfaction with the distance education applied in this process has had an important effect on the success of the students. For this reason, it is important to take comprehensive measures and implement appropriate regulations as a result of the results of the studies examining the satisfaction levels of students in a collective way. There was no study in the literature collectively examines the satisfaction level researches for the Covid 19 process. In addition, large-scale and global evaluation of the factors affecting the level of satisfaction is considered important in revealing the relationship between the field of education and technology and evaluating the applicability of the technology in education. In this context, it is expected that the study will make an important contribution to the literature. This research aims to examine the researches that deal with the satisfaction level of distance education applied in the Covid 19 process with bibliometric analysis. This study tries to answer to the following questions.

1. What is the distribution of the articles written about the satisfaction level for distance education in the Covid 19 process according to the subject areas?
2. What is the distribution of articles written about the level of satisfaction for distance education in the Covid 19 process by years?
3. What is the distribution of the articles written about the satisfaction level for distance education in the Covid 19 process by countries?
4. What are the journals with the most articles about the satisfaction level for distance education during the Covid 19 process?
5. What is the distribution of the articles written about the satisfaction level for distance education in the Covid 19 process according to the languages in which they are published?
6. What is the status of the articles written about the satisfaction level for distance education in the Covid 19 process in terms of multi-authorship?
7. What is the rate of keywords in the titles in the articles written about the satisfaction level for distance education during the Covid 19 process?
8. What is the rate of the keywords in the articles written about the satisfaction level for distance education in the Covid 19 process?
9. What is the country cooperation distribution according to the authors of the articles written about the satisfaction level for distance education in the Covid 19 process?

## **Method**

### **Model of the Research**

In this research, bibliometric analysis was used within the scope of data mining to analyze the articles on the satisfaction level for distance education applied during the Covid 19 process. Bibliometric analysis is a method that can use many analysis techniques such as co-entity, co-citation, co-author, bibliographic matching (Nova-Reyes, Muñoz-Leiva, & Luque-Martínez, 2020). Thanks to this analysis technique, influential authors, publications and prominent journals, countries and institutions on a particular subject can be determined. For this reason, those who want to follow the characteristics and development process of scientific outputs in a particular research area can apply this analysis method (Kurutkan & Orhan, 2018). The titles, abstracts, keywords, and collaboration between the authors of the article (n=107) obtained within the scope of this research were analyzed.

### **Article Selection Process and Including Criteria**

Since the number of articles written in the field of distance education is very high, some criteria were taken into account in determining the number of articles included in the research. In this process, only studies with the title of satisfaction with distance education applied during the Covid 19 process (2019-2021 years) were used. Articles suitable for the scope of the research were obtained using the Scopus database. Scopus database includes many databases such as Elsevier, Sage, Springer, and Taylor & Francis (Mongeon & Paul-Hus, 2016). Within the scope of the research, it was first entered into the Scopus database on 03.07.2021 and searched according to the determined criteria. Published articles were included in the scope of the research with the words distance education and satisfaction in the title between the years 2019-2021. (TITLE (Covid 19 AND satisfaction) AND ABS ( articles ) ) AND PUBYEAR > 2018 AND PUBYEAR < 2022 AND ( LIMITTO ( PUBSTAGE , "final" ) ) AND ( LIMIT TO ( OA , "all" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) ) AND ( LIMIT-TO ( SRCTYPE , "j" ) ) articles with the concept of covid 19 and satisfaction in the title and abstract in the last three years were filtered out. A total of (n=140) articles, conference proceedings, letters, reviews, and book chapters were obtained. When only the articles were classified (n=107), the article was reached.

### Analysis of Data

Analyzes were performed using the VOSviewer statistical program. The main reason for choosing the VOSviewer program in this study is that distance-based and graphic-based maps used in scientific mapping techniques can be prepared by the program. With the VOSviewer program, which is a text mining application, a bibliometric analysis of journals, analysis of certain subject areas, analysis to determine the word density in studies, analysis of the content of websites, analysis of student performances, analysis of theses and co-authorship can be performed. With VOSviewer, studies can be created in which the subject distributions of the journals are determined according to the years (Artsin,2020).

### Results

Between the years 2019-2021, 107 articles about the satisfaction level for distance education were reached during the covid 19 pandemic process. The distribution of the articles by subject areas, years, countries, journals in which they were published, and publication languages are presented respectively.

**Table 1.** Distribution of articles within the subject areas

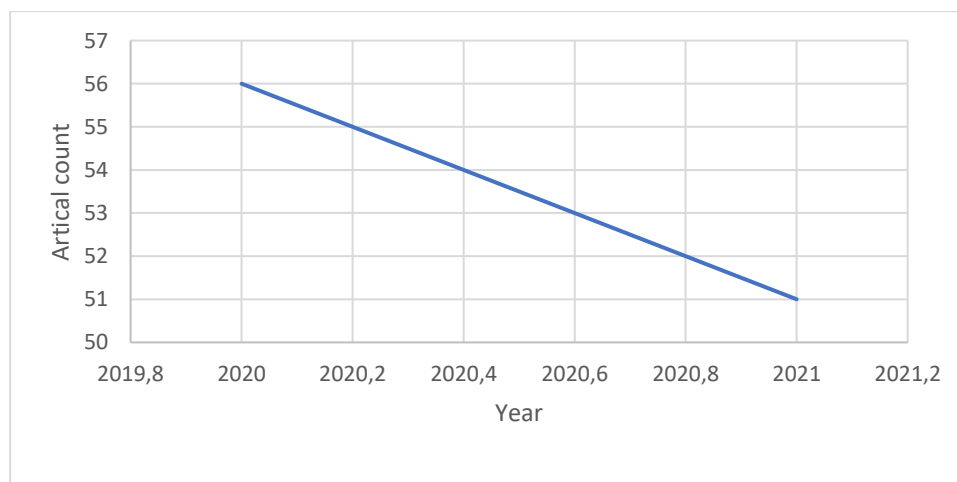
Subject Area	n
Social Sciences	46
Medicine	44
Computer Sciences	10
Other areas	7

When the satisfaction surveys designed for the quality of distance education applied worldwide during the Covid 19 process are examined, it was seen that these were conducted in the field of social sciences with a maximum of 42.99% (n=46). This was followed by Medicine 41.12% (n=44) and Computer Sciences 9.35% (n=10), respectively (Table 1).

**Table 2.** Distribution of articles by publication years

Article Year	n
2019	-
2021	56
2020	51

According to table 2, 52.33% (n=56) of the articles examining the level of satisfaction with distance education during the Covid 19 process were published in 2021, and 47.66% (n=51) in 2020. Beside it was seen that there was not any article published in 2019. This may be due to the small number of articles written on the subject due to the new onset of the Covid 19 pandemic.



**Figure 1.** Distribution of articles by publication years

When Figure 1 was examined, it can be said that approximately the same number of studies have been produced on the subject of satisfaction with distance education during the two-year pandemic period. Considering that 2021 has not yet ended, it can be predicted that there will be an increase in the number of researches in this field by the end of the year.

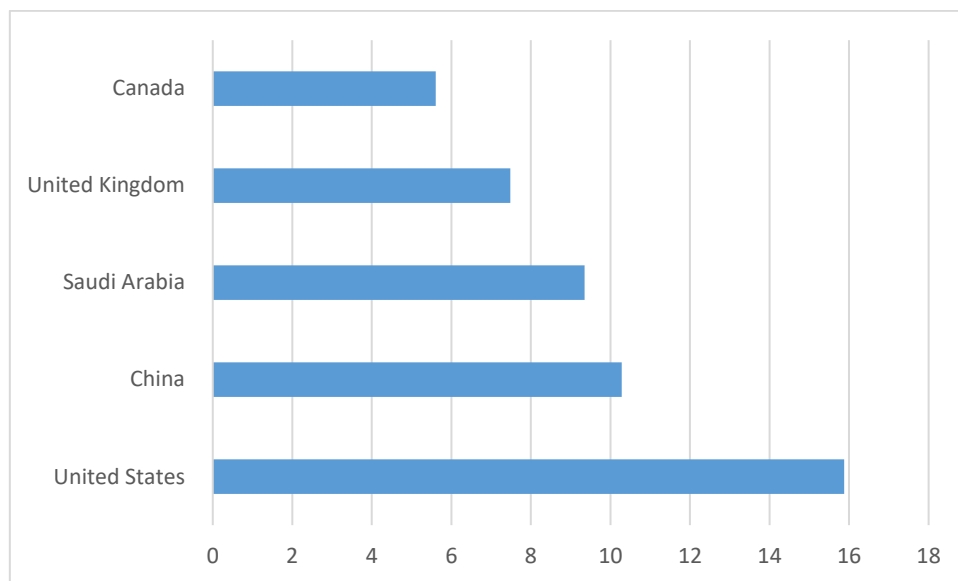


Figure 2. Distribution of articles by countries

When the origin of the articles about satisfaction with distance education was examined, the highest number of countries such as the United States of America with 15.88% (n=17), China with 10.28% (n=11), and Saudi Arabia with 9.35% (n=10) (Figure 2).

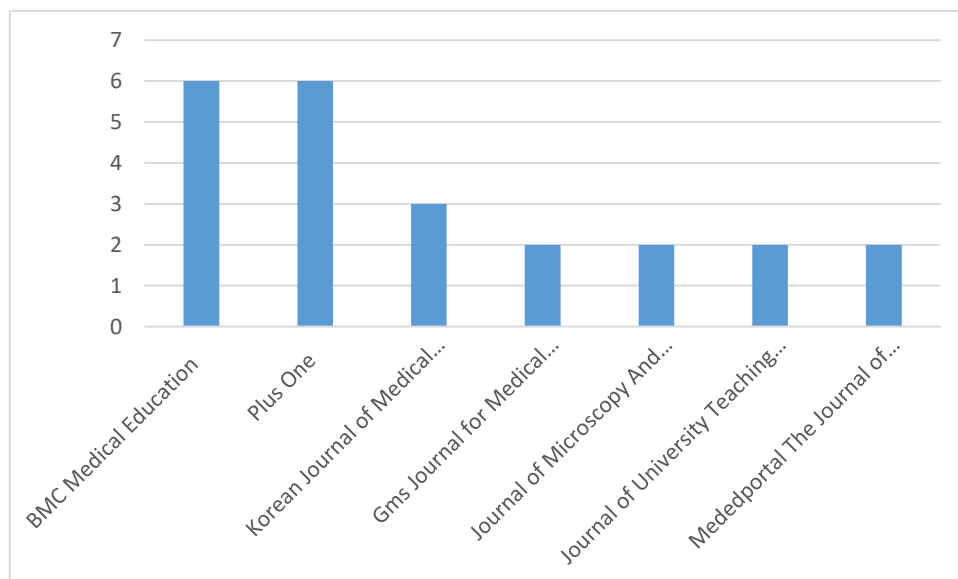
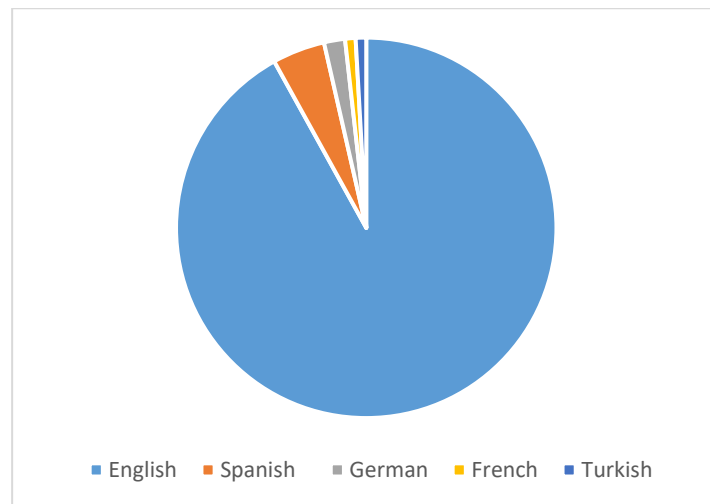


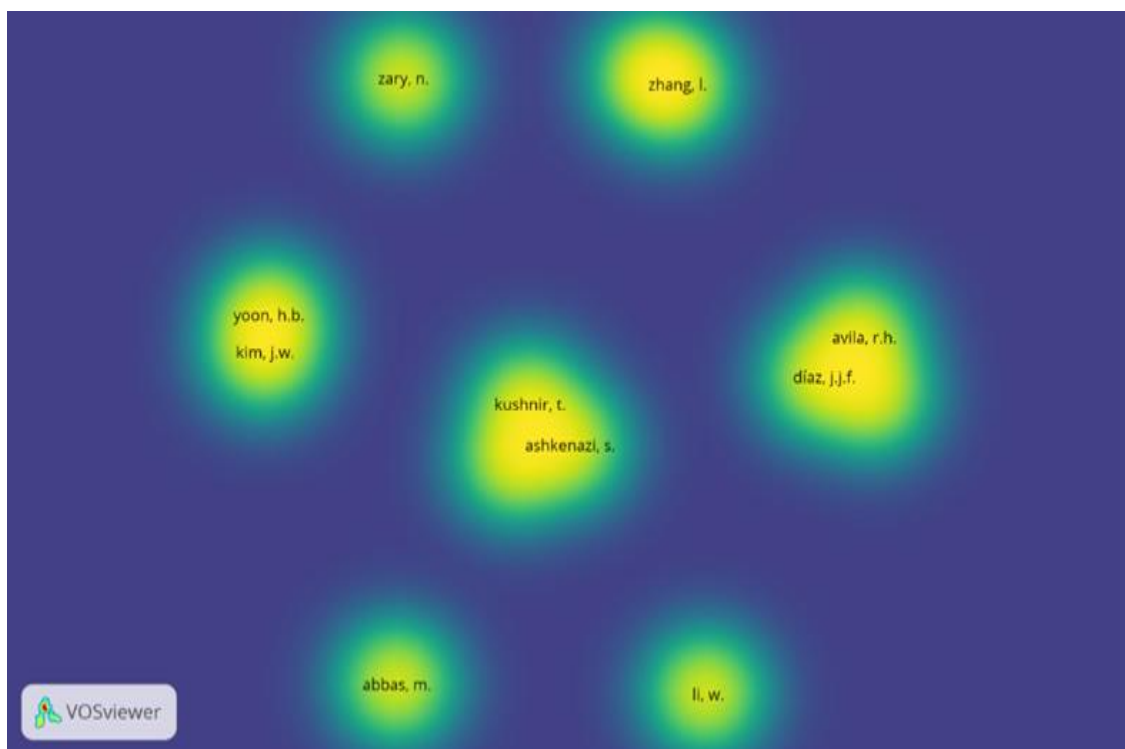
Figure 3. Journals with the most published articles

When the distribution of the articles based on journals was examined, it was seen that the most publications are in the journals named BMC Medical Education (n=6), Plos One (n=6), and Korean Journal of Medical Education (n=3). The article counts in the journal of Microscopy And Ultrastructure, Journal of University Teaching And Learning Practice and Mededportal The Journal of Teaching And Learning Resources are (n=2).



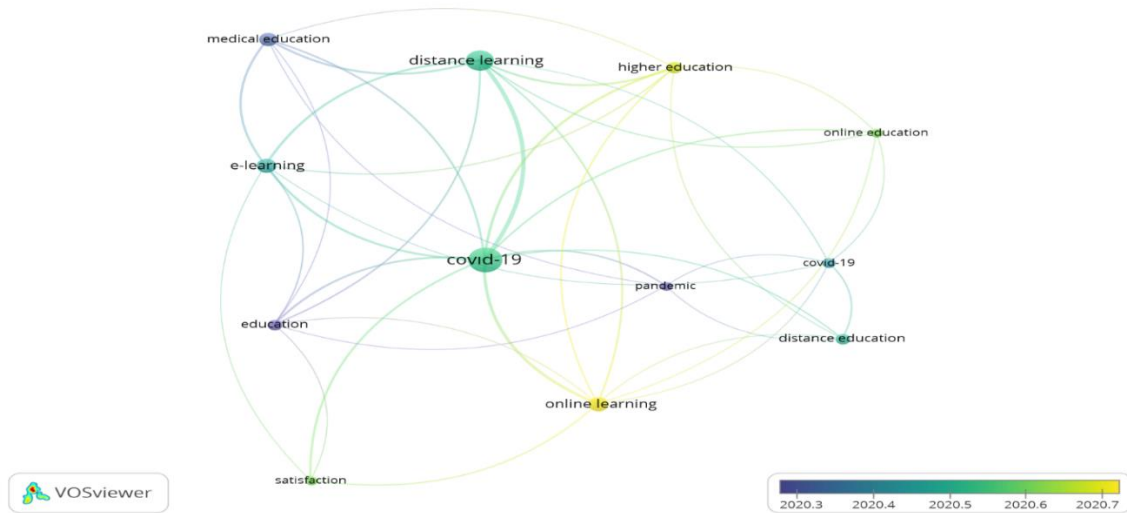
**Figure 4.** Language of the articles

It was seen that the majority of the articles were prepared in English (n=103), 96.26%. In some articles, it is understood that another language is used in addition to English. For example, (n=5) articles were written in Spanish language, (n=2) articles were written in German language, and other articles were written in French and Turkish languages. This shows that the articles were prepared in their native language, together with English, which is the language of scientific publication (Figure 4).



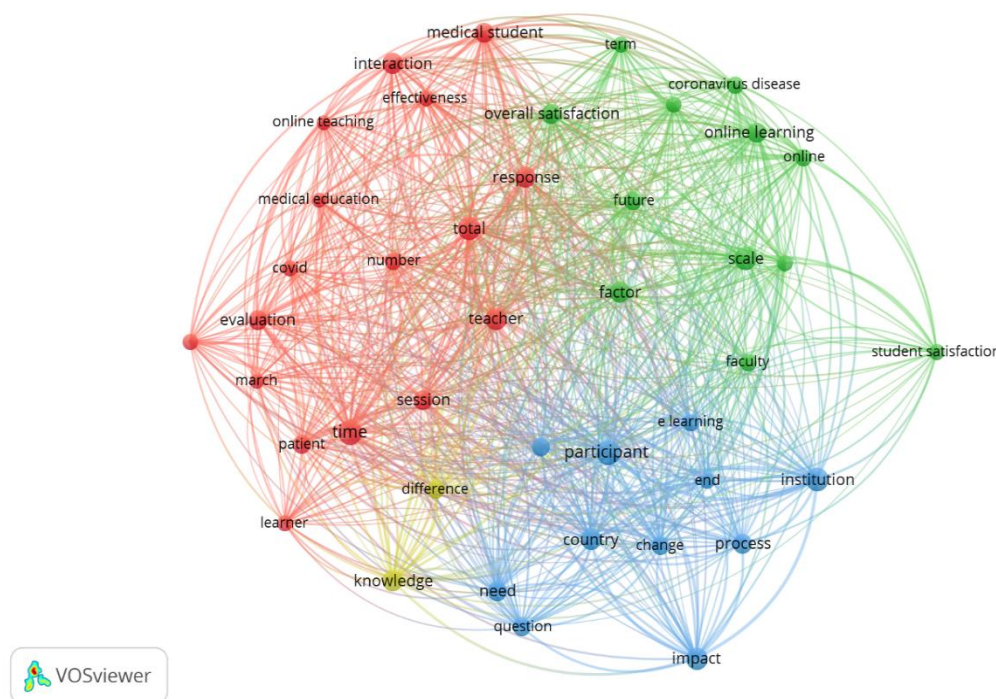
**Figure 5.** Density view showing the authors' relationships with each other

When Figure 5 was examined, it was seen that there are seven separate author clusters. Major researchers in the network are N. Zary, I. Zhang, H. B. Yoon, and J. W. Kim, T. Kushnir, and S. Ashkenazi, R.H. Avila, and J.J.F. Diaz, M. Abbas, W. Li. Other researchers depend on the main researchers in these seven groups.



**Figure 6.** Cluster density view by keywords

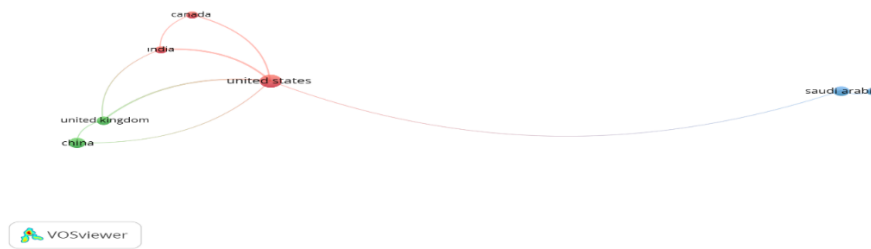
The results obtained from the VOSviewer program for keywords are shown in Figure 6. The most common keywords in the articles were analyzed by bibliometric analysis. In this technique, the number of articles in which two keywords appear together is calculated (Garrigos-Simon & et al., 2018). As a result of the analysis, it was seen that the keywords were networked with words such as a pandemic, online learning, distance education, satisfaction, e-learning, higher education, online education concerning the word Covid 19.



**Figure 7.** Cluster density view according to article abstracts (n=42)

According to the article summaries, when cluster density analysis is examined, it was seen that different concepts (n=42) have been reached (Figure 7). These concepts were grouped into four clusters. Under the first group, there are concepts such as medical education, medical students, learner, teacher, and evaluation. The second cluster includes the concepts of difference and knowledge, the third cluster includes expressions such as impact, process, country, need, and questions, and the fourth cluster includes concepts such as student satisfaction, future, online learning, coronavirus disease, and scale.





**Figure 8.** Country collaborations

When Figure 8 was examined, it was seen that cooperation between countries is gathered under three clusters. The first group countries are Canada, India, and the USA. D., the second group countries are classified as China and England, and the third group countries are Pakistan and Saudi Arabia.

### **Limitations of the Study**

Research findings are based on computer-based data obtained. It covers articles published in double-blind peer-reviewed journals over three years covering the Covid 19 process. Journals which in the Scopus database were included in the research data. Data obtained from conference proceedings, letters, compilations, and book chapters were excluded.

### **Conclusion and Discussion**

The research aims to examine researches that deals with the satisfaction level of distance education applied in the Covid 19 process with bibliometric analysis. At the end of the research, it was found that the articles which examined the level of satisfaction with distance education were generally carried out in the fields of medicine, computer sciences, and social sciences. It was determined that most of the studies were conducted in countries such as the USA, China, Saudi Arabia, England, and Canada, and the articles were mostly written in English in the research. Data were also analyzed by bibliometric analysis. According to the results of the analysis, it was found that the keywords formed a network with words such as a pandemic, online learning, distance learning, satisfaction, e-learning, higher education, online education concerning the word Covid 19. Finally, it was determined that the abstracts of the articles were grouped into four clusters.

It was observed that the articles examining the level of satisfaction with distance education are generally carried out in the fields of medicine, computer science, and social sciences. Supporting these findings Barteit, Guzek, Jahn, Bärnighausen, Jorge & Neuhann (2020) and Gurcan, Ozyurt & Cagıtay, (2021) stated e-learning studies in medicine have come to the fore in recent years. Due to studies in different disciplines and sample groups, there has been a rapid increase in articles in the field of distance education. The reason for this increase can be evaluated as the positive perceptions of institutions towards the field of distance education. In addition, another reason for the increase in research may be that the importance given to distance education studies is increasing day- by-day (Babur, Kiper, Çukurbaşı, Özer, Tonbuloğlu., Küçük, ... & Horzum, 2016). Rapid changes in the way students learn, especially in fields such as medicine, computer science, fine arts and architectural design, can be quite challenging for them (Pregowska, Masztalerz, Garlińska, Osial, 2021).

It was determined that the studies in the field of distance education are mostly carried out in countries such as the USA, China, Saudi Arabia, England, and Canada, and the articles are mostly written in English. Similar to this finding, it was stated that in the literature the most of the studies originate from the USA (Gurcan, Ozyurt & Cagıtay, 2021; Tibaná-Herrera, Fernández-Bajón & De Moya-Anegón, 2018). Again, it was stated in the literature that more than 80% of all articles were produced by researchers in only five countries (Zawacki-Richter, Bäcker & Vogt (2009).

According to the results of bibliometric analysis, keywords such as online learning, distance education, satisfaction, e-learning, higher education, online education were found to be associated with the word Covid 19. Similar to these findings, Zawacki-Richter (2009) indicates that the issues were discussed student support, instructional design, educational technologies, etc., as the main research topics in distance education since the 1980s. In support of this situation, Özmen & Kan (2021) stated that in the last five years most of the theses were prepared on distance education in fields such as computer sciences and educational sciences. The most frequently used words in the theses are e-learning, web-based distance education, online education, distance learning, internet-based education, distance education, success, higher education, motivation, attitude. Therefore, it would be appropriate to direct students to the use of different online education tools in order to increase their satisfaction levels during the pandemic process. When face-to-face education is introduced after the Covid-19 pandemic, teachers and students should be encouraged to use online tools to improve teaching and learning (Pokhrel & Chhetri, 2021). According to Can (2020) the pandemic has important pedagogical implications. During this period, there was a significant increase in demand for open and distance education. In addition, the importance of open and distance education services in the society was begun to be understood. This pandemic was shown that not only quantity but also quality is important in open and distance education. Covid-19 pandemic was showed that the open and distance education system in Turkey needs to be strengthened in terms of infrastructure, access, security, content, design, implementation, quality, legislation and pedagogy. In addition, Güneş, Üstündağ, Yalçın & Safran (2017) evaluated the bibliometric analysis of studies conducted in the field of education between 1980-2014 and found that the concepts of teacher, teaching and education were mostly included in the field of education. This is important in terms of showing that some common concepts are used in educational studies regardless of time.

One of the findings obtained in the research was that the cooperation between the authors of the articles written during the covid 19 process (2019-2021) were grouped under three clusters. The first cluster was composed of authors who were living in Canada, India and the USA. The second cluster was composed of authors who were living in China and England, and the last cluster was composed of authors who were living in Pakistan and Saudi Arabia. Similarly Zawacki-Richter, Bäcker & Vogt (2009) also stated that collaborative research and more qualitative studies have an important place in distance education research. Key words such as pandemic, online learning, distance education, satisfaction, e-learning, higher education, online education are frequently included in the studies, where the articles examined in the research are mostly in the fields of medicine, computer science and social sciences, the number of studies conducted in the USA and European countries is quite high. It can be said that the studies are concentrated at the higher education level.

This research includes articles (between 2019-2021) written to examine the level of satisfaction with distance education applied during the Covid 19 pandemic process. In this process, the effect of education applied in many different fields, especially medicine and social sciences, on students was reflected. Since the Covid 19 pandemic continues to show its effect worldwide, it was thought that the number of researches on distance education applied during the pandemic process will increase in the coming years. In this context, it would be appropriate to focus on meta-analysis studies and literature reviews that examine researches in a holistic way. In addition, bibliometric studies examining the quality of distance education in different disciplines, expectations, attitudes, satisfaction and successes of students, faculty members and other stakeholders in the process can also be brought into literature.

Another result of the study was the different usage patterns seen in the concepts related to distance education concerning the Covid 19 pandemic. Concepts such as online learning, distance education, and e-learning have started to take place more in educational environments. Considering the meanings of these concepts and their reflections on the educational environment, qualitative or quantitative research designs can be created and their effects on student satisfaction can be examined.

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