Mapping of Q-Methodology Studies in Education in Turkey: A Bibliometric Analysis[*]

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Abstract
Extensive literature searches are commonly undertaken across various educational disciplines to thoroughly investigate, analyze, and elucidate the outcomes derived from research, trends, and underlying methodologies. The objective of provide a thorough and comprehensive examination of existing research papers conducted in the field of education in Turkey, specifically focusing on those that utilize Q-methodology in their research design. Additionally, this research attempts to analyze these research articles through bibliometric analysis. The present study examined research articles published in journals indexed by Scopus, Dergipark, Yöktez, and TR Index. A total of 194 articles were identified and included in the analysis. Following the application of the inclusion criteria, a bibliometric study was conducted to assess the publications in terms of their publication year, journal of publication, number of citations received, keywords utilized, and authorship. Based on the findings, it has been ascertained that only 20 research publications were undertaken in the domain of education within the context of Turkey. Furthermore, these investigations were found to be rather constrained in scope when juxtaposed with other fundamental scientific disciplines.

1. Introduction

The inception of educational research in Turkey can be attributed to the commencement of the 20th century, during which the nation initiated efforts to modernize and adopt Western principles within its educational framework. Nevertheless, it was only in the 1970s that educational research in Turkey started to garner increased attention and acknowledgment (Çelikten, 2015).

The formation of the Turkish Higher Education Council (YOK) in 1981 marked a notable milestone in the advancement of academic research inside Turkey's educational establishments. This event was of great significance. The founding of this organization is often seen as a pivotal milestone in the history of Turkey due to its substantial contribution to the expansion and establishment of educational institutions in the country.

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During the 1990s, there was a big change in the way educational study was done in Turkey. This change was marked by a trend toward qualitative and interpretive study methods becoming more popular. Researchers started this trend when they started to question the popular positivist model and actively look for other ways to explain educational events (Donmez, 2016). People say that these researchers were the start of this trend.

In Turkey, bibliometric studies, in which publications and links are analyzed quantitatively, have been used more and more in recent years. Researchers, academics, and lawmakers are paying more attention to the field of bibliometrics because it can help them measure the productivity and impact of research and because it can help them make decisions about science policy.

Universities, research institutes, and government agencies in Turkey conduct bibliometric studies. These investigations generally examine scientific publications and their citations, as well as researcher and institution collaborations. Additionally, bibliometric analysis can evaluate the research output and efficiency of academics, academic departments, and organizations.

Turkish bibliometric research use Web of Science (WoS) database as a primary data source. This database covers scholarly articles in several academic subjects. Other databases like Scopus, Google Scholar, and CrossRef are used with bibliometric analyses.

In terms of methodology, bibliometric studies in Turkey frequently employ citation analysis, co-citation analysis, and network analysis to examine how individuals collaborate and the productivity of their research. In addition, content analysis is usually utilized in order to investigate the recurring topics that are discussed in scientific works.

The inclusion of in-text references is a crucial component of bibliometric inquiries since it allows scholars to track the source of a specific citation and evaluate its influence on later scholarly work. In academic writing, it is common practice to include in-text references that adhere to a defined citation style, such as APA, MLA, or Harvard. These citation styles serve the purpose of ensuring uniformity and facilitating comparability among various works.

In Turkey, the advancement of bibliometric studies has played a pivotal role in fostering a culture that prioritizes evidence-based decision-making in the realms of scientific policy and research appraisal. The evolving research landscape in Turkey is expected to witness a growing significance of bibliometric studies in influencing the trajectory of research and innovation inside the nation.

Currently, there is a notable expansion and advancement in educational research within the Turkish context. This growth is mostly centered around many areas of inquiry, including teacher education, curriculum development, educational policy, and educational technology (Büyüköztürk, 2016).

1.1. History of Education Studies in Turkey

Turkey has a significant historical legacy in the field of educational studies dating back to the Ottoman Empire. The establishment of the initial contemporary educational institution in Turkey occurred in 1848 under the reign of the Ottoman Empire. The institution, known as the "Mekteb-i Mülkiye," was founded to provide education and training for individuals aspiring to become government servants. In the initial stages of the Republic of Turkey, the government placed significant emphasis on education as a fundamental component of its endeavors to modernize the nation (Erdogan, 2009). The newly formed administration implemented a series of educational reforms, which encompassed the implementation of a novel alphabet, the development of fresh educational institutions at various levels, and the enforcement of mandatory schooling (Kuzu & Sengonul, 2017).

The 1980s marked a shift in the academic study of education toward an emphasis on sociocultural factors. Access to education, its role in social mobility, and cultural influences on the educational system have all been the subject of study (Kaya, 2005).The 1980s saw a shift in educational research that emphasized the significance of investigating the cultural and social contexts in which schools operate. The cultural aspects of education, as well as the ways in which socioeconomic status influences one's ability to advance in one's career, have recently received increased attention from scholars (Kaya, 2005).

Several facets of educational research have received increased attention in Turkey in recent years. These include but are not limited to curriculum development, teacher training, educational policy, and student learning outcomes. Previous research has also investigated the difficulties encountered by marginalized populations, including Kurdish and Syrian refugee children, in their pursuit of educational opportunities (Ozdemir & Topcu, 2017).

1.2. History of Q-Methodology Studies in Education in Turkey

Q-methodology is a research approach that integrates elements of both quantitative and qualitative methodologies. Stephenson (1953) posits that the utilization of the Q-method facilitates a thorough and logical exploration of subjective issues that are frequently encountered within social scientific disciplines, including psychology. Hence, it becomes more convenient to distinguish the approaches of individuals and organizations towards a particular subject matter. The Q-methodology allows individuals to assess the extent to which their values, opinions, or beliefs align or differ, hence potentially yielding more meaningful outcomes.

According to Yang (2016), the Q-methodology approach has been recognized as a viable method for both theory creation and verification. This particular approach is highly commendable for conducting comprehensive examinations of personal matters, encompassing one's thoughts and perspectives on a wide range of topics. According to Polat (2022), it is anticipated that the utilization of this particular approach will enable researchers to obtain participants' authentic perspectives in a more efficient and potentially more lucid manner on controversial matters in the field of education. Upon examination of the literature, it becomes evident that there is a notable increase in the utilization of Q-method in international studies,

whereas application of Q-methodology in national studies remains relatively scarce (Polat, 2022).

The utilization of Q-methodology was initially introduced to Turkey throughout the 1970s, where it was employed in a research endeavor investigating the perspectives of teachers regarding the curriculum (Akkan, 1979). Subsequently, Q-methodology has been employed in diverse educational investigations conducted in Turkey, including inquiries into teacher professionalism (Demir, 2011), the building of curricula (Karamustafaoglu, 2013), and the examination of student dispositions towards science (Çakmakci, 2016).

Numerous research studies have employed Q-methodology as their data collection tool to examine a range of viewpoints and attitudes pertaining to various educational matters within the context of Turkey. One notable application of Q-methodology in educational research in Turkey is considered to be its utilization in examining teacher attitudes toward technology. In a study that was carried out by Karaman and Kandir (2019), the employment of Q-methodology was one of the ways that they looked at the incorporation of technology in educational settings. The research's conclusions revealed three diverse points of view: those who have a strong attachment to technology, those who have worries or doubts about any matter, and those who take a reasonable and realistic perspective.

Researchers have used the Q-methodology to find out how students feel about their schooling. Gulmez and Karamustafaoglu (2014) used the Q-methodology in their research to distinguish between different ideas about what motivates students to learn math. The results show that there are three different points of view, which can be put into three groups: internal, extrinsic, and nonexistent.

In Turkey, the Q-methodology has been used not only in education, but also in psychology, politics, and social work.

1.3. Bibliometric Analysis

Applications of bibliometrics can be found in many different fields, including the domains of medicine, social sciences, and humanities, to name just a few of the possible applications. Both understanding the significance of the research and recognizing new patterns in the realm of scientific communication are significantly aided by the approach, which is a tremendous benefit in both of these areas.

Bibliometrics, on the other hand, has been subject to criticism due to the fact that it has its own limitations and could be prejudiced. However, it is essential to keep in mind that bibliometric data could not completely cover every attempt made to conduct research. There are distinctions to be made in spite of the fact that various academic subfields each have their own unique pattern of citations to follow. This is one thing that remains consistent. There has also been debate on the common practice of relying solely on bibliometric analysis as the method for determining an individual study's significance and applicability.

When taken as a whole, the study of bibliometrics is an efficient method for gaining knowledge about academic communication and determining what research has led to. However, it is essential to utilize bibliometrics in conjunction with other

methods of judging, and one must also be aware of the limitations associated with using this method.

1.4. Bibliometric Analysis in Education

In many areas of education, it is common practice to conduct exhaustive literature searches in order to study, analyze, and cast light on research findings, trends, and underlying techniques. According to research from 2020 by Drijvers et al., an increase in technological advancement has facilitated the development of numerous efficient methods for identifying and evaluating pertinent information. Several criteria can be used to evaluate the excellence of academic research and the individual contributions of academics. In light of this, the academic discipline of bibliometrics encompasses research activities that assess scholarly production in Turkey based on these factors (Al & Coştur, 2007).

Bibliometrics is the quantitative study of bibliographic information such as authorship, publication titles, publishing years, affiliations, journal sources, geographical origins, and citation counts. According to Zupic and Cater (2015), its goal is to evaluate, characterize, and monitor the overall corpus of published literature around the world. Bibliometrics is the statistical study of how books, academic articles, and other types of academic literature are used. The purpose of this analysis is to identify which countries, research disciplines, researchers, authors, and collaborative efforts are most important in each field of study. Unlike typical methods such as systematic literature searches, meta-syntheses, and meta-analyses, bibliometric analysis is seen as a more objective way of evaluating previous research (Zupic & Cater, 2015).

Scientific studies of bibliometric analysis can be used for a variety of methods, such as making cross-disciplinary benchmarks, researching general communication technology adoption information, and identifying a suitable team of authors for a newly established registered publication. However, it is seen that there has been little research on its use in educational settings (Danşman et al., 2016; Ukşul, 2016).

1.5. Types of Bibliometric Analysis

Academics can use various bibliometric tools and analysis methods available in the literature while conducting research. Citation analysis, h-indexes, impact factors, co-citations, bibliographic links, and co-authorship are all often considered excellent examples of the topic.

Researchers can use various bibliometric tools and statistical methods available in the literature while conducting research. Citation analysis, h-indexes, impact factors, co-citations, bibliographic links, and co-authorship are all often considered excellent examples of the topic. Citation analysis is useful as a way of determining the importance of an author, publication, or field of study. While doing a citation study on a particular topic, researchers can look at the most cited works in a given time period. This makes it easy to find which authors and publications have the most influence in a given field (Van Noorden, 2010).

In addition to the above mentioned features of the bibliometric analysis, the h-index is a measure of an author's influence and productivity (Rousseau and

Ye, 2014). This metric takes into consideration both the number of articles that an author has written as well as the number of times that those articles have been cited in other scholarly publications. The number of times that articles published inside a journal are cited by other works is one metric that is used to estimate the significance of the journal in the academic field in which it is published, which is referred to as the "impact factor."

Additionally, calculating the frequency with which two works are mentioned jointly in other scholarly publications can be accomplished through the utilization of a technique that is known as co-citation analysis. Keeping track of the number of times each work is cited is all that is required to attain this goal. We are able to utilize this strategy to investigate the connections that exist between literary works and the writers of those works. Additionally, it can be utilized to ascertain the primary scholarly concerns and methodological approaches in a particular area of research and study. The scientific field of ecology presents a suitable setting for applying the method of co-citation analysis, which aims to unearth pertinent ecological concepts and hypotheses.

Bibliographic coupling, which involves counting how often two publications cite the same sources, is another important part of bibliometric analysis. This method can be used to uncover commonalities among a massive body of literature and authors, making it simpler to spot major research trends within a certain field of study. Bibliographic coupling analysis has been put to use in the field of medical research for the purpose of determining overarching concepts and themes present in the body of published work.

Co-authorship analysis is all about analyzing the links between writers that develop as a result of how they collaborate together in a single publication. This is what the term "co-authorship" means. The analysis of these links makes use of works that were written by multiple authors. Using this method to find major author-institute cooperation can lead to the identification of interesting research trends within a certain discipline. For instance, in order to discover key collaborative actions being carried out by academics and other entities in the field of education, it is necessary to do an in-depth analysis of the patterns of co-authorship that are prevalent in that field of research.

Liu et al. (2020) carried out a study in which they investigated the standard procedures that are followed in the field of environmental science regarding co-authorship. The purpose of the study was to discover which institutions and researchers have the most influence in the area. Additionally, the study attempted to throw light on effective collaborations between researchers and institutions.

In summary, bibliometric analysis serves as a valuable instrument for assessing the impact and influence of academic works, authors, and research institutions. There are other methodologies that can be employed to conduct this review. There are numerous methodologies for doing this examination. According to Donthu et al. (2021) and Zupic & Cater (2015), contemporary bibliometric methodologies encompass the examination of citation networks, co-citation networks, bibliographic coupling, and authorship relationships. Analyses of co-citation networks are another type of method. These methods can be used to figure out

how important each author and publication is, as well as to find important patterns in study and how people work together.

The objective of this study is to present a comprehensive overview of research papers conducted in the field of education in Turkey, specifically focusing on the utilization of Q-methodology as a research design. Additionally, this study aims to analyze these research articles through the application of bibliometric analysis. The implications of these discoveries are expected to provide significant contributions to the progress of future study in various educational domains, reduce superfluous redundancy, and establish a solid basis for the development of further studies and theoretical frameworks. Taking into consideration the aforementioned factors, the subsequent inquiries were formed.

1.6. Research Questions

- What are the distributions of relevant publications in terms of the year, author, journal, and keywords?
- What are the rankings, and the number of references and citations of the publications?

2. Methodology

This study used bibliometric analysis to examine published articles in Turkish academic databases such as Dergipark, Yöktez, and TR index as well as Scopus that dealt with Q-methodology in educational research.

2.1. Design of the Study

This study employed bibliometric analysis as a methodological approach to investigate the relevant research literature. When performing bibliometric analysis for an academic essay, it is crucial to acquire relevant bibliometric data along with proper references to substantiate the claims and illustrate the significance of the research. The following are the procedural guidelines to be adhered to:
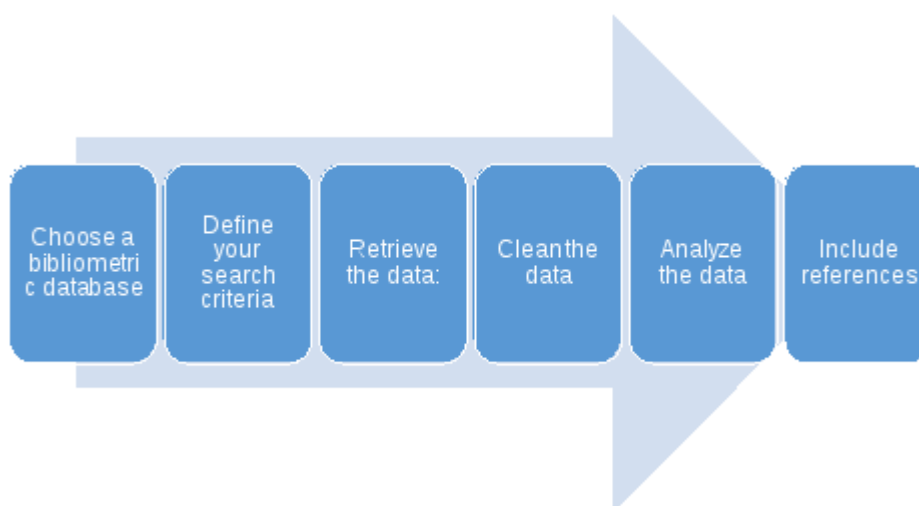

Figure 1. Steps to follow when conducting bibliometric analysis

There is a variety of bibliometric databases available for consideration, including Web of Science, Scopus, and Google Scholar. Each database has its strengths and limitations; therefore, it is essential to choose the one that best meets your specific needs. In order to collect bibliometric data that is relevant to your research, it is required to create and describe your search parameters. This approach requires the careful selection of search terms, writers, publications, and time periods. After you have established the specific search parameters, you should then extract the relevant data from the bibliometric database that you have specified. The data can be exported to a spreadsheet or software such as VOSviewer in order to perform analysis on them. In the field of bibliometrics, the process of data cleansing is extremely important since it solves the widespread problem of poor data quality, which can be caused by errors such as misspelled author names and wrong publication dates, amongst other types of mistakes. To purge the data, you should make sure that duplicate entries are removed, errors are fixed, and author names are standardized (Hicks, 2012).

Bibliometric tools should be used to analyze the aforementioned data in order to identify and investigate various patterns and trends. For this reason, it is possible that it will be essential to investigate indicators like citation rates, author collaboration, and the prestige of various journals. It is absolutely necessary, to improve the reliability and reproducibility of bibliometric data, and to provide references for the publications that were retrieved. According to Bornmann and Leydesdorff (2013), this makes it simpler to validate your data and delve deeper into noteworthy discoveries.

It is required to engage in careful preparation, retrieval, data cleansing, analysis, and documentation in order to get correct bibliometric data and the references that relate to them.

2.2. Data Collection

The data of the present study were retrieved from research articles published in journals indexed by Scopus, Dergipark, Yöktez, and TR Index. The inclusion criteria included search parameters such as "research article", "country", "language as Turkish & English", "q methodology" and "education" as keywords, and a total of 194 articles were reached. To determine the related articles, the abstracts of these articles were reviewed whether they were conducted in the field of social sciences, and whether they were about teachers, instructors, faculty members, or students. After possible errors and duplications were minimized, a total of 20 articles were selected as the data source of the study, and then a bibliometric analysis was carried out. Finally, the articles were examined in terms of year, author, journal, number of citations, keywords, and number of references.

3. Findings and Discussions

Following the application of the inclusion criteria, a total of 20 research publications were deemed eligible for inclusion. The research under examination was done within the time frame of 2016 to 2022, as shown in Figure 2. The emergence of the q-method in scholarly literature may be traced back to the year 2016. There has been a discernible, albeit modest, increase in scholarly attention toward educational research employing the q-methodology up until the year 2022 considering the total amount of publications.
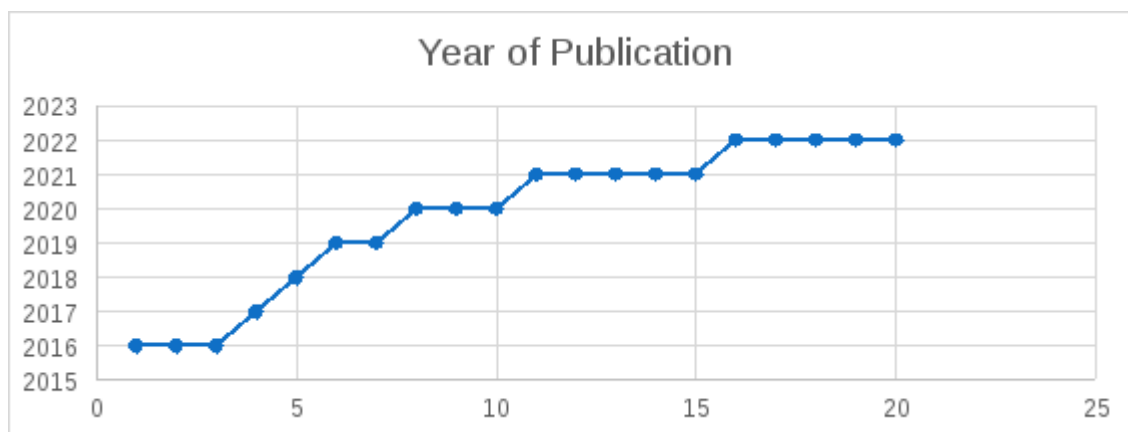
Figure 2. Number of included studies per year

The data in Figure 2 demonstrates diverse patterns in the quantity of publications during these years. In the year 2016, three scholarly publications pertaining to the field of education were produced. In the following year, namely 2017, there was a decline in the number of publications, with only one being recorded. The year 2018 followed a pattern that was recognizable even after it had been condensed into a single piece of text. The overall number of publications that were released in 2019 reached a new high of 2 after an increase in production. The year 2020 saw a total of three articles, which is one more than the previous year had seen. After that, in the year 2021, there was a discernible increase, which was characterized by the release of five publications regarding schooling. The number of papers published in 2022 was once again, reaching a total of 5. This may suggest that academics are paying a greater amount of attention to how q-methodology works in various educational environments.

Table 1 presented below displays the topics and the names of the writers of the published articles (For the full titles of the articles please see the References section).

Table 1. Article Topics with Year and Author details

Article Topics	Year	Authors
Blended learning supported by the quantum learning design	2016	Çırak
Faculty members' attitude towards environment	2022	Kartal & Mesci
Middle school science teachers' understanding of nature of science	2020	Mesci & Cobern
Sports science students' career anxiety	2022	Yüksel & Karafil
Teachers' professional development needs	2020	Yenen & Yöntem
Preservice teachers' views on the problems in teaching practise courses	2019	Aslan & Zırhlıoğlu
Social studies teachers' views on the 7th grade social studies teacher guidebook and its removal	2022	Çakmak, Akgün & Kaçar
Preservice science teachers' epistemological beliefs	2021	Mesci, Tuncay-Yüksel
Factors affecting classroom teachers' job performance	2019	Altunova
Teacher turnover problematic (Van sample)	2016	Turhan
Science teacher's perceptions of the nature of technology	2021	Türkoğlu, Aydın, Eş
Students' perceptions about gamification of education	2017	Yıldırım
Professional identities of academic staff of faculties of education	2022	Burak, Gültekin, Yaşar
Prospective teachers' professional skill needs	2021	Yenen
Guidance teachers' perceptions about the new guidance services regulation	2018	Nas
Teachers' perception of school counselors	2020	Tanhan & Nas
Preservice teachers' perception regarding factors in technology integration	2022	Atman-Uslu
Preservice science teachers' conceptions of learning science	2021	Mesci & Uzoglu
Child narcissism in the context of public and private schools	2021	Tanrıverdi & Korkmaz
Preservice teachers' attitudes and opinions regarding the teaching profession	2016	Demir

Among the 31 authors examined, Mesci and Nas emerge as the most prolific contributors, having authored four and two works respectively, on the subject matter under investigation. The number of research papers published by a single author is 8, whereas the number of papers authored by three individuals is just 4. The remaining research articles were collaboratively authored.

Table 2 displays the writers with the corresponding number of citations and references. Based on the findings, Yıldırım (2017) emerges as the author with the most impact, as evidenced by a total of 35 citations in the respective subject. Demir (2016) and Turhan (2016) are subsequent authors who have received 17 and six

citations respectively, following the work of the aforementioned author. The low quantity of citations can be attributed to the recent publication of the remaining publications. This observation is not unexpected. Furthermore, it is noteworthy that seven research studies have not yet garnered any citations to date.

Table 2. Authors with Citation Information

Authors	Year of publication	Number of citations	Number of references
Yıldırım	2017	35	67
Demir	2016	17	44
Turhan	2016	6	47
Mesci & Cobern	2020	5	50
Yenen	2021	5	59
Çırak	2016	3	38
Nas	2018	3	51
Altunova	2019	3	60
Yenen & Yöntem	2020	3	282
Aslan & Zırhlıoğlu	2019	1	121
Tanhan & Nas	2020	1	63
Türkoğlu, Aydın, Eş	2021	1	38
Çakmak, Akgün & Kaçar	2022	1	42
Mesci, Tuncay-Yüksel	2021	0	67
Kartal & Mesci	2022	0	15
Yüksel & Karafil	2022	0	25
Burak, Gültekin, Yaşar	2022	0	49
Atman-Uslu	2022	0	43
Mesci & Uzoglu	2021	0	26
Tanrıverdi & Korkmaz	2021	0	37

Table 2 furthermore presents the number of references employed within the investigation. In their respective studies, Yenen and Yöntem (2020) and Aslan and Zırhlıoğlu (2019) incorporated a total of 282 and 121 references, respectively. It is imperative to emphasize that these two research projects were conducted within the context of a master's thesis. Yıldırım (2017) and Mesci, Tuncay-Yüksel (2021) both exhibit an equal number of citations, with each author's works being referenced 67 times.

The distribution of keywords supplied by the studies reviewed in this research is depicted in Figure 2. Based on the findings, it was observed that the term "Q methodology" and its related forms, such as "Q method" or "Q-method," were the predominant keywords employed in the research. This determination was made through an analysis of the study's keyword data.

Figure 4. Distribution of keywords of research articles

Furthermore, the bibliometrics analysis program was limited to a maximum of 20 articles and key phrases, thereby impeding the generation of a thorough mapping. In other words, it is important to acknowledge that the absence of a generated mapping by the bibliometrics program should be regarded as a significant concern for academics in this regard. In order to have a more comprehensive knowledge of the predominant terms employed, a word cloud analysis was conducted. The subsequent terms that were utilized with the highest frequency included "pre-service teachers" (n=7), "education" (n=3), "job performance" (n=2), and "nature" (n=2).

4. Conclusion

There were many different elements and issues covered in the education research that was carried out in Turkey and used the Q-methodology in its research design. However, our ability to generate a substantial quantity of cases on the same issue, examined from diverse perspectives, was limited. The subjects encompassed under the study were teacher education, the perceptions held by pre-service teachers, the viewpoints expressed by current educators, and the perspectives shared by university professors. The themes that have garnered the most significant attention include the needs of pre-service teachers, challenges related to job performance and teacher turnover, the development of professional identities, and the nature of teaching as a profession. Q-methodology has mostly been employed in the investigation of several academic disciplines, including school subjects such as sports, social science, and physical sciences.

The limited number of study articles, specifically twenty, pertaining to education in Turkey suggests that the scope of these studies was considerably narrower in comparison to other fundamental sciences, such as medicine and technology. Hence, the utilization of bibliometric analysis can yield substantial benefits by guiding researchers toward the most pertinent studies before their engagement in reading, facilitating the prompt identification of research deficiencies within the domain, stimulating novel research concepts, providing insights into research patterns, and facilitating the mapping of the research domain to enhance

comprehension of its conceptual, social, or cognitive framework, among other advantages (Donthu et al., 2021; Zupic & Cater, 2015).

The research findings indicate the need for more investigation into methodological concerns, as these concerns have become increasingly important in the analysis of research. The envisaged outcome of this research is expected to contribute to the advancement of future research in the field, reduce unnecessary redundancy, and provide a foundation for subsequent studies and theoretical endeavors. According to Polat (2022), several subjects can be explored in the field of educational administration, including guidance, curriculum development, assessment, evaluation, organizational behavior, teacher qualifications, teacher candidate qualifications, suggestions for educational models, and numerous others.

Regarding the concluding remarks of the study, in alignment with the recommendations put forth by Polat (2022), the findings of present study also show that by employing Q-methodology approach, researchers should focus their attention on identifying challenges within diverse literary subgenres and subject domains. Moreover, enhancing the prominence of Q-methodology in the realm of educational studies and advocating for its utilization in compulsory education can contribute to the existing body of literature and research conducted in this domain, encompassing a diverse array of intricate subjects (Lundberg, et al., 2020).

4.1. Limitations and Recommendations

The present study investigates a corpus of Turkish educational research that has been published in academic journals indexed by Scopus, Dergipark, Yoktez, and TR Index. The limitation of not employing the sources contained within the SSCI, SCI-expanded, and AHCI databases may be perceived as a constraint in conducting this study. Furthermore, it is plausible to suggest that forthcoming research endeavors utilizing varied datasets may yield results comparable to those of the present study. The data presented in this study provide an opportunity to undertake further comprehensive bibliometric research across many educational subdomains. Likewise, it is justifiable to hypothesize that the next studies may employ a combination of several systematic review approaches.

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