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ARAŞTIRMA ÜNİVERSİTELERİNDE GÖREV YAPAN ÖĞRETİM ELEMANLARININ AKADEMİK YAYINLARI VE AKADEMİK İŞ BİRLİĞİ AĞLARI

ACADEMIC PUBLICATIONS AND ACADEMIC COLLABORATION NETWORKS OF ACADEMIC STAFF WORKING IN RESEARCH UNIVERSITIES[1]

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Özet

Öğretim elemanları arasındaki iş birliği, yükseköğretimde eğitim uygulamalarının, araştırma kalitesinin ve mesleki gelişimin artırılmasında önemli bir rol oynayan çok yönlü bir kavramdır. Bu araştırmanın amacı, Türkiye'deki araştırma üniversitelerinde görev yapan öğretim elemanlarının akademik yayınlarının ve akademik iş birliği ağlarının sosyal ağ analizi yöntemiyle incelenmesidir. Araştırmada Sosyal Ağ Analizi yöntemi kullanılarak tam ağ analizi yapılmıştır. Araştırmaya ölçüt örnekleme yöntemiyle, Araştırma Üniversiteleri Destek Programı kapsamında belirlenen 23 üniversiteden, içerisinde Eğitim Yönetimi Anabilim Dalı olan 15 üniversite araştırmaya dahil edilmiştir. Araştırmada her bir üniversitedeki öğretim elemanlarına ilişkin veriler, Yükseköğretim Bilgi Sistemi (YÖKSİS) üzerinden toplanmıştır. Verilerin toplanmasında araştırmacı tarafından geliştirilen altı kriterden oluşan kontrol listesi kullanılmıştır. Bu kontrol listesinde yazar adı, akademik yayının adı, akademik yayının tarihi, anahtar kelimeler, ortak yazarlar ve dergi adı yer almaktadır. Araştırmada verilerin analizi, sosyal ağ analizi programlarından UCINET 6.0 programıyla gerçekleştirilmiştir. Ağ analizi görselleştirmelerinin yanı sıra aktörlerin ağdaki konumlarına ilişkin merkezilik ölçümleri yapılmış; ağ yapısal özellikleri ve ağ gücüne ilişkin analizler gerçekleştirilmiştir. Araştırma sonuçlarına göre, araştırma üniversitelerindeki öğretim elemanları arasında akademik iş birliği ağının zayıf olduğu, buna karşın araştırma üniversitelerinde görev yapan akademisyenlerin diğer üniversitelerdeki meslektaşlarıyla kurdukları ağların daha yoğun ve güçlü ağlar olduğu görülmektedir. Araştırma üniversitelerindeki öğretim elemanları arasındaki zayıf bağlantılara karşın bu üniversitelerdeki akademik yayınların birbiriyle bağlantılı çok sayıda kavramı içerdiği görülmektedir. Akademik yayınlar incelendiğinde, en fazla kullanılan anahtar kelimelerin öğretmen, okul müdürü, liderlik, okul, Türk Eğitim Sistemi, güven, öğrenci, örgütsel bağlılık ve özyeterlik olduğu görülmektedir. Araştırmada, Hacettepe Üniversitesi ve Ankara Üniversitesi'nin diğer üniversitelere kıyasla daha güçlü akademik iş birliği ağları kurduğu bulunmuştur. Bu araştırma sonuçlarından hareketle, öğretim elemanları arasındaki akademik iş birliği ağlarının altında yatan nedenlerin ve sonuçların derinlemesine incelenmesinde nitel araştırmaların yapılması önerilebilir.
Anahtar Kelimeler: Sosyal ağ analizi, araştırma üniversitesi, öğretim elemanları, akademik yayın, akademik iş birliği ağları.

Abstract

Collaboration among academic staff is a multifaceted concept that plays an important role in increasing educational practices, research quality, and professional development in higher education. This study aims to examine the academic publications and academic collaboration networks of academic staff working in research universities in Turkey by using the social network analysis method. In the research, a whole network analysis was conducted using the Social Network Analysis method. Out of 23 universities determined within the scope of the Research Universities Support Program, 15 universities with a Department of Educational Administration were included in the study by criterion sampling method. In the study, data on academic staff in each university were collected through the Higher Education Information System (YOKSIS). A checklist consisting of six criteria developed by the researcher was used to collect the data. This checklist includes the name of the author, name of the academic publication, date of the academic publication, keywords, co-authors and journal name. The analysis of the data in the study was carried out with UCINET 6.0, one of the social network analysis programs. According to the results of the research, it is seen that the academic collaboration network among academic staff in research universities is weak, whereas the networks established by academics working in research universities with their colleagues in other universities are denser and stronger. Despite the weak connections between academic staff in research universities, it is seen that academic publications in these universities include many interconnected concepts. When academic publications are examined, it is seen that the most frequently used keywords are teacher, school principal, leadership, school, Turkish Education System, trust, student, organizational commitment and self-efficacy. The study found that Hacettepe University and Ankara University established stronger academic collaboration networks compared to other universities. Based on the results of this study, it may be recommended to conduct qualitative research to examine the underlying causes and results of academic collaboration networks among academic staff in depth.
Keywords: Social network analysis, research universities, academic staff, academic publication, academic collaboration networks.

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Introduction

Universities are institutions for education and research (Ben-David & Zloczower, 1962). The main activities in universities are research, teaching, and communication. Universities influence the national economy, social development, and society in general (Molas-Gallart et al. 2002, 5). In modern, knowledge-based societies, universities play an increasingly important role in economic growth and social progress (Pinheiro et al., 2015). The leading role of universities in innovation and development is indisputable. Universities are important institutions that initiate change and innovation in society. Universities are institutions of higher education consisting of academic units such as faculties, institutes, colleges, etc. that carry out higher-level education and training activities, scientific research, publication, and academic counseling (Law on Higher Education, 1981). One of the most important tasks of universities is to conduct research. The more successful universities are in promoting research, the stronger the communication between the various branches of learning (Ben-David & Zloczower, 1962). In this context, research universities aim to employ outstanding faculty members in the field and invest in the infrastructure necessary to establish research programs, including facilities, amenities, and personnel (Clotfelter, 1996; Toma, 2019: 165).

The Council of Higher Education (YOK) is responsible for the provision of higher education services in Turkey (YOK, 2007). The top management of the higher education system in the country is carried out by YOK, which is the institution that ensures the coordination of all higher education institutions (Gur & Celik, 2014). In Turkey, the 'Research Universities Support Program Cooperation Protocol' was signed between the Presidential Strategy and Budget Presidency and the Council of Higher Education in 2022. Within the scope of this protocol, it is planned to support the studies of 23 research universities in the fields of health, social sciences, and advanced technology with the Research Universities Support Program. It is aimed at increasing the competitiveness of research universities in the international arena, their R&D activities, and the number of academic publications (YOK, 2022b). Research universities in Turkey are intended to pioneer high-value-added academic production at both national and international levels and strengthen Turkey's capacity for human resources with doctoral degrees. Research universities consist of 23 universities, 3 of which are foundation universities and 20 of which are public universities. The main goals of research universities are regional and national development, the development of universities, and ensuring equal opportunities and academic quality (YOK, 2022a).

Social network analysis can examine the interaction and relationship dynamics within scientific communities (Bibi et. al., 2018). Academic social networks include complex networks of academic staff's relationships with other researchers (Kong et. al., 2019). Social network analysis can be used to identify co-authorship styles in scientific publications (Said et al., 2008) and to identify other researchers with whom researchers are connected. Academic collaboration networks significantly affect publication productivity in research institutions (Ynalvez & Shrum, 2011). Although some researchers argue that the use of co-authorship in academic publications as a measure of research collaboration is inadequate (Cimenler et. al., 2015), academic collaboration networks reveal unexpected ties between individuals and these connections are crucial for research and knowledge production at universities (Young et. al., 2015). Research universities in Turkey are of strategic importance for academic production and international competitiveness. This study aims to examine the academic publications and academic collaboration networks of academic staff working in research universities in Turkey by using the social network analysis method. In this context, the problem statement of the research was determined as; "How are the field-indexed academic publications and academic collaboration networks of academic staff working in research universities?". Three sub-problems were identified in the research. These are;

1. How are the academic collaboration networks of academic staff working in research universities with their colleagues working in research universities?
2. How are the academic collaboration networks of academic staff working in research universities with their colleagues working in other universities?
3. How are the field-indexed academic publications of academic staff working at research universities published between 2019-2024?

The reason for examining the field-indexed academic publications published between 2019 and 2024 is to analyze and interpret the studies conducted in recent years. In Turkey, there has not yet been a scientific study conducted with social network analysis in research universities, and it is thought that conducting this study on research universities with social network analysis, which is an up-to-date and new research approach, will contribute to the literature.

Method

With social network analysis, the relationships of actors with each other (Carolan, 2014: 4), informal groups, and group leaders in the organization can be determined (Balkundi & Kilduff, 2006: 419); the behaviors of individuals

within the framework of the interaction of individuals with each other and the environment are handled in a cause-effect relationship (Freeman, 2004: 3,5). The Social Network Analysis method was used in this study in which academic publications and academic collaboration networks among academic staff working in research universities were examined. In the social network analysis method, whole network analysis is performed to reach all participants in a group (Moolenaar, 2012). In the study, a whole network analysis was conducted and the academic publications and academic collaboration networks of all academic staff working in the research universities in the study group were examined. In addition to the findings of social network analysis, descriptive statistics regarding the publications of academic staff were also included in the study.

Study Group

The study group of the research was determined by the criterion sampling method. Among the 23 universities determined within the scope of the Research Universities Support Program, 15 universities with a Department of Educational Administration were included in the study. The universities in the study group and their code names are given below (Table 1).

Table 1. Codes of Research Universities

University	Code	University	Code
Ankara University	AU	Bogazici University	BO
Hacettepe University	HA	Ataturk University	AT
Gazi University	GA	Yildiz Teknik University	YT
Ege University	EG	Firat University	FI
Middle East Technical University	OD	Cukurova University	CU
Marmara University	MA	Dokuz Eylul University	DO
Uludag University	UL	Erciyes University	ER
Istanbul University	IS		

The study was conducted with academic staff in 15 state universities that meet the determined criteria. Foundation universities in the research universities category could not be included in the study because they did not have a Department of Educational Administration. The participants were numbered sequentially from the list of lecturers with the code name of the university where they worked. For example, the code name of a lecturer working at Ankara University and ranked fifth in the list was determined as "AU5". Finally, in the examination of academic publications published by academic staff in research universities, journal articles published between 2019 and 2024, which are internationally recognized and indexed in SSCI, SCI, and AHCI indexes, which are expressed as field indexes, were included in the study. Whether the academic publications were published in field-indexed journals was confirmed using the Web of Science[3] database and then included in the study.

Data Collection Tools

The data were collected through the Higher Education Information System (YOKSIS) for each university. Academic publication information about academic staff was accessed from the websites of the universities. A checklist consisting of six criteria developed by the researcher was used to collect the data. This list includes the author's name, name of the academic publication, date of the academic publication, keywords, co-authors, and journal name. Academic publications were listed through this checklist.

Data Analysis

The analysis of the data in the study was carried out with UCINET 6.0, one of the social network analysis programs (Borgatti et al., 2002). In this context, a social network map was created for the relationships between academic staff working in research universities and academic staff working in research universities and other universities, followed by a social network map for academic publications. Following the network analysis visualizations, centrality measurements were made regarding the positions of actors in the network, and analyses were conducted on network structural features and network strength.

Validity, Reliability, and Ethics

Expert opinion was consulted to ensure credibility in the research. The checklist created by the researcher for examining the academic cooperation and academic publications of the academic staff was examined by two field experts with the title of doctor. To ensure transferability in the research, a sample selection was made by the problem situation (whole network data collection), and in this context, academic publications and colleagues of all academic staff in the study group were examined. In addition, the findings of the social network analysis were

[3] https://mjl.clarivate.com/home

presented in detail to adapt the research to a different problem situation and to provide ideas for studies conducted under similar conditions. Finally, to avoid ethical violations during the research, the confidentiality of the participants was emphasized and the names of the participants were expressed with code numbers so as not to reveal their identity information.

Findings

Within the scope of social network analysis in the study, firstly, findings on the academic collaboration networks established by academic staff with academic staff working at research universities and other universities are presented. Then, findings on the structure of these networks and the strength of the ties between actors were presented. Another finding in the study is the social network analysis findings regarding the academic publications of academic staff working at the research university.

Findings on academic collaboration networks of academic staff

While discussing the findings regarding the academic collaboration networks of the academic staff, firstly, the academic collaboration networks of the academic staff with their colleagues working at research universities were examined, and then the relationships of the academic staff with their colleagues working at other universities were discussed. The academic collaboration networks of academic staff with academics working at research universities (Figure 1) and with academics at other universities (Figure 2) are presented below.

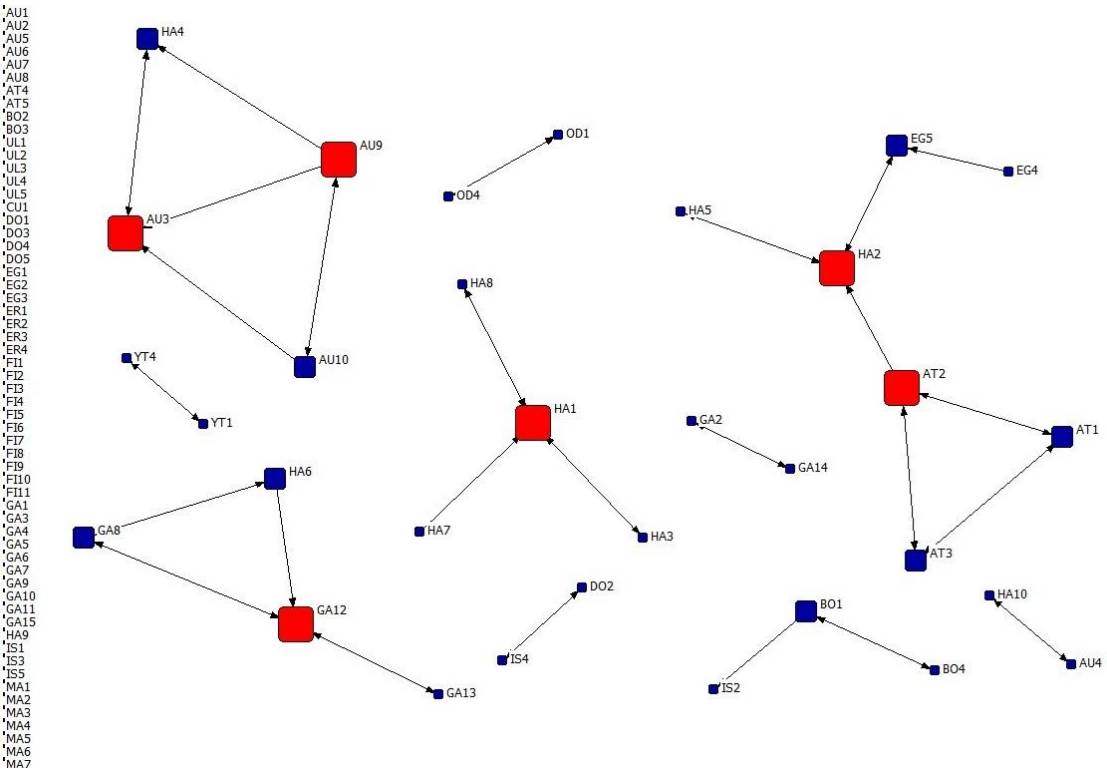

Figure 1. Academic collaboration networks established by academic staff with academics at research universities

As seen in Figure 1, it can be said that the academic staff working in research universities have limited relationships with each other. In the social network with 101 actors and 44 ties, it is seen that there are disconnections between the actors and that there is no holistic structure. In addition, there are many isolated actors on the left side of the network map. It is seen that these actors did not publish co-authored academic studies with academics at research universities between 2019-2024. According to the network map, it can be said that academic staff working at Ankara University, Gazi University, Hacettepe University, and Ataturk University are at the center of the network and have established ties with other actors. In this context, it can be concluded that AU3, AU9, HA1, HA2, GA12, and AT2 actors play a central role in the network. However, it is noteworthy that these actors mostly establish relationships with lecturers working in their universities.

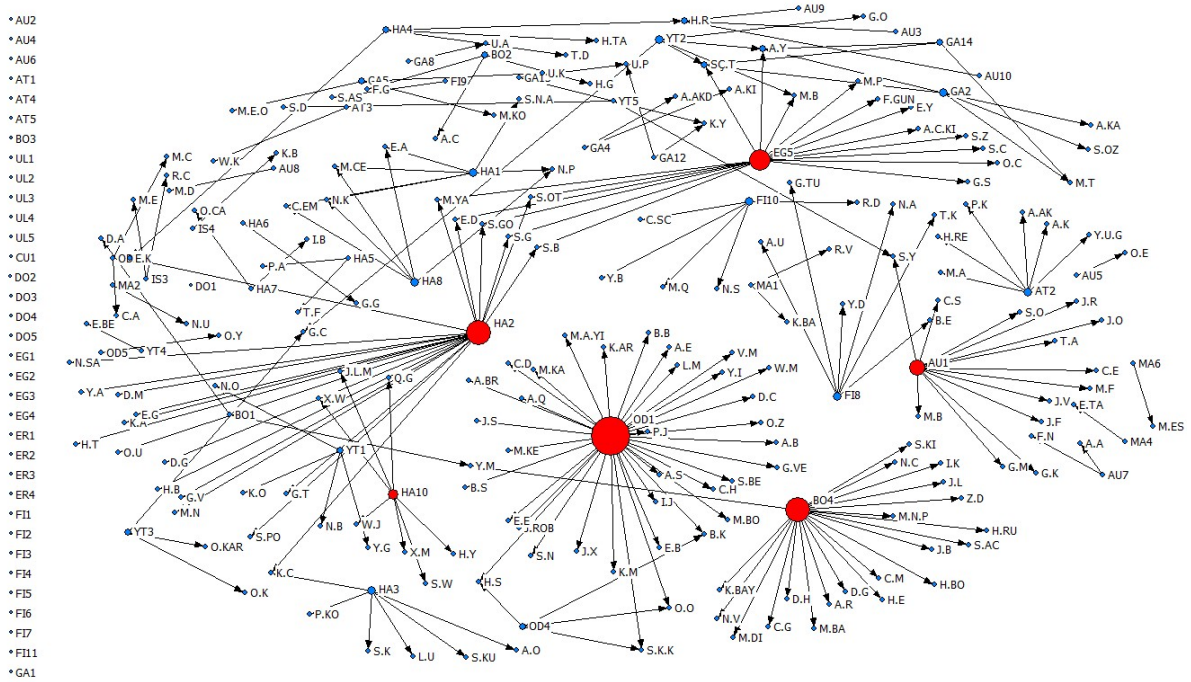

Figure 2. Academic collaboration networks established by academic staff with academics at other universities

As can be seen in Figure 2, it can be said that the collaboration networks of academic staff working at research universities with academics at other universities are denser compared to Figure 1 with 309 actors and 219 ties. The central actors in the social network are shown with big circles, and it is seen that academic staff at Bogazici University, Middle East Technical University, Hacettepe University, Ege University, and Ankara University have many academic collaboration networks with other academic staff. In this context, it is concluded that AU1, HA2, OD1, BO4, and EG5 actors have a central role in the network. Finally, it can be said that there are many isolated actors in the network map and the network has a fragmented structure. When the social networks are analyzed, it is seen that the networks established by the lecturers with the actors in other universities have a higher proportion of relationships, contain more reciprocal relationships, and have a more centralized structure compared to those in the research university. To summarize, when both networks are analyzed, it is possible to say that academic staff at Hacettepe and Ankara universities occupy an important and influential position in the social network.

Findings on the network structure of academic collaboration networks of academic staff

Network size, network density, clustering coefficient, reciprocity, and transitivity values were calculated to analyze the academic collaboration of academic staff. Before determining the academic collaboration networks established by academic staff with academics in other universities, the bimodal network matrix was converted into an unimodal network. The structural characteristics of the collaboration networks established by academic staff at research universities and other universities are given in Table 2.

Table 2. Network Structural Characteristics of Academic Collaboration Networks of Academic Staff

	Network size	Ties	Reciprocity *(diad)*	Reciprocity *(triad)*	Transitivity	Density	Cluster Coefficient
Research Universities	101	44	0.692	0.818	0.419	0.004	0.405
Other Universities	309	219	0.800	0.889	0.645	0.010	1.000

When the academic collaboration networks of academic staff working at research universities with academics at the research university and other universities are compared, it is seen that the number of connections of academic staff at research universities is quite low. It can be said that academic staff at research universities have more collaboration networks with their colleagues at other universities. The density value in social networks takes a value between 0 and 1. A density value of 0 indicates that there is no interaction, while a density value of 1 indicates that there are close relationships (Carrington et al., 2005; Everett & Borgatti, 2005). In the study, the density of the academic collaboration network of the academic staff at the research university was calculated as 0.004

(D=0.004, Std. Dev.=0.066, Avg. Degree=0.436), and the density of the academic collaboration network of the academic staff at other universities was calculated as 0.010 (D=0.010, Std. Dev.=0.176, Avg. Degree=0.950). From this point of view, it can be said that the density of both networks is low and there are loose ties.

When the reciprocity values of the network were analyzed, the reciprocity rate of academic collaboration networks established by academic staff with their colleagues in research universities was calculated as 82% (Arc Reciprocity=0.818), and the reciprocity rate in bilateral connections was calculated as 69% (Dyad Reciprocity=0.692). The reciprocity rate of academic collaboration networks established by academic staff with their colleagues in other universities was calculated as 89% (Arc Reciprocity=0.889) and the reciprocity rate in bilateral connections was calculated as 80% (Dyad Reciprocity=0.800). It can be said that the academic collaboration networks established by academic staff with their colleagues in other universities have higher reciprocal dyadic and triadic connections compared to their colleagues in research universities; therefore, the relationships in this social network are more structured and stronger.

Another network structural feature is transitivity. Transitivity determines groups of three in the network. Triplet groups make the network more balanced and sustainable (Kilduff & Tsai, 2007; Krackhardt, 1998). The transitivity rate of the professional collaboration network of the academic staff at the research university was calculated as 42% (Triplet Transitivity=0.419), and the transitivity rate of the professional collaboration network established with academics at other universities was calculated as 65% (Triplet Transitivity=0.645). According to this finding, it is seen that the professional collaboration network established by the academic staff with their colleagues at other universities is more structured and more sustainable than their colleagues working at the research university. Finally, the clustering coefficient is a measure of the direct connections of actors in the network with their neighbors. This coefficient takes a value between 0 and 1. A higher coefficient indicates that the actors in the network are more tightly connected (Scott, 2000; Wasserman & Faust, 1994). Based on this, it can be said that lecturers have tighter ties with their colleagues at other universities than their colleagues at the research university.

Centrality criteria (Freeman, 2004) are used to interpret the social network maps created in social network analysis and to determine the position of actors in the network. These criteria are important in terms of determining how important the actors in the network are in the network (Wasserman & Faust, 1994). The centrality measures of the academic collaboration networks established by academic staff with their colleagues in research universities and other universities are given below (Table 3).

Table 3. Centrality Measures of Academic Collaboration of Academic Staff [4]

	Centrality measures/Actors	Degree centrality	Closeness centrality	Betweenness centrality	Eigenvector centrality
Research Universities	Actors	AT2, HA1, HA2, GA12 (*deg*=5)	HA2 (*Clo*=0.514)	HA2 *(Betw.*=9.000)	AU3, AU9 (*eigenvector*=0.557)
			AT2 (*Clo*=0.512)	AT2 *(Betw.*=6.000)	AU10, HA5 (*eigenvector*=0.435)
			EG5, GA12 (*Clo*=0.511)	HA1, GA12 *(Betw.*=4.000)	
Other Universities	Actors	YT2 (*deg*=22)	HA2 (*Clo*=0.359)	HA2 *(Betw.*=58.000)	-
		EG5 (*deg*=20)	HA4 (*Clo*=0.357)	HA4 *(Betw.*=42.000)	
		HA2 (*deg*=16)	YT2, EG5 (*Clo*=0.356)	YT2 *(Betw.*=36.000)	
		GA2 (*deg*=14)		EG5 *(Betw.*=24.000)	

The table above shows the actors with the highest centrality values. The actors with the highest degree of centrality in the academic collaboration networks established by academic staff with their colleagues working at research universities are AT2 (deg=5), HA1 (deg=5), HA2 (deg=5), and GA12 (deg=5). The actors with the highest degree

[4] The table shows the actors with the highest centrality values.

of centrality in the academic collaboration networks established by academic staff with their colleagues in other universities are YT2 (deg=22), EG5 (deg=20), HA2 (deg=16) and GA2 (deg=14), respectively. *Degree centrality* refers to the number of direct connections each actor has with other actors in the social network (Everett & Borgatti, 2005). According to the table, it is seen that the degree of centrality of HA2 actors is high in both networks. From this point of view, it can be said that the HA2 actor has connections with a large number of actors and that this actor is at the center of the network and in an important position.

Closeness centrality is the degree of direct proximity or distance of an actor in a network to others. This degree refers to the actor's ability to quickly reach others in the network and access information (Carrington et al., 2005; Marsden, 2005). According to the table above, the actors with the highest closeness centrality in the academic collaboration networks established by academic staff with their colleagues working at research universities are HA2 (Clo=0.514), AT2 (Clo=0.512), EG5 (Clo=0.511) and GA12 (Clo=0.511). The actors with the highest closeness centrality in the academic collaboration networks established by academic staff with their colleagues in other universities are HA2 (Clo=0.359), HA4 (Clo=0.357), AT2 (Clo=0.356) and EG5 (Clo=0.356), respectively. When both networks are analyzed, it can be said that HA2 and EG5 actors can connect with other actors directly or indirectly in a short time and access information.

According to *betweenness centrality*, actors who act as bridges in the network may have an important position in the network since they have control over the flow of information (accessing information before anyone else, blocking the flow of information, or directing information in the direction they want) (Borgatti et al. 2013, 174-175). According to the table, the actors with the highest betweenness centrality in the academic collaboration networks established by academic staff with their colleagues working at research universities are HA2 (Betw.=9.000), AT2 (Betw.=6.000), HA1 (Betw.=4.000) and GA12 (Betw.=4.000). The actors with the highest betweenness centrality in the academic collaboration networks established by academic staff with their colleagues in other universities are HA2 (Betw.=58.000), HA4 (Betw.=42.000), PT2 (Betw.=36.000) and EG5 (Betw.=24.000), respectively. When both networks are analyzed, it can be said that the lecturer with the code number HA2 is the actor who plays a critical role among the actors who do not establish connections by acting as a bridge between other actors.

Finally, *eigenvector centrality* is a composite of all measures of degree, closeness, and betweenness centrality. The actors with the highest eigenvector centrality in the academic collaboration networks established by academic staff with their colleagues working in research universities are A3 and A9 actors. Since these actors are close to the actors who are active in the network and who are at the center of the network, it is expected that they will also provide various advantages (access to resources such as information, etc.). However, it is seen that the eigenvector values in the academic collaboration networks established by the academic staff with their colleagues in other universities are .000 and the quality of the connection between the actors is low. In summary, when the centrality measurements of the academic collaboration networks established by academic staff with their colleagues working in research universities and other universities are examined, it is seen that the HA2 actor is at the center of the network, acts as a bridge between other actors, provides the connection and is an effective actor in terms of its position in the network. Following the academic collaboration between academic staff, scientific journal articles published by academic staff at research universities in journals indexed in SSCI, SCI, and AHCI between 2019 and 2024 were analyzed. The number of scientific articles published in research universities during these dates is given below (Table 4).

Table 4. Number of Field Indexed Publications by Faculty Members in Research Universities

University/Date	2019	2020	2021	2022	2023	2024	Total
Hacettepe University	6	2	9	8	10	1	36
Ankara University	5	2	7	5	2	0	21
Firat University	0	6	3	4	5	1	19
Middle East Technical University	0	4	4	1	7	2	18
Yildiz Teknik University	4	1	1	5	3	1	15
Ege University	1	2	1	3	6	1	14
Gazi University	2	1	2	0	8	0	13
Ataturk University	0	3	2	3	2	0	10
Bogazici University	2	1	2	1	4	0	10
Marmara University	2	1	1	0	1	0	5
Uludag University	0	2	1	1	1	0	5
Istanbul University	1	0	1	1	0	0	3
Cukurova University	0	0	0	1	1	0	2

Dokuz Eylul University	1	0	1	0	0	0	2
Erciyes University	0	0	0	0	0	0	0

As can be seen in the table, the highest number of field-indexed publications between 2019-2024 was made by academic staff working at Hacettepe University. This is followed by Ankara University and Fırat University, respectively. It is seen that most of the researches were published in 2023. It is seen that Erciyes University, one of the research universities, has not published any scientific studies published in field-indexed journals between these dates. In this study, the social network analysis method was used to determine which keywords were studied in each research university. According to the research findings, when the keywords were examined, the most frequently studied topics in research universities were teacher (f: 31), school principal (f: 24), leadership (f: 16), school (f: 11), Turkish Educational System (f: 10), trust (f: 10), student (f: 10). The social network map of academic publications published by academic staff at research universities between 2019 and 2024 is presented below (Figure 3).

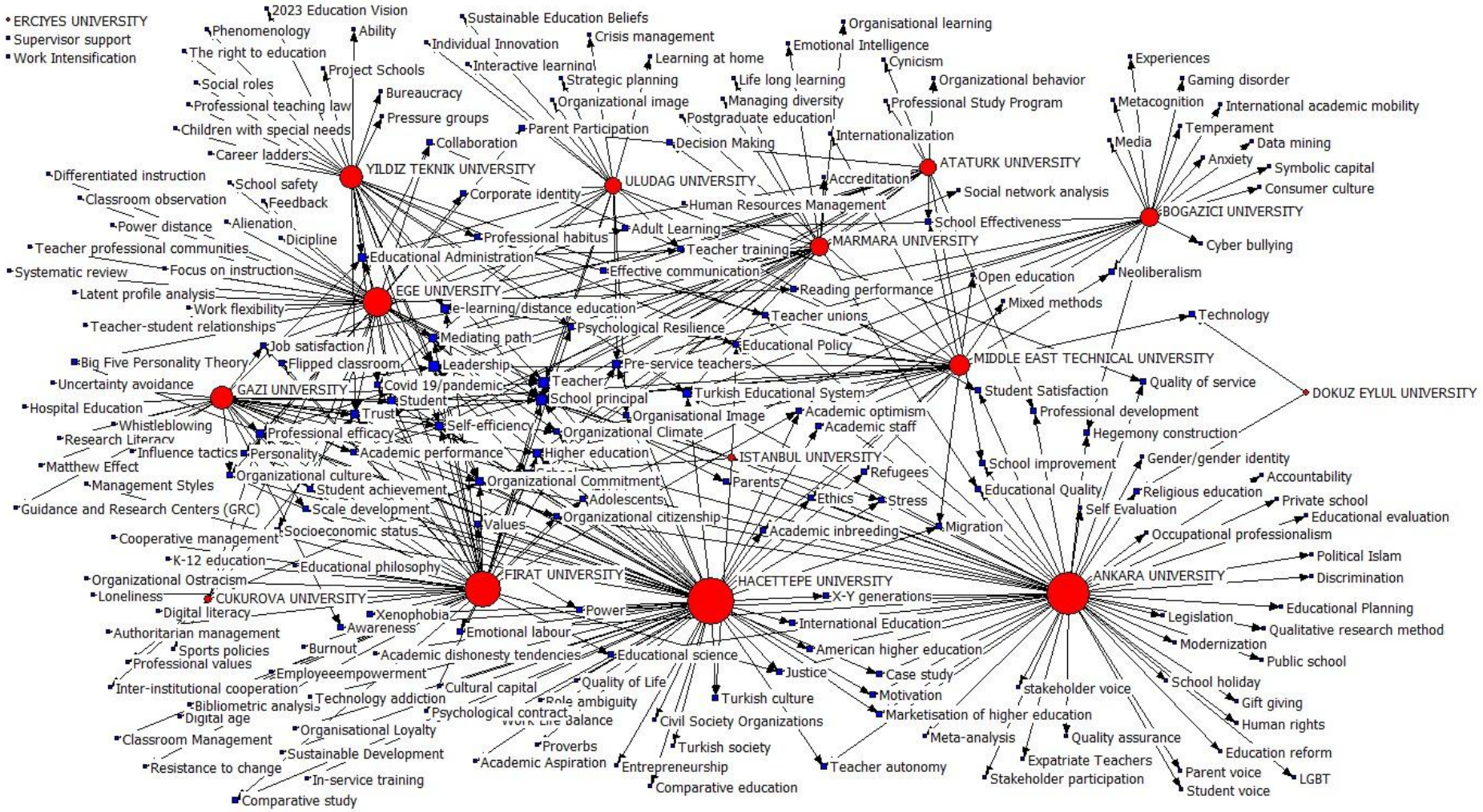

Figure 3. Keywords in Scientific Journal Articles Published in Research Universities between 2019-2024

According to the network map above, it can be said that a large number of topics are studied in research universities. There are 213 nodes and 367 links in the social network of academic publications. Therefore, it is possible to say that there are many connections in the network. It is seen that academic staff in research universities study similar topics to their colleagues in other universities. In the study, after the social network map was created for the field-indexed publications of academic staff in research universities, bimodal network data was converted into unimodal network data in the UCINET program for the analysis of the network. As a result of the analysis, the density of the network was calculated as 0.714. The fact that this value is close to 1 leads to the conclusion that there are tight and dense relationships in the network. Finally, the fact that the transitivity in the network is 92% (Triplet Transitivity=0.918) shows that this network is very balanced, structured and sustainable. According to the findings, Hacettepe University (HA) and Ankara University (AU) have higher centrality values than other universities.

Hacettepe University and Ankara University have conducted more studies than other research universities. There are many links between both universities and there are common topics such as motivation, ethics, Turkish Educational System. However, it is seen that different topics are studied in both universities. For example, at Ankara University, gender/gender identity, LGBT, human rights, discrimination and teacher unions are among the topics researched differently from other universities. At Hacettepe University, the COVID-19/pandemic, migration, refugees, Turkish society, Turkish culture, and technology addiction are among the topics studied. In summary, it is seen that the academic collaboration network among academic staff at research universities is weak, whereas the networks established by academics working at research universities with their colleagues at other universities are denser and stronger. In other words, academic staff at research universities engage in academic collaboration with their colleagues at other universities and publish co-authored studies with them. Despite the weak connections among academic staff in research universities, it is observed that academic publications in these universities include a large number of interconnected concepts. Faculty members at these universities study similar topics with their colleagues and continue their research on these topics.

Discussion, Conclusion, and Recommendations

In this study, which was conducted to examine the academic publications and academic collaboration networks of academic staff working in research universities in Turkey by using the social network analysis method, various results were reached. Academic staff in universities form complex social networks that are influenced by various factors and serve multiple purposes. Academic collaboration networks are complex structures that reflect the intricate relationships between individuals (Kong et. al., 2019). Social network analysis of academic staff in universities reveals informal structures that influence collaboration, innovation, and scientific output. These analyses show that academic networks are influenced by organizational roles, individual interactions, and the broader social structures in which they are embedded.

Social network analysis can be used to analyze social mobility, science citations, relationships, and community structure in universities (Scott, 1988; Yuce et. al., 2014). With social network analysis, metrics provided by academic social networks such as the number of scientific publications, co-authored works (Hassan, 2018; Said et. al., 2018), readings, and citations can be used to evaluate and compare researchers and research units (Bibi et. al., 2018). In the study, it was revealed that the academic collaboration network among academic staff in research universities is weak, but academics working in research universities establish more relationships with their colleagues in other universities. This can be explained by the intense individual competition environment in research universities and the fact that academics are not directed towards interdisciplinary cooperation. It is seen that academic staff at research universities focus on individual success due to institutional expectations and performance criteria, and therefore, intra-institutional collaboration is limited. On the other hand, it is thought that relationships with colleagues at different universities are more preferred due to their potential to provide diversity and new perspectives. It can also be stated that external connections increase the visibility of academics and open the door to new research opportunities. These findings suggest that academic collaboration networks should be strengthened and encouraged more at the institutional level.

Academic collaboration among teaching staff in higher education is crucial for academic and professional development. University administrators and institutions play an important role in encouraging these partnerships (Omotayo & Abdulrahman, 2021). Therefore, it can be said that higher education administrators have an important role to play in developing the academic collaboration networks of academic staff in research universities and encouraging them to collaborate. It is important for university administrators to create an organizational culture that paves the way for academic collaboration and to create an environment where trust and effective communication among employees are ensured. Developing collaborative networks among faculty can bring many benefits to the university and academic staff. For example, collaborating with other faculty members can lighten the workload of academics and revitalize teaching and research with the potential to re-energize faculty members and bring back their passion for their work (Eddy & Mitchell, 2011). In addition, effective knowledge sharing

among university faculty promotes quality teaching and research. Academic collaborative networks enhance individuals' personal development (Adamseged & Hong, 2018), share knowledge, build trust, and establish partnerships that enhance educational and research outcomes (Dallmer, 2004; Perry et. al., 2022; Richardson et. al., 2018).

Another result of the study is that despite the weak links between academic staff in research universities, academic publications in these universities include a large number of interrelated concepts. Lecturers in these universities study similar topics with their colleagues and continue their research on these topics. This can be considered as a result of the fact that academic staff at research universities individually focus on similar themes and research areas. Even if they do not directly collaborate with each other, the fact that academics work around common scientific interests contributes to the deepening of these universities in their areas of specialization. However, this parallelism also shows that potential collaboration opportunities within the institution are not sufficiently utilized. Moreover, this finding suggests that the lack of academic collaboration is more related to the models of collaboration rather than the diversity of research topics. Strategic interventions to increase collaboration within the institution can both increase scientific productivity and expand the university's overall impact. Academic collaboration networks have an impact on academic productivity. Therefore, it can be said that it is important for university administrators to encourage researchers to establish collaborative relationships as it significantly increases scientific productivity (Landry et. al., 1996). In this context, it may be effective to build consensus to encourage collaboration among faculty members at the university and to prefer collaboration models that value a less hierarchical approach. (Dallmer, 2004).

The study concludes that Hacettepe University and Ankara University, which are among the most prestigious universities in Turkey, have the highest number of field-indexed academic publications, and that actors at these universities have established more academic collaboration networks with their colleagues at research universities and other universities. Hacettepe University ranked 554th among the 3,000 universities with the highest academic performance according to the URAP (University Ranking by Academic Performance) Research Laboratory, 2023-2024 World Rankings. Hacettepe University ranks first in Turkey. Ankara University ranks 745th in the world and 6th in Turkey (URAP Center, 2024; Newspaper Hacettepe, 2024). Therefore, it is expected that academic collaboration networks and academic publications among academic staff in these universities with high academic success will be high.

When academic publications are examined, it is seen that the most frequently used keywords are teacher, school principal, leadership, school, Turkish Education System, trust and student. It is noteworthy that the Turkish Education System, Turkish society, and Turkish culture are studied in the research. In addition, Hacettepe University and Ankara University have different weights on the topics. In Ankara University, gender identity, LGBT, human rights, discrimination, teacher unions, religious education, and political Islam are among the topics researched differently from other universities. In Hacettepe University, the COVID-19/pandemic, migration, refugees, Turkish society, Turkish culture, and technology addiction are among the topics studied. The difference in these topics may be due to the differences in the interests of the academic staff, as well as the structure, management, and dynamics of the university. To make more detailed comments on this issue, it is necessary to evaluate all factors related to the university and to consider the university together with its conditions. Since social network analysis is used to determine the situation, the reasons behind the behaviors of individuals can be revealed through research conducted with a postpositivist paradigm.

It is possible to say that university administrators have a role to play in increasing academic cooperation among academic staff. To summarize, it can be said that faculty members in research universities have weak connections with their colleagues and the number of field-indexed publications that qualify as international publications is quite low. Considering that the main expectation from research universities is research, development, and improvement, the number of these publications is insufficient. In conclusion, university administrators should focus on building trust, rewarding collaborative efforts, and fostering an organizational culture that supports communication. They should also take into account power dynamics and structural barriers within the university and encourage interaction between different universities in increasing academic collaboration and the number of qualified academic publications. Within the scope of the research, the reasons underlying the academic collaboration networks in research universities can be examined in detail through qualitative research based on the views of academic staff and higher education administrators. It is thought that studies conducted in this context can contribute to the literature in terms of explaining the reasons and results of collaboration networks among academic staff.

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