Social Network Analysis of the Farabi Exchange Program: Student Mobility

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Abstract

Problem Statement: Exchange programs offer communication channels created through student and instructor exchanges; a flow of information takes place through these channels. The Farabi Exchange Program (FEP) is a student and instructor exchange program between institutions of higher education. Through the use of social network analysis and techniques unique to it, an analysis of this structure will uncover how much universities and teacher training institutions as actors are affected by these student exchange programs and how much of their capacity they actually use. A literature review shows that exchange programs have been the focus of several studies, but there is almost no research using social network analysis on exchange program and teacher training programs. In the evaluation of student exchange programs, the social network approach brings a new point of view in the evaluation of complex and multiple relationships.

Purpose of the study: The main purpose of this study is the mutual assessment of teacher training programs in universities which accept and send students through the exchange framework of the FEP.

Methods: The study has been carried out a social network analysis approach. Social network analysis defined as the method of digital and/or graphic mapping of the type, direction and density of relationships between groups of actors. In this study, data was acquired from the lists of students who participated in the FEP at 18 universities, which have been selected through the cluster sampling method for the 2013–2014 educational year. It has been analyzed with the UCINET 6.0 software program.

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Findings and Results: According to the findings of the study, 822 connections in the whole network and 451 connections in the teacher training network have been identified in the FEP. It has been determined that 47% of maximum connection possible in the density analysis were made for the whole network (D= 0, 472), while 15% of maximum connections possible in the density analysis were made for the teacher training network (D= 0, 155).

Conclusions and Recommendations: Results confirmed that, the networks between education faculties are relatively weaker. The high number of disconnected and isolated actors points to the necessity of strengthening connections between institutions which train teachers and education faculties.

Keywords: higher education, universities, teacher training network, exchange programs.

Introduction

Besides being institutions which create and spread knowledge, universities assume important functions in terms of the mobility of knowledge and man power. The student and instructor exchange programs stand out as the most influential tool in terms of mobility. Exchange programs have been one of the many strategies used for many years to prepare students for the future in the increasingly globalized world, both for states which produce politics and for universities (Rizvi, 2006). Classrooms in higher education institutions have gradually become places where local students and those who come from different countries receive education together, becoming more and more *internationalized* by time (Luxton & Peelo, 2009). According to Gudekli, Kilic and Taner (2013), exchange programs are defined as programs that, within the scope of the protocol made between two local or foreign higher education institutions, stipulate that students, who are enrolled in one of the intuitions, receive short-term education in the other institution, and the acceptance of classes taken in one institution is equivalent to classes taken from the other educational institution.

The most significant benefits of exchange programs include the circulation of knowledge, increased capacity, and increased interaction and cooperation between higher education institutions; they allow positive examples to be shared and spread, not only increasing capacity by making it possible for more students and instructors to make use of materials, equipment' and physical conditions but also supporting personal development, and allowing higher education institutions to compare evaluations of their own work with the work of other higher education institutions (Messer & Wolter, 2007). A literature review of exchange programs shows that topics such as the views of those who benefited from the student exchange program, rates of participation, and the hardships faced in terms of implementation have been

studied. In the evaluation of these types of programs, other criteria and methods can be used for the efficient and productive use of public resources which are limited.

The Farabi Exchange Program (FEP) is a student and instructor exchange program between higher education institutions between higher education institutions in Turkey. Regulations related to the program were published in the Official Gazette dated 18 February, 2009, no: 27145 becoming effective as of that date. The FEP allows instructors and students in particular to develop their vision by both increasing the exchange of information and seeing different educational institutions; through the chance to participate in a another higher education institution for one or two semesters, they acquire new points of view, and life experiences and the opportunity for different learning/teaching in universities other than their own.

Within the scope of the program, 537 students participated in a student exchange for the first time in the 2009–2010 academic year. The number of FEP students receiving education in another higher education institution for one semester or one year reached 2, 030 during the 2010–2011 academic year; 2, 907 during the 2011–2012 academic year, and 7,018 during the 2012–2013 academic year. A total of 12,492 students have benefitted from the student exchange program from the date the program was implemented until 2013. The students are given a monthly non-refundable grant of 420 TL. Within the scope of the FEP, a total of 27, 791, 406 TL in funds transfer has been to higher education institutions by Council of Higher Education (CHE). Throughout Turkey, a total of 105 higher education institutions are actively involved in the FEP, 90 of which are state and 15 of which are foundation higher education institutions. Of the students participating in the program, 62% were female and 38% were male (CHE 2012 *Financial Year Administrative Activity Report,* 2013, p. 105–107). In accordance with a decision taken in CHE's meeting dated 22 December, 2010, the exchange of instructors has been stopped. Student exchanges, however, continue.

According to CHE's 2009–2013 data, of a total of 139 universities, 98 of which are state and 41 of which are foundation universities, the university sending the most students has been Selcuk University (486, 5,3%), followed by Karadeniz Technical University, Afyon Kocatepe University, and Gazi Osmanpasa University, respectively. In the same statistical data, the university accepting the highest number of students has been Gazi University (1,706, 18,65%), followed by Anadolu University, Istanbul University, and Yildiz Technical University, respectively. With respect to subject area distribution in the Farabi programs, most student exchanges are made in the area of educational sciences (43%). This shows that the importance of student exchange programs and these being taken as a study area carries a separate importance in terms of educational sciences as well.

Exchange programs in scientific studies have been studied in terms of dimensions such as the experiences of students and instructors, the living conditions of the countries they go to, effects on academic success, and program contents and accreditation as factors which influence the adaptation processes of students (Boyaci, 2011; Gokcek, 2013; Kasapoglu-Onder & Balci, 2010; Maiworm, Steube, & Teichler,

1991; Messer & Wolter, 2007; Mirici et. al., 2009; Teichler, 1996; Teichler & Maiworm, 1994; Yagci et. al., 2007; Yigit et. al., 2009), managerial factors which influence the successful implementation of exchange programs (such as leadership and organizational culture) and factors which influence the decision processes of students to participate in exchange programs have also been studied (Daly & Barker, 2010). Bryla (2014) has researched the communication tools used in the continuation of relationships established during exchange programs.

The studies conducted display a complete picture in terms of issues such as the scale of exchange programs, their realization processes, views of students and participation rates. Exchange programs are extensive activities which are carried out in numerous universities in the world and in Turkey, supported by governments and higher institution, and encouraged with large–scale budget transfers. By increasing the interaction between universities in Turkey, great potential can be made use of in terms of the sharing of resources such as equipment' and student and instructor exchange, in addition to cooperation in the areas of education and research. Another aspect of exchange programs is that communication channels are created through the student and instructor exchange, and information flows take place through these channels. Thus, exchange programs can be evaluated from a social network point of view as well.

In evaluating student exchange programs, the social network approach brings a new point of view to the evaluation of multiple and complex relationships. Within the framework of protocols signed between numerous universities in bilateral agreements, regularly accepting and sending students from each other shows a relationship network and reciprocity between universities as actors. That this takes place within a framework of certain protocols, with announcements made at certain times determined each year, and supported by various funds through pre-established regulations and guidelines, shows the continuity of these connections. The relationship network created by the sending and accepting of students to each other by universities as actors forms the basis of the structure of the social network at this point. Therefore, through the use of social network analysis, the analysis of this structure with techniques unique to it will be able to uncover how much universities as actors are affected by these student exchange programs and how much of their capacity they use.

A social network means a consistent interaction and pattern of change between individuals or institutions (Powel, 1990). The conceptual background of the network theory on which this approach depends has been formed by making use of different disciplines and perspectives such as sociology, anthropology and role theory. The common point these spheres share is that, they all depend on the basis of communication and mutual influence (interaction) between the actors (Tichy, Tushman & Fombrun, 1979). Social network analysis is an interdisciplinary research approach that has unique calculation methods in terms of revealing relationships between actors. It allows for the structure formed by the relationships between actors and inter-actors to be revealed in a digitalized manner or in the form of graphics (Aggarwal, 2011). Wasserman and Faust (1995) state that social network analysis

contains four basic assumptions: mutual attachment, connections between the actors, effect of the network structure and continuity in the inter-actor relationships. In other words, there are actors connected to each other, but they are autonomous as well. Network structure either provides or limits opportunities for actors from social, economic and political environments. Lastly, a network requires a continuous relationship between the actors. In summary, social network analysis in its narrowest definition is the mapping of the types, direction and density of relationships between a group of actors in a digital and/or graphic manner (Oztas & Acar, 2003, p. 292).

This study conducted with the social network approach aims at providing a different point of view for the assessment of student exchange programs. In this respect, the main purpose of this study is to make a mutual assessment in terms of universities which accept and send students through student exchange taking place between universities within the framework of the Farabi Exchange Program. With respect to this purpose, the answers to the following questions have been sought for in the study in the 2013–2014 fall and spring semesters:

1. Which universities have sent students to which other universities within the framework of the Farabi Exchange Program?
2. Which universities accept and send more students in terms of the Educational Sciences and institutions which train teachers within the framework of the Farabi Exchange Program?
3. What proportion of the student exchange is taken up *(density)* compared with the maximum allowed under the framework of the Farabi Exchange Program?

Method

Research Design

This study is a survey model, which involves determining the existing situation. The survey model is a research approach which describes a situation that exists at that moment as it is and aims at defining it (Karasar, 1984, p.79). The study has been conducted with the social network analysis approach. Social network analysis is an interdisciplinary research approach which has unique calculation methods in terms of revealing relationships between actors. It allows the structure formed by the relationships between the actors and inter-actors and these relationships in a digitalized manner or in the form of graphics (Aggarwal, 2011). Social network analysis is a unique methodology with its own version of data collection, statistical analysis, and presentation of results (Kapucu, Yuldashev, Demiroz & Arslan, 2010, p. 541). According to Freeman (2004, p.2) these aspects are a part of all modern social network analysis examples. Social network analysis justifies the insights on the structural connections which tie social actors to each other. This empirical data is collected systematically and it is controlled. This data is presented through graphics. Mathematical models are relied on in the making of these calculations.

Research Sample

The population of the study was the state universities which accepted and sent students to each other within the framework of the Farabi Exchange Program during the 2013–2014 academic year. According to the Council of Higher Education (CHE) there were 101 state universities during the 2013–2014 academic year. In the study, the cluster sampling method was used in the selection of samples from the population. Cluster sampling is used in cases where there are different groups that have formed naturally in the considered population to be studied or been created artificially with different purposes, which display similarities in terms of certain aspects within them (Balci, 2005, p. 87; Yildırım & Simsek, 2008, p. 105). For the identification of clusters of universities to be taken as samples in the study, the classification of universities was made in accordance with their founding years and their level of institutionalization in relation to that. Accordingly, they were separated into three clusters, as universities founded prior to 1992, between 1992- and 2003, and after 2003.

The universities founded prior to 1992 are those which have existed since the first of the Republic, since even before that, which have been institutionalized as they have existed for years and have proven themselves and assumed a precursory role in the foundation of other universities. In 1992, there was been an extraordinary increase in the number of universities with 21 new state universities being founded. Four more universities came after those, making the number of state universities just about doubled by 2000. After 2003, with certain structural regulations in higher education, the total number of state universities reached 101 with the addition of new universities in 2003 and 2007 (Table 1).

Table 1.
Universities by Foundation Date in Turkey

Foundation Date	Universities
Prior to 1992	Akdeniz, Anadolu, Ankara, Ataturk, Bogazici, Cumhuriyet, Dicle, Dokuz Eylul, Ege, Erciyes, Firat, Gazi, Gaziantep, Hacettepe, Inonu, Istanbul Teknik, Istanbul, Karadeniz Teknik, Marmara, Mimar Sinan, On Dokuz Mayis, METU, Selcuk, Trakya, Uludag, Yildiz Teknik and Yuzuncu Yil
1992-2003	Abant Izzet Baysal, Adnan Menderes, Afyon Kocatepe, Balikesir, Celal Bayar, Canakkale On Sekiz Mart, Cukurova, Dumlupinar, Galatasaray, Gazi Osman Pasa, Harran, Izmir Yuksek Teknoloji, Kafkas, Kahraman Maras Sutcu Imam, Kirikkale, Kocaeli, Mersin, Mugla Sitki Kocman, Mustafa Kemal, Nigde, Eskisehir Osman Gazi, Pamukkale, Sakarya, Suleyman Demirel and Zonguldak Kara Elmas (Bülent Ecevit)
2003-2013	Abdullah Gul, Adiyaman, Agri Ibrahim Cecen, Ahi Evran, Amasya, Aksaray, Ardahan, Artvin Coruh, Bartin, Batman, Bayburt, Bilecik Seyh Edibali, Bingol, Bitlis Eren, Bozok, Bursa Orhan Gazi, Cankiri Karatekin, Duzce, Erzincan, Erzurum Teknik, Giresun, Gümüshane, Hakkari, Hitit, Igdır, Istanbul Medeniyet, Izmir Katip Celebi, Karabük, Karamanoglu Mehmet Bey, Kastamonu, Kirklareli, Kilis 7 Aralik, Mardin Artuklu, Mehmet Akif Ersoy, Mus Alparslan, Namik Kemal, Necmettin Erbakan, Nevsehir Hacibektas, Ordu, Osmaniye Korkut Ata, Recep Tayyip Erdogan (Rize), Siirt, Sinop, Sirnak, Tunceli, Turk-Alman, Usak, Yalova and Yildirim Beyazit

However, due to the cities where the universities are located, the environmental factors are different from each other. Turkey, in a classification related to socio-economic development (SEGE—2011), —has been separated into six development levels at the economic, social, and cultural levels (Republic of Turkey Ministry of Development, Regional Development and Structural Adjustment, General Directorate, Ankara, 2013). When the foundation years and cities' development levels were taken into consideration together, it was observed that universities are mostly among the first and second clusters in cities whose development levels are relatively higher in Turkey, while universities in the third cluster are in cities developed a lower level or still developing and receiving encouragement. Therefore, taking into consideration the development levels of the cities where universities have been founded as another criterion in the cluster sampling, a total of 30 universities from each sub-cluster were selected through the random sampling method. Next 7 universities (25%) were placed in the first cluster; 7 universities (25%) in the second cluster; and in the third cluster, 15 universities (%50). Random sampling is used as a complimentary method in studies, with other sampling methods based on probability (Yildirim & Simsek, 2008, p. 104). The selected universities were analyzed once again according to the development levels of the cities and a representation for each development level was provided. However, it was not possible to access the going-coming student lists for all universities' 2013—2014 autumn and spring semesters Farabi Exchange Program'. This is the limitation of the study.

As a result, the total number of samples given a place from the universities selected through the cluster sampling method and whose data was provided came to 18. In the first cluster, there were 7; in the second cluster, 7; and in the third cluster, 4 universities were included in the samples. These were, namely: in the first cluster Akdeniz, Cukurova, Gazi, Hacettepe, Istanbul, Marmara and, Uludag Universities; in the second cluster, Afyon Kocatepe, Celal Bayar, Eskisehir Osman Gazi, Kocaeli, Nigde, Pamukkale and, Suleyman Demirel Universities; and in the third cluster, Ahi Evran, Aksaray, Mardin Artuklu and Bitlis Eren Universities. In this study, which is a social network analysis of the connections between universities who send students to and accept students from each other within the framework of the FEP, the universities included in the samples constitute the basic actor list of the study as well.

Research Instrument and Procedure

A social network is a structure which is made up of connections (relationships) between actors and inter-actors (Carrington, Scott &Wasserman, 2005; Scott, 2000). The analysis of this network structure made up of the actors and their relationships allows the identification of the type, direction, density, areas which can be developed and limitations, and intervention areas through analysis methods unique to itself (Borgatti & Foster, 2003; Borgatti, Everett & Freeman, 2003; Cross & Parker, 2004). It also allows seeing and evaluating the relationships and the positions of the actors within the network visually through graphics (Barabasi, 2010; Degenne & Forse, 1999). In this study, the social network can be defined as the network of universities which send to and accept students from each other within the framework of the Farabi Exchange Program.

The main data for the analysis of the study was collected over the Internet from the universities' Farabi Coordinatorship and announcement pages. Although the

signed protocols between the universities show the possibility of a change to potentially take place, these cannot exactly be regarded as indications of change. Therefore, for the collection of data, announcement lists – where it was indicated whether the students who applied in the application periods (spring and fall) were accepted or not and to which university's department – were used. These announcement lists are open to the public and are accessible through the web sites of the universities. Data collected from the coming and going student lists were coded in accordance with this approach as: those who have a relationship between them "1" and those who do not have a relationship between them "0" ; thus a matrix called the adjacency matrix was created. The adjacency matrix represents who has a relationship with whom. Through the software program UCINET 6.0 (Borgatti & Foster, 2002) used for the social network analysis, this data was analyzed, the density, degree and, betweenness values which are calculations unique to social network analysis were performed and the network relationships presented visually with graphics.

In social network analysis, the three main units which make up a social network are actors (*nodes*), connections (*edge/tie*) and social network structure (Christakis & Fowler, 2012*).* Each of the analysis units have been defined for this study below:

1—Actors or nodes in social network analysis are each of the analysis units which make up the relationship network studied. Actors may be selected as individuals, institutions and countries, depending on the purpose and characteristics of the study (Marsden, 2005; Scott, 2000). The actors of this study are the state universities which have sent students to and received students from each other during the 2013—2014 academic years spring and fall semesters within the framework of the FEP. The actors whose relationship to each other will be analyzed have been selected and listed through the sampling approaches determined above.

2—Connection represents the relationship identified between the actors. In a social network analysis, the studies connection type (relationship) needs to be well defined and classified (Oztas & Acar, 2004). In this study, the relationship network analyzed is the relationships on accepting and sending students (coming-going students) in the spring and fall semester within the framework of the FEP. This type of relationship can be regarded as one of the indicator of how connected universities are to other universities. The student lists coming to and going from universities during the indicated period within the framework of the FEP represent the type of relationship which is analyzed. The mentioned lists are announced by the universities' Farabi Coordinatorships and can be accessed through the Internet.

Validity and Reliability

The network perspective does not supplant the importance of individual attributes in understanding the selection, interpretation, and implementation of change, but rather offers a complementary theoretical framework and set of methods for examining the dynamics of social processes in education (Moolenaar, 2012). According to *The Encyclopedia of Social Network Analysis and Mining* (Alhajj & Rokne, 2014, p. 1437), in the validity and reliability investigation of social network research, reliability is assessed in the measurement stage and validity pertains to the relationship between conceptualization (what we want to measure) through

operationalization (how the theoretical concepts are translated into empirical indicators) to actual measurement (what we actually measure). In this study, the social network can be defined as the network of universities which send to and accept students from each other within the framework of the Farabi Exchange Program. The main data for the analysis of the study was collected over the Internet from the universities' Farabi Coordinatorship and announcement pages. Through the software program UCINET 6.0 (Borgatti & Foster, 2002) used for the social network analysis, this data was analyzed, the density, degree and betweenness values which are calculations unique to social network analysis were performed and the network relationships presented visually with graphics.

Results

According to the findings of the research, 91 actors were identified which were connected with a total of 18 actors from the Farabi statistics belonging to 2013—2014 fall and spring periods. Within the whole network, 822 connections were identified between 91 actors. Which university sends students to which other universities within the framework of the exchange program was the purpose of the study and the state of the university within this change network has been presented graphically. The method to be followed in the interpretation of the network maps is as follows: In the study, the checkboxes represent the actors, the lines the relationship of student change. The actors who are located at the center of the network maps are the actors with the most connections. While the actors, who assume an active role, are located at the center, the actors displaying less activity are located at the perimeters (Figure 1).
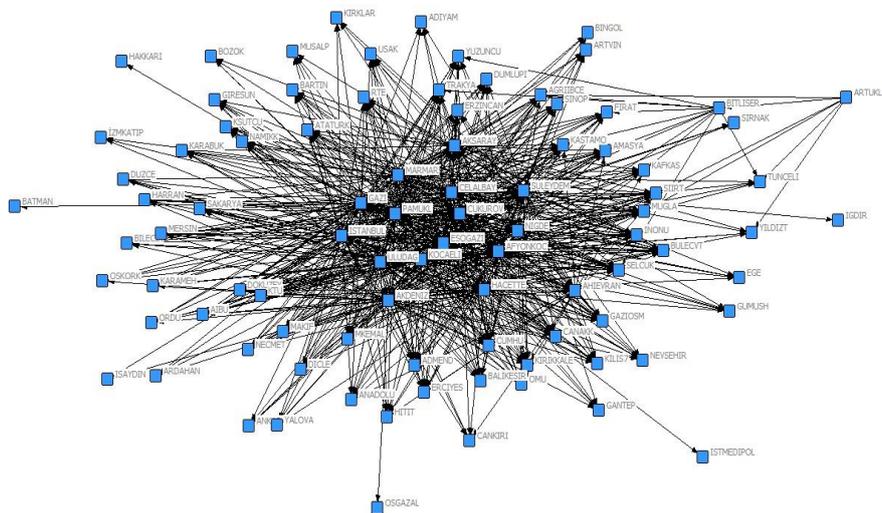
Figure 1. The Social network map of the student exchange program of the samples during the 2013—2014 Farabi spring and fall semesters

As can be seen from Figure 1, Gazi, Eskisehir Osman Gazi, Marmara, Pamukkale, Afyon, Kocaeli, and Nigde Universities are in the network's center. These universities have been identified as the most active universities in terms of student mobility. In the more in-depth analysis of these relationships which have been identified visually, in order to be able to identify which are more connected in comparison to the others, centrality measurements are made use of in the social network analysis. The degree of centrality is the degree which reflects the direct connections of the actor in terms of actors' positions within the network. This measurement shows the actors who have more or less connections and can be evaluated both as connections directed to them or from them to others. Determining scores of centrality, determines both those who are in active and leader positions within the network and those who are perimeter actors or groups (Cross & Parker, 2004, p. 192-193). In the study, according to centrality calculations, Gazi University was the actor most connected to other actors (*Degree*=73). Gazi University has been identified as the actor with the highest betweenness (*Betw*=529.88), closeness (*Clo*=81.333) and eigenvalue (*Eigw*=0.242) score. According to evaluations of 2009—2013 Farabi Statistics announced by CHE, Gazi University was found to be the university which most accepted students in the Farabi student exchange program (1.706, 18.65%). According to data collected from 18 main actors during the 2013—2014 spring and fall periods, Gazi University has been identified as the university with the most connections with other universities. The study findings show that the efficiency of Gazi University as the university which accepted the most students continued in the later years as well.

For the sample related to which universities accept and send more students in terms of educational sciences and institutions which train teachers, which pertains to the second question of the study, at the next network map involves only student exchanges in that area. According to the findings of the study, the number of actors which the 18 actors were related to the area of education (Education and Educational Sciences Faculties, Faculties of Theology Religious Culture and Ethics Teachership and BESYO Physical Education and Sports Teachership included) during the 2013—2014 spring and fall semesters within the scope of the FEP was determined to be 66. Twenty-five of the universities which accepted students from another exchanged students in the areas of education (*Isolation=25)*. Among the 66 actors within the network formed by the ones in the area of education, 451 connections were identified (Figure 2).
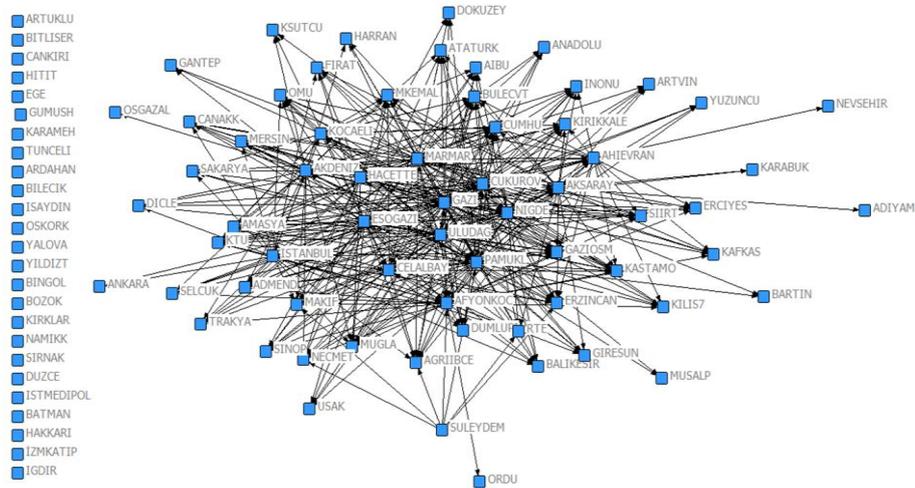
Figure 2. Student exchange program social network map between the educational sciences and teacher training departments from actors included in the samples of the 2013-2014 Farabi fall and spring semesters.

According to the findings of the study, Gazi University has been identified as the university with the most connections with the other actors *(Degree=53)* in the area of education (Education and Educational Sciences Faculties, Faculties of Theology Religious Culture and Ethics Teachership, and BESYO Physical Education and Sports Teachership included) during the 2013—2014 spring and fall semesters within the scope of FEP. Gazi University has been determined as the actor with the highest values of betweenness *(Betw= 319.918)*, closeness *(Clo=59.000)* and eigenvalue *(Eigw=0.292)*. Although the 18 universities included in the 2013-2014 spring and fall semester samples (Ahi Evran, Afyon Kocatepe, Akdeniz, Aksaray, Bitlis Eren, Celal Bayar, Çukurova, Eskisehir Osman Gazi, Gazi, Hacettepe, Istanbul, Kocaeli, Mardin Artuklu, Marmara, Nigde, Pamukkale, Suleyman Demirel, Uludag) have exchanged students from other branches, it has been determined that no student exchange took place in the area of educational sciences and teacher training in Mardin Artuklu, Bitlis Eren, Cankiri, Hitit, Ege, Gümüshane, Karamanoglu Mehmet Bey, Tunceli, Ardahan, Bilecik, Istanbul Aydin, Korkut Ata, Yalova, Yildiz Teknik, Bingol, Bozok, Kirklareli, Namik Kemal, Sirnak, Duzce, Istanbul Medipol, Batman, Hakkari, Izmir Katip Celebi and Igdır Universities. Among these universities, only Mardin Artuklu and Bitlis Eren universities are in the university samples.

Component size shows how all actors within the network are in a meaningful union with each other. If all of the actors in the network are connected to each other, this number is one. However, if there are divisions within the network, this number shows whatever number of divisions there are (Hanneman &Riddle, UCINET tutorial). In the study, while the size of components in student exchanges for the whole network from the universities which are included in the samples has been

determined as one *(component size=1)*, the component size in student exchanges in the area of education has been determined as two *(component size=2)*. Bitlis Eren University and Mardin Artuklu University have formed a separate component among themselves and, although it is connected to the whole network, it forms a separate whole (Figure 3).
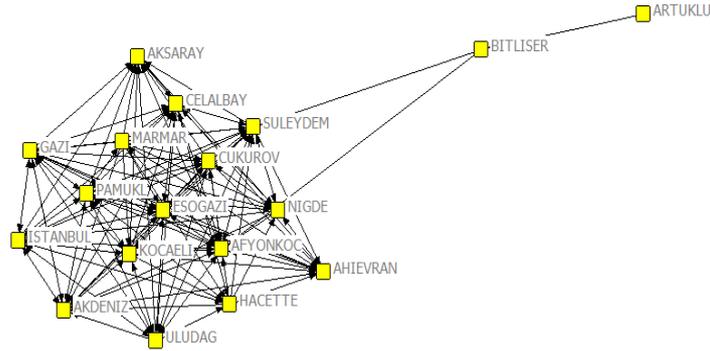

Figure 3. Student exchange network map among actors who are in samples.

As is seen from Figure 3, the two actors have not formed a unity with the other actors. The reason could be strongly that in both of the universities, there are noEducation or Education Sciences faculties. However, when the other teacher training sources of Religious Culture and Ethics Teachership and BESYO Physical Education and Sports Teachership branches included in the study are taken into consideration, these two actors have been determined as connected with the whole network although it is a weak connection. Still, in the isolated actors list (Figure 2), although there are many institutions which train a great number of teachers, the fact that there is no student exchange in institutions which are among the samples makes on think that various efforts may need to be under taken to develop these programs and strengthen the connections between institutions.

In terms of how much of the student exchange has been utilized given the maximum student exchange possible in the framework of the Farabi Exchange Program, which is the third question of the study, it has been determined with a density analysis, which is one of the measurements unique to social network analysis. Density calculation is defined as the proportion of the existing number of connections between the actors in a network to the highest number of possible connections (Scott, 2000). Network density is related to the level of connectedness in the whole network and is expressed in percentages. According to this measurement, if each of the actors in the network has a connection with the other actors, then the density is 100%; if no one has a connection with the other, then the network density is 0%. The strength of this number depends on the largeness of the group. Ten actors in full connection with one another is easier than compared to a group of 100. When interpreting network density, it is either necessary to compare groups which are close to each other in size, or define an ideal network pattern depending on the

groups' targets (Cross & Parker, 2004, p. 194). Within the FEP framework, the density analysis findings related to the networks of all networks and institutions which train teachers in terms of student exchange during the 2013−2014 fall and spring semesters are presented in Table 2.

Table 2.

The Greatness, Isolation, Connection Number, and Density of Student Exchange Networks During the Farabi Exchange Program of 2013−2014

FEP Networks	Network Size	Isolated	Ties	Density	Ss.	Density %
The Whole	91	0	822	0.472	2.147	47
Teacher Training	66	25	451	0.155	0.155	15

According to the findings of the study, 822 connections were identified among the 91 actors within the whole network with which a total of 18 actors are connected to in the Farabi statistics which belong to 2013−2014 fall and spring semesters. It was determined that 47% of the maximum connection possible in the density analysis made for the whole network (*D*= 0.472, *Std.Dev.* =2.147, *Average Degree*= 42.495). The number of actors to which the 18 actors are connected in the area of education was determined as 66, and the number of connections as 451. Twenty-five of the universities which accept students from one another have not exchanged any student in the educational areas (*Isolation=25*). It was determined in the density analysis that 15% of the maximum connection possible in the area of education was established (*D*= 0.155, *Std.Dev.* =0.871, *Average Degree*= 13.989).

Discussion and Conclusion

Today, there are no areas which the globalization phenomenon does not influence. Globalization, as a multi-dimensional concept calls for an economically, politically, socially, and culturally more unified world, where borders increasingly get blurred, and society is more knowledge−based and more *mobile*. The most significant benefits of globalization include the speedier expansion of technological advancement and knowledge due to economic development and faster growth, rising living standards and new opportunities (Akcay, 2003). The ramifications of globalization on education are a multi-dimensional area of study by itself. Four principles are noted regarding globalization in education. Learning to know, learning to learn, individual learning and learning to live together (Dagli, 2007, p. 3). Changing production styles has reshaped employment. Therefore, the competencies expected from labor have changed, necessitating educational processes be re-worked, the context rearranged, to allow continuous learning throughout life and creating

new educational opportunities by removing the limits of time and place and allowing people to learn whenever they wish.

Exchange programs between higher education institutions have been used for many years by countries for the purpose of equipping their graduates with knowledge and skills at an international level and allowing them to acquire the vision to make it possible for them to get to know different cultures and environments (Martin, 2009). There are no reservations about the benefits these programs provide. The conducted studies show that exchange programs provide benefits in terms of giving individual's life experience and new perspectives about activities in their own institutions, increasing the mutual exchange of knowledge and supporting the individual's development by providing occupational experience (Statsna, 2001). Exchange programs not only provide benefits to individuals, they also contribute to the success of higher education institutions as organizations. One of the factors that influences institutions' success in education is that they open to foreign countries also different universities provide opportunities for students to experience foreign countries and in order to contribute to their individual development.

The FEP, which was initially started in 2009, is a program carried out between domestic higher education institutions. According to CHE, the program's aim is not only to allow students who are enrolled in higher education institutions to receive a part of their education in another higher education institution. The main aim in the program is to enrich students' knowledge, skills, and competencies by diversifying these, giving them a chance to experience different social and cultural environments and contribute to students' reaching their career goals (Gudekli, Kilic & Taner, 2013, vi). In this respect, it may be stated that the characteristic which distinguishes this program from other international exchange programs with the same aims is that it is more local. The number of studies conducted on the FEP is limited.

Gokcek (2013) analyzed the reasons why students in education faculties apply to the FEP; he found that students apply for to domestic reasons, to get to know a different university environment and education, to develop themselves socially and culturally, and to receive a more quality education and that the program contributes to their social, cultural, individual and occupational development. In another study, Ozel, Bayindir and Demir (2014) analyzed the awareness levels and expectations of education faculty class teacher candidates regarding the domestic exchange program FEP. According to this study, the FEP features most singled out by candidates had to do with library facilities at preferred universities and environments where the education received could also be implemented. As it can be seen, the factors which guide the preferences of students are generally universities' conditions and the opportunities provided (Sahin, 2007). To what degree this preference is mutual has formed the object of this study.

In this study, the mutual preference of universities preferred by students has been presented through social network analysis both visually and with measurements unique to network analysis. Within the FEP Social Network, the social

network created by universities which accept and send students, Gazi University has been identified as the most active university both within the whole network and in the areas of educational sciences and teacher training. It has been determined that 47% of the maximum student exchange within the whole network has been realized and that this rate is 15% in institutions which train teachers and in education faculties. In the study, it has been found out that the networks between education faculties are relatively weaker. The high number of disconnected and isolated actors has shown the necessity of strengthening the connections between institutions which train teachers and education faculties.

Social network theory and methods provide a conceptual framework as well as a set of sophisticated methodological approaches for more closely examining teaching, learning, and change (Moolenaar, 2012). The social network analysis approach both provides a scientific outlook for higher level institutions which coordinate exchange programs and makes it possible for universities to analyze their own situations within this network (*egonetwork*) and bring their weak and strong connections out in the open. In fact, this study has made it possible to display the situation of each actor in terms of their position within the network. Therefore, social network analysis can be used as a new approach in the evaluation of these types of programs. In particular, an analysis which consists of all data network will provide a more in-depth evaluation of network relationships. Universities' FEP Coordinatorship web sites being more orderly and systematic will make this data accessible and provide an opportunity for research to be conducted within this scope. The greatest difficulty experienced in the collection of data in the study was that a majority of the coordinatorship pages were not updated and sufficient.

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Farabi Değişim Programının Sosyal Ağ Analizi: Öğrenci Hareketliliği

Özet

Problem Durumu: Üniversiteler bilgiyi yaratan ve yayan kurumlar olmanın yanı sıra, bilgi ve insan gücünün hareketliliği konusunda da önemli işlevler üstlenmektedir. Öğrenci ve öğretim üyesi değişim programları hareketliliğin önemli bir aracı olarak göze çarpmaktadır. Değişim programlarının en belirgin yararları bilginin dolaşımını sağlaması, kapasiteyi artırması, yükseköğretim kurumları arasında etkileşimi ve işbirliğini artırması, olumlu örneklerin paylaşılmasını ve yayılmasını sağlaması, malzeme, ekipman ve fiziki koşullardan daha fazla sayıda öğrenci ve öğretim elemanının yararlanmasının sağlanması yoluyla sadece kapasiteyi artırmak değil aynı zamanda bireysel gelişime de destek olması, yükseköğretim kurumlarının kendi çalışmalarını değerlendirirken diğer yükseköğretim kurumlarının çalışmaları ile kıyaslamalarına olanak sağlaması olarak sayılabilir (Messer ve Wolter, 2007). Farabi Değişim Programı (FDP), yükseköğretim kurumları arasında öğrenci ve öğretim üyesi değişim programıdır. Programın yürürlüğe girdiği günden 2013 yılına kadar toplam 12.492 öğrenci değişim programından faydalanmıştır. Öğrencilere aylık 420 TL karşılıksız burs verilmektedir. FDP kapsamında YÖK tarafından yükseköğretim kurumlarına toplam 27.791.406,92 TL kaynak aktarımı yapılmıştır. Türkiye çapında 90 devlet ve 15 vakıf olmak üzere toplamda 105 yükseköğretim kurumu aktif olarak FDP'de yer almaktadır.

Bilimsel çalışmalarda değişim programları, öğrenci ve öğretim elemanlarının deneyimleri, gidilen ülkelerin yaşam koşulları, akademik başarılarına etkileri, program içerikleri ve akreditasyon, öğrencilerin uyum süreçlerini etkileyen faktörler Teichler, 1996; Messer ve Wolter, 2007; Şahin, 2007; Yiğit, Kösterelioğlu, M.A.; Sezer ve Kösterelioğlu, İ., 2009; Kasapoğlu-Önder ve Balcı, 2010; Boyacı, 2011; Mutlu, 2013; Özdem, 2013, Gökçek, 2013, Özel Bayındır ve Demir, 2014) değişim programlarında uygulamanın başarısını etkileyen yönetsel faktörler (liderlik ve örgüt kültürü gibi) ve

öğrencilerin değişim programlarına katılımında karar süreçlerini etkileyen faktörler (Daly ve Barker, 2010) gibi boyutları ile ele alınarak araştırılmıştır. Değişim programları gerek dünyada gerekse Türkiye'deki çok sayıda üniversitede uygulanan, dünyadaki farklı ülkelerde hükümetler ve üst kuruluşlarca desteklenen, özendirilen ve oldukça büyük bütçelerin aktarıldığı kapsamlı faaliyetlerdir. Türkiye'de üniversiteler arasındaki etkileşimin artırılmasıyla; öğretim ve araştırma alanlarında işbirliklerinin yanı sıra ekipman gibi kaynakların paylaşılması ve öğrenci ve öğretim elemanı değişimi gibi konularda da büyük bir potansiyelden yararlanılabilir. Değişim programlarının bir başka özelliği de üniversiteler arasında öğrenci ve öğretim elemanı değişimi ile iletişim kanalları oluşturması ve bu kanallardan bilgi akışının gerçekleşmesidir. Bu yönü ile değişim programları sosyal ağ bakış açısı ile de değerlendirilebilir. Literatür incelemesinde öğrenci değişim programlarının sosyal ağ bakış açısıyla incelendiği bir araştırmaya hemen hemen hiç araştırma yapılmamış olduğu tespit edilmiştir. Mevcut çalışmanın bu anlamda önemli olduğu, alana katkı sağlayacağı umulmaktadır.

Araştırmanın Amacı: Sosyal ağ yaklaşımı ile gerçekleştirilen bu araştırma, öğrenci değişim programlarının karşılıklı olarak değerlendirilmesine farklı bir bakış açısı sunmayı amaçlamaktadır. Bu bağlamda araştırmanın temel amacı, öğrenci değişim programlarından biri olan Farabi Değişim Programı çerçevesinde, üniversiteler arasında gerçekleşen öğrenci değişiminin öğrenci kabul eden ve gönderen üniversiteler açısından karşılıklı bir değerlendirilmesini yapmaktır. Bu amaç doğrultusunda araştırmada aşağıdaki sorulara yanıt aranmıştır. 2013-2014 güz ve bahar döneminde:

Farabi değişim programı çerçevesinde hangi üniversiteler hangi üniversitelere öğrenci göndermiştir?

Farabi değişim programı çerçevesinde eğitim bilimleri ve öğretmen yetiştiren kurumlar açısından hangi üniversiteler daha çok öğrenci alıp göndermektedir?

Farabi değişim programı çerçevesinde yapılabilecek maksimum öğrenci alış-verişine göre gerçekleşen öğrenci alış-verişinin ne kadarı gerçekleşmiştir? *(yoğunluk-density)*

Araştırmanın Yöntemi: Araştırma var olan durum tespitini içeren tarama modelindedir. Araştırma, sosyal ağ analizi yaklaşımı ile sürdürülmüştür. Sosyal ağ analizi, aktörler arası ilişkilerin ortaya çıkarılmasında kendisine has ölçümlere sahip disiplinlerarası bir araştırma yaklaşımıdır. Aktörler ve aktörler arası ilişkilerin ve bu ilişkilerin oluşturduğu yapının sayısallaştırılarak ya da grafik halinde ortaya çıkarılmasını sağlar (Aggarwal, 2011). Freeman'a göre (2004, 2) şu özellikler tüm modern sosyal ağ analizi örneklerinde yer alır: Sosyal ağ analizi, toplumsal aktörleri birbirine bağlayan yapısal bağlar hakkında sezgileri gerekçelendirir. Bu ampirik veri, sistematik olarak toplanır ve kontrollüdür. Bu veri grafiklerle sunulur. Bu hesaplamaların yapılmasında matematiksel modellere güvenilir. Araştırmanın evreni, 2013-2014 bahar ve güz dönemlerinde Farabi Değişim Programı çerçevesinde birbirine öğrenci gönderen ve öğrenci kabul eden devlet üniversiteleridir. Yüksek Öğretim Kurulu verilerine göre, Türkiye Yüksek Öğretim Sisteminde 2013-2014 döneminde 101 devlet üniversitesi bulunmaktadır. Araştırmada evrenden örneklem

seçerken küme örnekleme yöntemi kullanılmıştır. Küme örnekleme, çalışılması düşünülen evrende doğal olarak oluşmuş veya farklı amaçlarla yapay olarak oluşturulmuş, kendi içinde belirli özellikle açısından benzerlikler gösteren değişik grupların olması durumunda kullanılır. (Yıldırım ve Şimşek, 2008, s. 105; Balcı, 2005, s.87). Araştırmada örnekleme girecek üniversitelerin seçiminde kümelerin belirlenmesinde üniversitelerin kuruluş yılları ve buna bağlı olarak kurumsallaşma düzeylerine göre sınıflandırılması esas alınmıştır. Buna göre üniversiteler, 1992 öncesi, 1992-2003 arası ve 2003 sonrası kurulan üniversiteler olmak üzere üç kümeye ayrılmıştır. Küme örnekleme yöntemiyle seçilen ve verilerine ulaşılabilen üniversitelerden her bir kümeye giren toplam örneklem sayısı 18 olmuştur. Birinci kümede 7, ikinci kümede 7, üçüncü kümede 4 üniversite örnekleme girebilmiştir. Buna göre, birinci kümede Akdeniz, Çukurova, Gazi, İstanbul, Marmara ve Uludağ Üniversiteleri; ikinci kümede Afyon Kocatepe, Celal Bayar, Eskişehir Osman Gazi, Kocaeli, Niğde, Pamukkale ve Süleyman Demirel Üniversiteleri; üçüncü kümede Ahi Evran, Aksaray, Mardin Artuklu ve Bitlis Eren Üniversiteleri yer almıştır. Bir sosyal ağ analizi olan ve Farabi Değişim Programı çerçevesinde birbirine öğrenci gönderen ve birbirinden öğrenci kabul ederek aralarındaki bağlantıların analiz edileceği bu araştırmada, örnekleme giren üniversiteler araştırmanın aynı zamanda temel aktörler listesini oluşturmaktadır.

Araştırmanın Bulguları: Araştırma bulgularına göre, 2013-2014 güz ve bahar dönemlerine ait Farabi istatistiklerinden toplam 18 aktörün bağlantılı olduğu 91 aktör tespit edilmiştir. Tüm ağ içinde 91 aktör arasında 822 bağlantı tespit edilmiştir. Öğretmen yetiştiren kurumlar arasında yapılan analizde 422 18 aktör arasında 422 bağlantı bulunmuştur. Araştırmanın yoğunluk analizinde var olan kapasitenin ne kadarının kullanıldığı ortaya konulmuştur. Tüm ağ içinde kapasitenin % 47 'si kullanılırken bu oran öğretmen yetiştiren kurumlarda % 15'e düşmüştür. Araştırma amacı olan hangi üniversitenin hangi üniversiteye değişim programı çerçevesinde öğrenci gönderdiği ve bu değişim ağı içinde üniversitenin durumu grafik olarak ortaya konulmuştur. Araştırmada ağ merkezileşme ölçümlerine göre Gazi Üniversitesi, diğer aktörlerle en fazla bağlantılı aktör olarak bulunmuştur. Öğretmen yetiştiren kurumlar açısından yapılan analizlerde sayıca daha düşük bağlantı belirlenmiştir.

Araştırmanın Sonuçları ve Önerileri: Bu araştırmada üniversiteler arası öğrenci değişimi üniversitelerin karşılıklı tercih edilme durumları sosyal ağ analizi bakış açısı ile hem görsel hem de ağ analizine özgü ölçümlerle ortaya konulmuştur. Araştırmada eğitim fakülteleri arasındaki ağların nispeten daha zayıf olduğu bulunmuştur. Bağlantısız izole aktör sayısının fazlalığı öğretmen yetiştiren kurumlar ve eğitim fakülteleri arasındaki bağlantıların güçlendirilmesi gereğini ortaya koymuştur. Bu araştırmanın başka bir sonucu da araştırmada kullanılan sosyal ağ analizi yaklaşımının yararlılığıdır. Sosyal ağ analizi yaklaşımı hem değişim programlarını koordine eden üst kurumlar için genel ve bütünsel bir bakış sağlarken hem de üniversitelerin bu ağ içinde kendi durumlarını analiz ederek zayıf ve güçlü bağlantılarını ortaya çıkarma olanağı sağlar. Dolayısıyla sosyal ağ analizleri bu tür

programların değerlendirilmesinde yeni bir yaklaşım olarak kullanılabilir. Araştırmada verilerin toplanmasında karşılaşılan en büyük güçlük, koordinatörlük sayfalarının büyük bir bölümünün güncellenmemiş ve yetersiz olmasıdır.

Anahtar Kelimeler: Yükseköğretim, üniversite, öğretmen yetiştirme ağları.