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Research Article

Determining Open Education Related Social Media Usage Trends in Turkey Using a Holistic Social Network Analysis

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Abstract

The aim of this study is to reveal Open Education related social media usage in Turkey through social network analyses. To this end, the most widely used social media network in Turkey, Facebook, was chosen. All the pages and groups created on Facebook related to Open Education were found. A total of 207 groups and 521 pages were accessed and entered into the social network analysis. Within the scope of this study, the density and centrality features of the network were analyzed for groups whereas the density, centrality, and degrees features of the network were analyzed for pages. The study's results revealed that while pages and groups related to programs emphasizing current job opportunities and student support services were more actively used, commercial accounts attempted to exploit students' exam anxiety instead of generating actual content. The findings also revealed that well structured institutional pages appeal to students and have the potential to reach high levels of popular in short periods of time.

Keywords

Open education • Social media • Facebook • Social network • Social network analysis

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The rapid development of the internet has given birth to social network sites that have found themselves among the most frequently used internet applications within a very short period of time (Wang, Jackson, Gaskin, & Wang, 2014). Testifying to this fact, 2016 data reveals that 2.307 billion out of 3.419 billion (67%) internet users worldwide are active social media users (Kemp, 2016), demonstrating just how widely social media networks have been adopted. Societies have rapidly adopted social networks, which by bringing individuals together in different ways, like game playing, tagging, working, online socializing, collaboration and communication (Ghali, Panda, Hassanien, Abraham, & Snasel, 2012). With the emergence of social networks, interactions between individuals have changed to a great extent, and with the internet and mobile devices becoming so widespread, a wide variety of collaborative learning opportunities and new e-learning platforms have emerged (Stantchev, Prieto-González, & Tamm, 2015).

According to Kim, Jeong, and Lee (2010), social network sites are defined as a virtual venue facilitating internet users to reach out and communicate with each other and in which online societies are established. According to Junco and Mastrodicasa (2007), social network sites are also the easiest way to connect in a disconnected world. In general, these sites are used by societies for social communications and entertainment purposes (Wang et al., 2014). Today many social network sites are used for various purposes. The most popular being blog-type social networks (Facebook, Google +, tumblr), microblog networks (Twitter), professional networks (LinkedIn, XING), photography related networks (Instagram), video based networks (YouTube, Vine, Instagram video), and networks in which personal interests are shared (Pinterest) (Stantchev et al., 2015).

Providing learners with opportunities to participate in both learning and course groups, social networks are widely used in education environments and have become the subject of various studies. According to Al-Rahmi, Othman, and Yusuf (2015), the use of social media sites in educational activities increases academic performance, satisfaction, engagement, collaboration, and interaction with instructors. According to Wheeler, Yeomans, and Wheeler (2008), benefitting from social network sites in educational environments provides learners with opportunities to share their opinions, show their creativity, and receive feedback from their friends. Providing learners with a wide array of opportunities, social media use in learning environments continues to increase both in traditional classes (inside the classroom) and in online open and distance learning environments (outside the classroom) (Blaschke, 2014; Seaman & Tinti-Kane, 2013).

According to Blaschke (2014), social media provides instructors with opportunity not only to support the development of learners' skills and competencies but also to include them in online classes as part of either open or distance learning systems. The

literature includes certain studies on the use of social media to increase interaction between learners and instructors in open and distance learning environments (Van Wyk, 2014). A study conducted in IGNOU, an open university in India, identified the objectives of internet use and revealed that open and distance learners mostly used (80%) such social media as Facebook, Twitter, YouTube, and Blogs for learning and teaching purposes (Awadhiya, Miglani, & Gowthaman, 2014). In another study revealing the importance of social media use in open and distance learning environments, Özmen and Atıcı (2014b) not only concluded that learners using social media in open and distance learning environments develop positive attitudes toward lessons but also reported increased quality of communication between "learner - learner" and "instructor – learner." Another study by Özmen and Atıcı (2014a) compared the academic achievements of instructors on the basis of their use of learning management systems and social media. Conducted on 75 undergraduate learners in Turkey, the results of their research revealed not only that social media support in open and distance learning activities had positive effects on students' academic success but also that the use of learning management systems in open and distance learning systems must be supported by social media. In another study comparing learning management systems and social media, Thoms and Eryilmaz (2014) stated that social media provided students greater satisfaction in terms of social interaction and their perception of lesson groups than did learning management systems. Additionally, the results of their social network analysis verified that online social media provided a greater number of interactions and a more interesting learning experience.

Social media strengthens the communication as well as the interaction in open and distance learning environments (Özmen & Atıcı, 2014b). Social media can be used as an effective technological tool to strengthen online communication in open and distance learning environments within the scope of higher education and, when compared with face-to-face learning, the use of social media in open and distance learning environments provides a better communication environment among learners (Brady, Holcomb, & Smith, 2010). According to Moore's (1993) transactional distance approach, open and distance learners are those learners who most frequently deal and cope with the "sense of distance" that learners feel. Therefore, due to its heavy use of internation and communication, the use of social media in open and distance learning environment is important for open and distance learners' as it allows them the opportunity to interact socially, which thereby decreases their "sense of distance." One of the most widely known Web 2.0 applications used effectively in open and distance learning environments is the social media network *Facebook* (McLoughlin & Lee, 2007).

First established as a local social media connecting university students to one another, Facebook has, with its 1.18 billion daily active users and 1.79 billion monthly active

users as per the data of September 2016 (Facebook, 2016), become the fastest and easiest way for individuals to socialize (Ainin, Naqshbandi, Moghavvemi, & Jaafar, 2015). Facebook also draws attention for being the most accessed social network site in the world and the second most popular website after Google (Alexa, 2016).

By providing opportunities for communication, knowledge sharing, making friends, sending private messages, chatting, tagging, creating photograph albums, joining social groups, experiencing different online applications and playing games, Facebook presents its users the possibility of creating personalized profiles (Mazman & Usluel, 2010). In addition, Facebook provides a venue for commercial promotions and advertisement applications (Chan, 2011; Chu, 2011). With these features, it has become not only popular among learners and instructors but also an almost integral part of social life (Deng & Tavares, 2013; Junco, 2012). As a result, it is the social media network used by the vast majority of the students both in Turkey and worldwide (Öztürk & Akgün, 2012).

When used for learning purposes, Facebook increases communication, interaction, collaboration, and the sharing of resources, thereby contributing to the development of learning processes (Sánchez, Cortijo, & Javed, 2014). By also providing informal and unstructured learning environments, Facebook provides avenues for learners' to achieve their academic purposes and to work in a collaborative manner (Selwyn, 2009).

There are certain studies discussing the use of Facebook in open and distance learning environments. According to Wiid, Cant, and Nell (2013), the most widely used social media network by open and distance learners is Facebook. Through the online learning environments it hosts, Facebook increases learner-learner interaction, ensures that instructors become better acquainted with their students, and supports the formation of richer instructor-learner cooperation (Susilo, 2008). Another study conducted by Aydın and Özkeskin (2012) emphasizes that Facebook is popular in open and distance learning environments in Turkey. Accordingly, open and distance learners in Turkey mostly use Facebook, and a great majority of these learners are ready to use social media for learning purposes.

Facebook hosts a high volume of interaction, and connections among its users are very intense (Sánchez et al., 2014; Susilo, 2008). Therefore, Facebook may be suggested as an appropriate platform for social media analysis.

Problem

Technology plays a key role in open and distance learning due to its potential to enrich interaction, deliver education, and ensure communication among individuals (Koçak-Usluel & Mazman, 2009). One of the most significant technological

components used in open and distance learning environments is social media. In one of the studies supporting this argument, Anderson and Dron (2011) separate open and distance learning pedagogy into three generations: (i) Cognitive–behaviorism, (ii) Constructivism, and (iii) Connectivism. Accordingly, they state that Web 2.0 and social media are the most important technological components of the third generation, Connectivism. Additionally, Moore and Kearsley (2011) cite various technologies used in open and distance learning, including "print, audio/video recordings (podcasts), computer conferencing, web based learning, social media, and mobile technology," emphasizing that social media has strong elements of collaboration, immediacy, and participatory. In this context, the studies available in the relevant literature show that not only are social media networks widely used in open and distance learning environments, they also yield positive results (Awadhiya et al., 2014; Blaschke, 2014; Seaman & Tinti-Kane, 2013; Thoms & Eryilmaz, 2014).

Similarly, the relevant studies reveal that those open education (OE) institutions providing open and distance learning services in Turkey make intensive use of social media and that this has positive effects on learners' success (Aydın & Özkeskin, 2012; Elitaş, 2015; Erdem & Kibar, 2014). When we examine these studies, we see that the most widely used social media network in OE is Facebook. Although Facebook is widely used by OE learners in Turkey, it presents itself as a problem in that there are a very limited number of studies that have investigated trends of Facebook use for educational purposes at the national level (Elitaş, 2015). As such, using a holistic social media analysis method will address this specific deficiency in the relevant literature.

Significance of the Current Study

When we consider that 46.01% of the higher education students in Turkey are in OE institutions as of the 2015-2016 academic year (Yüksek Öğretim Kurulu [YÖK], 2016), it can be said that OE plays an important and critical role in the Turkish higher education system. Conducting a holistic social network analysis on how OE students use social media networks, especially that of Facebook, since it is the most actively used social media network in Turkey (Kemp, 2016) is important in:

- Determining the programs toward which learners are inclined,
- Clarifying which Facebook pages and groups draw more attraction,
- Determining which OE institutions have a greater social media presence,
- Presenting the current situation with respect to social media use in OE,
- Revealing possible deficiencies with respect to social media use, and
- Presenting data that may be used by institutions providing OE services.

Aim of the Current Study

This study aims to use a holistic social network analysis to reveal social media use trends in OE in Turkey. Since it is the most widely used social media in Turkey, Facebook has been chosen for analysis. Facebook groups and pages are among the most effective social media tools that may be used both to determine not only learners' inclinations and interests but also user trends (Chou & Pi, 2015; Yunus & Salehi, 2012). In this context, the current study conducts a holistic social network analysis of all Facebook groups and pages created to address OE programs in Turkey. In order to determine the current situation and trends of OE students' use of Facebook, this study analyzes the density, centrality and degrees of related Facebook groups, on the one hand, and the density, centrality, and degrees of related Facebook pages.

Method

This study was designed as a social network analysis study. Diversification and the widespread use of social media has increased the popularity of social network analysis concept lately (Luo & Zhong, 2015). Social network analyses follow an analytical method to examine the relations between groups of nodes and connections (Lee & Bonk, 2016). The nodes represent the individual actors while the connections show the relations between these actors (Lee & Bonk, 2016). Social network analyses are comprised of a series of techniques and methods stemming from the relations between different actors (individuals, groups, organizations) and either concrete (materials, services) or abstract (information, social support, effects) resources (Haythornthwaite, 1996). Emphasizing that social structure is an interpersonal network, this method interprets the interpersonal relations existent in social media, its content, and social phenomena (Luo & Zhong, 2015).

Social network analyses provide both a visual and statistical analysis on human relations (Shea et al., 2010) and through the use of graph theory and structural theory, they present an assessment of such network properties as density, centrality, connectivity, betweenness, and degree, (Dawson, Tan, & McWilliam, 2011). Social network analyses employ two types of network analysis; one being an "ego network analysis" and the other a "holistic network analysis" (Akhtar, 2014). Accordingly, an ego network analysis deals with the analysis of individual nodes while a holistic network analysis examines the relations between many nodes.

This study uses a holistic social network analysis to examine all Facebook groups and pages originating from Turkey that have many nodes related to OE. Accordingly, the current study analyzes the density, centrality, and degree properties of pages and groups through the use of graph theory and structural theory.

Data Collection Process

In order to find Facebook pages and groups that not only originate from Turkey but are also related to OE, Gephi's Netvizz v1.25 application was utilized. Entering the acronym *AÖF* (Açık Öğretim Fakültesi – Open Education Faculty) into the search module of this application, a query was run. This module presents an interface that allows for pages groups, locations, and events on Facebook to be searched. *AÖF* has become a commonly used abbreviation to refer to OE services in Turkey. Therefore OE related pages and groups in Facebook have been using this abbreviation in their titles or explanations. As a result of the queries run using Netvizz, a total of 207 groups and 521 pages related to OE were found on Facebook. The data obtained were transferred to Microsoft (MS) Excel.

When the pages and groups were analyzed, pages originating from countries other than Turkey used for different purposes were also discovered. In addition, pages and groups of Turkish origin containing the same abbreviation though unrelated to OE were encountered. As a result, all of the pages and groups uncovered by the search were analyzed individually.

Out of the Facebook pages discovered, unrelated pages such as AOF Telemark og Vestfold, AOF Østfold, AOF Midt-Norge, AOF SYD, AOF Nord Aftenskole, AOF - Association des Optométristes de France, and AOF Frederiksberg-København were excluded from the analysis. All unrelated pages (N=201) were excluded from the total 521 pages discovered, and the remaining 320 pages were included in the analyses. Likewise, a total of 17 groups were excluded from the original 207 found, leaving 190 groups to be included in the analyses. The information accessed using the Netvizz application was transferred to MS Excel from an HTML page. The pages and groups discovered were organized and given an appropriate classification in MS Excel. The data's analysis was also performed in MS Excel.

Data Analysis

NodeXL was utilized to analyze the data obtained. NodeXL is one of the most widely used tools in social network analyses. In addition to its flexible and simple structure, its ability to work with different data sources was the reason for preferring this tool. The data that were analyzed and classified in MS Excel were entered into the NodeXL application. In this way, separate social network analyses for pages and groups were started.

The Facebook groups were analyzed first. The original name of each Facebook group was entered into the NodeXL Vertex 1 column whereas to which category each group belonged was entered into the NodeXL Vertex 2 column. Groups were categorized by an independent researcher in addition to the main researchers.

Groups' titles and explanations were read one by one and an analysis was conducted to determine whether the group was for either a program, a course, a support service, or a commercial purpose. After adding the categories into NodeXL Vertex 2, they were color-coded according to which university a group originated.

The Facebook pages were analyzed during the second phase of the social network analysis. A classification strategy similar to the one used for groups was followed. Categories and colors deemed appropriate to be used for pages were used. In addition, because pages' *like* data were accessed, the number of *likes* were added to the Width column of Visual Properties. By doing so, pages were analyzed in respect to the number of likes.

Findings

The research findings are presented in two titles: (i) analysis of groups and (ii) analysis of pages.

Analysis of Groups

After eliminating the irrelevant ones, 190 groups were identified and included in the analysis. Certain themes were identified by creating titles and descriptions for these groups. The classification was completed by writing each of these themes next to its relevant group in MS Excel. Figure 1 below shows how many groups fell under each theme.

As can be seen in Figure 1, the themes containing the highest numbers of groups are *sociology*, *general*, *child development*, *support services*, *theology*, *public administration*, *occupational health and safety*, and *justice*. When these themes are analyzed, it is observed that other than general and support services, all the themes are related to programs. This shows that Facebook groups created for OE dealt mostly with a particular program. Furthermore, that there are close to thirty groups related to sociology undergraduate degree programs and that this number is even higher than the number of general purpose groups is particularly noteworthy.

As a result of the analysis performed to determine from which university pages originated, it was discovered that groups were either related to Anadolu University OE programs, Ataturk University OE programs, or Istanbul University OE programs, or had a commercial purpose. When the distribution of groups with respect to their origins was analyzed, 62% were found to have been created for Anadolu University OE programs, 33% for Ataturk University OE programs, and the rest were either commercial or for Istanbul University OE programs.

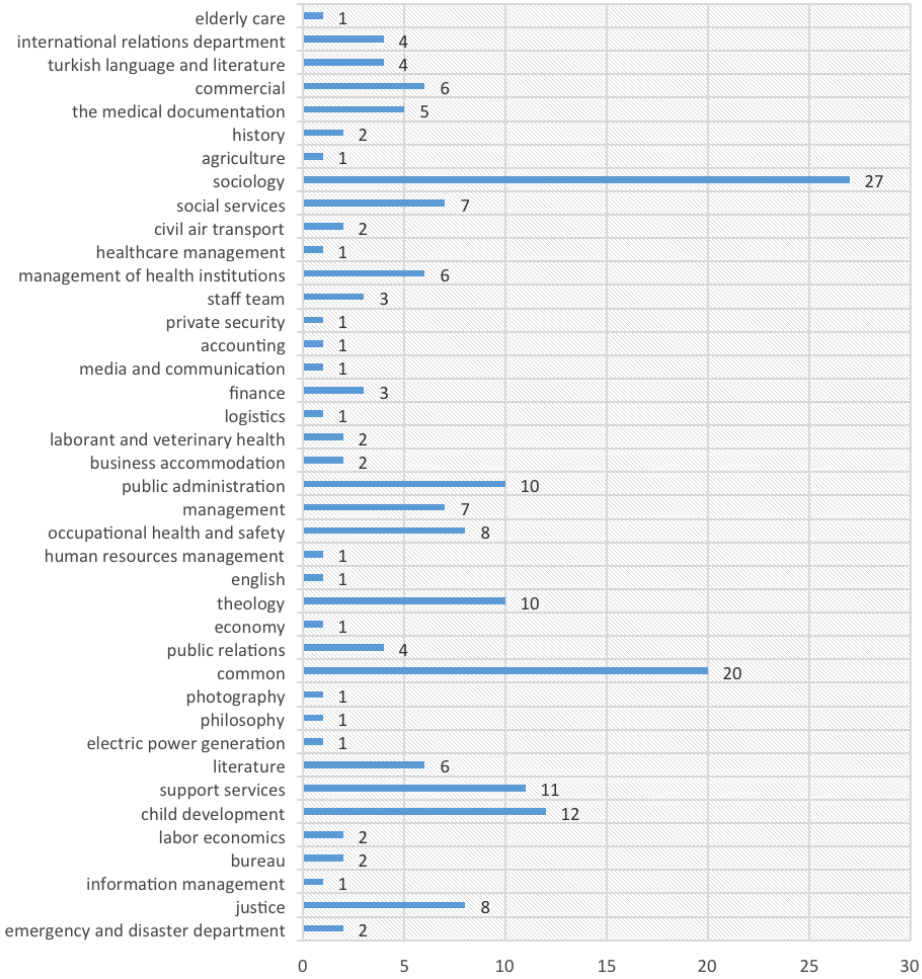

Figure 1. Distribution of group numbers with respect to themes.

A network analysis of the groups was performed using Gephi, Netvizz, and NodeXL. The holistic network analysis pertaining to the groups found using Netvizz (the Facebook application of Gephi) was conducted in NodeXL. Groups' density and centrality characteristics were investigated. In the query performed with Netvizz, all groups containing the key word *AÖF* were downloaded into MS Excel. After unrelated groups were eliminated, the number of edges for Vertex 1 and Vertex 2 were determined using the titles and explanations created for groups. Vertex 1 contained the groups' names while Vertex 2 contained groups' themes. In addition, university origins of groups was determined from the explanations in groups information. Based on social network analysis graph theory, the Fruchterman Reingo Algorithm was used to draw the graph. The network graph is provided in Figure 2.

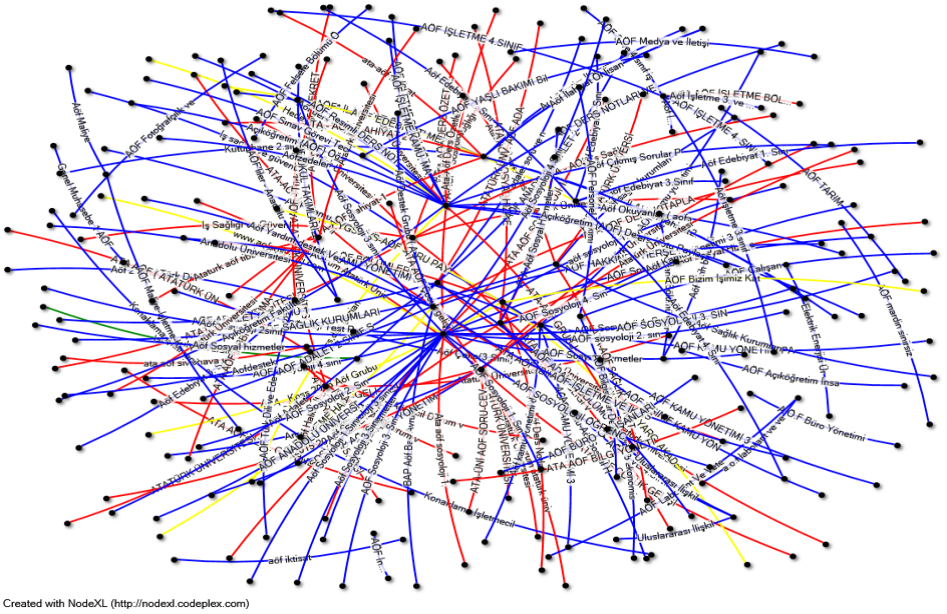

Figure 2. Groups' Fruchterman Reingo algorithm graph.

The network structure presented in Figure 2 is a network structure drawn by the Fruchterman Reingo Algorithm that brings forward theme-based densities. In this network structure, connections represent the group (name of the group) whereas nodes represent the themes. In the network structure the color *blue* shows groups related to Anadolu University OE, *red* shows groups related to Ataturk University OE, and *green* shows Istanbul University OE programs. Likewise, *yellow* shows those groups with a commercial purpose. When the graph was analyzed, it was observed that there was a distribution in which those groups related to Anadolu University OE programs were at the center (centrality) and that there was a density in favor of groups related to Anadolu University OE programs. Outside of the center, Ataturk University have a density with the Occupational Health and Safety OE program in particular.

In order to bring forward the density and centrality characteristics of OE related Facebook groups with respect to themes, a social network graph was drawn using the Harel-Koren Fast Multiscale algorithm. Figure 3 below presents the social network graph, in which colors represent groups' university of origin, nodes represent themes, and connections represent groups.

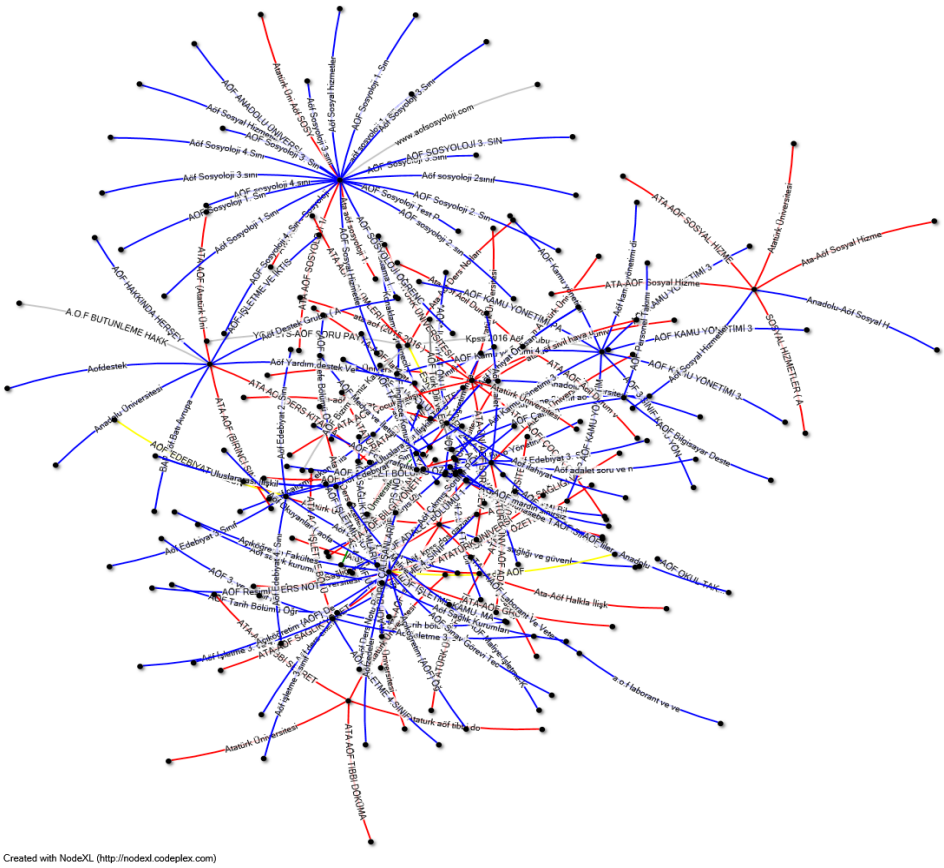

Figure 3. Harel-Koren fast multiscale algorithm graph for the groups.

When the social network graph drawn using the Harel-Koren Fast Multiscale algorithm is analyzed, it is observed that themes play a fundamental role in determining density and centrality. Although the density related to Anadolu University OE programs comes to the fore, it was observed that themes form more than one center. In particular, groups related to sociology programs formed a density far from the center on the top part of the graph. Likewise, *social services*, *public administration*, *theology*, *justice*, *and child development programs* formed groups with certain degrees of density.

In order to enhance the study's comprehensiveness, not only Facebook groups, Facebook pages related to OE were also analyzed.

Analysis of the Pages

A total of 320 pages related to OE in Turkey were included in the analysis. After analyzing pages' titles and one by one, they were classified by theme. As was the

case for groups, the themes were controlled by four researchers. Themes and the total number of likes received by all pages falling under each individual theme are presented in Figure 4 below.

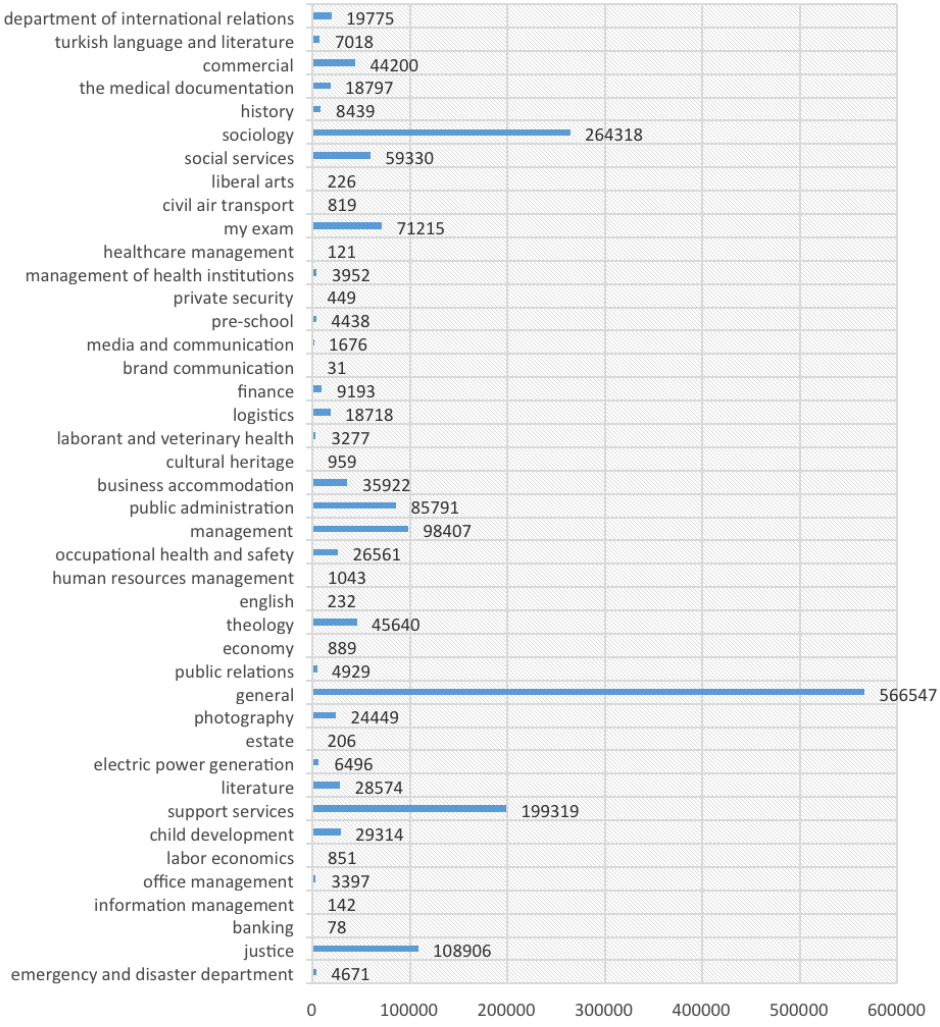

Figure 4. Pages' themes and number of likes each theme received.

The analysis of themes revealed that *general purpose* Facebook pages received the highest number of likes. Among specific programs however, it is noteworthy that *sociology* again received the highest number of likes in pages. On the other hand, the third most liked theme was *support services*. Included under this theme are institutional pages created to provide students with orientation to the institution and related OE services and information. Facebook pages related to OE receiving the most likes are presented in Table 1.

Table 1
Number of Likes Received by Facebook Pages

Facebook Pages	Likes
AÖF – Open Education Faculty	184,150
AÖF Sociology Graduates	118,924
AÖF Social Services	75,539
AÖF JUSTICE	70,464
AÖF My Anadolu - Anadolu University Open Education System	68,289
Open Education Faculties Student Union{AÖF}	65,142
Open Education Faculty (AÖF)	45,619
AÖF PUBLIC ADMINISTRATION 3RD YEAR STUDENTS (Transfers from Associate Program)	44,795
AÖF Announcement	43,723
AÖF Business Administration	34,895
AÖF Past Exam Questions	33,252
AÖF Support Center	29,114
AOF (Open Education Faculty)	28,841
ATA-AÖF	27,731

Table 1 shows that in terms of likes received by Facebook pages related to OE, Anadolu University and sociology programs are at the forefront. That Anadolu University AÖF My Anadolu, which was opened at the beginning of 2016, found itself in 5th place in such a short time is also of remark.

NodeXL was also used to perform the network analysis of Facebook pages. When the distribution of pages' university of origin regarding was analyzed, 74% were found to be related to Anadolu University OE programs, 14% were for commercial purpose, and the remainder were related to either Ataturk University or Istanbul University OE programs. It is noteworthy that the number of commercial Facebook pages related to OE is high. In the network structure, the color *blue* represents pages related to Anadolu University OE programs, *yellow* represents commercial pages, *red* represents pages related to Ataturk University OE programs, and *green* represents pages related to Istanbul University OP programs. Figure 5 below depicts the pages' graph drawn using the Fruchterman Reingo Algorithm.

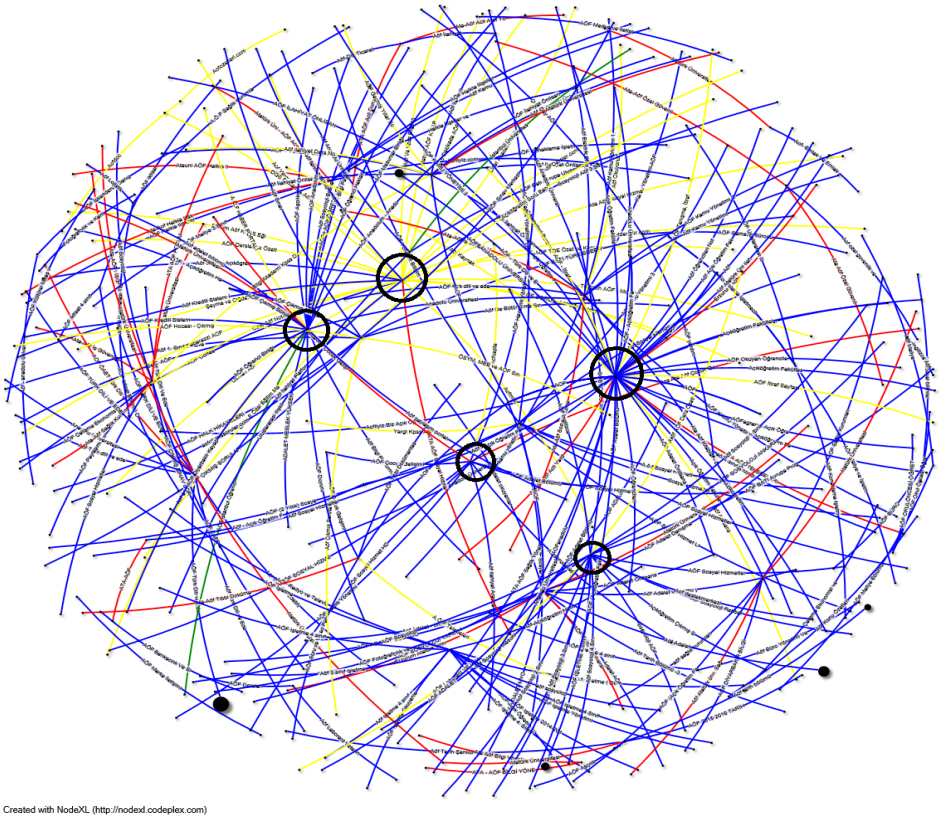

Figure 5. Pages' Fruchterman Reingo algorithm graph.

In the drawing of the graph given in Figure 5, the number of edges for Vertex 1 and Vertex 2 were determined using NodeXL. Vertex 1 shows the name of the page whereas Vertex 2 shows the theme to which the page belongs. The number of *likes* received by a page was also used where conducing pages' social network analysis. Vertices in NodeXL were designated as *like size*. An analysis of Figure 5 reveals the existence of a theme-centric distribution in which Anadolu University has the highest density. This finding shows that pages, unlike groups, are distributed across *themes* rather than *origins*. It is also noteworthy that out of these themes, that of *exam* is most related to commercial (yellow) pages.

In order to analyze Facebook pages created for OE according to their themes and number of *likes*, the Harel-Koren Fast Multiscale algorithm was employed to draw a social network graph. Here, the objective is to reveal the density characteristic with respect to *likes*, and the centrality characteristic with respect to themes. Figure 6 below shows the social network graph in which colors represent origin, nodes represent theme, connections represent pages, and node sizes represents number of *likes*.

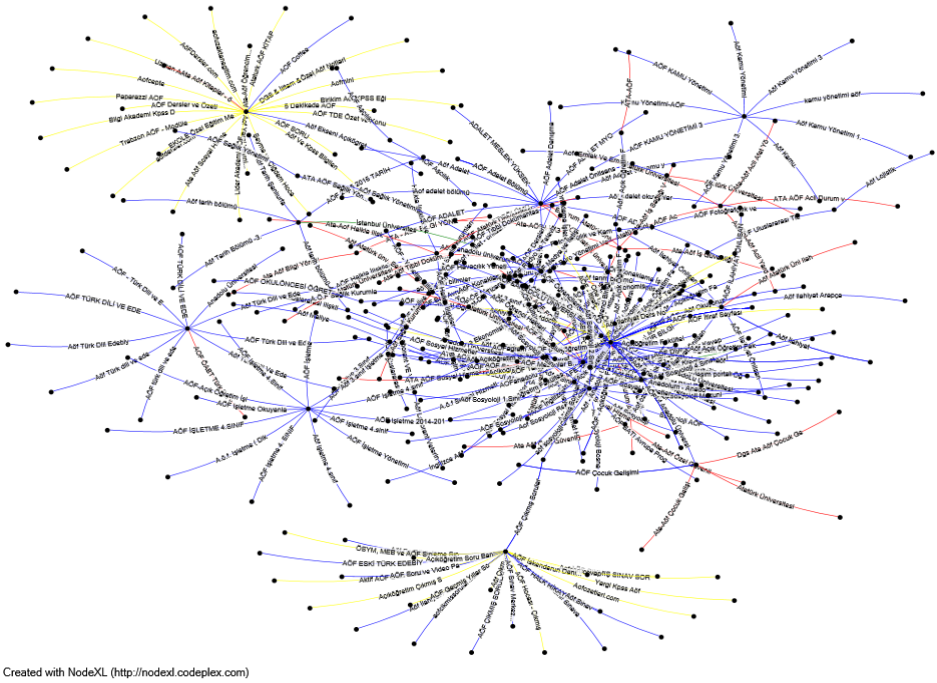

Figure 6. Pages' Harel-Koren fast multiscale algorithm graph.

A closer look at Figure 6 reveals the existence of a clear non-centric distribution with respect to themes. It can be said that in general, the constructed social network structure was shaped with respect to themes distributed in accordance with program types. What is striking here is that the commercial (yellow) pages seen on the upper left and bottom middle of the graph gain a degree of density and start to form groups among themselves.

Discussion and Conclusion

Since Facebook is widely used by OE students, the findings of this study are significant for determining the OE students' trends in Facebook use. Analyzing 190 groups and 320 pages related to OE on Facebook, the results revealed that groups created for Anadolu University OE programs were centrally distributed at 62%. This finding suggests that the majority of social media mobility on Facebook in Turkey is realized by Anadolu University. In other words, this result shows that among all OE institutions, Anadolu University is the most popular on Facebook. This is mostly because Anadolu University's OE Faculty openly encourages its students to use Facebook to enhance instruction. Another reason for this result may be because Anadolu University has such a large number of learners that it considered to be among the world's mega universities (Daniel, 1996).

Another finding is that the number of groups created for the undergraduate sociology program was greater than that for all other programs. One reason for this may be because the sociology program is more open to social interaction compared to other programs. This finding supports those of Wang et al. (2014), who found that university students are most likely to use social media for social interaction purposes. Another study supporting this finding was conducted by Beer and Burrows (2007). Accordingly, we see that those Facebook groups and pages related to sociology in particular have a high user percentage.

Except for *general purpose* groups and *support services purpose* groups, all groups on Facebook were created to serve a specific program. Not only do groups created for the Sociology undergraduate program in particular exhibit a density far from the center, they are higher in number than all other groups, even higher in number than the total number of groups created for general purposes. Other groups showing intra-grouping at a certain density that were found to be far from the center are (in order of their distances from the center) *child development*, *theology*, *public administration*, *justice*, and *social services*. This finding, which shows that groups created for certain programs show a density far from the graph's center, is supported by Dawson et al. (2011) who found that learner groups of different interest and basis points may cluster at different centers.

The study also determined that in addition to sociology, Facebook groups created for other OE programs in Turkey (*child development*, *theology*, *public administration*, *justice*, and *social services*) are actively used. Since these particular OE programs have a practical application in real life, their pages and groups have a high number of *likes*. When looking at the common characteristics of these programs, it is seen that they provide ample employment opportunities for those studying them. These findings match those of Russo and Koesten (2005) who found that university students participated more frequently in prestigious networks having *centrality* and real life application.

Groups and pages created for OE programs were found to be well structured and actively managed by their administrators. This finding supports those of De Villiers (2010) who found that learners accessed well-structured Facebook groups and pages more earnestly. Furthermore, consistent with De Villiers' (2010) findings is the fact that the *Anadolu University AÖF My Anadolu* page reached 5th place in terms of *likes* despite having been created at the beginning of 2016, which is due possibility to the fact that it is actively managed by page administrators.

The number of *likes* was used to determine the themes of Facebook pages created for OE. The analysis found *general purpose* pages to have the highest number of *likes*. The reason for this may be that promotional pages opened by corporate accounts were

visited more frequently. Similar to groups, pages related to Sociology were found to have the highest number of *likes*. Likewise, the high number of *likes* for pages related to *social services*, *justice*, and *public administration* programs were found to be similar to their group counterparts. Moreover, *support services* pages, which aimed to provide information and introductions to students, found themselves in third place in terms of number of *likes*, similar to their group counterparts. The current study also found that universities used Facebook groups and pages for support services. Relatedly, Junco (2012) concluded that support services provided to university students on Facebook are important in preparing learners for courses. Considering that open and distance learners need support services (McLoughlin, 2002; Thorpe, 2002) to help them resolve the many obstacles they face during learning processes (Ludwig-Hardman & Dunlap, 2003), official Facebook groups and pages providing support services play a fundamental role in facilitating learners to find easy solutions for their needs.

The social network analysis on pages found that contrary to groups, pages were distributed on the basis of themes rather than origins. The relation between commercial and examination oriented pages shows that commercial initiatives seek to exploit students' exam anxiety rather than creating actual content. When looking at themes, it is observed that there is a non-central, significant distribution and that social network structure is generally shaped by the themes' distribution. One of the most striking findings is that Facebook pages created for commercial purposes cluster by gaining density among themselves. This finding shows that commercial initiatives focusing on OE have grown rapidly and have even become a separate, independent sector.

The social network analysis found that the number of Facebook pages created for OE with commercial purposes is very high. Other studies in the literature support this finding. Chan (2011), for example, included commercial ads found on pages to increase students' use of the university library's Facebook page, resulting in twice the number of visitors to it. Aiming to increase university students' interactions on Facebook groups through the use of viral marketing strategies, Chu (2011) found not only did that advertisements for marketing purposes increase learners' interaction on Facebook, but also that learners started to develop a more positive attitude toward social media use. The marketing and advertisement strategies of commercial pages are thought to contribute to their continuously increasing presence on social media. As such, it is thought that marketing strategies may be used not only to reach out to more learners on social media but also to ensure better communication. Further, that the number of commercial pages on Facebook is higher than the number of groups created for learning purposes shows that it is easier to use pages for promotional purposes than groups. This may be because content shared in certain members-only groups cannot be accessed by non-members of said group.

Suggestions

Recommendations for Application

It is possible to make certain significant proposals for implementation based on the results of social network analysis. Accordingly, in addition to program-based sharings, support services have started to make significant use of social media for OE purposes in Turkey. On this basis, one may suggest that OE institutions integrate support services into social media more thoroughly.

One of the most important results obtained from the social network analyses conducted in this study is that certain programs are clearly more active on social media than others. With *sociology* being in the lead, groups and pages for *social services*, *occupational health and safety*, *theology, public administration, justice*, and *child development* programs were widely accessed on Facebook. These programs may be said to attempt to meet the students' current needs in their daily lives, and for this reason are thought to keep retain learners' continued interest in and access to them. Considering the unique role of OE in Turkish society and higher education and that adult learning aims to be applicable to real life, this specific result finds meaning. Therefore, institutions and organizations offering OE services may be advised to open programs with ample employment opportunities addressing current real life needs.

The social network analyses conducted in this study show that for-profit ventures have been growing at a steady pace, rendering certain factors to have gained a certain degree of importance for universities. Particularly, since commercial ventures targeting student anxiety toward examinations are observed to have increased in number, more work should be done to address students' exam anxiety. The chapter summaries, sound recordings of these summaries, leaflet tests, and pilot exams available via Anadolu University's Open Education System may serve as an example for other OE institutions. Supplying similar exam materials to learners may be an important step in diminishing such commercial related initiatives.

The current study also reveals that social media in general and Facebook in particular constitute an effective venue for ensuring that OE learners receive greater benefits from instruction. Instructors teaching in OE institutions may therefore be advised to use social media, such as Facebook, as part of their instruction so as to students' academic success.

Students of OE institutions may be advised to take active part in Facebook groups and pages created to aid instruction as such participation may facilitate: (i) greater academic success; (ii) socialization through communication with other students attending the same program; (iii) their ability to benefit from pages and groups created to provide support services; and (iv) their ability to access useful information shared on these pages and groups while preparing for exams.

Recommendations for Further Research

The findings of this study can be benefitted from in future studies, and comprehensive studies can be conducted with different social media components. Similar to this study, studies can be carried out nationwide in Turkey, or social network analyses can be made in certain specific fields. In this vein, several research questions to be addressed are provided below:

i. Does using social media in Open Education have a significant effect on students' academic achievements, interests, and motivations?

ii. What social media instruments are available OE in Turkey and what trends do they exhibit?

iii. What are the opinions and recommendations of students and field experts in regards to using social media for Open Education?

iv. What are the reasons that programs actively use social media in accordance with today's requirements while also providing employment opportunities?

v. What strategies and techniques can be employed while using social media for Open Education?

vi. What kinds of features and characteristics should an Open Education social media account have if it is to reach a large audience?

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