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A BIBLIOMETRIC STUDY ON CREATIVITY IN THE GIFTED

ÜSTÜN YETENEKLİLERDE YARATICILIK ÜZERİNE BİR BİBLİOMETRİK ARAŞTIRMA*

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ÖZ: Bu çalışmada yaratıcılık ve üstün yetenek kavramlarını içeren makaleler sosyal ağ analizi ile incelenmiştir. Bu makalalerin daha çok hangi zaman aralığında yapıldığı ve hangi makalelerin bu zaman aralıklarında önemli bir etkiye sahip olduğu araştırılmıştır. Ortak atıf analizini ve doküman analizini gerçekleştirmek için CiteSpace programı kullnılmıştır. Araştırma sonucunda, atıflar arasındaki ilişkiye göre, üstün yetenek ve yaratıcılık kavramlarıı içeren en çok atıf alan ve önemli makaleler sunulmuştur. CiteSpace gibi sosyal ağ profilini yansıtan programların yardımıyla, çalışma konusu belirlenebilir, literatürdeki eksiklikler veya boşluklar hakkında güncel bilgiler elde edilebilir.
Anahtar sözcükler: Yaratıcılık, Üstün Yeteneklilik, Sosyal Ağ Analizi, CiteSpace

ABSTRACT: In this study, it was investigated articles that c concepts of gifted and creativity with social network analaysi searched that these articles were made in which time periods which articles had a significant effect in these time intervals. CiteSpace program was used to make a document/article co-c analysis. As a result of the research, clusters were determined on the relationship in the citations, articles that were the most and important contained concepts of gifted and creativity wer presented. With the help of the programs reflecting the social profile such as CiteSpace, the subject of study can be determi obtained up-to-date information on deficiencies or gaps in the literature.
Keywords: Creativity, Giftedness, Social Network, CiteSpac

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UZUN ÖZET

Giriş

Üstün yetenekli bireylerin tanımlanması ve bu bireylerin yetenekleri doğrultusunda yönlendirilmesi toplumların kalkınmasında faydalı olacaktır. Üstün yeteneklilik kavramı bireylerin akranlarından üstün olma durumu olarak tanımlanırken net bir sınır çerçevesine sahip değildir. İlk olarak bu kavram IQ seviyesine göre değerlendirilirken (Olszewski-Kubilus, Subotnik & Worrell, 2015; Renzulli, 1986), daha sonraları bu test yeterli bi ölçü olarak görülmemiştir (Renzulli, Smith & Reis, 1982; Renzulli, 2005; Sternberg, 2009; Singer, 2018; Torrence, 1962). Genel olarakta bu kavram bireylerin kendi yaşıtlarından bilişsel, sosyal, duygusal ve yaratıcılık bakımından akranlarında daha avantajlı olmaları durumunda değerlendirilmektedir. Özellikle bu farklılıklar arasında yer alan yaratıcılık üstün yeteneklilik için önemlidir (Besançon, 2013; Davis & Rimm, 1998; Jackson & Klein, 1997; Kaufman, Plucker & Russell, 2012; Kaufman, Gentile, & Baer, 2005; Luria, O'Berien & Kaufman, 2016; Mann, 2006; Naglieri & Kaufman, 2001; Ronksley-Pavia, 2014; Sternberg & Lubart, 1993).

Bu çalışmada üstün yeteneklilik için önemli olan yaratıcılık kavramı sosyal ağ analizi ile incelenmiştir. Yaratıcılık ve üstün yeteneklilik kavramlarının birlikte ele alındığı çalışmalar temel alınarak, bu kavramların yer aldığı makalelerin hangisinin daha çok atıf aldığının, dönüm noktası olarak değişimlere

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yol açacak hangi çalışmaların yapıldığının ve bu makalelerden oluşan kümelerin zaman dilimlerinde nasıl bir ilişki gösterdiğini ortaya çıkarmak amaçlanmıştır.

Yöntem

Araştırma için gerekli olan veriler Web of Science™ core collection veri tabanından elde edilmiştir. Veriler,1946-2016 yılları arasında yer alan "Yaratıcılık (creativitiy)" ve "Üstün (gifted/ talented)" kavramlarını temel alan ve indeksleri SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI olan toplam 115 makaleden oluşmaktadır. Makalelere ulaşıldıktan sonra aynı veri bulunmayacak şekilde çalışma adları ve yazarlar tek tek incelenmiştir. Son hali ile çalışma 89 makale üzerinden yürütülmüştür.

Bulgular

Bu kavramlarından elde edilen 89 makale için 788 tane atıfın bulunduğu ve h-index değerinin 16 olduğu bulunmuştur.

Çalışma ile 1964-2016 yılları arasında Üstün yeteneklilik ve yaratıcılık kavramlarını temel alan 89 makalenin arasındaki ilişki Citespace programı kullanılarak incelenmiştir. Ortak atıf analiz sonucunda 175 ortak atıf kümesi elde edilmiştir. Bu kümeler genişlikleri yönünden ele alındığında en geniş 52 küme ön plana çıkmıştır. Oluşan ağın yoğunluğu .0042 olup düşük yoğunluk olarak değerlendirilmektedir. Bu durum makalelerin tek bir küme veya yapı altında toplanmaya meyili olmadıkları şeklinde yorumlanabilir. Bu iki kavramı içeren makalenin analizinden elde edilen ağın önemliliğini gösteren iki katsayı yer almaktadır. Bu katsayılar "Ortalama Silhouette Değeri" ve "Modularity Q" değeridir. Analize ait ortalama Silhoutte değeri 0,3091; Modularıty Q değeri 0,9729 olarak elde edilmiştir. İyi bir ağ yapısı göstergesi olarak bu iki değerin de 0,5 den yüksek olması beklenmektedir (Song, Zhang & Dong, 2016).Modularıty Q değeri oldukça yüksek seviyede olup bu değerin yüksek olması ağda yer alan çalışmaların mantıklı ve bağımsız bir şekilde kümelere ayrılıp ayrılmadığı hakkında bilgi vermektedir (Chen, 2014; Zhao & Wang, 2011). Dolayısı ile bu çalışma ile makalelerin oluşturdukları kümeler mantıklı bir çerçevede yer almaktadır. Ortalama Silhouette değeri ise kümelerin homojenliğini göstermektedir. Bu değerin yüksek olması küme üyelerinin daha kararlı yapılar gösterdiğini işaret etmektedir. Ancak küme boyutu küçük olduğu durumda silhouette değerinin yüksek olması çok yüksek bir homojenliği gösterdiği anlamına gelmemektedir.

Elde edilen sonuçlarda 982 düğüm, 2022 de bağlantının olduğu görülmektedir. Makale başlıklarında en çok tekrar eden terimlerden hareketle kümelerin isimleri oluşmaktadır.

Oluşan kümelerden en genişi #0 kümesi olup diğer kümelerde büyüklük sırasına göre #1, #2, #3,… şeklinde sıralanmıştır. 42 Makaleden oluşan ilk küme #0 olup, bu küme LLR algoritmasına göre "gifted education" olarak adlandırılmıştır. Bu kümeye ait Silhouette value=0.986 olup bu kümenin homojen olduğunu görülmektedir. Bütün kümeler dikkate alındığında ağ homojen bir yapı göstermese de kümeler kendi içlerinde homojen bir yapıya sahiptir.

Tartışma ve Sonuç

Kümelerin isimlerinde çoğunlukla üstün yeteneklilere ait programlar ön plana çıkmaktadır. Kümelerde yer alan makalelerin birbirleri ile ilişkisini ve kümelerinde ki önemlerini incelemek için zaman dilimlerine ait grafikleri incelenmiştir. Alandan elde edilen tüm makaleler için sonuçlara bakıldığında kümelerin aşırı bir homojenlik göstermediği ancak mantıklı ve bağımsız bir şekilde kümelerin elde edildiği görülmektedir. Yaratıcılık ve üstün yeteneklilik kavramlarının ilk ortaya çıktığı zamanları #10 kümesi ve # 31 kümesinde görmek mümkündür. En büyük küme olan 0 kümesi incelendiğinde, üstün yeteneklilerin eğitimi ile ilgili çalışmaların 2002 ile 2012 yılları arasında yoğunlaştığı görülmüştür. Her küme için önemli makaleler konu bazında elde edilmiştir. Genel olarak, 1946-2016 yılları arasında üstün zekalılar ve yaratıcılık kapsamında yapılan çalışmalarda en son çalışmaların *Girişimci yetenek* ve *Duygusal zeka* üzerine yoğunlaştığı gözlemlenmiştir. Bu alanda yapılan en eski çalışmaların *ebeveynlik* ve *üstün zekalılığı yeniden düşünme* üzerine olduğu, en az atıfta bulunulan konu alanlarının ise *iş tercihi* ve *üstün yetenekli kıdemli öğrenci* üzerinde olduğu görülmüştür.

Bu alana yönelik olarak çalışmalar artsa da hale literatürde üstün yeteneklilik ve yaratıcılık kavramları geliştirmeye açıktır. CiteSpace ile literatürde eksikliği ve yapılmış çalışmaların önemi, etkisi ortaya konulmuştur. Bu gibi programlar yardımı ile daha önceden çalışılmamış veya çalışmak istenilen alan hakkında güncel bilgiler elde edilerek çalışma konusu belirlenebilir.

INTRODUCTION

Each individual has different characteristics. Individuals are evaluated and given a label according to these characteristics. In the school or classroom environment, individuals are named as gifted, intelligent, naughty as label. As each individual is special, it will be beneficial to identify a gifted person and guide them according to their characteristics. The concept of giftedness can be defined as the superiority of individuals from peers in many abilities. Definitive frameworks are not drawn to describe this concept, which is described by different researchers with reference to different characteristics. While the concept of giftedness was first evaluated according to the level of intelligence (IQ) (Olszewski-Kubilus, Subotnik & Worrell, 2015; Renzulli, 1986), this test was not considered sufficient in the later process (Renzulli, Smith & Reis, 1982; Renzulli, 2005; Sternberg, 2009; Singer, 2018; Torrence, 1962). In general, it can be said that gifted individuals are more advanced than their peers in areas such as cognitive, social, emotional and creativity. The advantages of these individuals from their peers are due to their being different in terms of physical, perceptual, analysis, synthesis, problem solving, abstract thinking, logical process, language skills and creativity (Alberta Learning, 2004; Baykoç-Dönmez, 2009; Clark, 2002; Flint, 2001; Galagher, 2015; Kurup, Chandra & Binoy, 2015; Manning, 2006; Ronksley-Pavia, 2014). The concept of Giftedness is confused with many concepts. For this reason, Renzulli, Smith and Reiss (1982) tried to eliminate the misconception by examining this concept under two categories as schoolhouse giftedness and creative-productive giftedness. Although these concepts support each other, some individuals are considered to be more dominant in only one area. Defining creative-productive giftedness is not as easy as defining schoolhouse giftedness. Because creative productive gifted students may not show high success in academic success and IQ tests (Besançon, Lubart & Barbot, 2013; Stein, 1968; Van Tassel-Baska, 2004). In addition, each individual with high intelligence and skills cannot be considered as gifted (Van Tassel-Baska, 2004) and may not be included in this classification (Ronksley-Pavia, 2014; Runco, 2007; Van Tassel-Baska, 2001; Winner, 2000).

In addition, creativity does not always mean the production of a concrete end product (Ronksley-Pavia, 2014). Kaufman, Plucker and Russell (2012) arguing that creativity should be a part of gifted assessment; Hersh and John-Steiner (2017) emphasized that creativity is more common in daily life rather than a concept used only for gifted ones. But no matter what, creativity is seen as the most important and fundamental component of the concept of giftedness (Besançon, 2013; Davis & Rimm, 1998; Jackson & Klein, 1997; Kaufman, et al, 2012; Kaufman, Gentile, & Baer, 2005; Luria, O'Berien & Kaufman, 2016; Mann, 2006; Naglieri & Kaufman, 2001; Ronksley-Pavia, 2014; Sternberg & Lubart, 1993). In order to define creativity that does not have a fully valid definition (Mann, 2006), researchers have tried to identify many features (Amabile, 1996; Hennessey, 2005; Renzulli, 1986).In general, creativity is defined as individuals' approach to existing situations with different sensitivity than others (Ronksley-Pavia, 2014; Runco, 2004), producing original ideas and solutions about these situations and adapting these ideas / solutions to appropriate environments (Ausubel, 1964; Mann et al, 2017; Po & Merryman, 2010; Singer, 2018; Torrence, 1965). In addition to such definitions, it is possible to find many different definitions or uses of the concept of creativity in gifted people in the literature. Visually presenting this concept with which articles in which time periods and which articles are more prominent will make it easier for researchers to improve their literature on the field or to see the deficiencies in this field.

One of the methods used to increase the impact of the research and to reveal the appropriate research status is bibliometric research (Glaser & Laudel, 2015). Bibliometric research provides useful information about the field of interest to examine the development of incomplete, current issues (Glänzel & Thijs 2012) over time periods (Glanzel & Thijs, 2011) and to make inferences about future fields of study (Mark, Roberts & Natali 2010).

In this study, it is aimed to map the works that are mostly cited and mark the time periods by examining together the studies on the creativity of gifted individuals. With this aspect, the relationship of the articles with each other was examined by social network analysis.

METHOD

Research Model

Bibliometric researches are used to compare researches in many areas (Besimoğlu, 2015), to evaluate and to follow scientific processes (Gmür, 2003; Mongeon & Paul-Hus, 2016; Santos, 2015; Van Raan, 2005). Doing investigations with bibliometric researches serve to identify the co-citation methods that reveal the relationship between documents and the quality and quantity of resources with citation analyzes to

examine the development of a research topic (Tsay, Xu & Wu, 2003; Yu, Chang, Yu, 2016). In this study, creativity in gifted students network structure will be examined bibliometrically. This is a descriptive study because it presents the current situation visually.

The Data of The Research;

The data required for the research were obtained from the Web of Science ™ core collection database**.** The data consisted of articles**,** included in the SCI-EXPANDED, SSCI, A & HCI, CPCI-S, CPCI-SSH, ESCI indices**,** containing creativity and gifted / talented concepts between 1946-2016. A total of 115 articles were obtained. After the articles were reached, the study names and the authors were examined one by one without the same data. The last case the study was carried out through 89 articles.

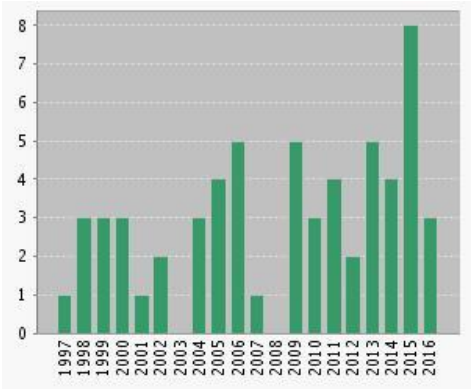

Figure 1. Articles published by years

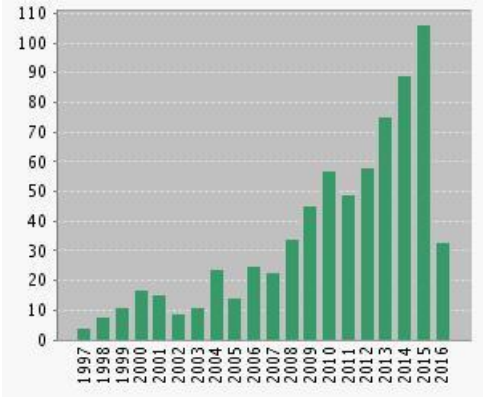

Figure 2. Citiations by years

Figure 1 shows the distribution of the articles examined by years. In the 89 articles obtained from creativity and gifted / talented concepts, there were 788 cited. The citations of these articles by years are shown in Figure 2. Citations are especially high in 2015 compared to other years.

Analysis of Data;

Social network analysis provides visualization by measuring the closeness between documents or desired terms for the mapping of scientific features (Liu, Yin, Liu & Dunford, 2015). The relationship between the documents is examined by examining the citation network.

Citespace is a java application that analyzes and visualizes the large network structure obtained from bibliometric data (Chen, 2006; Feng, Zhang, Du & Wang, 2015; Zhao & Wang, 2011;). The program, developed by Chaomei Chen, produces co-citiations or c networks of nodes and links. It is an effective program for measuring relationships and links between sources such as authors, articles, institutes, terms and keywords (Seyedghorban, Jekanyika-Matanda & LaPlaca, 2016; Tsay et all., 2003; Zhao & Wang, 2011). Citespace is a program developed to map information fields, explain the relationship between different disciplines, examine and estimate the studies in a certain time period, uncover the most recent studies and use it to predict the trend issues that arise according to the analysis of the bibliographic records of related publications (Chen, 2014; Feng et all., 2015; Khan & Niazi, 2017; Liu et all., 2015; Zhao & Wang, 2011). The study was carried out with the analysis of 89 articles between 1964-2016 with Citespace program.

RESULTS

Citespace software presents the patterns of the subject to be investigated visually. In this study, citations to articles that include the concepts of giftedness and creativity and the relationship between these articles have been revealed. The articles constitute a cluster according to their relationships in the citations. As a result of the co-citation analysis, 175 co-citation clusters were obtained. Considering the widths of these clusters, the 52 largest clusters have come to the fore. The clusters representing the relationship between the citiations of the articles is shown in Figure 3.

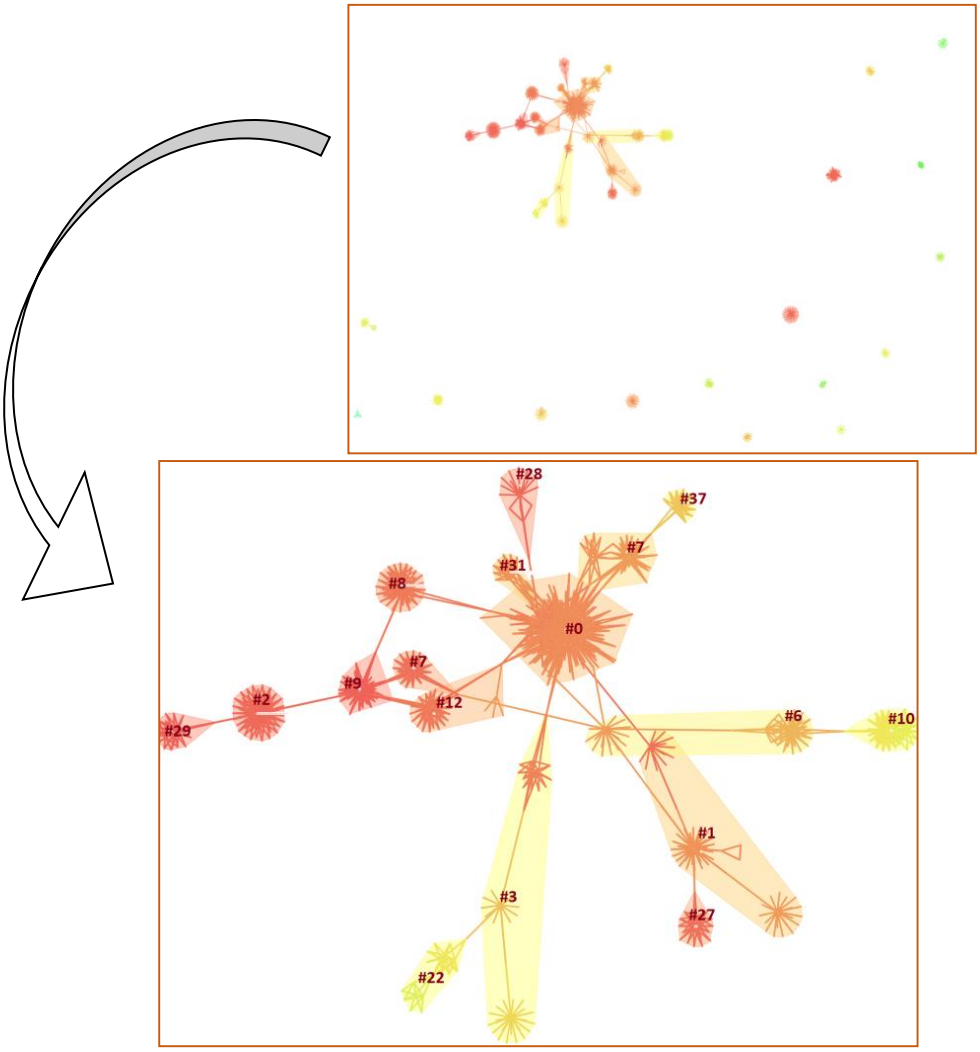

Figure 3. Clusters and network created by articles

The results obtained from the analysis of 89 articles show that there are 982 nodes and 2022 links between articles. 175 different clusters have been obtained, which reduces the density of clusters. The density obtained from the program was obtained as 0.0042. This supports the fact that articles do not tend to be collected under a single cluster or structure.

On the clustering process, there are two coefficients showing the importance of the network obtained from the analysis of the 89 articles which contain the concepts of gifted and creativity. These coefficients are the mean Silhouette Value and the Modularity Q value. The mean Silhoutte value was 0.3091; Modularity Q value was obtained as 0.9729. These two values are expected to be higher than 0.5 as a good network structure indicator (Song, Zhang & Dong, 2016). Modularity Q value is high and high value of this value gives information about whether the articles in the network is logically and independently divided into clusters (Chen, 2014; Zhao & Wang, 2011). Due to too many clusters, the clusters formed by the articles are included in a logical framework for getting more homogenity structure. The higher the silhouette value in the clusters indicates that the cluster members show more stable structures. 175 clusters formed from 89 articles is indicative of the fact that each article is element of many clusters. Homogeneous clusters have high Silhoutte. If the silhoutte value approaches 1, it is an indicator of homogeneity. However, when cluster size is small, the high value of silhouette does not mean that it shows a very high homogeneity (Chen, 2014). According to the mean Silhouette value obtained from this study, we can say that the clusters are partially homogeneous or the structure has a big range.

The names of the each clusters are formed from the most repetitive terms in the article abstract. These terms characterize the nature of the cluster. Three different algorithms are used in the

characterization process. One of these algorithms is the LLR algorithm which is the only one that gives the best results for the terms in the field of publication (Chen, 2014). The values of the first 20 clusters and the most cited articles are given in Table 1.

Table 1.
Cluster names and properties determined by article co citiation analysis for first 20 clusters

ClusterID	Size	Silhouette	Label (LLR)	Most cited article in the cluster
#0	42	0.986	Gifted education	Subotnik, R. F., Olszewski-Kubilius, P., & Worrell, F. C. (2011). Rethinking giftedness and gifted education: a proposed direction forward based on psychological science. *Psychological Science in the Public Interest*, *12*(1), 3–54.
#1	38	0.985	Programmed creativity-training material	HUBER,, J (1979) Self-instructional use of programmed creativity-training materials with gifted and regular students. *Journal of Educational Psychology*, vol.71, n3, 303-09.
#2	34	0.92	Difference	Jausovec,, N. (2000). Differences in cognitive processes between gifted, intelligent, creative, and average individuals while solving complex problems: an EEG study. *Intelligence*, *28(3*), 213-237
#3	34	0.994	Identifying gifted student	Jarosewich, T., Pfeiffer, S. I., & Morris, J. (2002). Identifying gifted students using teacher rating scales: a review of existing instruments. *Journal of Psychoeducational Assessment*, *20*(4), 322–336.
#4	33	1	Emotional intelligence	Şahin, F., Özer, E., Deniz, M.E. (2016). The predictive level of emotional intelligence for the domain-specific creativity: a study on gifted students, *Educational and Science*, *41*, 181-197
#5	30	0.94	Crucial role	Memmert, D. (2006). Developing creative thinking in a gifted sport enrichment program and the crucial role of attention processes, *High Ability Studies*, 17(1), 101–115
#6	30	0.994	Adjunct	Root-Bernstein,, R (2015). Arts and crafts as adjuncts to STEM education to foster creativity in gifted and talented students. *Asia Pacific Educ. Rev*. 16:203–212
#7	27	1	Independence	Gallucci, NT, Middleton, G, & Kline, A (1999). The independence of creative potential and behavior disorders in gifted children. *Gifted Child Quarterly*, *43*, 194–203.
#8	25	1	Critical case study	Hebert, T. P., & Beardsley, T. M. (2001). Jermaine: A critical case study of a gifted black child living in rural poverty. *Gifted Child Quarterly*, 45, 85-102.
#9	25	1	Entrepreneurial talent	Weitzel, U., Urbig, D., Desai, S., Sanders, M., & Acs, Z., (2010). The good, the bad, and the talented: entrepreneurial talent and selfish behavior. *Journal of Economic Behavior & Organization*, 76, 64–81.
#10	22	0.896	Rethinking giftedness	Subotnik, R. F., Olszewski-Kubilius, P., & Worrell, F. C. (2011). Rethinking giftedness and gifted education: a proposed direction forward based on psychological science. *Psychological Science in the Public Interest*, *12*(1), 3–54.
#11	20	1	Gender	Kershner, J. R., & Ledger, G. (2007). Effect of sex, intelligence, and style of thinking on creativity: a comparison of gifted and average IQ children. *Journal of Personality and Social Psychology*, 48, 133-140.
#12	19	1	Attitude	Lukash,, EY (2004). Attitude to social adaptation in creatively gifted children in Russia and The USA. *Russian Education and Society*, 47 (11), p57-70

Tablo 1 devamı

ClusterID	Size	Silhouette	Label (LLR)	Most cited article in the cluster
#13	19	1	Academic self-concept	Van Boxtel, H. W., & Monks, F. J. (1992). General, social, and academic self-concepts of gifted adolescents. *Journal of Youth and Adolescence*, 21, 169—186.
#14	18	0.99	Exploring identification procedure	Chan, D., W., (2000). Exploring identification procedures of gifted students by teacher ratings: Parent ratings and students self-reports in Hong Kong. *High Ability Studies*, 11(1), 69-82.
#15	18	0.993	Area	Kovacic,, B & Rozman J. C. (2014) Musically talented pupils in Slovene elementary schools: gender and age differences in thearea of musical abilities. *Croatian Journal of Education - Hrvatski časopis za odgoj i obrazovanje* , Vol. 16; doi:10.15516/cje.v16i4.624
#16	18	1	Psychological approache	Bajcık,, V., Halasova, D., Bronis M (1993) Gifted and talented students - on the educational and psychological approachesto the identification process. *Studia Psychol*. 35(3). 237-247
#17	18	0.989	Creative writing experts rate creativity	Kaufman, J. C., Gentile, C. A., & Baer, J. (2005). Do gifted student writers and creative writing experts rate creativity the same way. *Gifted Child Quarterly*, *49*(3), 260–264.
#18	18	0.96	Education program	Sak, U. (2013). Education programs for talented students model (EPTS) and its effectiveness on gifted students' mathematical creativity. *Education and Science*, 38 (169), 51-61.
#19	16	0.994	Work preference	Ferriman, K., Lubinski, D., & Benbow, C. P. (2009). Work preferences, life values, and personal views of top math/science graduate students and the profoundly gifted: developmental changes and gender differences during emerging adulthood and parenthood. *Journal of Personality and Social Psychology, 97*, 517–532.

The largest of these clusters is cluster # 0, in the order of size in the other clusters # 1, # 2, # 3,… The first cluster # 0, consists of 42 articles, is called gifted education according to the LLR algorithm. Silhouette value is 0.986 for this cluster and it can say that it is homogeneous with 42 articles. Considering all the clusters, although the network does not show a homogenous structure, the clusters have homogenous structure within themselves. The most cited article in cluster #0 is "Subotnik, R. F., Olszewski-Kubilius, P., & Worrell, F. C. (2011). Rethinking Giftedness and Gifted Education: A Proposed Direction Forward Based on Psychological Science. *Psychological Science in the Public Interest*, *12*(1), 3–54". In this cluster, studies on creativity are considered as a feature that should be included in gifted education. Other clusters were named according to their sub-study areas and the most cited articles were given for this sub-area.

Articles can refer to more than one cluster. As the number of articles is low and their content is rich, the same article can take place as the most cited article in more than one cluster. For example, in the first cluster and in the 10th cluster, the most cited article is the same. Information about other clusters can be interpreted similarly.

It can be examined the relationship between the clusters and their importance in their clusters with articles co-citation timeline. Figure 4 shows the image obtained according to the timelines of the clusters.

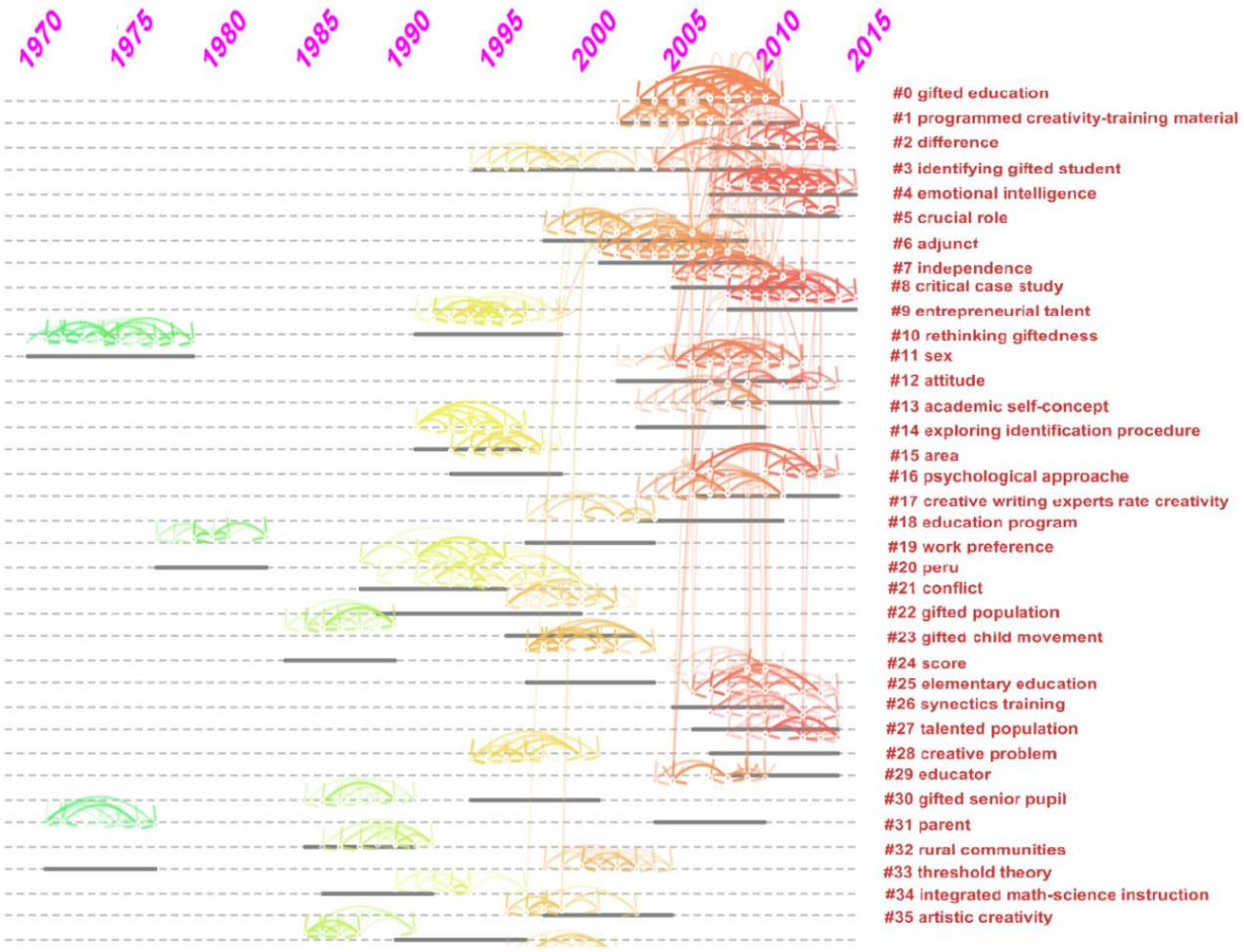

Figure 4. Articles Co-citation timeline for the first 35 clusters

In Figure 4, nodes and co-citation networks vary according to their color and size. The size of the nodes is proportional to the number of citations. The colors of the citation rings represent articles to a particular time period. It shows a communication link between the 2 peaks in the networks. The thickness of the lines indicates the strength of co-authoring. Blue color represent the first years; green color show the middle years; orange and red colors show the current years. Darker shadows of the same colors represent earlier time periods; lighter colors show later times (Khan & Niazi, 2017). As seen in the timelines, the most intensive studies were conducted between 2005 and 2015. It is possible to see that the articles made between these years are quite interactive with each other. The fact that these articles are related to each other shows that they refer to each other and they are similar in content. Recent researches focus on "gifted education and curriculum" and "psychological approaches". Since there are no purple rings in the nodes of the articles, it can be said that the articles used as the turning point in these periods are the same as the most cited articles. The turning point article can be expressed as the one that leads many articles or attracts the most attention. Table 2 shows the most important turning points according to figure 4.

Table 2:
The most cited articles and articles with turning points

Citation counts	Articles	cluster #
5	Lubinski D, Benbow CP, Webb RM, Bleske-Rechek A (2006) Tracking exceptional human capital over two decades. *Psychol Sci* 17:194–199	0
4	Cramond, B., Matthews-Morgan, J., Zuo, L.& Bandalos, D. (2005). A report on the 40-year follow-up of the torrance tests of creative thinking: Alive and well in the new millennium. *Gifted Child Quarterly*, 49 (4), 283-292.	12
4	*Park, G.*, Lubinski, D., & Benbow, C. P. (2007). Contrasting intellectual patterns for creativity in the arts and sciences: Tracking intellectually precocious youth over 25 years. *Psychological Science, 18,* 948-952	7
3	Batey M, Furnham, A. & Safiullina, X. (2010). Intelligence, general knowledge and personality as predictors of creativity. *Learning and Individual Differences* 20, 532–535.	9
3	Sternberg RJ, (2004),Culture and intelligence, *Am Psychol*, V.59, p.325	1
3	Wai J, Lubinski, D. & Benbow, C.P.. (2005). Creativity and occupational accomplishments among ıntellectually precocious youths: an age 13 to age 33 Longitudinal Study. Journal of Education Psychology, V.97, p.484	0

It is noteworthy that the dates of the prominent articles are quite close to each other. These articles are important studies in the clusters are considered to be the most influential articles in the period. It is seen that the most cited and centralized articles are in the cluster # 0. The article in the most central role is "Tracking exceptional human capital over two decades" by Lubinski D, et al. (2006). This study shows the most cited study among 42 studies in cluster 0.

DISCUSSION AND RECOMMENDATIONS

Creativity is first considered as a personal feature and evaluated as individuals' ability to produce practical solutions in case of a situation. Therefore, it is evaluated the process of social and technical development depends on creative individuals (Runco, 2004). Creativity is often associated with giftedness in the literature and emerges as an important concept for gifted ones (Davis & Rimm, 1998; Heller, Perleth & Lim, 2005; Jackson & Klein, 1997; Mann, 2006).

Many definitions and properties have been defined for creativity and gifted. The subject of creativity of gifted individuals has been studied mostly in relation to intelligence (Kim, 2005; Leikin, 2008; Yamamoto, 1964), and it has been handled in a very limited way with other aspects. This situation is predicted to be due to the lack of a detailed descriptive information map on this subject area. In this study, the articles in which the concepts of creativity and gifted considered as a whole and social network structure of articles containing the concept of gifted and creativity was revealed. CiteSpace software, which has an important place to reveal new orientations and to find critical points and connections in a field, was used in this study**.** The data required for the research were obtained from the Web of Science **™** core collection database**.** According to the relationship of 89 articles, 175 samples were obtained in total. 52 of these clusters were found to be more important in terms of scope, content and size. In the # 0 cluster, which is the largest of these clusters, there are 42 articles and this cluster is called "gifted education". The articles in the clusters are related to the articles in the other clusters. It is observed that most of the studies on creativity and gifted concepts were carried out between 2005 and 2015. The clusters in themselves show very high homogeneity. When we look at the results for all articles obtained from the field, it is seen that the clusters do not show excessive homogeneity but the clusters are separated in a logical and independent manner. It can be said that the articles which has the most central role in all articles is about creative thinking and intelligent. The most cited article/s for the articles in the clusters determined the weight in this cluster. Thus, important studies conducted in this field and their relation with each other are included. Articles classified according to the similarities of their citations formed a cluster. In the clusters formed, it was examined which articles the articles cited the most and which article in this cluster received the most citations. When we examined the largest cluster, cluster 0, it was seen that the studies on gifted education also intensified between 2002 and 2012 years. Articles found to be important about gifted education in the Web of ScienceTM core collection database mostly refered to

article conducted by Subotnik, et al. (2011). Also in this cluster, the most cited article was the article conducted by Lubinski et al (2006). Examinations made in the same way for each cluster and the important articles have been obtained by topic. In general, it has been observed in the studies conducted within the scope of gifted and creativity between 1946 and 2016 that the most recent studies have focused on *Entrepreneurial talent* and *Emotional intelligence.* It was observed that the previous studies in this field were on *parenting* and *rethinking giftedness*, and the least cited subject areas were *work preference and gifted senior pupil.*Considering these issues, researchers can determine the subject areas to be studied and contribute to the literature.

When a research is to be conducted about any topic, it is important to examine the studies conducted in relation to the research and to see in which categories these studies are handled. As seen in this study, the subject of articles can be determined by obtaining up-to-date information about the subject / area that has not been studied and studies on deficiencies or gaps in the literature.

In future studies, the relationship between studies in different fields can be examined by including more articles and selecting the words with the meaning of the board. Thus, a study field that needs to be updated and expanded can be seen in the literature and studies can be increased in those fields.

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