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Nesibe Aydın Eğitim Kurumları tarafından yayımlanan *Eğitim ve Gelecek Dergisi* yirmi birinci sayısında sizinle buluşuyor. Dergimizin yirmi birinci sayısında yer alan çalışmaları siz değerli okurlarımıza sunuyoruz.

Ergenlik dönemi, sosyal-duygusal öğrenme becerilerinde ve akran ilişkilerinde önemli gelişmelerin yaşandığı kritik bir dönemdir. **Zeynep Apaydın Demirci, Müdriye Yıldız Bıçakcı ve Burhanettin Uysal** tarafından hazırlanan *"Sosyal Duygusal Öğrenmenin Ergenlerin Akran İlişkileri Üzerindeki Etkisinin İncelenmesi"* başlıklı çalışmanın amacı sosyal duygusal öğrenme ile akran ilişkileri arasında bir ilişkinin bulunup bulunmadığını belirlemektir. Bu çalışma, anket esasına dayalı kesitsel bir alan araştırmasıdır. Araştırma sonunda ergenlerin ölçek alt boyutlarında sorumlu karar verme ve bağlılık boyutunda en yüksek puana sahipken kendini açma ve sadakat boyutunda en düşük puana sahip olduğu bulunmuştur.

Berrin Şenses ve Nihan Demirkasımoğlu tarafından hazırlanan *"Farklı Kuşaklardan Öğretmenlerin İş Değerleri ile İşten Keyif Almaları Arasındaki İlişkinin Çeşitli Değişkenler Açısından İncelenmesi"* başlıklı araştırmanın amacı, X ve Y kuşağı öğretmenlerinin çalışma değerleri ile işten keyif alma düzeyleri arasındaki ilişkileri ile bu değişkenlerin cinsiyet, kıdem ve kuşak değişkenleri bakımından incelemektir. Araştırmanın sonuçları, Y kuşağı öğretmenlerinin X kuşağı öğretmenlerinden daha fazla çalışma değerlerini önemsediğini göstermiştir.

Mustafa Çağrı Engin ve Adnan Taşgın tarafından hazırlanan *"Öğretmen Adaylarının Mesleki Adanmışlıkları ve Öğretim Tekniklerini Seçme Becerileri"* başlıklı çalışmanın amacı öğretmen adaylarının öğretmenlik mesleğine ilişkin adanmışlıkları ile öğretim tekniklerini seçme becerileri arasındaki ilişkiyi incelemektedir. Bu çalışma, ilişkisel tarama modeline göre gerçekleştirilmiştir. Araştırma sonucunda elde edilen bulgulara göre, pedagojik formasyon eğitimi alan öğretmen adayları ile eğitim fakültesi öğretmen adaylarının öğretmenlik mesleğine adanmışlık ve öğretim tekniğini seçme becerileri ile ölçeklerin diğer alt boyutları açısından anlamlı farklılıklar görülmüştür.

Gamze Mercan ve Pınar Köseoğlu tarafından hazırlanan *"Biyoloji Öğretmenlerinin Yakın Çevrelerindeki Ağaçları Tanıma Düzeyleri"* başlıklı çalışmanın amacı, Milli Eğitim Bakanlığı'na bağlı liselerde görev yapan biyoloji öğretmenlerinin biyoçeşitlilik kavramı içerisinde önemli bir kapsamı oluşturan ağaçlar kapsamında yakın çevrelerindeki ağaçları tanıma düzeylerinin incelenmesidir. Araştırmanın modeli nicel araştırma yöntemlerinden genel tarama modelinde ilişkisel bir çalışmadır. Araştırmada elde edilen çıktılara göre; biyoloji öğretmenlerinin yakın çevrelerindeki ağaçları tanıma düzeylerinin düşük olduğu saptanmıştır.

Modern eğitim anlayışında giderek yaygınlaşan ve yerleşik hâle gelen görsel okuryazarlık veya dijital okuryazarlık becerisinin kazandırılmasında Türkçe dersinin ve Türkçe öğretmenlerinin katkısı önemlidir. **Sıddık Bakır ve Ayşe Şimşek** tarafından hazırlanan *"Sekizinci Sınıf Öğrencilerinin Görsel Okuma ve Mantık Muhakeme Testi Sorularındaki Başarıları"* başlıklı çalışma kapsamında öğrencilerin görsel okuma ve mantık muhakeme sorularına yönelik başarıları ile okunan kitap sayısı, günlük çözülen soru sayısı, sosyal medya kullanımı, Türkçe dersi başarısı ve ailenin sosyoekonomik durumu arasında bir ilişki olup olmadığı incelenmiştir. Çalışma grubundaki öğrencilerin uygulanan başarı testinden aldıkları puanları ile ayda okunan kitap sayısı ve ailenin sosyoekonomik durumu arasında anlamlı ilişki bulunmamıştır. Bununla birlikte başarı testi puanları ile Türkçe dersi başarısı, günlük çözülen soru sayısı ve sosyal medya kullanımı arasında anlamlı ilişki tespit edilmiştir.

İnternet insan yaşamını olumlu ve olumsuz olarak etkileyebilmektedir. Bu etkilerden biri internet bağımlılığıdır. **Ayten Doğan Keskin ve Neriman Aral** tarafından hazırlanan ***"Türkiye'de İnternet Bağımlılığı ile İlgili Yapılan Lisansüstü Tezlerin İncelenmesi"*** başlıklı çalışma, Ulusal Tez Merkezi web sitesinde, tüm alanlarda ve tüm tez türlerinde "İnternet bağımlılığı" arama terimi kullanılarak gerçekleştirilmiştir. Veri tabanlarında arşivlenen 279 tez incelenmiştir. Araştırma sonunda internet bağımlılığı ile ilgili lisansüstü düzeyde yapılan tezlerin çalışma gruplarının %53,1'inin ergenlerden oluştuğu, internet bağımlılığı ile ilgili yapılan tezlerde, internet bağımlılığı ile en fazla ilişkili bulunan değişkenlerin; depresyon, anksiyete, bağlanma, cinsiyet ve internet kullanım süresi olduğu tespit edilmiştir.

Rüveyda Kandal ve Fatih Baş tarafından hazırlanan ***"Türkiye'de Matematik Eğitimi Alanında Yayınlanan Üstbiliş Konulu Tezlerin Betimsel İçerik Analizi"*** başlıklı çalışmada, matematik eğitimi alanındaki üstbiliş temalı yapılan lisansüstü tezlerin yapısal özellikleri (yayım yılı, yöntem, çalışma grubu, veri toplama araçları, veri analiz yöntemi) ve çalışma konusuna göre incelenmesi amaçlanmıştır. Araştırma kapsamında 80 adet lisansüstü teze ulaşılmıştır. Yapılan betimsel analizler sonucunda; tezlerin 2009, 2014 ve 2017 yılları hariç son yıllara doğru bir artış gösterdiği ve yapılan araştırmaların en çok 2019 yılına ait olduğu görülmüştür. Çalışmalarda genellikle nicel araştırma yaklaşımı benimsenmiş olup buna bağlı olarak da betimsel ve deneysel çalışmalar üzerinde yoğunlaşıldığı belirlenmiştir.

Günümüzde, fiziksel öğrenme ortamlarının kalitesinin doğrudan eğitimin kalitesiyle ilişkili olduğu yaygın biçimde kabul görmektedir. Bu nedenle, okul binalarının ve fiziksel öğrenme ortamlarının yapısı ve özellikleri, pedagojinin gereksinimlerine göre belirlenmektedir. **Mehmet Gültekin ve Gözde Özenç İra** tarafından hazırlanan ***"21. Yüzyıl İlkokullarında Fiziksel Öğrenme Ortamlarının Pedagojiye Dayalı Tasarım Temelleri"*** başlıklı çalışmada, ilkokulların bina tasarımına ve fiziksel öğrenme ortamlarına rehberlik eden pedagojik temellere bütünsel bir bakış açısı getirmek amaçlamıştır. İlkokul binalarının pedagojik temelleri, 'çocuk dostu tasarım' ve 'öğrenme için tasarım' ana kategorileri altında toplanmıştır. Bu pedagojik temellerle ilgili olarak fiziksel öğrenme ortamının uygun tasarımları; çocuk ölçeğinde alanlar, etkileşimli açık alanlar, öğretim araçları olarak amaçlanan, esnek ve toplumla bağlantılı alanlardır.

Eğitim ve Gelecek Dergisi olarak gösterdiğiniz ilgi ve değerli katkılarınız için teşekkür ediyorum.

Gelecek sayıda buluşmak üzere…

Prof. Dr. Erten GÖKÇE

Eğitim ve Gelecek Dergisi Baş Editörü

Editorial

Journal of Education and Future published by Nesibe Aydın Education Institutions, meets you with the twenty first issue. We present the studies in the twenty first issue of JEF to our valuable readers.

Adolescence is a critical period in which significant developments occur in social-emotional learning skills and peer relationships. In the article titled *"Investigation of the Effect of Social Emotional Learning on Peer Relationships of Adolescents"*, which is prepared by **Zeynep Apaydın Demirci, Müdriye Yıldız Bıçakcı and Burhanettin Uysal**, it is important to know which variables are effective in social-emotional learning skills and peer relationships and to determine whether there is a relationship between these two skills. This study is a cross-sectional field study based on the model of the quantitative descriptive survey. As a result of the study, it was found that adolescents had the highest score in the sub-dimensions of responsible decision-making and commitment and the lowest in self-disclosure and loyalty.

The aim of the article titled *"The Relationship between Teachers' Work Values and Work Enjoyments from Different Generations according to Some Variables"*, which is prepared by **Berrin Şenses and Nihan Demirkasımoğlu**, is to determine the relationship between work values and work enjoyments of teachers from X and Y generations in relation to their gender, seniority and generation. The study was designed with single and correlational survey models. Results indicated that Y generation teachers more care about each dimension of work values than the X generation teachers.

The aim of the article titled *"Preservice Teachers' Professional Engagement and Their Ability to Choose Teaching Techniques"*, which is prepared by **Mustafa Çağrı Engin and Adnan Taşgın**, is to investigate the relationship between the engagement of the preservice teacher to the teaching profession, and their ability to choose teaching techniques. The study adopted correlational survey research. The obtained findings have shown that there are significant differences between the pre-service teachers who have taken externally pedagogical training and the preservice teachers studying at the faculty of education in terms of their engagement to the teaching profession, their skills to choose teaching techniques, and other sub-dimensions of the scales.

The aim of the article titled *"Biology Teachers' Level of Recognition of Trees in Their Close Environment"*, which is prepared by **Gamze Mercan and Pınar Köseoğlu**, is to determine how effectively biology instructors at high schools connected with the Ministry of National Education identify trees in their immediate surroundings in the context of trees, which are critical to the notion of biodiversity. The research model is a relational one that is based on the general survey model, a quantitative research technique. According to the study's results, biology instructors' capacity to identify trees in their immediate surroundings is limited.

Turkish lessons and teachers play essential roles in the acquisition of visual and digital literacy skills, which have become widespread in modern educational approaches. The aim of the article titled *"8th Grade Students' Success in Visual Reading and Logical Reasoning Test Items"*, which is prepared by **Sıddık Bakır and Ayşe Şimşek**, is to explore 8th-grade students' performances in visual reading and logical reasoning tests by particular variables such as the monthly number of books they read, the daily number of Turkish tests, social media use, Turkish lesson performances, and the socioeconomic status. This non-experimental quantitative study used a correlational design to determine the relationships between variables. The findings indicated no significant difference between the students' scores from the achievement test and the monthly number of books, and the family's socioeconomic status. However, there was a significant relationship between achievement test scores and Turkish lesson performance, the daily number of Turkish test items, and social media use.

Internet can affect the human life in both positive and negative way. One of these effects is an internet addiction. In the article titled *"A Review of Graduate Theses Conducted in Turkey on Internet Addiction"*, which is prepared by **Ayten Doğan Keskin and Neriman Aral**, a search of the National Thesis Center website was conducted using the search term "Internet addiction" in all fields and in all thesis types. 279 theses were examined which archived at the databases. According to the findings; adolescents for the sample type were used in 53.1% of the thesis. In the theses about internet addiction, the variables that are most related to internet addiction are; depression, anxiety, attachment, gender, internet usage time.

The article titled *"The Descriptive Content Analysis of Theses with the Topic of Metacognition Published in Turkey on Mathematics Education"*, which is prepared by **Rüveyda Kandal and Fatih Baş**, was aimed to investigate the graduate theses with metacognition theme on mathematics education according to their structural properties (publication year, method, study group, data collection tools and data analysis technique) and study topics. 80 graduate theses were reached within the scope of the research. At a result of the descriptive analyses, it was noticed that the number of theses has increased until recent years except from 2009, 2014 and 2017 and the highest number of conducted researches were in 2019. It was determined that generally the quantitative research approach was employed in the studies; accordingly, it was focused on descriptive and experimental studies.

Today, it is widely acknowledged that the quality of physical learning environments is directly related to the quality of education. Hence, the structure and characteristics of school buildings and physical learning environments are determined by the requirements of pedagogy. The aim of the article titled *"Pedagogy-driven Design Fundamentals of 21st Century Primary Schools' Physical Learning Environments"*, which is prepared by **Mehmet Gültekin and Gözde Özenç İra**, is to provide a holistic perspective on the pedagogical foundations that guide the building design and physical learning environments of primary schools. The pedagogical foundations of primary school buildings were subsumed under two main categories, i.e. 'child-friendly design' and 'design for learning'. Appropriate designs of the physical learning environment concerning these pedagogical principles were spaces that are child-scale, interactive open, purposed as teaching tools, flexible, and community-connected.

Thanks for your interest and valuable contributions for *Journal of Education and Future*.

Look forward to meeting in the next issue…

Prof. Dr. Erten GÖKÇE
Editor in Chief of
Journal of Education and Future

Investigation of the Effect of Social Emotional Learning on Peer Relationships of Adolescents

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Abstract

Adolescence is a critical period in which significant developments occur in social-emotional learning skills and peer relationships. Therefore, it will be important to know which variables are effective in social-emotional learning skills and peer relationships and to determine whether there is a relationship between these two skills. This study is a cross-sectional field study based on the model of the quantitative descriptive survey. The research group of the research consists of 364 students between the ages of 14 and 18, those who are located in the Provincial Center, those who are associated with Bilecik Provincial Directorate of National Education in Turkey within the 2019-2020 Academic Year and those who continue their high school education. For the research data, Social-Emotional Learning Scale developed by Totan (2018) and Peer Relationships Scale developed by Kaner (2000) and personal information form about students were used. As a result of the findings, it was found that adolescents had the highest score in the sub-dimensions of responsible decision-making and commitment and the lowest in self-disclosure and loyalty. Self-awareness and relationship skills, which are the sub-dimensions of social-emotional learning, affect the peer relationship. Besides peer relationship was found to be positively associated with social-emotional learning.

Keywords: Adolescence, social-emotional learning, peer relationships, commitment

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Sosyal Duygusal Öğrenmenin Ergenlerin Akran İlişkileri Üzerindeki Etkisinin İncelenmesi

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Öz

Ergenlik dönemi, sosyal-duygusal öğrenme becerilerinde ve akran ilişkilerinde önemli gelişmelerin yaşandığı kritik bir dönemdir. Bu nedenle bu araştırmanın amacı, sosyal duygusal öğrenme ile akran ilişkileri arasında ilişkinin bulunup bulunmadığının belirlenmesinin önemli olacağı düşünülmektedir. Bu çalışma, anket esasına dayalı kesitsel bir alan araştırmasıdır. Araştırmanın çalışma grubunu, 2019-2020 Eğitim Öğretim Yılı içerisinde Bilecik İl Milli Eğitim Müdürlüğü'ne bağlı İl Merkezinde bulunan ve lise öğrenimine devam eden 14-18 yaş aralığında olan 364 öğrenci oluşturmaktadır. Araştırma verileri için Totan (2018) tarafından geliştirilen "Sosyal Duygusal Öğrenme Ölçeği" ile Kaner (2000) tarafından geliştirilen "Akran İlişkileri Ölçeği" ve öğrenciler hakkında kişisel bilgi formu kullanılmıştır. Bulgular sonucunda, ergenlerin ölçek alt boyutlarında sorumlu karar verme ve bağlılık boyutunda en yüksek puana sahipken kendini açma ve sadakat boyutunda en düşük puana sahip olduğu bulunmuştur. Sosyal duygusal öğrenmenin alt boyutlarından öz farkındalık ve ilişki kurma akran ilişkisini etkilemektedir. Ayrıca, akran ilişkisinin sosyal duygusal öğrenme ile pozitif yönde ilişkili olduğu bulunmuştur. Sosyal duygusal öğrenmenin, akran ilişkisi alt boyutlarında bağlılık boyutu ile pozitif yönlü orta kuvvette istatistiksel olarak anlamlı bir ilişki bulunmaktadır.

Anahtar Sözcükler: Ergenlik, sosyal-duygusal öğrenme, akran ilişkileri, bağlılık

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Introduction

As children are in puberty, the time spending with their peers increases (Brown & Klute, 2003). Adolescence is a period in which social relations outside the family gain importance and the communication of individuals with their peers is at the forefront. Individuals have a desire to act independently from their parents at this period, and their social circle increases gradually and they try to socialize with their peers (Çiftçi, 2018). Peer groups can become the most important determinant of the individual's socialization and adolescent behavior (Rohrbeck, 2003). Adolescents' social-emotional behavior, which is negative, aggressive, or destructive, can cause their friends to move away from themselves (Woodhouse, Dykas & Cassidy, 2012). The social relationships that adolescents establish with their peers provide an opportunity to learn many social-emotional skills (Brown & Klute, 2003). Besides while organizing family and friend relationships, these skills help adolescents to take part development, social activities, to make excellent choices, and to get along well with teachers and all other individuals (Semrud-Clikeman 2007; Kathryn, 1991). According to Horroks (1965), the adolescent peer relationships (PR) teach self-knowledge and coping with others, and also offer the opportunity to prove herself and start social relationships, so PR increase the social learning experiences of adolescent. Coie (1990) states that adolescent PR are important in developing social skills, self-efficacy, ability to cope with stress, and a sense of sincere emotional support. In the study conducted by Pepler and Bierman (2018), they emphasized that it was important the fact that every child has healthy relationships at home, at school, in the peer group, and takes part in positive PR to attain social-emotional development. During adolescence, which is a severe and stressful period that an emotional confusion is experienced, conflict with parents, moodiness and thoughtless behaviors and are at risk for anti-social behaviors (Hall, 1904). SEL skills and friends in learning processes of adolescents and social communication in their relationship are very important. SEL is an approach that aims to protect children and adolescents from negative consequences by supporting them in mastering their behavioral and cognitive competencies (Taylor et al., 2017). After the 1980s, SEL gained importance quickly. Because the experienced problems by children and adolescents increase and the developments in psychology, social-emotional education was gained more importance after the 1990s (McKenzie, 2004). Goleman's book titled 'Emotional Intelligence' forms the basis of SEL activities. Stating that there are different fields of intelligence and different ways of learning, Goleman has brought a different perspective to the learning field. The concept of the affective domain, which is also one of the educational objectives mentioned by Bloom, Krathwohl and Masia (1964) includes skills such as considering others' thoughts, being open to discussions, and feeling self-confident while working independently. In the 1990s, the Fetzer Institute first addressed the term Social and Emotional Learning (SEL) to define interventions that would enable the development of personal skills to reduce risk factors and develop protective factors for positive development of youth. It has also defined SEL as recognizing and managing emotions, setting and achieving positive goals, appreciating others' perspectives, establishing and maintaining positive relationships, making responsible decisions, and gaining core competencies to deal with interpersonal situations, constructively (Elias et al. 1997).

As understood from these definitions, SEL includes self-awareness, self-management, social awareness, relationship skills, and responsible decision-making skills (CASEL, 2020). SEL skills enable the person to take pleasure in the relationships it has established by correctly managing emotional processes in social life and this improves the life quality of the person (Merter, 2013). The World Health Organization (WHO, 1996) states that SEL programs to be implemented for adolescents can affect mental health positively and reduce risk factors, emotional, and behavioral problems. Thus, SEL skills contribute to children by strengthening their bonds with their peers and adults and increasing their learning motivation (Lopes & Salovey, 2004). Adolescents' friend relationships can mutually affect SEL skills. When adolescents hook up to peers who exhibit social competence, their social skills can attain the desired level (Bee & Boyd, 2009). In particular, it is important for adolescents to understand the clash may experience with their peers and to learn a range of interpersonal problem-solving strategies that they can use when interacting with their peers (Nanda, 2005). Buhrmester (1996) stated that the development of sincere and mutual friendship in adolescents is related to social-emotional adjustment and relational competence. Besides, social competency interventions for adolescents acquired the social, emotional, cognitive, and behavioral skills that adolescents need to successfully interact with other adolescents (Lynch, Lerner & Leventhal, 2013). Adolescents who have difficulties in PR generally need systematic and properly SEL guidance (Pepler

& Bierman, 2018). When the studies conducted in Turkey are examined, it is seen that the SEL skills of adolescents are related to perceived parental attitudes (Öztürk, 2017), lifelong learning (Akcaalan, 2016), loneliness (Körler, 2011), bullying (Totan & Kabakçı, 2010), emotional intelligence levels (İşeri, 2016), problem-solving skills and social adaptation skills (Melikoğlu, 2020), social relationship elements, and hope levels (Candan & Yalçın, 2018). Despite great interest in supporting SEL in adolescents, no studies have been found examining the relationship between SEL and PR. Adolescence involves important interactions with peers. SEL skills contribute to both the quality of this interaction and the consequences of these interactions. It can be said that a detailed examination of the development of social skills with SEL is necessary during adolescence when peer interaction comes to the fore (Bradford-Brown & Larson, 2009). Considering all these, adolescence is a critical period in which significant developments occur in SEL skills and PR. In this period, it is thought that determining whether there is an affair between the SEL and PR levels of adolescents and these two skills will be useful for individuals working with adolescents.

Method

Research Design

This research is a cross-sectional field study based on the model of the quantitative descriptive survey. The survey model is a research model used to reveal an existing situation, summarize the evaluation of the study populations, and develop relevant theories by evaluating the underlying causes of these characteristics (Chambers & Clark, 2012).
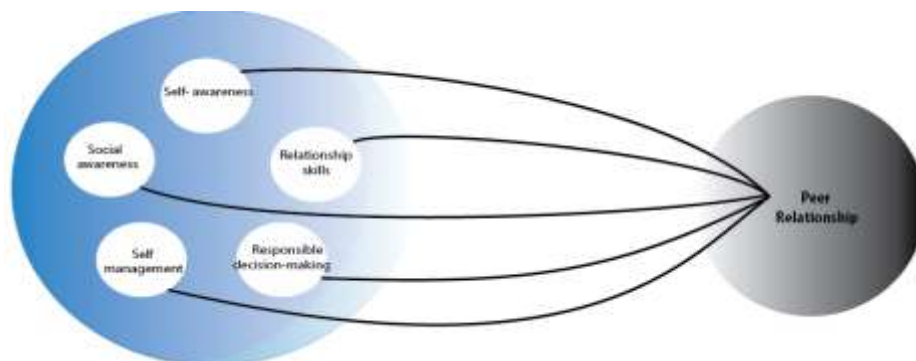
Figure 1. *Model of the Research*

Research Sample Group

The research group of the research consists of 364 students between the ages of 14 and 18, those who are located in the Provincial Center, those who are associated with Bilecik Provincial Directorate of National Education in Turkey within the 2019-2020 Academic Year and those who continue their high school education. The convenience sampling method was used to select schools for sampling. In this method, individuals who are easy to reach, suitable for research and volunteering are selected (Gravetter & Forzano, 2012).

A total of 364 adolescents, 216 of whom were boys (59.3%) and 148 were girls (40.7%), participated in the research. Considering their age, 43 (11.8%) of adolescents were fourteen, 83 (22.8%) were fifteen, 109 (29.9%) were sixteen, 105 (28.8%) were ten seven and 24 (6.6%) are eighteen years old. Considering the education levels, 67 (18.4%) of the adolescents are in the 9th grade, 102 (28%) are in the 10th grade, 95 (26.1%) are in the 11th grade, 100 (27.5%) are in the 12th grade.

Research Instruments and Procedures

For the research data, the 'Social Emotional Learning Scale' developed by Totan (2018) and the 'Peer Relationships Scale (PRS)' developed by Kaner (2000) and personal information form in students were used. Confirmatory factor analysis results regarding the data collection tools used are illustrated in Table 1.

Table 1

Estimates of Goodness-of-fit Index for Model

The Criterion of Model Fit	Good Fit	Acceptable Fit	SEL Fit / Accept	PR Fit / Accept
CMIN/SD	χ^2 / sd ≤ 3	χ^2 / sd ≤ 5	2.41	2.04
Chi-square Fit Test (χ^2) (p= 0.0)	0.05<p≤1	0.01<p≤0.05	0.000	0.000
RMSEA	RMSEA ≤0.05	RMSEA ≤0.08	0.062	0.05
NFI	0.95≤NFI	0.90≤NFI	0.90	0.92
NNFI	0.95≤NNFI	0.90≤NNFI	0.93	0.95
CFI	0.97≤CFI	0.95≤CFI	0.94	0.96
IFI	0.95≤IFI	0.90≤IFI	0.94	0.96
RMR	0<RMR≤0.05	0<RMR≤0.08	0.06	0.05
SRMR	0<SRMR≤0.05	0<SRMR≤0.08	0.058	0.05
GFI	0.90≤GFI	0.85≤GFI	0.89	0.92
AGFI	0.90≤AGFI	0.85≤AGFI	0.86	0.90

CFA was performed for the PRS, which was evaluated by EFA and obtained in four dimensions, and it was tested whether the model was compatible. The values generally considered in the model fit are χ2 / DF, GFI, CFI, and RMSEA. The value of χ2/DF is a good fit to be below 3, the GFI value is 0.92, it is a good fit, the CFI value is acceptable to be 0.96, and RMSEA value is a good fit to be 0.05. Within the framework of the obtained fit indices, it was revealed that the model has a good fit (Karagöz, 2016).

CFA was performed for the social-emotional scale, which was evaluated by EFA and obtained in five dimensions, and it was tested whether the model was compatible. The values generally considered in the model fit are χ2 / DF, GFI, CFI, and RMSEA. The value of χ2/DF is a good fit to be below 3, the GFI value is 0.89, it is acceptable, the CFI value is close to acceptable compliance to be 0.94, and RMSEA value is acceptable to be 0.062. Within the framework of the obtained fit indices, it was revealed that the model has an acceptable fit (Karagöz, 2016).

Social-Emotional Learning Scale

This scale was developed by Totan (2018) to determine the SEL of adolescents and consists of 23 items and 5 sub-dimensions. Sub-dimensions of the scale; self-awareness, social awareness, self-management, relationship skills, and responsible decision making. This scale is Likert type. High scores obtained from the scale indicate the high level of SEL of the participants. Cronbach's alpha internal consistency coefficient of the scale is .92, while McDonald's omega is the .94. Among the applications of the scale with two-week intervals, the .82 level is statistically significant for the total of the scale. In our research, the reliability analysis results (Cronbach's alpha) of the SEL scale are illustrated in Table 2.

Peer Relationships Scale

The scale developed by Kaner (2000) consists of 18 items and 4 sub-dimensions, and that created with data collected from adolescents who studied at high school to examine their relationships with their peers. Sub-dimensions of the scale are commitment, confidence and identification, self-disclosure, and loyalty. This scale is Likert type. High score obtained from the scale indicates positive relationships with with peers, while a low score indicates negative relationships. The Cronbach Alpha of the scale is .86 and the Spearman-Brown test value is .73. Besides, the reliability coefficient of the test-retest reliability study is .93. In our research, the reliability analysis results of the PRS (Cronbach's alpha) are illustrated in Table 2.

Data Analysis

The data obtained were analyzed with the help of the statistical package program Jamovi 1.1.9. In the data analysis, it was first examined whether normality, homogeneity, they are independent of

each other. For the normality of the range, Skewness and Kurtosis values, mean and median proximity levels were determined to illustrate the normal range, and parametric tests were used in the analysis of the data. In descriptive statistics, frequency, percentage, arithmetic mean, standard deviation, minimum and maximum values were used. The values obtained are illustrated in Table 2. Relationships between SEL Scale and PRS scores were evaluated using the correlation coefficient test (Watkins, 2016). Simple and Multiple Regression Analysis was carried out to determine whether the social-emotional development of adolescents predicted PR (Shafer and Zhang, 2012). On the other hand, to evaluate fit between the scale and the sub-dimensions according to EFA results confirmatory factor analysis was performed with Lisrel 8.80.

Results

Table 2

Findings related to the Basic Level Analysis Results for the Dimensions of the Research

Scales and Sub-dimensions	Cronbach's alpha (α)	Shapiro-Wilk	Skewness/SE	Kurtosis/SE	Descriptive Variables		
					$\bar{x} \pm SS$	Sum	Min/Max
SEL		0.149	-,04	-1.32	88±11.2	31904	60 / 115
Self- awareness		<.001	-2.17	-0.79	24±3.34	8562	14 / 30
Social awareness		<.001	-1.83	-1.45	15±2.48	5540	8/20
Self-management	α = .848	<.001	-1.53	-1.19	15±2.80	5333	7/20
Relationship skills		<.001	0.15	-1.02	19±2.97	6755	11/25
Responsible decision-making		<.001	-2.67	-1	16±2.64	5714	8/20
PR		0.11	-0.91	-1.42	63±11.7	23039	31 / 90
Commitment		<.001	-3.67	-1.11	31±5.78	11441	13 / 40
Confidence and identification	α =.874	<.001	-4.17	0.77	14±3.32	5183	4/20
Self-disclosure		<.001	0.03	-3.13	8.8±3.20	3207	3/15
Loyalty		<.001	1.15	-2.82	8.8±3.22	3208	3/15

*= p< .001; SE= Standard error

Cronbach's alpha coefficient of the SEL scale was 0.92 in the original research; the coefficient of the PR was found to be 0.86. In the reliability analysis, no expression in the original research was removed. According to Cronbach's alpha (α) values, the SEL scale (0.848) and PRS reliability coefficient (0.874) were found to be highly reliable (Santos, 1999). According to the normality test results studied for the scales and its sub-dimensions, since the p-value is greater than 0.05 for the overall scales; Skewness Kurtosis (divided by standard error) values were examined and the range of the mean-median values was found to be a normal range by looking at the level of closeness to each other (Karagöz, 2016).

When the findings obtained, it is seen that the PR ($\bar{x}$ = 63; SS = 11.7) and SEL ($\bar{x}$ = 88; SS = 11.2) levels are moderate. Besides, the highest score that can be obtained in the sub-dimensions is 40, and the lowest score is 3. The lowest score that can be taken in the scale is 31, and the highest score is 115. In the arithmetic mean, which is one of the descriptive variables, calculations were made according to the total scores. In terms of the highest score obtained in the analysis made according to the total scores in the scale dimensions, in the dimension of responsible decision making ($\bar{x}$ = 15.7; SD = 2.64; 78.5%) and the commitment dimension ($\bar{x}$ = 31.4; SD = 5.78; 78.5%) were got. The dimensions with the lowest average are the self-disclosure ($\bar{x}$ = 8.81; SD = 3.20; 58.7%) and the loyalty ($\bar{x}$ = 8.81; SD = 3.22; 58.7%).

Table 3

Findings regarding Correlation and Regression Analysis regarding the Dimensions of the Research

Scales and Sub-dimensions	1	1.1	1.2.	1.3.	1.4.	1.5.	2	2.1.	2.2.	2.3.	2.4.
1. SEL	1	R^2=.65* t=25.75	R^2=.55* t=20.8	R^2=.60* t=23.1	R^2=.59* t=22.9	R^2=.71* t=30	R^2=.10* t=6.28	R^2=.16* t=8.31	R^2=.10* t=6.39	R^2=.03* t=3.13	R^2=.004* t=-1.25
1.1.Self-awareness	r=.80 p<.001	1	R^2=.32* t=13	R^2=.23* t=10.4	R^2=.22* t=10	R^2=.34* t=13.6	R^2=.10* t=6.26	R^2=.12* t=7.09	R^2=.09* t=6.15	R^2=.04* t=3.70	R^2=.005 t=.109
1.2.Social awareness	r=.74 p<.001	r=.57 p<.001	1	R^2=.18* t=8.84	R^2=.21* t=9.74	R^2=.27* t=11.4	R^2=.04* t=3.71	R^2=.07* t=5.31	R^2=.04* t=4.02	R^2=.005 t=1.32	R^2=.004 t=-1.26
1.3.Self-management	r=.77 p<.001	r=.48 p<.001	r=0.57 p<.001	1	R^2=.24* t=10.82	R^2=.43* t=16.38	R^2=.03* t=3.23	R^2=.07* t=5.09	R^2=.04* t=3.78	R^2=.04* t=3.70	R^2=.002 t=.825
1.4.Relationship skills	r=.77 p<.001	r=.47 p<.001	r=0.46 p<.001	r=0.494 p<.001	1	R^2=.36* t=14.1	R^2=.10* t=6.32	R^2=.13* t=7.26	R^2=.11* t=6.55	R^2=.04* t=4.11	R^2=.001 t=-.685
1.5.Responsible decision-making	r=.85 p<.001	r=.58 p<.001	r=0.52 p<.001	r=0.652 p<.001	r=0.596 p<.001	1	R^2=.05* t=4.32	R^2=.11* t=6.6	R^2=.04* t=3.76	R^2=.001 t=1.89	R^2=.01 t=-1.49
2. PR	r=.31 p<.001	r=0.31 p<.001	r=0.19 p<.001	r=0.167 p<.001	r=0.315 p<.001	r=0.222 p<.001	1	R^2=.70* t=29.3	R^2=.66* t=26.6	R^2=.57* t=22.1	R^2=.30* t=12.5
2.1.Commitment	r=.40 p<.001	r=.35 p<.001	r=.27 p<.001	r=.259 p<.001	r=.357 p<.001	r=.328 p<.001	r=.839 p<.001	1	R^2=.38* t=14.8	R^2=.21* t=9.88	R^2=.03* t=3.32
2.2.Confidence and Identification	r=.32 p<.001	r=.31 p<.001	r=.21 p<.001	r=.195 p<.001	r=.325 p<.001	r=.194 p<.001	r=.814 p<.001	r=.614 p<.001	1	R^2=.29* t=12.2	R^2=.09* t=59.4
2.3.Self-disclosure	r=.16 p=.002	r=.19 p<.001	r=.07 p=.189	r=.043 p=.410	r=.211 p<.001	r=.099 p=.06	r=.757 p<.001	r=.461 p<.001	r=.539 p<.001	1	R^2=.15* t=7.90
2.4.Loyalty	r=.07 p=.214	r=.01 p=.913	r=.07 p=.208	r=.098 p=.063	r=.036 p=.494	r=.078 p=.136	r=.548 p<.001	r=.172 p<.001	r=.298 p<.001	r=.383 p<.001	1

(Left side vertical label: Correlation Analysis; Right side vertical label: Regression Analysis)

*= p< .001; r= correlation coefficient

In the correlation analysis in terms of scales and sub-dimensions;

The correlation level of self-awareness (r = .80) and responsible decision making (r = .85) dimensions in the SEL scale is higher than in other dimensions. In the PRS, the correlation level of commitment dimension (r = .839) and confidence and identification (r = .814) dimensions are higher than other dimensions. There is a statistically significant relationship between SEL and PR with a low-strength positive (r = .31). In the sub-dimensions of the PRS, there is a statistically significant relationship with the loyalty dimension and a positive moderate strength (r = .40). There is a low and very low positive relationship with other dimensions.

Table 4

Findings on the Comparison of Peer Relationships and Social Emotional Learning

Dependent Variable	Independent Variables	Estimate (B)	Estimate (SE)	t	VIF	p	Shapiro-Wilk	Durbin Watson	R²	Adj. R²	F	p
PR	Constant	31.122	4.667	6.70		< .001						
	Self- awareness	.884	.232	3.81	1.81	< .001						
	Social awareness	-.151	.297	-.51	1.64	.613	Statistic=.994	Autocorrelation=.364				
	Self-management	-.192	.279	-.69	1.83	.492	p=.188	DW=1.25	.138	.126	11.5	< .001
	Relationship skills	.998	.251	3.97	1.68	< .001		p < .001				
	Responsible decision-making	-.129	.338	-.38	2.40	.702						

Multiple regression analysis results to determine the effect of SEL on PR are given in the table. The regression model established according to the results of the analysis was found significant ($F=11,5$; $p<0,001$). Accordingly, while self-awareness and relationship skills, which are the sub-dimensions of SEL, affect the PR ($\beta1 = .884$; $\beta2 = .998$; $p <0.001$), other dimensions do not. According to the regression model, self-awareness and relationship skills explain 12.6% of the PR.

Discussion, Conclusion and Recommendations

This study aims to examine the PR relationship and SEL levels of adolescents and the relationship between these two variables. When the findings were examined, it was found the PR and SEL levels of adolescents were moderate. In the study conducted by Candan & Yalçın (2018), it was seen that there was a moderately positive relationship between SEL skills and peer support. It can be stated that for this situation are effective the reasons such as intense emotions during their adolescence, emotions ups and downs, (Pedük, 2011), which adolescents in high-school are in an intensive study pace for the university exam, and that given more importance to academic success in high school period because of making crucial decisions about their future professionally in this period (Ergene & Yıldırım, 2004). Besides, it can be thought the negative social behaviors that may occur during adolescence will decrease with age (Erdoğan, 2002). Social skills such as making friends, the ability to look from the perspective of others, communication skills, self-control, understanding others' intentions, desires and beliefs require SEL (Rubin et al. 1998). For this reason, it can be said the level of SEL causes PR to be at a medium level. It is seen that adolescents have moderate PR and SEL levels. Also, adolescents have the highest score in the scale sub-dimensions, responsible decision making and commitment, and the lowest in self-disclosure and loyalty. Decisions taken during adolescence have a lifetime effect on the individual's health, psychological well-being, and society's acceptance (Ersever, 1996). As a result of the study conducted by Çoban and Hamamcı (2006), it was found that high-school students mostly use logical decision-making strategies. Adolescents want to be included in a group as developmental period features and to be accepted by that group. This makes friends and friend loyalty important during adolescence (Başdaş, 2018; Bee & Boyd, 2009). As a result of the study conducted by Sarı (2012) to examine adolescents 'friend loyalty, adolescents' level of loyalty to their friends was found high. In adolescence, the person acts with his/her friends and turns to positive interactions such as problem-solving, decision making, and establishing intimacy (Hay et al. 2008). Adolescents turn to friends rather than their families for emotional support during stress (Furman & Buhrmester, 1992). Adolescence is a process that is sensitive to negative social assessments and has peer loss concerns (Westenberg et al., 2007). For this reason, even adolescents may find it difficult to open themselves, even their close friends. While they convey their personal feelings and thoughts of their peers, they may feel a sense of shame and rejection by their peers (Omarzu, 2000). In order to examine PR with high school students, Çiftçi (2018) observed that they scored lower in self-disclosure and loyalty sub-dimensions. This result is consistent with our research results. Friendships are not as special as romantic relationships. Unlike romantic or marital

relationships, individuals can have multiple friendships at the same time. Therefore, loyalty to friendships may not be as important as in romantic relationships in this period (Le & Agnew, 2003). During adolescence, a person can maintain multiple wonderful friendships at the same time, but can choose a better alternative in romantic relationships (Feiring, 1999). In light of this information, it can be said that the quality of adolescent SEL skills plays an important and facilitating role in engaging with peers.

The findings support the idea that PR is positively associated with SEL. It is thought that being SEL, understanding their feelings and thoughts, and controlling their emotions, having effective skills with others, and maintaining these relationships healthily to develop PR. The results of our research are consistent with many studies conducted that social-emotional skills affect PR positively (Kramer et al., 2010; Schofield & Kafer, 1985; Lawrence, 1982; Taylor, Oberle, Durlak & Weissberg, 2017). Also, as a result of studies conducted on SEL intervention programs, these programs were found to reduce bullying and physical aggression by peers (Espejo-Siles, Zych & Llorent, 2020; Raimundo, Marques – Pinto & Lima, 2012; Totan & Kabakçı, 2010). Some social behaviors, such as helping peers when necessary and collaborating with others, contribute positively to PR (Layous et al., 2012). Besides, children with positive social behaviors are more likely to be accepted by their peers (Fredricks, Blumenfeld & Paris, 2004). In the study conducted by Greca (1983), it was found that the PR of adolescents developed as a result of the social skills training program developed to teach interpersonal skills to adolescents having problems with their peers. It was observed that students with low social skills had difficulties in communicating with their peers (Öztürk, 2008). For this reason, adolescents with poor social skills may face negative social situations such as peer rejection, isolation, limited social activity, and weak social support. In these individuals may cause to top levels of loneliness and poor quality friendship (Braddock et al., 2015). Studies prove that children with friends are more socially competent than children who are alone, children with friends are more social, self-confident, and less likely to be alone (Newcomb & Bagwell, 1995). Adolescents with a high level of SEL can be said to be more responsible and harmonious with their peers and have high relationships-building skills.

According to the findings, self-awareness, and relationship building, which are the sub-dimensions of SEL, affect the PR. Self-knowledge, awareness of talents and abilities are effective in establishing healthy relationships with others. Being aware of the positive characteristics, abilities and beneficial aspects of adolescents helps them establish positive relationships with their peers. In the research conducted for high school students, it was found that the education given for self-knowledge has a significant effect on the increase of PR scores (Poorgholami et al., 2015). Social skills require frequent interpersonal communication and interactions. In peer interactions, the person must correctly perceive the needs of the other person, regulate their behavior and emotions, know which behavior is effective and socially acceptable, can resolve conflicts, and make appropriate decisions (Caprara et al., 2000; Melikoğlu & Bedel, 2021). Adolescents' attitudes towards their peers and peer acceptance are indicators of social skills. Skills such as establishing good relationships, respecting the rights and feelings of others, and considering group norms for appropriate social behavior are important for PR (Çetin et al., 2003; Furtana, 2018).

In the PR between sub-dimensions of SEL, there is a statistically significant relationship with the loyalty dimension and a moderately positive force. PR are more important during adolescence. Adolescents who securely connect to their peers will also be able to feel socially and emotionally. Adolescents who have safe relationships with their peers do less negative and aggressive behavior than adolescents who have insecure relationships with their peers (Laible, 2007; Şafak-Soyaslan, 2019). Research proves that peer commitment affects the social-emotional characteristics of adolescents such as self-esteem, self-efficacy, self-control, and emotional competence (Liu et al., 2016; Wilkinson, 2004). Adolescents with a high level of SEL are more likely to build trust-based relationships with their peers. The bond between peers helps create and maintain interrelationships.

Like many studies, this study has some limitations. The fact that survey data was not collected from all regions of Turkey represents the limit of generalization of results. This study helps to understand the link between SEL and peer connections. However, because of the data's correlational

nature, causal interpretations of these associations are not possible. Longitudinal investigations are needed to prove that these variations are linked.

Conclusively, it is considered important to have a variety of social skills as well as having the necessary cognitive abilities and abilities to become healthy individuals in our daily life. Therefore, to develop PR that is of great importance during adolescence, SEL should be provided to adolescents. For this reason, SEL programs for adolescents can be prepared in schools. These programs can include activities that will improve self-awareness and relationship skills. Besides, adolescents should be encouraged to participate in social activities in educational settings, and opportunities to interact and establish relationships with their peers should be provided. By giving training to teachers and parents for SEL, it can be ensured that they support adolescents in terms of SEL. It can also be applied by developing both preventive and improved school psychological counseling and guidance programs for adolescent SEL. To promote PR and social-emotional development, adolescents' participation can be secured by organizing out-of-school social events. Adolescent social-emotional learning can be studied experimentally and longitudinally.

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The Relationship between Teachers' Work Values and Work Enjoyments from Different Generations according to Some Variables[*]

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Abstract

The aim of this research is to determine the relationship between work values and work enjoyments of teachers from X and Y generations in relation to their gender, seniority and generation. The study was designed with single and correlational survey models. A total of 28501 elementary and public secondary school teachers from Ankara were represented by 381 participants in the sampling from nine central districts of Ankara."Work Values Scale" was developed by the researchers and "Work Enjoyment Scale" was translated to Turkish. Results indicated that Y generation teachers more care about each dimension of work values than the X generation teachers. Teachers have a moderate work enjoyment level. Female teachers attach more importance to self-improvement, external rewards than male teachers. Teachers with seniority of 21 years or more enjoy more than the teachers with seniority 6-10 years. The relationships between extrinsic rewards and work enjoyment levels of the X generation teachers were found to be positive and low whereas the other dimensions of work enjoment levels of X generation teachers were found to be positive and medium level. Since Y generation refuses to count in place and expect continuous improvement during their career pathways, it would be appropriate to enrich career opportunities for Y generation teachers.

Keywords: Work values, work enjoyment, X generation teachers, Y generation teachers

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Farklı Kuşaklardan Öğretmenlerin İş Değerleri ile İşten Keyif Almaları Arasındaki İlişkinin Çeşitli Değişkenler Açısından İncelenmesi[*]

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Öz

Bu çalışmanın amacı, X ve Y kuşağı öğretmenlerinin çalışma değerleri ile işten keyif alma düzeyleri arasındaki ilişkileri ile bu değişkenlerin cinsiyet, kıdem ve kuşak değişkenleri bakımından incelemektir. Araştırma, tekli ve ilişkisel araştırma modelleri ile tasarlanmıştır. Ankara ilinde kamu ilkokul ve ortaokul kademlerinde görevli toplam 28501 öğretmenin örneklemde 381 öğretmen ile temsil edilebileceği varsayılmıştır. Veri toplama aracı olarak, araştırmacılar tarafından geliştirilen "İş Değerleri Ölçeği" ve "İşten Keyif Alma Ölçeği" nin Türkçe'ye uyarlanması ile geliştirilen iki farklı ölçek kullanılmıştır. Araştırmanın sonuçları, Y kuşağı öğretmenlerinin X kuşağı öğretmenlerinden daha fazla çalışma değerlerini önemsediğini göstermiştir. Kadın öğretmenler, erkek öğretmenlere göre kişisel gelişime ve dış ödüllere daha çok önem vermektedir. 21 yıl ve üzeri kıdeme sahip öğretmenler 6-10 yıl kıdeme sahip öğretmenlerden daha fazla işten zevk almaktadır. Genel olarak öğretmenler, işlerinden orta düzeyde keyif almaktadır. X kuşağı öğretmenlerinin dışsal ödüller ve işten keyif almaları arasında pozitif, anlamlı ve düşük bir ilişki vardır. Her iki kuşaktan öğretmenler için işten keyif almanın diğer boyutları arasında pozitif, anlamlı ve orta düzeyde ilişkiler saptanmıştır. Araştırma sonuçlarına dayalı olarak, Y kuşağı öğretmenlerinin, kariyer sürecinde yerinde saymayı reddetmesi ve sürekli gelişim beklemesi bulgularından hareketle, yeni nesil öğretmenler için kariyer fırsatlarını zenginleştirmek önerilebilir.

Anahtar Sözcükler: İş değerleri, işten keyif alma, X kuşağı öğretmenleri, Y kuşağı öğretmenleri

Introduction

In today's organizations, different generations work together and their work values vary according to the characteristics of the period in which they were born. Individuals' generation affect their feelings and attitudes towards the organization (Smola and Sutton, 2002). Schools are one of the organizations with the most generational differences. In recent years, Baby Boomers, Generation X and Generation Y teachers have been working together. The experiences and social events of generations are quite different from each other. Thus, it is expected that teachers' expectations, goals, attitudes and job enjoyment levels will be different from each other. While some researchers (eg Ros et al., 1999) do not separate work values from general values, some researchers (eg. Elizur and Sagie, 1999) argue that work values are independent of values. Rokeach defines the values as "determinants of virtually all kinds of behavior that could be called social behavior or social action, attitudes and ideology, evaluations, moral judgments and justifications of self and others, and attempts to influence others" (cited in Licata, 2007, p.17). Work values are related to general values and work values are a more specific part of general values. Work values have more prominent features than general values because they are related to beliefs about desired situations or behaviors specific to the work environment (Ros, et al., 1999).

There are two types of work values, intrinsic and extrinsic (eg Lyons et al., 2010; Ros, et al., 1999). Schwartz (1999) states that intrinsic work values are formed by desirable situations, such as the ability to achieve personal improvement in the workplace, to obtain opportunities for autonomy or creativity. Intrinsic work values allow the employee to develop himself/herself and to use his/her abilities (Kalleberg, 1977). Extrinsic work values include values related to the financial aspect of the work such as salary, interests or security (Lyons et al., 2010). Ros et al. (1999) define extrinsic work values as protective values that provide the necessary needs for occupational safety, regular payment of salaries and general security of employees. Extrinsic work values mean that the employee can improve socially, receive financial rewards, and provide the physical opportunities that will make the employee happy in the work environment. In his empirical study, McGrath (2012) reported that teachers rated the intrinsic work values as the most important among seven workplace domains comprised of extrinsic and intrinsic values. Thus for teachers, intrinsic work values are perhaps more important than all other professions. Therefore, it seems important that teachers have their intrinsic incentives, intrinsic values and positive psychology for the profession.

The concept of work enjoyment was first dealt with by Spence and Robbins (1992) as a sub-dimension of the work on workaholism. It is indicated that an employee creating a work environment that includes his or her needs or preferences will increase his /her job pleasure (Tims et al., 2014). Work enjoyment is defined as making positive judgments about the quality of work-life or enjoying the activities performed by the employees. For this reason, job enjoyment is mostly related to the intrinsic motivation of the employees (Deci and Ryan, 1992; Graves et al., 2012). The more an employee enjoys his job, the more his commitment to the organization will increase and the organization will adopt its goals as its own goals (Graves et al., 2012). The work enthusiasm of the teacher can be easily understood from his/her voice, looks, facial expressions, body language and words (Allen, 1980). The teacher who enjoys his job can be expected to be more active in learning-teaching activities that he will perform his job with pleasure and willingly.

In organizational studies, the subject of the generations constitutes quite a new research area (Costanza et al., 2012). The most common definition of the concept refers a group that has certain characteristics and is born together in the same time period and has acquired certain common experiences due to the period in which they live historical and social events together that are critical in social history (Davis et al., 2006; Kupperschmidt, 2000, Westerman and Yamamura, 2006). The generation group of the individual develops the character of an individual's feelings towards the organization, expectations from the job and how these expectations were met (Smola and Sutton, 2002).

Generation X consists of individuals born between 1960-1980 (Zemke et al., 2013, p.21). Due to significant changes between 1960 and 1980, Generation X is expressed with the concept of "transitional generation" both in and outside Turkey (Ayhan, 2013) because this period has affected the people of this period negatively due to the oil and financial crisis. This is a generation that prefers to work for a

living (Zemke et al., 2013). The quality of work-life, family life, quality and the balance between the two are very important for individuals belonging to generation X (Burke, 1994). Teachers of Generation X can also be expected to prefer comfortable conditions and flexible working hours in working environments to maintain the balance between work life and private life.

Generation Y is the generation of people born between 1980 and 2000 (Zemke et al., 2013). Generation Y is expressed in different definitions such as "Gen Y","Gen Me "," Millenials ", "Echo Boomers", "Generation Next", "Digital Generation" or "Internet Generation (Broadbridge, Maxwell, and Ogden, 2007). Born in a period of economic prosperity (Hurst and Good, 2009), they have experienced globalization, rapid technological advances and increased diversity (Kuron et al., 2015). A life without technology is considered impossible for them (Ware, 2013). Researches have identified Generation Y as an ambitious, self-confident, open to cooperation and free generation (Ng et al., 2012). Generation Y seeks to answer the question "what can the organization do for me?" rather than keeping the organization's goals above its own. This generation places great importance on enjoyment at work rather than strict organizational rules (Gravett and Throckmorton, 2007), and prefer social and enjoyable working environments (İliç and Yalçın, 2017). Several studies (e.g. Çengelci, et al, 2013; Holdsworth, 2000; Karagöz and Şeref, 2019; Markham et al., 2008) investigated the sociological phenomenon of values in school settings mostly concentrating on students' values and values education. On the other hand, the number of studies examining the teachers' work values are quite limited. One of the earlier studies (Kuşdil and Kağıtçıbaşi, 2000) examining Turkish teachers' value orientations included 183 teachers from public and private schools. Based on a list of 60 values, results revealed that teachers do not show a completely homogeneous value structure, and individuals have psychological needs in terms of both autonomy and commitment. The results also showed that religious orientation has a decisive role in the value system of Turkish teachers. Another study (Göktürk, 2009) investigated the relationship between teachers' leisure orientation and organizational commitment. It was found that a high level of leisure orientation increased work group commitment and accordingly organizational commitment. The generation group to which the individuals belong affect their feelings towards their organizations, management, authority and their expectations from their jobs (Smola and Sutton, 2002). For example, Bledsoe (2018), investigated whether teachers from Baby Boomers, X and Y generations use technology effectively at school. He found that Y generation teachers use technology more comfortably and better than other generations. One of the biggest challenges that managers face today is to effectively manage different generations working side by side (together) in many organizations (Lester et al., 2012). In schools where different generations work together, it seems important to know the working values of different generations, to make managerial designs that will enable them to enjoy it, and thus to reach empirical data to improve school effectiveness. To this end, the purpose of this study is to investigate the work values of public primary and secondary school teachers in relation to their work enjoyment levels, generation, and seniority.

Method

Research Design

Work values and work enjoyment levels of the teachers from the X and Y generations were determined by a single survey model. The relationship between the work values from X and Y generation teachers and their work enjoyment was determined by the correlational survey model.

Sample

According to the formal Statistics of MoNE (2017), the population is composed of 28501 teachers working in public primary and secondary schools in the largest nine districts of Ankara (Çankaya, Altındağ, Etimesgut, Keçiören, Gölbaşı, Mamak, Pursaklar, Sincan and Yenimahalle) in the 2017-2018 academic year. It was assumed that 381 teachers could represent the population at α = .05 significance level and 5% tolerance level (Balcı, 2004). Depending on the ratio of teachers in the population, 180 primary school teachers and 201 secondary school teachers were sampled. 47% of the teachers who participated in the study worked in public primary school and 52% worked in public secondary schools. Of the participants, 52% were in the 58-38 age range, 48% were in the 38-18 age range. Therefore, 52% of the participants are from the X generation and 48% from the Y generation. 13% of teachers have 1-

5 years, 17% 6-10 years, 24% 11-15 years, 22% 16-20 years and 24% have 21 years or more seniority. 84% of teachers have an undergraduate degree and 16% graduate degrees.

Instruments and Procedures

Two scales and one information form were used to determine the teachers' work values and job enjoyment levels.

Work Values Scale. While developing the work values scale, an item pool was created by considering the literature and previous scales. The preliminary scale draft included 22 items and four sub-dimensions: self-improvement dimension (six items), social benefit dimension (three items), job opportunities dimension (eight items) and extrinsic rewards dimension (seven items). Response options in the scale consisted of; not important (1), less important, important, very important and absolutely important (5) ".

The dimension of self-improvement includes items expressing: personal improvement (Zhang et al., 2007), and achievement (Lyons, 2010; Schwartz and Sagiv, 1995; Schwartz and Bilsky, 1990) using skills (Lyons, 2010), encouragement (Schwartz and Sagie, 1995; Schwartz and Bilsky, 1990). The social benefit dimension expresses teachers' expectations about the social dimension in their work lives that emphasizes the interestingness of the work, the interactive working environment (Hattrup et al., 2007) and the work-life balance (Lyons, 2003). The extrinsic rewards dimension is a dimension based on extrinsic work values (Elizur, 1984; Lyons, 2010).

As a result of the AFA, it is seen that the first factor (self-improvement) consists of seven items, the second factor (social benefit) consists of three items, the third factor (opportunities provided by the job) consists of four items and the fourth factor (external rewards) consists of three items. Factor loadings of the scale items ranged from 0.50 to 0.81 in the first factor, from 0.71 to 0.76 in the second factor, from 0.54 to 0.85 in the third factor, and from 0.69 to 0.87 in the fourth factor (Appendix 1). The items took place in the final form of the scale after the reliability and validity analysis are largely consistent with the draft scale.

The total variance explained by the four-factor scale was 66.9%. The first dimension explained 44,153% of the total variance, the second dimension explained 9,028% of the total variance, the third dimension explained 8,155% of the total variance and the fourth dimension explained 5.46% of the total variance. The Cronbach alpha coefficients of the subscales were .87, .83, .82 and.82, respectively. The items on the scale are scored between 1-5. Increasing scores from each scale indicate that the work values in the related dimension are considered important by the raters.

Work Enjoyment Scale. To measure teachers' work enjoyment, a sub-scale of Spence and Robbins's (1992) "Workaholism Scale" (revised by McMillan et al. 2002) was translated to Turkish within this research. The original form of the Work Enjoyment Scale was tested on 320 employees and consisted of six items. Cronbach Alpha coefficient of this scale was determined to be .85. The necessary permissions have been obtained from the authors. Turkish validity of this scale was tested through the explanatory factor analysis and reliability analysis was performed through the item analysis. Cronbach Alpha coefficient was also calculated for reliability. The scale consisted of six items and is arranged in a 5-point Likert form. Response options in the scale consist of the expressions: "totally disagree" (1) to "totally agree" (5). Increasing scores indicate that teacher enjoyment is high. As a result of the exploratory factor analysis, the scale was found to be one-dimensional. Factor load values of items under a single factor were .68 and .82, and item-total correlations were .56 and 72. The total variance explained by this factor is 59%. Accordingly, the total variance is assumed to be a good value because it is over 30% (Büyüköztürk, 2005, p.125). Cronbach Alpha coefficient is .86. Final form of the "Work Enjoyment Scale" consisted of six items and one dimension (Appendix 2).

Data Analysis

The arithmetic mean and standard deviation, t-test, one-way analysis of variance were used for the analysis of the data. Descriptive analyses were carried out using SPSS 18.0 and 0.05 was taken as a basis for significance tests. Statistics Package Program for Social Sciences (SPSS) 22 program was used in the analysis. Permissions for data gathering were obtained from Hacettepe University Ethics

Commission and MEB. Before data analysis, it was first examined whether there were missing data in the data set and there were no more than 5% missing data. Demir and Parlak (2012) stated that the most appropriate way is to assign the average of the existing data instead of deleting the missing data. Therefore, the missing data were completed by applying the mean assignment method. Secondly, in order to examine whether the items have outliers, z scores were examined and no value outside the -3 and +3 score range was found (Pallant, 2007).

The missing data were completed by applying the average assignment method, Then, z scores were examined in order to examine the outliers. The data took values between -3 and +3 score range (Pallant, 2007). While deciding to use the parametric or non-parametric tests, data was tested in terms of normal distribution and the equality of variances. "The normal distribution property of scores obtained from a continuous variable can be examined by three methods. The first is the use of descriptive statistics such as skewness coefficient, arithmetic mean, and standard deviation. The second is the method of examining with graphics. For this, the histogram chart graph, in which the normal distribution curve is also drawn, is often used. The Q-Q method is recommended if the group is 20 and above" (Büyüköztürk, 2005). In order to test the normality of the data, skewness coefficients, histogram and Q-Q graph were examined. Since the skewness and kurtosis coefficients of the data belonging to the study values scale are between -2 and +2 (George and Mallery, 2010), the assumption of equality of the variances of the measurements in the groups (Büyüköztürk, 2005) was examined with the Levene test. Data showed normal distribution.

Results and Discussion

Work values in the self-improvement dimension. It was determined that the teachers of Generation X highly rated the expression of "Provide me the opportunity to use my professional knowledge and skills" (M = 4.26) most in this dimension. Generation X teachers rated the "Provide opportunities for improvement and learning, as it involves tasks that challenge my skills" (M = 3.95) lower than the other items. Y generation teachers highly rated "my profession offers continuous learning and gaining new information opportunities (M = 4.46), probably because members of the Y generation constantly like to improve themselves and open to innovations (Zemke et al., 2013, p.139). Chen and Choi (2008) also showed that generations attach great importance to self-improvement rather than the other work values and that personal improvement is the dimension which generations rate the highest.

Teachers' opinions related to working values in the self-improvement dimension according to independent variables. Teachers' opinions about self-improvement dimension do not show significant difference according to the variables of generation (t $_{(379)}$ = 1.742, p> .05) and seniority (F (4) = 2.12, p> .05). Ware (2013) asserted that the X generation attaches more importance to using their creativity. Cennamo (2005), on the other hand, found that the Y generation attaches more importance to the interestingness of the work, continuous learning, diversity and creativity. Similarly, Usta (2014) reported that the teachers of the X generation attach more importance to creativity than the Y generation. These conflicting results imply the need for more and more in-depth research. The differences may be due to the other work related conditions such as sector or job title. There is a significant difference between the opinions of male and female teachers about this dimension (t $_{(379)}$ = 3.77, p <.05). Namely, female teachers attach more importance to self-improvement than male teachers, giving more importance to using their skills, continuous learning and acquiring new knowledge and using their professional knowledge.

Work values in the social benefit dimension. Items in the social benefit dimension of the work values are found to be the most important aspect of the scale among all other dimensions. It is equally important for teachers of both generations that their professions are compatible with moral values and benefits society. The social benefit dimension is seen as a little more important by Generation Y teachers (M = 4.47) than Generation X teachers (M = 4.40).

Teachers' opinions about working values in terms of social benefit dimension according to independent variables. Teachers' opinions of the social benefit dimension did not show significant differences according to gender (t $_{(379)}$ = 1.95, p> .05), generation (t $_{(379)}$ = 1.073, p> .05) and seniority variables (F (4) = 2.91, p> .05).

Work values in job opportunities dimension. The scores of Generation X teachers (M = 4.22) and Generation Y teachers (M = 4.26) are very close to each other. Generation Y teachers have a slight higher score in this dimension. Both generations love fun at work, but generation X is a self-sufficient generation that loves fun and rejects changes and prefers more individual work (Ware, 2013). Generation Y (Zemke et al., 2013) is a generation that loves team-oriented work and gives importance to sociality in the workplace (Zemke et al., 2013). (M = 4.25). That's why Generation Y teachers (M = 4.31) seem to attach more importance to the item "opportunity to be in constant interaction and communication with people" than the teachers (M = 4.25) of Generation X.

Cox (1999) found that X-generation give great importance to work-life balance. Twenge et al. (2010) emphasized with their research findings that both X and Y generation members attach great importance to work-life balance. They also reported that generation X and Y attach great importance to freedom of work, but generation Y places more emphasis on free work conditions. Contrary to the findings of this research, Twenge et al. (2010) expressed that generation Y attaches less importance to social interaction than generation X because this generation is in constant communication with their families or friends through technology, so social interaction is not that much important for generation Y employees. Similarly, Usta (2014) emphasized that X and Y generation teachers value flexibility in working conditions and working hours.

Teachers' opinions about working values in terms of job opportunities dimension according to independent variables. Teachers' views about job opportunities do not show significant differences according to generation (t $_{(379)}$ =. 599, p> .05) and seniority variables (F (4) = 1.120, p> .05). The work values of the teachers in terms of job opportunities showed a significant difference (t $_{(379)}$ = 3.1, p <.05) according to gender. Higher scores of the female teachers can be interpreted that female teachers attach importance to sociality in their work values and they expect flexibilities, look for fun and interactive working environment.

Work values in job extrinsic rewards. Generation Y teachers (M = 3.76) give more importance to the economic returns of the profession than teachers of X Generation (M = 3.56). However, when the general characteristics of the generations are considered Generation X attaches more importance to financial opportunities and they care about a fixed salary to guarantee themselves (Aygenoğlu, 2015). Current research results displayed that teachers from Generation X are less interested in financial returns. This finding is contradictory to the past research findings. This difference may be stemming from the nature of the teaching profession which includes roles and responsibilities that are different from other professions. More specifically, some motives that the teaching profession includes such as public service ideals may be much more dominant than the other profession which in turn teachers may be giving priority to these social benefit dimensions than the extrinsic motivators. It is determined that the Y generation teachers attach more importance to all expressions in the dimension of external rewards. Findings of Twenge et al. (2010) are consistent with the current findings of this research in the sense that generation Y gives more importance to financial gain, appreciation, and status. An additional support comes from Cennamo (2005) that the Y generation attaches more importance to extrinsic rewards than the X generation. Usta (2014) in his research found that there is no difference between generations in terms of economic gains. Marcus (2014) suggests that career improvement is more important for generation Y than generation X. Although it is emphasized in the literature that Generation X attaches importance to economic benefits, including the current research it has been proved by many studies that individuals of Generation Y pay more attention to economic benefits.

Teachers' opinions about working values in terms of extrinsic rewards dimension according to independent variables. The work values of teachers in the dimension of extrinsic rewards did not show significant differences according to generation (t $_{(379)=}$1.889, p> .05) and seniority variables (F(4)=1.323 p>.05). Teachers' views on the dimension of the extrinsic rewards show a significant difference in terms of gender (t(379)=3.2, p<.05). The average importance given by female teachers to the items about external rewards is lower than male teachers. Accordingly, female teachers (M=4.42) give more importance to financial gain than male teachers (M=3.81). Job opportunities and extrinsic rewards were more valued by female teachers than men in this study. Lee et al. (2012) reported that there are no significant differences between males and females in their preferred work values of preservice teachers in Malaysia. On the other hand, several previous studies that have tested the differences in job values

of young people have revealed that men prefer jobs that offer external rewards, as opposed to jobs with social and altruistic rewards that are preferred by women (Krahn and Galambos, 2014). The findings of this study is consistent with this cumulative approach.

Teachers' work enjoyment. Teachers rated "Because I enjoy my work, I do more than my work requires"(M = 3.87) the highest in this dimension whereas they rated "When I wake up in the morning, I look forward to going to work" (M=3.24) the lowest. In general, it is understood that generation X teachers (M = 3.62) enjoy higher levels of work than Y teachers (M = 3.48). Generation X prefers to enjoy life and work (Cordeniz, 2002). The teachers of Generation X showed the highest agreement to the item, "because I enjoy my work, I do more than my work requires"(M = 3.94). Generation X loves working and fulfills the requirements of the work and is affiliated with its organization (Öz, 2015). "My job is so interesting that I don't think of it as a job" (M = 3.35) is the item that it least rated item X generation teachers. These findings of the current study are in line with the Cogin's research (2012) proving that the most important value for Generation X was "asceticism" and for Generation Y was "leisure". In line with the past arguments (e.g. Zemke et al., 2013; Gravett and Throckmorton, 2007) this research has shown that X generation teachers were more work-oriented and enjoy working.

Teachers' opinions about work enjoyment according to independent variables. The opinions of the teachers about the enjoyment of work do not show significant differences according to generation (t $_{(379)}$ = 1.754, p> .05) and gender variables (t $_{(379)}$ =. 571, p> .05). On the other hand, the opinions of teachers about their work enjoyment show a significant difference according to seniority (F(4)= 3.79, p <.05). In the group comparisons using the Tukey test, teachers with seniority of 21 years or more (M = 3.78) enjoy more than the teachers with seniority 6-10 years (M = 3.30).

The relationship between the work values of teachers from X and Y generations and their enjoyment. The results of the Pearson correlation coefficient test were evaluated to explain the relationship between teachers' work values and their enjoyment from work (Table 1).

Table 1
The Relationship between Work Values of Generation X Teachers and their Work Enjoyment Levels

		Variable	1	2	3	4	5
Work Values	1	X self-improvement	1				
	2	X social benefit	.718**	1			
	3	X job opportunities	.651**	.727**	1		
	4	X extrinsic rewards	.495**	.692**	.528**	1	
	5	X work enjoyment	.453**	.347**	.446**	.175*	1

According to Table 1, the work values of teachers from generation X show a moderate positive and significant relationship (r=.453, p<.01) between self-improvement and work enjoyment scores. Accordingly, it can be assumed that as teachers of the X generation develop themselves, their level of pleasure in work will increase. The relationship between the social benefit dimension of teachers' work values and their enjoyment is moderate and positive (r=.347, p<.01). Meeting the needs and expectations of teachers from generation X towards the social dimension positively affects their level of pleasure at work.

The relationship between the job opportunities of the teachers of the X Generation and the enjoyment of the job (r = .446, p <.01) is moderate, significant and positive. Meeting the needs and expectations of teachers of X Generation regarding the opportunities provided by the job positively affects their level of pleasure in their job. It can be asserted that the level of work enjoyment is increased especially when the needs of generation X teachers are met such as appropriate working hours, work-life balance, happy work environment. In other words, the satisfaction of the needs of X generation teachers increases the work enjoyment levels of Y generation teachers. The relationship between the extrinsic rewards dimension and work enjoyment (r = .175, p <.01) of the X teachers was found to be weak and positive.

The relationship between the work values of Y generation teachers and job enjoyment is explained in Table 2 below.

Table 2
The Relationship between Work Values of Generation Y Teachers and their Work Enjoyment Levels

	Variable	1	2	3	4	5
Work Values	1 Y self-improvement	1				
	2 Y social benefit	.653**	1			
	3 Y job opportunities	.630**	.685**	1		
	4 Y extrinsic rewards	.701**	.654**	.686**	1	
	5 Y work enjoyment	.455**	.370**	.353**	.301**	1

From the analysis of Table 7, it is seen that there is a moderate positive and significant relationship (r = .455, p <.01) between the Y-teachers' self-improvement and work enjoyment scores. Accordingly, it can be assumed that the level of enjoyment of work increases as teachers of Generation Y develop themselves. There is a moderate and positive relationship between the social benefit dimension of the work values of teachers from the Y generation and their work enjoyment (r = .370, p <.01). According to this, meeting the needs and expectations of the Y generation teachers related to the social benefit dimension positively affects their level of pleasure in the job.

A moderate, significant and positive relationship was found between the work values of Y Generation teachers and their work enjoyment levels (r = .353, p <.01). Especially when Y generation teachers' needs such as appropriate working hours, work-life balance, happy work environment were met, their levels of work enjoyment increase more than X Generation teachers. The relationship between the work values of Y Generation teachers related to job opportunities and work enjoyment displayed a moderate, significant and positive relationship (r = .353, p <.01). These findings can be interpreted that satisfaction of the expectations of teachers from both X and Y generations related to their work values will result in a moderate level of increase in their work enjoyment levels.

Conclusions

Teachers from both generations care about being successful in their profession and think that it is important for them to demonstrate their skills in work life. Female teachers attach more importance to opportunities for self-improvement than male teachers. Generation Y teachers attach more importance to; a) self-improvement opportunities in the profession, b) the sense of success, c) develop and to use their skills, d) learn continuously, e) different workplace activities than the teachers of generation X. Teachers attach greater importance to the social benefit dimension among the other work values. Teachers most value their professional values that are compliable with their moral values. Teachers most value suitable working hours among the job opportunities and they expect their working hours to be adjusted accordingly. Compared to male teachers, female teachers pay more attention to the sociability, the benefits of the work, their working hours and also the balance between work and private life. Extrinsic rewards is relatively the least important aspect of work values for the teachers. It means that economic benefits in the teaching profession is of the least important among working values for the teachers. Considering the nature and social aspects of the teaching profession, female teachers put less emphasis on external rewards than for male teachers. Male teachers give more importance to extrinsic values such as income and seniority.

Teachers from the X and Y generations enjoy their jobs at a moderate level. This finding implies that the differentiaton between two generations is not sharp. As Lee et al. (2012) expressed "research in western countries proved that young generations are more individualistic and prefer intrinsic work values such as work autonomy, work identity, challenging jobs, and self-expression". Thus, as a non-western context, Turkish teachers' generational differences do not seem to portray a striking difference between X and Y generations.

Teachers are often satisfied with their work and therefore think that they do much more than their profession requires and find their works enjoyable. During the working hours, the teachers of generation X enjoy their work and try to do more than the profession requires during the working hours. Generation Y teachers enjoy their jobs less than generation X. Teachers with a seniority of 21 years or more enjoy their job more than teachers in the other seniority groups. The teacher group with the lowest work enjoyment have seniority of 6-10 years which consists of a younger generation, the Y generation group.

Finding of this study verified the past research revealing generational differences in work values from other sectors (e.g. Cogin, 2012; Gravett and Throckmorton, 2007; İliç and Yalçın, 2017). Among teachers' job-oriented goals, being financially satisfied or being promoted are relatively the least important values. Considering the nature and social aspect of the teaching profession, the fact that financial gains do not stand out for teachers is a result consistent with the references in the literature. Although the importance given by teachers to financial gain is not very low, and Y generation generally gives more importance to material rewards, teachers in both generations place little importance on financial gains and emphasize service to society rather than economic gains in the currnt research. There is a moderate, positive and significant relationship between the self-improvement, social benefit, and job opportunities dimensions of the work values from X generation teachers. It means that teachers of the X generation who develop themselves, be respected by society and can balance their work and private life enjoy their work much more. There is a low and positive relationship between generation X teachers' emphasis on extrinsic rewards and work enjoyment. There is a moderate, positive and meaningful relationship between all dimensions of working values of teachers of the Y Generation and their work enjoyments. Taken together, generational work values provide meaningful insights to grasp the work related perspectives of teachers and important clues for school administrators to motivate them in school settings.

Recommendations

1.   Personal improvement is an opportunity that teachers expect and value support from their professions and administrators. The opportunities that teachers can transfer their knowledge and skills to their colleagues, the improvement of opportunities and environments that can support teachers' creativity have the potential to increase the attractiveness of their working life.

2.   Social benefits include the values that teachers from both generations gave the most importance. Taking steps to improve the social status of the teaching profession can increase teachers' work-life enjoyment.

3.   Although the economic benefits in the teaching profession is a work value that is pushed to the background among teachers, teachers of Generation Y have a desire to earn more than those of Generation X teachers. Considering that income level is an important value for new generations, improving the income level of teachers can increase the interest of young talents to the profession.

4.   The number of young teachers is gradually increasing. The youngest teacher who started to work as a teacher is around 22 years old and teachers born between 1981-2000 will enter the teaching profession as Generation Y. One of the ways to increase their commitment to their profession is to pave the way for them to progress in their careers and professions. Because the new generation refuses to count in place, they expect continuous improvement, progress, and appreciation during their career pathways. For this reason, it would be appropriate to enrich career opportunities for new generation teachers.

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Preservice Teachers' Professional Engagement and Their Ability to Choose Teaching Techniques[*]

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Abstract

This study aims to investigate the relationship between the engagement of the preservice teacher to the teaching profession, and their ability to choose teaching techniques. The study adopted correlational survey research. The sample group is the students studying at the faculty of education of a state university in the Eastern Anatolia Region, and the preservice teachers taking pedagogical formation training. The obtained findings have shown that there are significant differences between the preservice teachers who have taken externally pedagogical training and the preservice teachers studying at the faculty of education in terms of their engagement to the teaching profession, their skills to choose teaching techniques, and other sub-dimensions of the scales. Based on the findings, it was concluded that the preservice teachers who took pedagogical formation training had higher average scores for professional engagement and dedication to the professional dimension; the mean scores were higher than the preservice teachers studying in the faculty of education in terms of the positive prediction and competence perception regarding the technical selection dimension. In addition, a significant relationship was found between the professional engagement of pre-service teachers and their skills in the selection of teaching techniques.

Keywords: Teacher training, engagement to the teaching profession, the ability to choose teaching techniques, preservice teachers

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Öğretmen Adaylarının Mesleki Adanmışlıkları ve Öğretim Tekniklerini Seçme Becerileri*

Makale Türü	Başvuru Tarihi	Kabul Tarihi
Araştırma	25.11.2020	4.12.2021

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Öz

Bu çalışmanın amacı öğretmen adaylarının öğretmenlik mesleğine ilişkin adanmışlıkları ile öğretim tekniklerini seçme becerileri arasındaki ilişkiyi incelemektedir. Bu çalışma, ilişkisel tarama modeli bir çalışmadır. Araştırmanın örneklemini, Doğu Anadolu Bölgesi'nde bir devlet üniversitesinin eğitim fakültesinde öğrenim gören öğrencileri ile pedagojik formasyon eğitimi alan öğretmen adayları oluşturmaktadır. Araştırma sonucunda elde edilen bulgulara göre, pedagojik formasyon eğitimi alan öğretmen adayları ile eğitim fakültesi öğretmen adaylarının öğretmenlik mesleğine adanmışlık ve öğretim tekniğini seçme becerileri ile ölçeklerin diğer alt boyutları açısından anlamlı farklılıklar görülmektedir. Araştırmadan elde edilen bulgulardan hareketle, pedagojik formasyon eğitimi alan öğretmen adaylarının mesleki adanmışlığa ilişkin mesleğe bağlılık ve özverili çalışma boyutu puan ortalamalarının daha yüksek olduğu; teknik seçimine ilişkin olumlu öngörü ve yeterlik algısı boyutunda da eğitim fakültesinde öğrenim gören öğretmen adaylarından daha yüksek olduğu sonucuna ulaşılmıştır. Ayrıca öğretmen adaylarının mesleki adanmışlıkları ile öğretim tekniklerinin seçimine ilişkin becerileri arasında anlamlı ilişki bulunmuştur.

Anahtar Sözcükler: Öğretmen yetiştirme, öğretmenlik mesleğine adanmışlık, öğretim tekniği seçme becerisi, öğretmen adayları

Introduction

In an attempt to have a more qualified teacher training system, preservice possibilities, opportunities are evaluated, and the standards are tried to be increased. In this context, teacher training programs, standards, and competencies are constantly updated (Şişman, 2011, p. 230). Effective and successful education and training practices depend on first and foremost the teacher's commitment to the profession (Hoy & Miskel, 2010, p. 68).

The method is the way the strategy is applied and the technique is the way the method is applied. Success in technique will determine success in method; success in method use will also determine the success of strategy selection and use. Criteria determining strategy, method, and technique selection will be student characteristics, subject area features, and the teacher's ability to use strategy, method, and technique. As a student feature students' level of readiness in cognitive, affective, and motor skills is important. The student must know and skills of the previous stages of learning that will enable the targeted behavioral change (Demircioğlu, Genç, & Demircioğlu, 2015).

To guide the process of learning to learn, teachers are expected to have sufficient knowledge and equipment in the subjects of teaching strategies, methods, and techniques. Ataç (2003) emphasizes that the teacher training process is important for teaching in schools to be more desirable and expected. There are idiosyncrasies in learning, and innate characteristics will have an impact on each individual's learning. Because the learning of each individual is idiocratic like his / her own fingerprint. In this case, it should be accepted that teachers can guide their target audience within the framework of their learning (Fry, Ketteridge, & Marshall, 2009, p. 8-10). Engagement requires a psychological definition including special meanings (Buchanan, 1974; Mowday, Porter, & Steers, 1982). A committed employee is more interested in the values, purposes of objects, and their fields of activity, and in addition to the minimum expectations from those objects does more and tries to reach new dimensions (Firestone & Penell, 1993; Kanter, 1968). Based on many studies in this field, it can be stated that teacher engagement is the main variable that determines the teacher's professional performance, training equipment, and competence (Tsui & Cheng, 1999).

Engagement to the profession is a concept that is tried to be put forward with the words great effort, handicraft, dedication. This concept is the motivation for doing the best. With the dependence and excitement created by an engagement to any object, goal, and purpose, one does not hesitate to disregard even her/his own life for this purpose. Engagement is one of the values of the affective domain, one of the learning domains that people have (Sağsan & Fırtına, 2015, pp. 1-15). At this point, human psychology comes to the forefront, and the control of the organism is now in its hands in every aspect. The important issue is to create the fundamental structure, and values that are worth making these sacrifices. The value of martyrdom in our belief is a value committed to this scale (Celep, 1995, pp.1-7).

Innovator working conditions such as teachers' engagement to their profession, school development strategies, participation in decision-making processes, and lifelong learning should be developed in the places where they work. Otherwise, teachers may be negatively affected by the process (Rosenholtz & Simpson, 1990; Rowan, 1990). Although there are many different opinions about job responsibility, most scientists support the idea that responsible employees have higher energy and do their jobs devotedly (Bakker, Schaufeli, Leiter, & Taris, 2008; Kanste, 2011).

Committed teachers are the individuals who make important and major changes in our lives. Passion manages teachers' motivational performance. It can be said that teachers with high professional engagement have an important effect on student success. There is a significant relationship between student achievement and passionate teaching. The emergence of the need for school performance, quality improvement, and the development of a spirit of engagement while practicing the teaching profession in the globalizing world is considered important. Teachers giving themselves to their jobs are the determinants of the academic performance and education quality of the school or students (Mertler, 2002). Lema, Mbilinyi, and Rajani (2004) assert that "The reason for teachers' existence is students." Indeed, it is the students who need to be socialized and cultured. However, it can be said that for many years, trainers have not been effective in ignoring this reality. The effects of low-performing

students and schools continued (Mkumbo, 2012). Rahmatullah (2016) found a correlation among learning effectiveness, teacher engagement, performance, and competence.

Teacher motivation has been a field of study for researchers for quite some time (Ames & Ames, 1984; Sylvia & Hutchison, 1985). Because teachers who suffer from motivation weakness cannot be expected to be devoted to the student and their profession. To develop intrinsic motivation, professional conditions, and expectations must be met at a sufficient level. It can be claimed that teacher motivation will be at a sufficient level depending on this and similar external motivation sources. Motivation as a significant variable directly influences learning and practices in this sense. The determinant indicator of people's reasons for turning to certain areas and their engagement is motivation. For this reason, motivation is one of the key concepts of learning (Taşgın & Coşkun, 2018, p. 936).

When similar studies are reviewed, it is emphasized that teachers should be teachers who are like friends with their students, can make the learning environment more comfortable, and comfortable, can implement their plans, and make their students happier by using different strategies, methods, and techniques (Shinn, 1997) that variables being basic constructors in effective teaching practices, are designated as productive teaching techniques, systematically structured classroom management, personal responsibilities, and positive interpersonal relationships (Manatte & Stow, 1984), that students' problem solving skills and critical thinking can be developed through instructional activities, particularly by choosing appropriate teaching approaches (Dyer & Osborne, 1996), that the methods, techniques, and instructional technologies which are envisaged in the curriculum, include students to the learning process and provide support in developing scientific research competencies such as project work, trips, and observations; applications such as utilizing experimental, and observation tools are not properly used by science and technology teachers, instead, applications such as question-answer, and lecture are preferred (Şimşek, Hırça, & Coşkun, 2012), that teachers have a high level of competence perception towards determining teaching techniques for teaching activities of social studies lesson, they tend to use teacher-centered teaching techniques in their lessons, and that they are in confusion about the concepts of teaching strategy, method, and technique (Durdukoca, 2018).

When the studies on engagement to the teaching profession are examined, female participants were found to have a higher and positive level of engagement to teaching profession than male participants (Guarino, Santibañez, & Daley, 2006), that the feeling of passion for the teaching profession also controls teachers' behaviors, attitudes, performances, and engagement (Fried, 2001; Thapan, 1986), that teacher engagement is the main variable that determines a teacher's professional performance, training equipment, and competence (Tsui & Cheng, 1999), that teachers' engagement to their profession, school development strategies, innovator fields of study such as lifelong learning, and participation in decision-making processes should be developed, otherwise teachers may be negatively affected by the process (Rosenholtz & Simpson, 1990; Rowan, 1990), that factors affecting teachers' professional engagement levels are "loving the profession, endeavoring, cherished, social status, and difficulty in the profession" (Turhan, Demirli, & Nazik, 2012). In this context, the purpose of this study is to examine the relationship between preservice teachers' engagement to the teaching profession, which is one of the main problems of teacher training and their ability to choose teaching techniques. For this purpose, we asked the following research questions:

✓ Is there a difference between preservice teachers' professional engagement and their choice of teaching techniques?
✓ Is there a significant relationship between preservice teachers' professional engagement and their choice of teaching techniques?
✓ Does professional engagement predict their choice of teaching techniques?

Method

Research Design

This research is a correlational survey model and has a quantitative structure. Survey research aims to reveal individuals' beliefs, views, characteristics, and past or present behaviors (Neuman, 2013). Relational research is the study in which the relationship between two or more variables is examined without any intervention to these variables (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz, & Demirel, 2013). In this research, since the relationship between two continuous variables was examined without any intervention, the relational survey model was used.

Research Sample

The population of this research is all the preservice teachers who are at the education faculty of a state university in the Eastern Anatolia Region, and all of these preservice teachers who receive pedagogical formation training in the same faculty. The sample consists of senior preservice teachers who continue their education in the fall semester of the 2019-2020 academic year at the faculty of education of the same university, and preservice teachers who took pedagogical formation training, theoretical courses, and teaching practice courses in the same period. The sample of the study consists of 599 preservice teachers, 282 of whom are senior preservice teachers of education faculty, and 317 of whom have taken pedagogical formation training. The distribution of teacher candidates by gender is given in Table 1.

Table 1

The Distribution of Pre-service Teachers by Gender

		Preservice teachers having pedagogical formation training		Preservice teachers studying at the faculty of education	
		f	**%**	**f**	**%**
Gender	Male	88	27.8	88	31.2
	Female	229	72.2	194	68.8

Research Instruments and Procedures

Two data collection tools were used in this research.

The first research instrument

Engagement to Teaching Profession Scale: The scale was developed by Kozikoğlu and Senemoğlu (2018). The scale consists of 20 items, and 3 sub-dimensions: "engagement to the profession", "devotion to students", and "dedication to the profession". These three factors explained 58.9 % of the total variance. The developers of the scale analyzed the difference between the scores of the upper group (27%) and the lower group (27%) using the t-test to test its validity according to internal criteria. As a result of the analysis, they found a significant difference. ($t_{(174)}$=37.002, p<0.01). Some examples of items included in the scale are "I am proud to be a teacher.", "I want to spend the rest of my life as a teacher.", "As a teacher, I enjoy working with students." The scale is rated as 5-point Likert. In addition, the Cronbach Alpha internal consistency coefficient for the whole scale was 0.90, and the reliability coefficients for the subscales were 0.92, 0.86, and 0.70. In our research, we calculated the Cronbach Alpha for the reliability of this scale; engagement to the profession: .937, devotion to students: .914, dedication to the profession: .838, and .952 in total.

The second research instrument

Perception Scale of Preservice Teachers' Skills to Choose Teaching Techniques: The scale was developed by Durdukoca, Yardımcıel, Beşeren, and Özbek (2017). The scale consists of 22 items, and 2 sub-dimensions: "positive foresight on technical choice" and "negative foresight on technical choice". These two factors explained 49.36% of the total variance. Some examples of items included in the scale are "I can choose teaching techniques that will give my students the ability to work independently.", "I can choose out-of-class teaching techniques suitable for the objectives of the course.", "I may not be

able to choose teaching techniques that will make my students active in the teaching-learning process." According to the CFA, the results were as follows: χ2/sd=1,80, RMSEA=.04 SRMR=.04, CFI=.96, GFI=.93, AGFI=.91, NFI=.91. The Cronbach Alpha internal consistency coefficient for the total scale was found as 0.90, and the reliability coefficients for the subscales were 0.92 and 0.82. In our research, we calculated the Cronbach Alpha for the reliability of this scale; positive foresight on technical choice: .920, negative foresight on technical choice: .882, and .906 in total.

Data Analysis

Before analysis, we tested whether the data showed a normal distribution. We examined the kurtosis, skewness coefficients, arithmetic mean, median values, Q-Q plot graphs, and normality test results (p> .05). Accordingly, we concluded that the data showed a normal distribution. In the analysis of the data, independent samples t-test was used to determine the significant difference between a two-category variable and a continuous variable. Pearson Product Moment Correlation analysis was conducted to determine whether the relationship between the two continuous variables was significant. Regression analysis was used to determine the predictive status of the scores

Ethical Issue

The data used in this study were collected anonymously as directly identifying information was never obtained or used. Also participating in the survey was ensured voluntarily. "The research was approved by the Ethics Committee at the university where the data was collected."

Results

The differences between the "Engagement to Teaching Profession Scale" and " Perception Scale of Preservice Teachers' Skills to Teaching Techniques" scores of preservice teachers having pedagogical formation training and preservice teachers studying at the faculty of education are shown in Table 2.

Table 2

The Differences between Pre-service Teachers' Professional Engagement and their Skills in choosing Teaching Techniques

	Preservice teachers having pedagogical formation training		Preservice teachers studying at the faculty of education		Test and significance	
	$\overline{X}$	sd	$\overline{X}$	sd	t	p
Engagement to profession	33.99	6.36	32.67	7.25	2.361	.019*
Dedication to profession	16.00	3.36	15.19	3.29	2.959	.003*
Devotion to students	35.20	5.24	33.82	5.64	3.109	.002*
Engagement to teaching profession scale	85.19	13.44	81.68	14.28	3.088	.002*
Positive foresight on technical choice	62.40	8.14	60.96	9.56	1.972	.049*
Negative foresight on technical choice	25.03	5.32	23.30	5.25	3.992	.000*
Perception scale of preservice teachers' skills to choose teaching techniques	87.43	11.05	84.26	11.93	3.372	.001*

Whether there is a significant difference between the "Engagement to Teaching Profession Scale" and "Perception Scale of Preservice Teachers' Skills to Choose Teaching Techniques" of preservice teachers having pedagogical formation training and those studying at the faculty of education was analyzed by t-test for independent samples. When Table 2 is examined, it is understood that there is a significant difference between preservice teachers having pedagogical formation training and preservice teachers studying at the faculty of education in terms of their engagement to the profession, their skills to choose teaching technique, and other sub-dimensions of the scales. When the arithmetic averages are analyzed, the difference is understood to be in favor of preservice teachers having pedagogical

formation training. This finding can be assumed that preservice teachers having pedagogical formation education have more engagement to the profession and their perception of competence in choosing teaching techniques than preservice teachers studying at the faculty of education.

"Pearson Correlation Analysis" was applied to understand if there is a relationship between "Engagement to Teaching Profession Scale" and "Perception Scale of Preservice Teachers' Skills to Choose Teaching Techniques", and the results are shown in Table 3.

Table 3

Results of Correlation Analysis between Professional Engagement and Ability to Choose Teaching Techniques

		Positive foresight on technical choice	Negative foresight on technical choice	Perception Scale of Preservice Teachers' Skills to Choose Teaching Techniques
Engagement to profession	r	.460*	.196*	.443*
Devotion to students	r	.504*	.214*	.485*
Dedication to profession	r	.576*	.167*	.518*
Engagement to Teaching Profession Scale	r	.572*	.213*	.537*

(*) p<0.001

When Table 3 is examined, all of the correlation values between the scores of the "Engagement to Teaching Profession Scale" and the scores of the "Perception of Competency Scale for Choosing Teaching Techniques" were found to be significantly positive. As a result, it can be said that as the "Engagement to the Teaching Profession Scale" scores increase, the scores of the " Perception Scale Preservice Teachers' Skills to Choose Teaching Techniques" will also increase.

Linear regression analysis was made to understand the predictive power of "Engagement to Teaching Profession Scale" scores to the "Perception Scale of Preservice Teachers' Skills to Choose Teaching Techniques" and the results are presented in Table 4.

Table 4

Linear Regression Analysis Results regarding the Prediction of Scores

	Variable	B	Std. Error	Beta	t	p
Positive foresight on technical choice	Stable	28.330	1.876		15.103	.000
	Dedication to profession	**.518**	**.171**	**.196**	**3.029**	**.003**
	Devotion to students	**.642**	**.119**	**.397**	**5.390**	**.000**
	Engagement to teaching profession	.037	.066	.058	.567	.571
	R=.601 R^2=.361 F$_{(3. 595)}$=111.884 p=.000					
Negative foresight on technical choice	Stable	17.883	1.380		12.955	.000
	Dedication to profession	.166	.126	.104	1.316	.189
	Devotion to students	-.049	.088	-.051	-.564	.573
	Engagement to teaching profession	.065	.048	.170	1.353	.177
	R=.224 R^2=.050 F$_{(3. 595)}$=10.433 p=.000					
Perception Scale of Preservice Teachers' Skills to Choose Teaching Techniques	Stable	46.213	2.549		18.130	.000
	Dedication to profession	**.684**	**.233**	**.198**	**2.942**	**.003**
	Devotion to students	**.593**	**.162**	**.280**	**3.661**	**.000**
	Engagement to teaching profession	.102	.089	.123	1.150	.251
	R=.555 R^2=.308 F$_{(3. 595)}$=88.103 p=.000					

The Durbin-Watson (D-W) test was used to understand whether it is auto-correlation in the model. The D-W value was found to be 1.851, and since this value is close to 2, it can be said that there is no auto-correlation. For the multicollinearity problem, tolerance values were checked, and it was seen that all tolerance values were greater than $(1-R^2)$. After it was seen that there were no auto-correlation and multiple connection problems, the analysis was continued. When Table 3 is examined, the positive foresight on technical choice variable gives a significant relationship with "Dedication to Profession", "Devotion to Students", "Engagement to the Teaching Profession" of preservice teachers, and the regression coefficient was found to be .361 (R = .601, R^2 = .361, p <0.05). "Dedication to Profession", Devotion to Students", and "Engagement to the Teaching Profession" variables explain 36% of the variance in the dependent variable. When the t-test results for the significance of the regression coefficients are examined in Table 4, it is understood that the variables of "Dedication to Profession", and "Devotion to Students" are significant predictors of the positive foresight on technical choice. The negative foresight on technical choice variable gives a significant relationship with "Dedication to Profession", "Devotion to Students", and "Engagement to the Teaching Profession" of preservice teachers, and the regression coefficient was found to be .050 (R = .224, R^2 = .050, p <0.05). Although it is seen that the negative foresight on technical choice variable explains 5% of the total variance of the total variables of "Dedication to Profession", "Devotion to Students", and "Engagement to the Teaching Profession" of preservice teachers when the t-test results for the significance of the regression coefficients are examined in Table 4, it is understood that none of the variables is a significant predictor on "Negative Foresight on Technical Choice". The "Perception of Preservice Teachers' Skills to Choose Teaching Techniques" variable gives a significant relationship with "Dedication to Profession," "Devotion to the Students", and "Engagement to the Teaching Profession", and the regression coefficient was found to be .308 (R = .555, R^2 = .308, p <0.05. The "Perception of Preservice Teachers' Skills to Choose Teaching Techniques" variable explains 31% of the total variance of the total variables "Dedication to Profession", "Devotion to the Students", and "Engagement to the Teaching Profession" of preservice teachers. When the t-test results for the significance of the regression coefficients are examined in Table 3, it is understood that the variables of dedication to the profession, and devotion to students are significant predictors of the "Perception of Preservice Teachers' Skills to Choose Teaching Techniques ".

Discussion, Conclusion and Recommendations

It was concluded that the devotion to the profession and the perception of competence in choosing teaching techniques of the preservice teachers who took pedagogical formation education were higher than the preservice teachers studying in the education faculty. With this result, it can be said that preservice teachers who choose the faculty of education to become a teacher have a lower level of engagement, and perceptions of competency in choosing teaching techniques than those who have the right to be a preservice teacher by taking pedagogical formation training need to address. At the beginning of the process, the low average of the engagement, and perceptions of competency in choosing to teach of preservice teachers who chose the education faculty for being a teacher may indicate important problems in this regard. It can be thought that while the employment areas of preservice teachers studying at the faculty of education are becoming narrow, it is important that students who have the right to take pedagogical formation training, and become preservice teachers later have a new opportunity, and possibility. It can also be thought that the low level of motivation of the preservice teachers who chose the faculty of education with the dream of becoming a teacher may be due to the fact that they could not be appointed after successful graduation. Being appointed as a teacher is not an extra achievement for preservice teachers studying at the faculty of education. However, this situation is a new, and important achievement for the participants who become preservice teachers by taking pedagogical formation training. The motivation created by this situation can be interpreted as being more positive in terms of engagement to the profession, devotion to the student, and positive foresight on technical choice.

The correlation values between the scores of the "Engagement to Teaching Profession Scale", and the "Perception Scale of Preservice Teachers' Skills to Choose Teaching Techniques" were found to be positively significant. It can be said that as the "Engagement to the Teaching Profession Scale" scores increase, the scores of the "Perception Scale of Preservice Teachers' Skills to Choose Teaching

Techniques " also increase, and will generally increase. Knowledge about teaching methods, techniques, selection of the method, and technique suitable for the outcome, application of the chosen method or technique will affect the effective teaching (Ocak, 2007) and learning outcomes (Arslantaş, 2011; Gibson, 2009). Based on the result of the research, it can be said that preservice teachers who have high teaching engagement will have high perceptions of competency in choosing teaching techniques.

"Dedication to Profession", Devotion to Students" and "Engagement to the Teaching Profession" variables explain 36% of the variance in the dependent variable. When the t-test results for the significance of the regression coefficients are examined, it is understood that the variables of "Dedication to Profession" and "Devotion to Students" are a significant predictor of the positive foresight on technical choice. Although it is seen that the negative foresight on technical choice variable explains 5% of the total variance of the total variables of "Dedication to Profession", "Devotion to Students" and "Engagement to the Teaching Profession" of preservice teachers. When the t-test results for the significance of the regression coefficients are examined, it is understood that none of the variables is a significant predictor of "Negative Foresight on Technical Choice". The "Perception of Preservice Teachers' Skills to Choose Teaching Techniques" variable gives a significant relationship with "Dedication to Profession," "Devotion to the Students", "Engagement to the Teaching Profession", and the regression coefficient was found to be .308. The "Perception of Preservice Teachers' Skills to Choose Teaching Techniques" variable explains 31% of the total variance of the total variables "Dedication to Profession", "Devotion to the Students", and "Engagement to the Teaching Profession" of preservice teachers. As a result of t-test results for the significance of the regression coefficients, it is understood that the variables of dedication to the profession, and devotion to students are significant predictors of the "Perception of Preservice Teachers' Skills to Choose Teaching Techniques". As engagement in the teaching profession is a desire to care about the work and focus on the profession to increase the success of the students (Butucha, 2013), it is supported by the results obtained that it will also positively contribute to the perception of competence in choosing teaching techniques. The more willingness of teachers with high self-efficacy to choose teaching methods, and techniques in the teaching process can be associated with engagement (Tschannen-Moran, Wolfolk, & Hoy, 1998). There are similar research results in the literature. In his research, Çelik (2008) concluded that there is a relationship between the management models adopted by educational administrators in primary schools and engagement to the profession of teachers. Eroğlu (2007) reached a similar conclusion; she concluded that there is a positive significant relationship between the quality of management practices and teachers' level of engagement. Dalay (2007) concluded that engagement to an organization functions as a partial moderator between trust in an organization, and being attracted to work. In addition, it has been determined that engagement to work plays the role of the conditional variable between the "identification" dimension of organizational engagement and the "vitality" dimension of being attracted to work. Zöğ (2007) revealed that there is a positive relationship between teachers' job satisfaction and their organizational engagement levels. Kozikoğlu and Özcanlı (2020) concluded that there are moderate, positive, and significant relationships between teachers' engagement in the profession and their 21st-century teacher skills.

As a result of the study, when the data obtained were evaluated, it was concluded that preservice teachers who were placed in the faculty of education become a teacher starting from university preferences experienced a loss of motivation. The fact that preservice teachers who have pedagogical formation training have the opportunity to become preservice teachers after doing formation training tend to move away from the parameters that cause university preferences of their departments may be a problematic situation in a sense. It can be stated that it would be better if the reasons for the decisions taken by decision-makers in this field are determined by specialization commissions and implemented after sufficient discussion. Considering teacher training practices within the framework of current practices, it should be ensured that the skills of devotion to the teaching profession and choosing teaching technique that emerged in this study are developed, and the level of engagement to the profession is increased, and this positively affects the choice of strategy, method, and technique. It should be thought that achieving quality in teacher training can only be possible by focusing on values education concerning the problematic situations identified in the research for engagement to the profession and dedication to the profession. Making the teaching profession a preferred profession in every respect should be the top priority of societies. Since the results obtained from this study are limited

to the quantitative data obtained from two data collection tools, in-depth qualitative research can be recommended. In addition, by conducting causal-comparative research for the results obtained, more detailed information on the reasons for the results can be obtained. By using different variables and data collection tools, engagement to the teaching profession, and the skills of choosing teaching techniques can be discussed more comprehensively. It may also be suggested to conduct researches on the engagement of teachers, who are also practitioners in the process, to the teaching profession, their skills, and competence to choose teaching techniques.

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Biology Teachers' Level of Recognition of Trees in Their Close Environment[*]

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Abstract

The purpose of this study is to determine how effectively biology instructors at high schools connected with the Ministry of National Education identify trees in their immediate surroundings in the context of trees, which are critical to the notion of biodiversity. The population comprises of biology instructors who worked in high schools in various regions of Turkey during 2020 and 2021 under the auspices of the Ministry of National Education. The research sampled 262 biology teachers volunteer using an accessible sampling technique. The research model is a relational one that is based on the general survey model, a quantitative research technique. Mercan and Köseoglu's (2019) "Given Tree Recognition (GTR) Test" was used to gather data for the study. The Mann Whitney U Test was used to compare matched groups and the Kruskal-Wallis H test was used to compare more than two groups in the analysis of the data collected throughout the study. According to the study's results, biology instructors' capacity to identify trees in their immediate surroundings is limited. It is deemed critical to ascertain biology instructors' degree of recognition of trees in their immediate surroundings, since the research's findings begin with an understanding of the importance of biodiversity, which is one of the most critical problems in the conceptual framework of biology teaching.

Keywords: Tree, biodiversity, environmental education, tree recognition test, biology teachers

Biyoloji Öğretmenlerinin Yakın Çevrelerindeki Ağaçları Tanıma Düzeyleri[*]

Gamze Mercan[**]   **Pınar Köseoğlu**[***]

Öz

Bu araştırmanın amacı, Milli Eğitim Bakanlığı'na bağlı liselerde görev yapan biyoloji öğretmenlerinin biyoçeşitlilik kavramı içerisinde önemli bir kapsamı oluşturan ağaçlar kapsamında yakın çevrelerindeki ağaçları tanıma düzeylerinin incelenmesidir. Araştırmanın evreni 2020-2021 yılları arasında MEB'e bağlı Türkiye'nin farklı illerindeki liselerde yapan biyoloji öğretmenlerinden oluşmaktadır. Araştırmanın örneklemi, ulaşılabilir örnekleme yöntemine göre belirlenmiş 262 gönüllü biyoloji öğretmeninden oluşmaktadır. Araştırmanın modeli ise nicel araştırma yöntemlerinden genel tarama modelinde ilişkisel bir çalışmadır. Araştırmanın veri toplama aracı olarak Mercan ve Köseoğlu (2019) tarafından geliştirilen "Verilen Ağacı Tanı (VAT) Testi" kullanılmıştır. Elde edilen veriler parametrik olmayan test yöntemlerinden ikili grupların karşılaştırılmasında Mann Whitney U Testi ve ikiden fazla grupların karşılaştırılmasında Kruskal Wallis H testi kullanılarak analiz edilmiştir. Araştırmada elde edilen çıktılara göre; biyoloji öğretmenlerinin yakın çevrelerindeki ağaçları tanıma düzeylerinin düşük olduğu saptanmıştır. Ayrıca araştırma sonuçlarının hayati öneme sahip bir konu olan biyoçeşitliliğin öneminin yakın çevreyi tanımakla başladığı bilindiğinden biyoloji öğretmenlerinin yakın çevrelerindeki ağaçları tanıma düzeylerinin belirlenmesinin önemli olduğu düşünülmektedir.

Anahtar Sözcükler: Ağaç, biyoçeşitlilik, çevre eğitimi, verilen ağacı tanı testi, biyoloji öğretmenleri

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Introduction

Biodiversity is defined as a part of sustainable development, according to Lindemann-Matthies' research (2009), but it is a concept that both society and students are unfamiliar with. There is a need for a well-informed society that realizes the economic, social, and ethical value of biodiversity, recognizes its importance in sustainable development, and is sensitive to and aware of biodiversity protection (McCoy et al., 2007; Uzun and Sağlam, 2005). A new education program has also been proposed to promote biodiversity education (Sterling, 2009). In current programs, biodiversity issues are included in the environmental education course. The main purpose of environmental education is to make everyone environmentally literate, enabling them to acquire the knowledge, values, attitudes, commitments, and skills necessary to protect and improve the environment (Sterling, 2003).

Environmental education, it has been explained, can serve as a bridge to biodiversity education, but it is not adequate (Alexandar, 2014; Sterling, 2009; Mayr, 2004). Teachers have an essential role in ensuring that biodiversity education is implemented successfully in schools (Borg, 2012; WCED, 1987). Biodiversity education should not be restricted to only conceptual learning; it should be designed such that students can comprehend the system as its whole, including its dynamics and processes (Tilbury & Calvo 2005; Stevenson, 2006; Van Weelie and Wals 2002; Mayer 1992; Barker and Slings 1998). Instead of being taught in the classroom, biodiversity education should be taught in ecological environments outside of the classroom. Out-of-class learning should complement and enhance classroom learning (Ramadoss & Moli, 2011). There is a need for a well-informed community that understands the economic, social, and ethical importance of biodiversity and is concerned about its maintenance (McCoy et al., 2007). Teachers, in this regard, carry the greatest responsibility for biodiversity and sustainable development education. Biodiversity training that teachers receive before service has a potential multiplier effect (Gayford, 2000; Kápylá & Wahlström, 2000; Powers, 2004). That is, each teacher both share their knowledge with their colleagues and trains a large number of students. Therefore, it is vital in ensuring the quality of the teacher education system (Barker & Elliot, 2000). Studies conducted in various countries have shown that there is not enough emphasis on biodiversity education in pre-service teacher education programs (Plevyak et al., 2001; Fiebelkorn and Menzel, 2013). Thus, a large part of pre-service teachers cannot receive proper biodiversity training during their education (Gayford, 2000; Barker & Elliot, 2000). This showed that they were not willing enough to provide biodiversity education as of the lack of self-confidence in their knowledge when they started their service (Lane et al., 1995; Lieber et al., 2000 Fullan, 2002; Gayford, 2000; Brewer, 2002; Howitt, 2007; Falkenberg, 2014; Dikmenli, 2010; Kassas, 2000).

The studies carried out within the scope of environment and biodiversity education in the related literature are examined. n the study, they selected students from different age groups as a sample, their study to investigate how they see (Tunnicliffe & Reiss, 2000) and perceive plants, it was determined that the students differ in terms of time and attention, and those with older age groups were more inclined to use the habitat features of plants (Tunnicliffe & Reiss, 2000; Gatt et al., 2007). While it was determined that primary school 8th grade students (Ulucanlı, 2009) and secondary school 9th grade students (Civelek, 2012) had low awareness levels about the plants around them (Nates et al., 2010; Yli-Panula & Matikainen, 2014), high school students' perceptions of biodiversity loss are high (Bilir &Özbaş, 2017), medical students do not know enough about plants used in health and their usage areas (Aktürk et al., 2006), and village people do not know enough about beneficial plant species (Guerreco, et. al, 2007), the students in Germany know better the tree species from popular local plants and trees than the plant species (Lückman & Menzel, 2013), within the scope of the "Dendrology Education for 9th Grade High School Students" project, the dendrology education project having an effect on the environmental awareness and tree recognition levels of the high school students positively and significantly (Köseoğlu, Mercan & Pehlivanoğlu, 2019), and the "Dendrology School for Preschool Students" Project, based on environmental responsibility awareness from an early age, having a positive effect on the level of recognition of trees by preschool teachers and preschool children (Köseoğlu et al., 2021), was detected. As a result, since biodiversity education, which is related to environmental education, is one of the most important subjects in the conceptual framework of biology education, the protection of biodiversity is implemented through an understanding of its importance. Based on this context, the focus of the research is to examine how well biology teachers at Ministry of National

Education-affiliated high schools recognize trees in their immediate surroundings within the context of trees, which play an essential role in the concept of biodiversity. In the related literature, it is considered that the concept of biodiversity is addressed in terms of plant (Ulucanlı, 2009; Civelek, 2012; Yüce, 2017) or animal (Şahin, 2018) species, but there is no previous research on tree species by biology teachers and the findings obtained as a result of the research are important in terms of guiding future research.

The Problem of Research

What are the biology teachers' levels of recognizing the trees they see in their close environment and their recognition levels according to various variables (gender, educational status, professional seniority, the most vital benefit of trees and whether it's attractive to walk through the forest and discover different types of trees) does it differ?

Method

E-76942594-6600-00001649842 approval number dated 13 July 2021 was obtained from the Ethics Committee of Hacettepe University for this research.

Research Design

The general survey method, which is one of the most extensively used research types in the field of educational sciences, involves studies conducted to quantify a phenomenon, orientation, or to set a theory to the test in real-life circumstances (Descombe, 2010). This study's model is a relational study based on the general survey model. Relational studies are research models that aim to investigate whether two or more variables change together and how much they change (Karasar, 2005). The relationship between the relational study model and the variables determined within the research's scope was evaluated.

Research Sample / Study Group

Between the years 2020 and 2021, the study's universe included biology teachers who worked in high schools across Turkey under the Ministry of National Education. The study's sample, on the other hand, was chosen using an accessible sampling approach and consists of 262 biology teachers who volunteered to take part in the study between July and August 2021. The study's generalization to the accessible population is its limitation, and its external validity is weak. The research, on the other hand, has internal validity because the teachers who made up the study's sample did it voluntarily. Google Questionnaire Form was used to collect data in the research. The results of the frequency distributions related to the personal characteristics (gender, educational status, professional seniority, etc.) of the biology teachers who constitute the sample of the research are given in Table 1.

Table 1
Distribution of Demographic Characteristics of Biology Teachers

		Frequency (f)	**Percentage (%)**
Gender	Female	209	79,8%
	Male	53	20,2%
Educational status	Bachelor's degree	259	60,7%
	Master's degree	92	35,1%
	Doctorate (Ph.D.)	11	4,2%
Professional seniority	0-4 years	20	7,6%
	5-9 years	70	26,7%
	10-14 years	42	16,0%
	15-19 years	33	12,6%
	20 years and above	97	37,0%
The most vital benefit of trees	Human life	50	19,1%
	Climate	104	39,7%
	Air pollution	32	12,2%
	Other living things	76	29,0%
Whether it's attractive to walk through the forest and discover different types of trees	Yes	218	83,2%
	No	44	16,8%
Total		262	100,0%

Table 1 shows that women make up 79.8% of biology teachers and 20.2 % male of all biology teachers. More than half of biology teachers (60.7 %) are undergraduates, followed by those with Master's degrees (35.1 %) and Ph.D. (35.1%) (4.2%). When it comes to professional seniority, 7.6% have 0-4 years of experience, 26.7% have 5-9 years of experience, 16% have 10-14 years of experience, 12.6% have 15-19 years of experience, and 37.0% have 20 years or more of experience. When asked about the benefits of trees, 19.1% think they are useful to human life, 39.7% think they are beneficial to the climate, 12.2% think they are beneficial to air pollution, and 29% think they are beneficial to other living things. While the majority of teachers (83.2%) explore different tree species, 16.8% do not.

Research Instruments

Mercan and Köseoğlu (2019) developed the "Given Tree Recognition (GTR) Test" as the research's data collection tool. The Given Tree Recognition (GTR) Test is divided into two sections, the first of which includes three questions (gender, education level, professional seniority, the most important benefit of trees, and whether it is attractive to explore different tree species by walking in the forest) to determine the demographic characteristics of biology teachers. The second part of the test comprises photographs of 24 trees that biology teachers encounter most frequently in their daily lives. In the second part of the test, there are four photographs of each tree, and they are photographs taken during field trips by Necati Güvenç Mamıkoğlu, the author of the book Trees and Bushes of Turkey. These photographs consist of a view of the tree from afar, where its leaves, trunk, and fruit, if any, can be seen clearly.

Analysis of Data

The data was analyzed using the SPSS 22.0 program. Quantitative techniques were used to analyze the data collected throughout the study. The demographic characteristics and tree recognition levels of the teachers participating in the study were analyzed using descriptive analysis (frequency and percentage). The GTR Test scores did not have a normal distribution, they were analyzed using nonparametric test methods such as the Mann Whitney U Test and the Kruskal Wallis H Test. Table 2 shows the normality distribution of the scores received from the GTR Test.

Table 2

GTR Test normality distribution results

	Statistics	DF	p
GTR Test	0,100	262	0,000

DF: degrees of freedom; p: Significance value

The non-parametric test techniques were evaluated using the Mann Whitney U Test for comparison of paired groups and the Kruskal Wallis H test for comparison of more than two groups, as the GTR Test scores of the teachers were not adequate for the normality distribution (p<0.05), according to Table 2. GTRT test levels (cut points) determined that based on standart deviation scores of sample (SD = 4.32 in Table 3). There are 24 trees in the GTR Test, and each tree is evaluated as 1 point, and the maximum score that biology teachers who know all trees can get is 24, and the minimum score is 0. In relation to this, the tree recognition levels of biology teachers, according to the findings; 0-4 points were classified as very low level, 5-9 points as low level, 10-14 points as intermediate level, 15-19 points as good level and 20-24 points as advanced level.

Results

The results regarding the tree recognition scores of the biology teachers included in the study are shown in detail in Table 3.

Table 3
Descriptive Statistics on Tree Recognition Scores of Biology Teachers

	N	Min	Max	X̄	SD
Tree Recognition Score	262	0,00	23,00	9,67	4,32

Min.: Minimum; Max.: Maximum; X̄: Mean; SD: Standard Deviation

According to Table 3, the teacher who knew the most trees in the GTR Test of biology teachers knew 23 trees, while the teachers who knew the least is none (0). In addition, biology teachers' tree recognition scores were calculated to be 9.67±4.32. As a result, it is reasonable to conclude that biology teachers have a moderate level of tree recognition.

The results are shown in Table 4 as a distribution of the level of recognition of the aghas that biology teachers observe in their immediate environment, arranged from greatest to least.

Table 4

Distribution of Biology Teachers in order of Recognizing Trees They See in Their Immediate Environment, Ranked from Most to Least

Rank No.	Tree Name	Number of Biology Teachers Recognizing Trees (f)	Percentage (%)	Number of Biology Teachers Who Don't Recognize Trees (f)	Percentage (%)
1	Calabrian pine	225	85,9%	37	14,1%
2	Larch	222	84,7%	40	15,3%
3	Oak	212	80,9%	50	19,1%
4	Scotch pine	209	79,8%	53	20,2%
5	Whitewood	182	69,5%	80	30,5%
6	Lime	178	67,9%	84	32,1%
7	Silverberry	176	67,2%	86	32,8%
8	Chestnut	172	65,6%	90	34,4%
9	Cypress	159	60,7%	103	39,3%
10	Plane	143	54,6%	119	45,4%
11	Juniper	96	36,6%	166	63,4%
12	Maple	86	32,8%	176	67,2%
13	Spruce	80	30,5%	182	69,5%
14	White willow	65	24,8%	197	75,2%
15	Yew	57	21,8%	205	78,2%
16	Cedar	56	21,4%	206	78,6%
17	Fir	52	19,8%	210	80,2%
18	Birch	43	16,4%	219	83,6%
19	Beech	28	10,7%	234	89,3%
20	Sweetgum	27	10,3%	235	89,7%
21	Hornbeam	23	8,8%	239	91,2%
22	Ash	16	6,1%	246	93,9%
23	Hackberry	14	5,3%	248	94,7%
24	Alder tree	12	4,6%	250	95,4%

According to Table 4, it was found that no biology teacher recognizes all of the 24 trees in the GTRT Test. The first 5 trees that biology teachers know the most are Calabrian pine (85.9%), larch (84.7%), oak (80.9%), Scotch pine (79.8%) and whitewood (69.5%). On the other hand, if they are least familiar with the last 5 trees; sweetgum (10.3%), hornbeam (8.8%), ash (6.1%), hackberry (5.3%) and alder (4.6%). Additionally, there is no tree that none of the teachers recognized.

The results regarding the tree recognition levels of biology teachers are given in Table 5.

Table 5
Distribution of Biology Teachers' Tree Recognition Levels

Tree Recognition Level	Frequency (f)	Percentage (%)
Very Low Level	24	9,2%
Low Level	117	44,7%
Moderate Level	87	33,2%
High Level	28	10,7%
Advanced Level	6	2,3%

Total		262	100,0%

According to Table 5, when biology teachers' tree recognition levels are evaluated; it was found that 9.2% was very low, 44.7% had low, 33.2% was moderate, 10.7% was good and 2.3% was advanced.

Results that stand out from the similar names given by biology teachers to trees in the GTR Test are discussed in Table 6.

Table 6

Information on the Different Names that Biology Teachers Gave to the Trees in the GTR Test

Rank No.	Tree Name	Different Names Biology Teachers Give to Trees
1	Cypress	Juniper, Beech, Oak, Fir, Chestnut
2	White willow	Silverberry, Olive Tree, Linden, Cedar, Laurel
3	Chestnut	Oak, Beech, Hazelnut Tree
4	Sweetgum	Ash, Plane, Chestnut, Maple, Spruce, Oak
5	Juniper	Cedar, Spruce, Fir, Cypress
6	Alder	Acacia, Sweetgum, Plane, Fir, Oak, Ash, Birch
7	Hackberry	Walnut Tree, Ash Tree
8	Plane	Chestnut, Oak, Fir, Whitewood
9	Beech	Chestnut, Hornbeam
10	Spruce	Fir, Cedar, Cypress, Juniper, Calabrian Pine
11	Linden	Acacia
12	Hornbeam	Elm, Beech, Acacia, Chestnut
13	Whitewood	Willow, Oak, Cypress
14	Larch	Spruce, Cedar, Fir
15	Calabrian pine	Cedar, Spruce, Fir
16	Silverberry tree	Olive Tree, Dogwood, Cherry Tree, Linden Tree
17	Yew	Juniper, Spruce, Cedar, Fir, Dogwood
18	Birch	Willow, Whitewood, Maple
19	Oak tree	Hazelnut tree
20	Scotch pine	Juniper, Cedar
21	Ash	Willow, Plane, Maple, Acacia
22	Cedar	Juniper, Fir, Spruce, Cypress, Scotch Pine, Larch
23	Fir	Spruce, Cedar, Cypress, Juniper
24	Alder	Elm, Hazelnut Tree, Fir, Mulberry Tree

According to Table 6, when the results of the different names given by the biology teachers to the trees in the GTR Test were examined, it was observed that the tree names were generally close to each other (such as juniper, beech, fir for cypress; oak, beech for chestnut; silverberry, olive for white willow; cedar, spruce, fir for juniper).

The findings regarding the relationship between the GTR Test tree recognition scores according to the gender of the biology teachers are shown in Table 7.

Table 7

Biology Teachers' Results on the Relationship between GTR Test Trees Recognition Scores by Gender

	Gender	N	Mean rank	U*	p
Tree recognition score	Female	209	131,17	5470,00	0,88
	Male	53	132,79		

Mann Whitney U Test; p< 0,05

According to Table 7, the mean rank of GTR Test tree recognition scores of female biology teachers was 131.17; the number of male biology teachers is 132.79. There is no significant difference between biology teachers' scores for recognizing trees by gender ($p>0.05$) and it can be claimed that their scores are close to each other.

The results regarding the relationship between the GTR Test tree recognition scores according to the education levels of the biology teachers are given in Table 8.

Table 8

The Results of the Biology Teachers on the Relationship between the GTR Test Tree Recognition Scores according to Their Educational Background

	Educational status	N	Mean rank	Chi-Square	DF	p	
Tree recognition score	Bachelor's degree (1)	159	130,29				**Difference** 1-3, 2-3
	Master's degree (2)	92	125,15	10,29	2	0,00*	
	PhD (3)	11	202,09				

p<0,05

According to Table 8, the mean rank of GTR Test trees recognition scores among Bachelor's degree of biology teachers was 130.29, 125.19 for master's graduates, and 202.09 for Ph.D. degrees. There is a statistically significant difference in tree recognition scores among biology teachers based on their educational status ($p<0.05$). Biology teachers with doctorates are said to know trees better than both undergraduate and graduate students.

The results regarding the relationship between the GTR Test tree recognition scores according to the professional seniority of the biology teachers are given in Table 9.

Table 9

The Results of the Biology Teachers on the Relationship between the GTR Test Tree Recognition Scores according to Their Professional Seniority

	Professional seniority	N	Mean rank	Chi-square	DF	p	Diff.
	0-4 Years (1)	20	102,35				
	5-9 Years (2)	70	115,79				
Tree recognition score	10-14 Years (3)	42	138,67	12,43	4	0,01*	1-5, 2-5
	15-19 Years (4)	33	120,94				
	20 Years and above (5)	97	149,34				

p<0,05

According to Table 9, the mean rank of GTR Test tree recognition scores of 0-4 years senior biology teachers was 102,35; 115,79 for those with 5-9 years of experience; 138,67 for those with 10-14 years of experience; 120,94 for those with 15-19 years of experience; and 149,34 for those with 20 years or more of experience. There is a significant difference in tree recognition scores among biology teachers based on their professional seniority ($p<0.05$). Biology teachers with a seniority of 20 years or more have a superior recognition of trees than those with 0-4 years and 5-9 years of experience.

The results regarding the relationship between the GTR Test tree recognition scores according to the opinions of the biology teachers about the benefits of trees are given in Table 10.

Table 10

Results on the Relationship between GTR Test Tree Recognition Scores according to Biology Teachers' Opinions about the Benefits of Trees

	Benefits of trees	N	Mean rank	Chi-square	DF	p
Tree recognition Score	Human life	50	137,43			
	Climate	104	131,94	0,50	3	0,91
	Air pollution	32	128,64			
	Other living things	76	128,80			

p<0,05

Table 10 shows that the rank average of the GTR Test tree recognition scores of biology teachers who answered "human life" about the benefit of trees was 137.43, 131.94 for those who answered "climate," 128.64 for those who answered "air pollution," and 128.80 for those who answered "other living things." There is no significant difference in the tree recognition scores (p>0.05), according to the biology teachers' opinions on the benefits of trees, and the scores are close to each other.

The results regarding the relationship between GTR Test tree recognition scores according to biology teachers' discovery of different tree species are shown in Table 11.

Table 11

Results on the Relationship between GTR Test Tree Recognition Scores according to Biology Teachers' Discovery of Different Tree Species

	Discovery of different tree species	N	Mean rank	U	p
Tree recognition score	Yes	218	140,37		
	No	44	87,55	2862,00	0,00*

p<0,05

According to Table 11, the mean rank of GTR Test tree recognition scores of biology teachers who discovered different tree species was 140.37; those who did not discover it were found to be 87.55. There is a significant difference between the scores of recognizing trees according to the biology teachers' discovery of different tree species (p<0.05). It can be considered that biology teachers who discovered different tree species knew trees better than those who did not.

Discussion, Conclusion and Recommendations

According to the study's results, biology teachers were unfamiliar with the names of a large number of trees in their local area, suggesting a poor degree of awareness for trees in their immediate context. The results of tests performed by Ulucanl (2009) and Civelek (2012), in which they compared the identification levels of plants in a near setting using various samples, indicated that the study is genuine. Additionally, Bast (2010), Demirezen (2012), Şenel (2015), Şahin (2018), Mercan & Köseoglu (2019) all shown poor knowledge of biodiversity in their environments, which is consistent with the results of this research.

The first five trees that biology teachers are most familiar with are calabrian pine, larch, oak, scotch pine, and whitewood. On the other side, they are least acquainted with the following five trees: sweetgum, hornbeam, ash, hackberry, and alder. Additionally, when the results of the GTR Test were compared to the various names provided to the trees by biology instructors, it was discovered that the tree names were usually similar (such as juniper, beech, fir for cypress; oak, beech for chestnut; silverberry, olive for white willow; cedar, spruce, fir for juniper). Ulucanlı (2009), Bastı (2010), Civelek (2012), Türkmen et al. (2016), and Şahin (2018) conducted studies with various sample groups and discovered that while individuals have a high level of recognition for the fruits they consume at home, they do not recognize trees whose fruits they do not consume; while Nates et al. (2010) discovered that

while individuals have a high level of recognition for the trees whose fruits they do not consume, they do not recognize the trees whose fruits they do

There was a strong connection between biology teachers' tree identification scores and their educational level, with biology teachers with doctorates doing higher than those with bachelor's and master's degrees in tree recognition. Additionally, there was a substantial difference in tree identification ratings between biology instructors with 20 years or more of professional experience and those with 0-4 years and 5-9 years of experience. Due to the absence of comparable study findings in the literature, the findings may be deemed unique. However, studies conducted by Ürey and ahin (2010), Gök (2012), Özsevgeç and Artun (2012), and Çavuş (2013) with diverse sample groups contradict the findings of the research, as they concluded that knowledge-based environmental education has no effect on individuals' ability to transform information into behaviors and associate it with daily life.

There was no significant correlation between the biology teacher applicants' tree recognition scores and their location of birth and upbringing (village/city). However, in studies conducted by Civelek (2012), Lückmann and Menzel (2013), and Şahin (2018), the level of plant and tree recognition in the immediate environment was compared to those living in villages or city centers.

While there is no significant difference in scores for identifying trees depending on biology instructors' views on the advantages of trees, there is a significant difference in scores for recognizing trees based on their discovery of new tree species. It is conceivable that biology instructors who discovered new tree species had a greater understanding of trees than those who did not. Individuals' perceptions of the significance of plant identification were assessed in a study performed by Civelek (2012) with various sample groups in order to ascertain the health advantages and risks, and they partly coincide with the research findings.

According to the results of the research, the following recommendations are given:

1) It is a cross-sectional study because the sample of the study was selected by the accessible sampling method. For this reason, mixed method research can be applied by using quantitative and qualitative research with different study groups and sampling methods. By this way, in-depth results can be obtained within the scope of the research purpose.

2) By adding different variables within the scope of the research, the relations between concepts can be handled by different teacher groups.

3) Researchers need to plan the application times well. It is significant to choose the periods when teachers are not busy in order to increase participation in the applications to be made in educational institutions.

4) It is advised that researchers interact with experts in systematic botanic when conducting educational research on systematic botanic.

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8th Grade Students' Success in Visual Reading and Logical Reasoning Test Items

Sıddık Bakır*   **Ayşe Şimşek****

Abstract

In the 21st century, the primary goals of education systems are to educate individuals who can understand, perceive and interpret electronic graphics and symbols on the screens and who have advanced logical reasoning skills. Turkish lessons and teachers play essential roles in the acquisition of visual and digital literacy skills, which have become widespread in modern educational approaches. This study aimed to explore 8th-grade students' performances in visual reading and logical reasoning tests by particular variables such as the monthly number of books they read, the daily number of Turkish tests, social media use, Turkish lesson performances, and the socioeconomic status. This non-experimental quantitative study used a correlational design to determine the relationships between variables. The sample consisted of 200 8th grade students from three public secondary schools in Palandöken, Erzurum. The study data were analyzed using descriptive statistics, the Mann-Whitney U test, and Spearman Correlation Analysis. The findings indicated no significant difference between the students' scores from the achievement test and the monthly number of books, and the family's socioeconomic status. However, there was a significant relationship between achievement test scores and Turkish lesson performance, the daily number of Turkish test items, and social media use.

Keywords: Visual reading, logical reasoning skills, 8th-grade students, Turkish lesson, literacy types

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Sekizinci Sınıf Öğrencilerinin Görsel Okuma ve Mantık Muhakeme Testi Sorularındaki Başarıları

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Öz

21. yüzyıl eğitim sistemlerinde, okuduğunu anlayabilen bireylerle birlikte ekranlardaki elektronik şekilleri, işaretleri algılayabilen, yorumlayabilen, mantık muhakeme becerisi gelişmiş bireyler yetiştirmek önemli hâle gelmiştir. Modern eğitim anlayışında giderek yaygınlaşan ve yerleşik hâle gelen görsel okuryazarlık veya dijital okuryazarlık becerisinin kazandırılmasında Türkçe dersinin ve Türkçe öğretmenlerinin katkısı önemlidir. Bu çalışmanın amacı, sekizinci sınıf öğrencilerinin görsel okuma ve mantık muhakeme sorularına yönelik başarılarını çeşitli değişkenler açısından incelemektir. Bu doğrultuda, öğrencilerin görsel okuma ve mantık muhakeme sorularına yönelik başarıları ile okunan kitap sayısı, günlük çözülen soru sayısı, sosyal medya kullanımı, Türkçe dersi başarısı ve ailenin sosyoekonomik durumu arasında bir ilişki olup olmadığı incelenmiştir. Nicel araştırma yaklaşımıyla hazırlanan ve deneysel olmayan bu çalışmada, değişkenler arasındaki ilişki tespit edilmek istendiği için korelasyonel desen kullanılmıştır. Çalışmaya, Erzurum ili Palandöken ilçesinde bulunan üç devlet ortaokulunda öğrenim gören sekizinci sınıf düzeyindeki 200 öğrenci katılmıştır. Katılımcılardan elde edilen veriler betimsel istatistik, Mann-Whitney U testi ve Spearman Korelasyon Analizi ile çözümlenmiştir. Katılım grubu öğrencilerinin uygulanan başarı testinden aldıkları puanları ile ayda okunan kitap sayısı ve ailenin sosyoekonomik durumu arasında anlamlı ilişki bulunmamıştır. Bununla birlikte başarı testi puanları ile Türkçe dersi başarısı, günlük çözülen soru sayısı ve sosyal medya kullanımı arasında anlamlı ilişki tespit edilmiştir.

Anahtar Sözcükler: Görsel okuma, mantık muhakeme becerisi, sekizinci sınıf öğrencileri, Türkçe dersi, okuryazarlık türleri

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Introduction

Scientific and technological innovations quickly spread in our lives in today's world. In parallel with the progress in various fields, novel methods, strategies, and innovations can be observed in education. There is a new and different group of learners today; therefore, one of the initial goals of nations is to raise individuals proficient in communication technologies and metacognitive learning strategies to analytically read, search, question, think and solve problems. In this sense, traditional teaching methods and techniques do not produce satisfactory educational outcomes.

In the digital age surrounded by visual images, the meaning and extent of the term *literacy* have changed due to the new computer technologies and mass media, which have become widespread in daily life. Traditional text-based literacy does not satisfy the requirements of the age anymore. Thus, the target goal is to reach a high level of visual literacy, characterized by perceiving and making sense of electronic graphics, images, and symbols on the screen (Akpınar, 2009; Akyol, 2011). It should also be emphasized that visual messages and images are used as tables, graphics, emojis, smart signs, boards, and pictures in any communication tools and public places (Arı & Soylu, 2020).

Historically considered, visual information dates back to much earlier times than the written information (Tanrıverdi & Apak, 2013). Humankind attempted to express their views of the universe and nature, their fears, desires, struggles, and relationships with other beings through petroglyphs they created centuries ago (Alyılmaz, 2005). Similarly, today, visual reading refers to understand and interpret the world and social events through images and visuals such as pictures, graphics, symbols, graphics, signs, and colors (Güneş, 2013).

People think visually while figuring out a problem or situation because visual information is processed 60.000 times faster than verbal information in mind. Thanks to visual thinking skills, information can be used more quickly. Logical reasoning and assessments are also easier to understand through visuals (e.g., images, graphics, tables). Thus, visuals can also be called robust and fast carriers of information (Burmark, 2002; Köksal, Temur & Akçam, 2006).

The theoretical studies of grasp, interpretation, and reconstruction of visuals are categorized as interdisciplinary under the heading of "visual literacy" (Öncü Yıldız, 2012). The term *visual literacy* was first used by John Debes, co-founder of the International Visual Literacy Association. Debes (1969) describes visual literacy as a skill that can be improved by using eyes and other sensory organs. Visual literacy skills play a vital role in learning. A person with visual literacy skills can perceive and interpret visual movements, objects, symbols, and other signs in the universe and appreciate and enjoy many visual masterpieces. According to Stokes (2005), visual reading is the set of skills that help people perceive and analyze everything in their environment. For Braden and Hortin (1982), visual literacy is the ability to grasp and use symbols, including the stages of thinking, perceiving, and analyzing various images. Weis (2004) defines visual literacy as the capacity to interpret, use, and create visual tools and suggests using them to improve thinking, decision making, communication, and learning processes. It is a well-known fact that technological images and visuals are embedded in children and teenagers' lives today, which affects the mental perceptions and arousal levels of the new generation (Bleed, 2005). At this point, visual reading is of critical significance as it can attribute meaning to visual messages and produce clear visual messages (Tüzel, 2010). Güleryüz (2004) describes the concept of visual reading as the ability to evaluate a situation and establish a cause-effect relationship. According to Ateş, Sur, and Çelik (2020), visual reading refers to understand and make inferences from any kind of images and sharing those inferences with others. Ünalan (2006) emphasizes that visual literacy is also characterized by grasping and assessing several concepts such as body language and social events as well as visual symbols and images.

Thanks to the technological advancements and innovations, visuals and images can be seen in printing and publishing products such as newspapers, magazines, storybooks, and specifically textbooks. Today, textbooks without images, illustrations, or visuals are considered dull and poor for permanent learning (Ateş et al., 2020). All those recent developments have led educators to seek new methods and practices. Although traditional educational approaches are only concerned with recognizing images, the recent approaches focus on perceptual outcomes and competency gains. However, there are global and local barriers to visual literacy. According to Bleed (2005),

generational differences, technical and political problems, teacher attitudes, and teacher training approaches can be considered among the global challenges. In Turkey, it is still believed that the use of images and visuals would undermine the effects of text-based literacy (Akpınar, 2009).

Students' visual reading skills are measured in international studies like PISA and PIRLS using two different text types: continuous vs. non-continuous. The continuous type includes narrative, expository, and descriptive texts. Non-continuous texts are graphics, tables, maps, and formulas (Güneş, 2013), and they are used to understand, describe, concretize and compare the continuous texts, and apply reflective reading methods on them (Arı & Soylu, 2020).

Visual literacy is increasingly widespread in contemporary education approaches of today. It was integrated into the Turkish education system in 2005 as a new primary education skill (1-5th grades). In the Turkish Lesson Curriculum of 2005, visual reading and visual presentation were discussed as different learning areas that encouraged students to read, understand, and interpret visuals such as images, figures, symbols, pictures, graphics, tables, body language, and natural and social events. It also promoted students' comprehension and logical reasoning skills, categorization competencies, and visualization and concretization of abstract concepts. In the Turkish Lesson Curriculum of 2015 for primary and secondary schools, visual reading was not labeled as a separate area but acknowledged as a part of reading skills (i.e., "*Students use visuals to make sense of what they read*"). Similarly, the visual reading skill was not considered a separate field in the Turkish Lesson Curriculum of 2019. However, it is strongly suggested not to ignore the significance of visual literacy in education programs and curriculums today when students are surrounded by technological and communication tools and visual materials. In their review of the Turkish Lesson Curriculum of 2015, İşeri and Baştuğ (2016) stated that the exclusion of the visual reading and visual presentation skills from the curriculum was an unfavorable outcome for learning. However, about 40 percent of the high school placements test items in recent years are closely related to visual reading and logical reasoning skills. Placement tests, including items that are not available in the curriculum, pose serious problems.

The use of images and visuals facilitates grasping abstract concepts, solving problems that require logical reasoning skills, and visualizing images. Therefore, students should be allowed to examine and read various images to efficiently express themselves, improve comprehension and questioning skills, and learn about their culture and environment. The visual reading process structures and organizes the brain. Students acquire new information and learn to organize and classify the information and concepts and establish relationships (Güneş, 2013). It is also observed that the learning materials enriched with images and visuals improve students' attention span and provide a better understanding of the target content (Bozkurt & Ulucan, 2014). According to Beydoğan (2010), visual thinking also stimulates creativity. Following the visual thinking skills and constructivist approach, students can perform sophisticated mental activities such as analysis and synthesis, interpretation and deduction, and critical and multi-dimensional thinking (Maden & Altunbay, 2016; Sarıkaya, 2017).

Visual reading skills acquisition considerably contributes to Turkish lessons and Turkish teachers, as visual reading is one of the necessary learning skills, such as listening, speaking, reading, writing, and thinking (Güneş, 2013). In this sense, it is suggested to use images and visuals in addition to texts in Turkish lessons; students should be taught how to prepare graphics and tables, and the learning environment should be enriched with activities and practices to improve visual reading skills (Şimşek & Bakır, 2019; Taşgın, İleritürk & Köse, 2018). Hence, students develop logical reasoning skills and keep up with this age's requirements, which refers to the fulfillment of life-oriented education goals (Arı & Soylu, 2020).

Several studies in the literature addressed teachers' knowledge, perceptions, and attitudes towards visual reading, their proficiency in visual literacy, and the challenges they encounter in visual literacy practices (Akpınar, 2009; Ateş et al., 2020; Balun, 2008; Bozkurt, 2011; Kuru, 2008; Özyurt Aydemir, 2016). The findings revealed that Turkish lesson teachers had positive attitudes towards visual reading but did not feel competent in this field and did not receive any visual reading training, so they preferred a text-based instruction approach without visual reading practices. A few studies also investigated the effects of visual literacy activities and practices on visual reading skill

acquisition and indicated positive outcomes on students' visual reading skills (Balun, 2008; Çelik, 2017; Doğan, 2015; Erem Özdemir, 2015; Kuru, 2008; Örs & Baş, 2018). In their study, Stokes (2005) found that using visuals positively affected learning. Similarly, White (1987) emphasized that images and visuals contribute to students' intellectual development. Some studies demonstrated the positive effects of visual reading skills on academic performance in Turkish lessons (Arı & Soylu, 2020; Arıkan, 2009; Çam, 2006; Dönmez, 2013). In their studies, Baş and Kardaş (2014), Beydoğan (2010), Hibbing and Rankin Erickson (2003) stressed the favorable effects of visual reading skills on comprehension. Some researchers underlined insufficient number and quality of visual literacy activities in the textbooks (Aydemir, 2016; Çam Aktaş, 2010; Çarkıt, 2019; Deniz, Tarakçı & Karagöl, 2019; Göçer & Tabak, 2012). Avcı and Çelik (2018) conducted an experimental study on the extent of students' visual literacy skills. Similarly, Lieury (1995) carried out a laboratory study with a group of adults. He showed 2500 images to them and asked how many they remembered on different days and times. It was concluded that the participants remembered 90% of the images. However, Bleed (2005) found that the only use of visuals reduced reading rates and vocabulary size. For instance, the vocabulary of a 14-year-old child in the USA was 25,000 in 1950, but it dropped to 10,000 words in 1999. In their studies, Arı and Soylu (2020), Çam (2006), Çelik (2017), Erem Özdemir (2015) and Semizoğlu (2013) proved that students' visual reading skills varied by certain variables.

It is crucial to determine students' patterns of perception, interpretation, and inference in the school environment and daily lives to improve their visual reading skills and identify their weaknesses. The study's main goal was to investigate 8th-grade students' visual reading and logical reasoning performances by certain variables such as gender, the daily number of Turkish test items, Turkish lesson performance, socioeconomic status, daily internet and social media use, and the monthly number of books. No study in the literature addressed the relationships between high school placement tests (e.g., LGS), assessment tests and written exams, and visual reading and logical reasoning skills of 8th-grade students. However, visual literacy skills are included in the assessment and examination system today, so a description of 8th-grade students' success in such test items has become even more critical. The study aims to examine the 8th-grade students' performances in visual reading and logical reasoning items by different variables and contribute to the literature to increase student achievement levels, describe the possible problems, and guide future practitioners and researchers. Since education programs and curriculums are always open to improvement, describing students' performances in visual reading and logical reasoning also contributes to program development studies and future research. In addition to the primary research problem, "What are 8th grade students' levels in visual reading and logical reasoning test items?", the researchers also sought answers to the following sub-problems:

1. Do 8th-grade students' performances in visual reading and logical reasoning performance differ by gender?

2. Do 8th-grade students' performances in visual reading and logical reasoning performance differ by Turkish lesson academic performance?

3. Do 8th-grade students' performances in visual reading and logical reasoning performance differ by the daily number of Turkish test items?

4. Do 8th-grade students' performances in visual reading and logical reasoning performance differ by socioeconomic status?

5. Do 8th-grade students' performances in visual reading and logical reasoning performance differ by daily internet and social media use?

6. Do 8th-grade students' performances in visual reading and logical reasoning performance differ by the monthly number of books?

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Method
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Research Model

It is a quantitative and non-experimental study using a correlational design to determine whether there is a relationship between two or more variables, measure the degree of relationship, and make inferences. In those studies, a researcher does not manipulate the variables or speculate on a cause-effect relationship but checks the interrelations between variables (Creswell, 2012/2019; Fraenkel, Wallen, & Hyun, 2012; McMillan & Schumacher, 2010). The researcher used an "explanatory design" to explain and interpret interrelations between two or more variables by collecting data at one time (Creswell, 2012/2019). The research explained and interpreted the interrelations between the variables.

Data Collection Tools

The data collection tools are presented below.

Personal Information Form

It consists of 6 questions about students' gender, the monthly income, the Turkish lesson performance, the daily number of Turkish test items they solved, the monthly number of books they read, and the time they spent on the internet and social media daily.

Achievement Test

Before the researchers developed an achievement test with 20 multiple-choice questions to measure students' visual reading and logical reasoning performances, they reviewed the 8th-grade attainments in the Turkish Lesson Curriculum of 2020-2021. Then, they prepared the achievement test items considering the related eight attainments in the curriculum (T.8.3.3., T.8.3.14., T.8.3.23., T.8.3.25., T.8.3.27., T.8.3.29., T.8.3.32., T.8.3.35.) and themes in the 8th Grade Turkish Textbooks (Virtues, The War of Independence and Atatürk, Science and Technology, Individual and Society, Time and Space, Our National Culture, Nature and the Universe, Citizenship). The visual reading and logical reasoning items were prepared with images such as posters, photographs/pictures, graphics, maps/sketches, signs, cartoons, tables, and emojis suitable for 8th-grade students and were supported by discontinuous texts. The test items aimed to evaluate six sophisticated intellectual skills (i.e., recognizing information and relationships, making comparisons and classifications, and the steps of comprehension, assessment, and interpretation). The first version of the 50-item test was examined by one assessment and evaluation expert, four Turkish lesson teachers with ten years seniority, and one visual art teacher to check the validity. Those experts were asked to evaluate the items considering the achievement and theme tables and determine the best 20 items that met the criteria. There were 20 items in the final version, and the number of correct options was equal. A pilot study was carried out with 53 students from the 15th of July Martyrs Imam Hatip Secondary School in Erzurum to check the instrument's reliability. The achievement test was administered online in one class hour. The pilot study data were analyzed using a statistical package program, and to the KR 20 reliability analysis results, it was 0.802, which proved the test's reliability as it was above 0.70 (Tezbaşaran, 1996). The item analysis was also completed, and item discrimination and difficulty levels were calculated for validity. Item discrimination was followed considering specific points: the items with a zero or negative discrimination index cannot be included in the test. If it is 0.40 or higher, the item is perfect. If it is between 0.30-0.40, it is good and can be used. If it is between 0.20-0.30, it can still be used or changed in case of necessity. If it is less than 0.20, the item cannot be used and should be revised (Turgut, 1992). The standard item difficulty index is set at 0.50 for achievement tests, which indicates a medium-level difficulty. Although item difficulty indices in a test are different, the standard mean should be close to 0.50. (Çepni et al., 2008). Table 1 shows the values of achievement test items.

Table 1

Item Analysis Results

Items	Difficulty Index	Discrimination Index
I 1	0.25	0.43
I 2	0.33	0.48
I 3	0.38	0.54
I 4	0.27	0.41
I 5	0.41	0.48
I 6	0.38	0.5
I 7	0.32	0.59
I 8	0.26	0.7
I 9	0.4	0.54
I 10	0.31	0.63
I 11	0.39	0.44
I 12	0.31	0.69
I 13	0.37	0.56
I 14	0.35	0.56
I 15	0.41	0.5
I 16	0.37	0.56
I 17	0.18	0.5
I 18	0.46	0.30
I 19	0.29	0.74
I 20	0.4	0.52
Mean	0.34	0.54

The item analysis results showed that the mean difficulty index was 0.34, and the mean discrimination index was 0.54. Since all items' discrimination index was 0.30 and above, no item was removed from the test. As a result of expert opinions and item analysis, it was concluded that the validity of the achievement test was high.

Research and Sample

The research universe consisted of 8th-grade students studying at public secondary schools. The sample comprised 200 8th grade students studying in three public secondary schools in the Palandöken district of Erzurum. In order for the families to have similar economic levels, students studying in public schools have been included in the study. Of the volunteer participant students selected using the convenience sampling method, 112 (55.7%) were girls, and 88 (44.3%) were boys. The study was carried out with the permission of the Erzurum Governorship and the Provincial Directorate of National Education.

Data Analysis

The data analysis was conducted using a statistical package program and descriptive analysis methods. Since the data did not have a normal distribution, the data were analyzed using the Mann-Whitney U test and the Spearman Correlation Analysis.

Results

The study results are explained in the section below.

Researchers administered Kolmogorov-Smirnov and Shapiro-Wilk tests to determine whether the data had a parametric or nonparametric distribution.

Table 2

Normality Test Results

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistics	**n**	**p**	**Statistics**	**n**	**p**
Achievement test score	.127	200	.000	.951	200	.000

(p<0.05)

As seen in Table 2, the data did not show a normal distribution (p<0.05). The coefficient of skewness is -0.610 and the coefficient of kurtosis is -0.346. According to the q-q plot and histogram graphics analysis, the graph was skewed to the left and did not show normality. Since all items' discrimination index was 0.30 and above, no item was removed from the test. The Mann-Whitney U test was applied to determine differences by gender as the data did not have a normal distribution, and Spearman Correlation Analysis was used to describe the relationships between variables.

Table 3

Mann-Whitney U Test Results by Gender

	Gender	N	Mean Rank	Total Rank	u	z	p
Achievement test score	Girl	112	111.92	13535.50	3648.500	-3.159	.002*
	Boy	88	85.96	7564.50			

(p<0.05)

Table 4

Correlation Analysis Results regarding the Students' Test Scores and Turkish Lesson Performance

	Achievement score	Turkish lesson performance
Achievement test score	1	0.440**
Turkish lesson performance	0.440**	1

** p < 0.01

There was a significant relationship between the students' visual reading achievement test scores and Turkish lesson grades (p <0.05). As stated in the literature, the relationship between variables is "weak" if it is between +0.35 and -0.35, it is "medium" if it is between +0.35 and +0.65 or between -0.35 and -0.65, and it is "strong" if it is between +0.65 and 1.00 or between -1.00 and -0.65 (McMillan & Schumacher, 2010). In this sense, there was a moderately positive correlation between the two variables (r = 0.440).

Table 5

Correlation Analysis Results regarding the Students' Test Scores and the Daily Number of Turkish Test Items They Solved

	Achievement test score	Daily number of Turkish test items
Achievement test score	1	0.312**
Daily number of Turkish test items	0.312**	1

** p < 0.01

According to Table 5, there was a significant relationship between the students' visual reading achievement test scores and the daily number of Turkish test items (p <0.05). A weak but positive correlation was found between the two variables (r = 0.312).

Table 6

Correlation Analysis Results regarding the Students' Test Scores and the Socioeconomic Status

	Achievement score	The socioeconomic status of the family
Achievement test score	1	0.129
The socioeconomic status	0.129	1

$p < 0.05$

As shown in Table 6, there was no statistically significant relationship between students' visual reading achievement test scores and their socioeconomic status ($p < 0.05$).

Table 7

Correlation Analysis Results regarding the Students' Test Scores and Daily Social Media Use

	Achievement score	Daily social media use
Achievement test score	1	-0.140*
Daily social media use	-0.140*	1

* $p < 0.05$

There was a significant relationship between students' visual reading achievement test scores and social media use ($p < 0.05$). A weakly negative relationship was measured between the two variables ($r = -0.140$).

Table 8

Correlation Analysis Results regarding the Students' Test Scores and the Monthly Number of Books They Read

	Achievement score	The Monthly Number of books
Achievement test score	1	-0.36
The monthly number of books	-0.36	1

$p < 0.05$

According to Table 8, there was no statistically significant relationship between the students' visual reading achievement test scores and the monthly number of books they read ($p < 0.05$).

Discussion, Conclusion and Recommendations

This study investigated the relationships between 8th-grade students' success in visual reading and logical reasoning test scores and particular variables. The results were discussed with similar research findings in the literature.

The achievement test was applied to 200 8th grade students, and the average of correct answers was approximately 66%, which indicates a medium level of success. In their study with 203 students, Arı and Soylu (2020) found that the average of correct answers in the visual reading test was approximately 77%, and the students had fine visual reading skills. Similarly, Sarıkaya (2018) emphasized that students had good and promising visual reading skills.

There was a statistically significant difference in girls' visual reading achievement test scores. In their study with 1053 5th grade students from private and public schools, Çam (2006) also found similar positive differences in visual reading test scores in favor of female students. Hekimoğlu (2016) also determined a statistically significant difference in students' visual literacy achievements by gender. Female students had a higher visual literacy level than male students. In their study with 414 fifth-grade students, Semizoğlu (2013) observed a significant difference in visual reading tests in favor of female students. However, in their study of Karaçam (2020) and Sarıkaya (2008) measured no significant difference in students' visual literacy level by gender.

Similarly, in their studies with 5th-grade students, Arı and Soylu (2020) found no relationship between visual literacy and gender. Çelik (2017) carried out a similar study with 7th-grade students and found no statistically significant difference in visual reading performance by gender. Since those

studies in the literature were carried out with different samples and times, the differences in visual reading performance by gender are acceptable outcomes.

There was a moderately positive correlation between the participants' visual reading test scores and Turkish lesson achievement scores. Thus, it can be inferred that as the students' visual reading skills improve, their Turkish lesson achievement scores increase, which overlaps with the findings of Çam (2006). and Arı and Soylu (2020). Çam (2006) found a high level of significance between 5th-grade students' visual reading scores and Turkish lesson performance in their research. Similarly, Arı and Soylu (2020) revealed a moderately significant relationship between Turkish lesson performance and visual reading scores. It is known that students' attention span and comprehension performance increase thanks to visual reading (Bozkurt & Ulucan, 2014). Students with advanced visual reading skills can easily understand long paragraphs in Turkish lessons and recognize implicit meanings, cause-effect relationships, and metaphors.

There was a weak but positive correlation between the students' visual reading achievement test scores and the daily number of Turkish test items. In this sense, as the daily number of Turkish tests rises, students' visual reading skills improve. Visual reading help students learn to organize and categorize information, establish relationships, and solve problems efficiently (Güneş, 2013). The students who frequently solve similar questions get used to such tests and easily grasp the logic of testing and details.

No significant relationship was found between the participants' visual reading achievement test scores and their socioeconomic status, which might stem from the fact that they were from similar socioeconomic backgrounds. However, there are different findings in the literature. For instance, in their studies of Çam (2006), Semizoğlu (2013), Arı and Soylu (2020) found a significant relationship between the visual reading mean scores and socioeconomic status. The visual reading scores of students from high-income families were significantly high. Hekimoğlu (2016) emphasized that private school students' visual reading performances were higher than public school students.

There was a statistically significant difference between the students' visual reading achievement test scores and their time on social media. A weak and negative relationship was found between the two variables, which might indicate that as the daily duration of social media use increases, visual reading performance declines. Today, there is no time and place limitation for access to social media, and students become addicted to social media as the time they spend online increases (Bilgilier, 2018), which is thought to result in loss of control, lack of reasoning, and visual perception skills, and thus a decline in academic success. There are various findings regarding the use of social media in the literature. For example, Hekimoğlu (2016) found a significant relationship between students' visual literacy performance and computer use. Those who said, "I never use the Internet" and "I use it for over four hours" had lower visual literacy performance than those who said "I use less than an hour daily" and "I use it for one to three hours daily.". However, in their studies, Baş and Kardaş (2014), Çam (2006), and Karaçam (2020) concluded different findings indicating that the students' visual reading skills improved as the type and use of communication tools in their homes increased.

There was no significant relationship between the students' visual reading achievement test scores and the monthly number of books they read, which might stem from the lack of visuals and images in the books. It is known that books with illustrations promote students' visual skills (Doğan, 2015). Çam (2006) found that students who regularly read magazines and newspapers had sophisticated visual reading skills.

This study attempted to determine the interrelations between 8th-grade students' performance in visual reading and logical reasoning questioning, and specific variables. The study findings and results were discussed above. It was concluded that the students showed an average performance in visual reading tests, so they should be improved. The visual reading success was associated with students' performances in Turkish lessons and the daily number of Turkish test items they solved. Therefore, it is suggested to do more visual reading and logical reasoning activities in Turkish lessons, prepare Turkish exam items to improve this skill and include more visual reading practices in the Turkish Lesson Curriculum.

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A Review of Graduate Theses Conducted in Turkey
on Internet Addiction[*]

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Abstract

Internet can affect the human life in both positive and negative way. One of these effects is an internet addiction. Several studies have been done relating to Internet addiction**.** Examination of the studies are important for revealing which topics have been studied more. Therefore, the study was undertaken to examine the theses made associated with Internet addiction. This study was conducted through document analysis method. A search of the National Thesis Center website was conducted using the search term Internet addiction in all fields and in all thesis types. 279 theses were examined which archived at the databases. According to the findings; adolescents for the sample type were used in 53.1% of the thesis. In the theses about internet addiction, the variables that are most related to internet addiction are; depression, anxiety, attachment, gender, internet usage time. The variables with the most significant difference with internet addiction are gender, class level, income. Repeating this study at regular intervals would make it possible to assess the progress of studies into Internet addiction over time.

Keywords: Addiction, behavioral addiction, excessive internet use, thesis

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Türkiye'de İnternet Bağımlılığı ile İlgili Yapılan Lisansüstü Tezlerin İncelenmesi[*]

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Öz

İnternet insan yaşamını olumlu ve olumsuz olarak etkileyebilmektedir. Bu etkilerden biri internet bağımlılığıdır. İnternet bağımlılığı ile ilgili çeşitli çalışmalar yapılmaktadır. Yapılan çalışmaların incelenmesi, hangi konular üzerinde daha fazla çalışıldığının belirlenmesi açısından önem taşımaktadır. Bu nedenle, çalışmada internet bağımlılığıyla ilgili lisansüstü düzeyde yapılan tezlerin incelenmesi amaçlanmıştır. Bu çalışma nitel araştırma yöntemlerinden doküman analizi ile yapılmıştır. Ulusal Tez Merkezi web sitesinde, tüm alanlarda ve tüm tez türlerinde İnternet bağımlılığı arama terimi kullanılarak araştırma yapılmıştır. Veri tabanlarında arşivlenen 279 tez incelemeye alınmıştır. İnternet bağımlılığı ile ilgili lisansüstü düzeyde yapılmış tezlerin çalışma gruplarının %53,1'i ergenlerden oluşmaktadır. İnternet bağımlılığı ile ilgili yapılmış tezlerde, internet bağımlılığı ile en fazla ilişkili bulunan değişkenler; depresyon, anksiyete, bağlanma, cinsiyet ve internet kullanım süresidir. İnternet bağımlılığı ile en fazla anlamlı farklılık bulunan değişkenler; cinsiyet, sınıf düzeyi ve gelirdir. Bu çalışmayı düzenli aralıklarla tekrarlamak, zaman içinde internet bağımlılığı konusundaki ilerlemeleri değerlendirmeyi mümkün kılacaktır.

Anahtar Sözcükler: Aşırı internet kullanımı, bağımlılık, davranışsal bağımlılık, tezler

Introduction

The Internet, which connects devices like computers, tablets and phones with one another, and can be a driver of social change as a global means of communication, has rapidly become more widespread in recent years. The Internet is an important means of communication and information-sharing. It offers many activities that have changed many aspects of daily life, as well as making it easier (Yellowlees and Marks, 2007). That said, it has also led to some problems, foremost among them being Internet addiction. Previous debates about Internet addiction revolved around the issue of whether or not non-substance addictions were possible, but it is now recognized as a behavioral addiction, and was included in Section III of the The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as Internet Gaming Disorder (IGD) in 2013, with further research recommended for the inclusion of IGD in the main section of the book (American Psychiatric Association [APA], 2013). In 2018, World Health Organization (WHO) included Gaming Disorder in ICD-11 (WHO, 2019).

Internet addiction is considered to be a behavioral addiction. Behavioral addictions have been associated with social and personal problems. Internet addiction has been defined as a clinical disorder that gives rise to relationship, professional and social problems (Young, 2007). The rapid spread of the Internet has resulted in problems related to pathological over-use. A decline in performance at work or in school and health issues related to the over-use of the Internet are indicators of Internet addiction (Öztürk, Odabaşıoğlu, Eraslan, Genç and Kalyoncu, 2007). Epidemiological studies of Internet addiction have shown that the prevalence of Internet addiction is in the range of 6–14% (Black, Belsare and Schlosser, 1999; Doğan, 2013; Sherer, 1997). It has also been found that 38% of people with Internet addiction have additional addictions, such as gambling or sex addictions (Arısoy, 2009).

As a source of information, the Internet is a critical tool both for researchers and for society at large. The Internet, Internet use and the problems associated with the Internet have been studied in many disciplines (Doğan, 2013), and the studies of Internet addiction reflect this diversity. Reviewing the studies conducted in a given field is important, in that it can help identify the level and extent of our knowledge in the field, and can clarify which topics are the most studied (Kozak, 2000).

According to Internet World Stats (IWS) 2019 data, Turkey ranks third in internet usage in Europe (Russia 16%, Germany 10.9%, Turkey 9.5%, United Kingdom 8.7%, France 8.3%) (IWS, 2019). Internet use is spreading rapidly in Turkey. The Internet creates many problems related to gambling, betting, online shopping, cyber-crime, and last but not least, Internet addiction. Many studies are being conducted in different parts of the world on the misuse and negative effects of the Internet, however those conducted in Turkey and their results provide little practical guidance. There have been academic studies conducted in Turkey examining diagnosis and treatment interventions, as well as preventive healthcare policies, while there is a lack of experimental studies into treatments, and a further lack of studies identifying policies that may protect and improve health. To address this shortfall, the present study examines previous graduate theses on the subject of Internet addiction, aiming to contribute to literature by answering the questions of whether these theses complement or repeat one another, which topics and concepts related to Internet addiction are studied, and whether the same methods are used in the examination of similar concepts.

There is an increasing number of studies conducted in Turkey on the subject of Internet addiction. Conducting an in-depth review of studies on Internet addiction would serve to draw attention to the issue so that the necessary measures can be taken. This study aims to evaluate the graduate theses conducted to date in Turkey on Internet addiction, which is considered to be a public health issue, and will seek answers to the following questions:

Regarding the theses conducted in Turkey on Internet addiction:

1) What is the distribution of the theses with regards to the type of thesis, the type of graduate school, the language, the research design, the participants and the regions in which they were conducted?
2) What are the findings regarding the prevalence of Internet addiction?
3) Which terms are the most common in the thesis titles?

4) Which variables are found to be associated/unassociated with, and vary/do not vary significantly with Internet addiction?
5) What are the risk factors for Internet addiction, and which groups are most at risk?
6) Which variables increase or decrease with higher levels of Internet addiction/Internet use?

Method

Research Design

This study makes use of a document analysis, as a qualitative research method. A document analysis involves an examination of written materials containing information about the target phenomena (Yıldırım and Şimşek, 2011). A document analysis can be used as a standalone research method in cases where interviews or observations are not possible (Şimşek et al., 2008). The theses reviewed in the study were selected using a criterion sampling method, which is a non-random and purposive sampling approach. Purposive sampling allows the researcher to select cases that are rich in information, given the purposes of the study, allowing an in-depth examination. In criterion sampling, the units that meet the criteria for inclusion are included in the sample. Criterion sampling is also used when an in-depth follow-up study is planned based on the results of a quantitative study (Büyüköztürk, Çakmak, Akgün, Karadeniz and Demirel, 2015).

Research Sample

The study population were graduate theses conducted in Turkey on the subject of Internet addiction. The sampling criterion used was that the theses had to be graduate theses on Internet addiction, and archived by the National Thesis Center (NTC) of the Turkish Council of Higher Education. For the in-depth analysis, a total of 279 theses between 2003-2019 on Internet addiction identified in the NTC archive were included in the study. Only the abstracts were included in the analysis, as time limitations prevented scrutiny of the entire texts of the theses.

Research Procedure

A search of the NTC website was conducted between August 30 and November 2, 2019 using the search term *"Internet bağımlılığı"* ("Internet addiction" in Turkish) in all fields (title, subject, index terms and abstract) and in all thesis types. The search turned up a total of 279 master's, PhD and medical specialty theses on Internet addiction.

Data Analysis and Process

The theses included in the study were read by the researchers and analyzed in terms of date of publication, type of publication, type of graduate school, research design, language and region. The theses were also examined in terms of reported prevalence of Internet addiction, the most frequent words in the titles, variables found to be associated/unassociated with, and varying/ not varying significantly with Internet addiction, the risk factors of Internet addiction and the at-risk groups, and variables found to increase or decrease with higher levels of Internet addiction/Internet use. The theses included in the study were organized on the basis of the criteria set, the data was defined and coded, and frequency distributions were created.

Results

The findings of the present study, being a review of graduate theses written in Turkey on Internet addiction, are reported in the following tables and graphs.
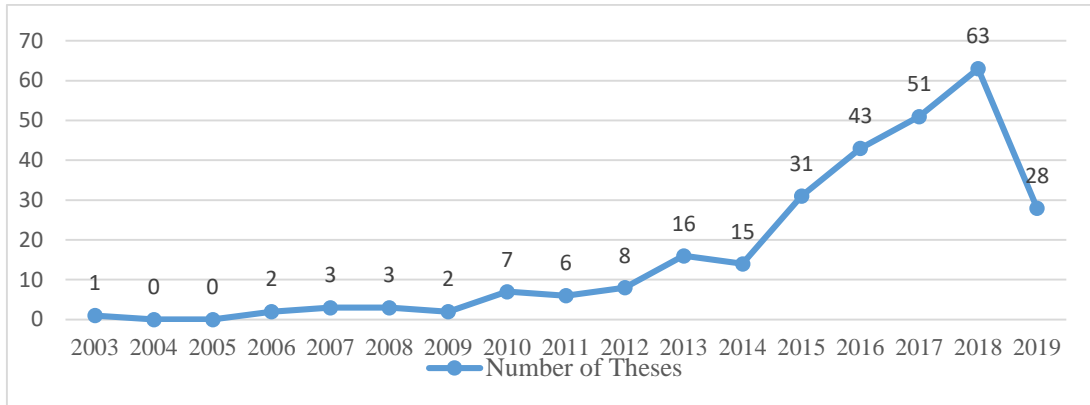
Figure 1. *Publication Years of Theses on Internet Addiction*

Figure 1 shows that the number of graduate theses on Internet addiction has increased over time. The first thesis on Internet addiction was written in 2003. Theses on Internet addiction continue to be prepared.

Table 1

Frequency and Percentage Distributions Theses on Internet Addiction by Type of Thesis, Type of Graduate School, Research Design, Language and Region

	f	**%**
Type of Thesis		
PhD	18	6.5
Medical specialty	52	18.6
Master's	209	74.9
Type of Graduate School		
Social sciences	129	46.2
Educational sciences	57	20.4
Faculty of medicine/training and research hospital	52	18.7
Health sciences	28	10.1
Natural sciences	8	2.8
Other (forensic science, sports science)	5	1.8
Research Design		
Quantitative	266	95.4
Other (qualitative, mixed, unspecified)	13	4.6
Language		
Turkish	274	98.2
English	5	1.8
Region		
Mediterranean	21	7.6
Eastern Anatolia	25	9
Aegean	29	10.4
Southeastern Anatolia	9	3.2
Central Anatolia	52	18.6
Marmara	131	46.9
Black Sea	10	3.6
Other/Mixed	2	0.7
Total	**279**	**100**

Table 1 shows that a total of 279 graduate thesis were written on Internet addiction over the time period covered by this study. Of these, 74.9% were master's theses. Of the graduate theses on Internet addiction, 46.2% were written in social sciences graduate schools, 95.4% used quantitative designs, 98.2% were in Turkish and 46.9% were conducted in the Marmara region.

Table 2

Frequency and Percentage Distributions of Theses on Internet Addiction by Participants

	f	**%**
Adolescents	148	53.1
College students	74	26.5
Adults	34	12.2
Children, children and adolescents, adolescents and college students	9	3.2
Unspecified or no participants	14	5
Total	**279**	**100**

Table 2 shows that participants were adolescents in 53.1% of the graduate theses on Internet addition, college students in 26.5% of the theses, adults in 12.2% of the theses (public servants, parents, office workers, academicians, teachers, healthcare providers, law enforcement officials, working women, married couples, etc.), children, children and adolescents, and adolescents and college students in 3.2% of the theses, and unspecified in 5% of the theses.

Table 3

Variables Found to be Associated with Internet Addiction

	Internal Variables		**External Variables**
	Individual		Smartphone use
	Type of attachment/Attachment/Attachment style/Maternal attachment style/Insecure attachment		Number of computers
			Online sex
	Self-respect/Low self-respect/Self-esteem		Online gambling
	Conscious awareness		Digital game addiction/Online gaming/Gaming addiction
	Perceived information technology self-efficacy		
	Obsession with sexual behaviors, compulsive sexual behavior		Having computers at home
			Time spent on Facebook
	ADHD/ADHD traits/Impulsivity		Easy access to the Internet
	Depression		Duration of Internet use/Frequency
	Emotional intelligence		of Internet use/Hours spent a day on
	Perceived social support by parents/Perceived social support		the Internet/Uninterrupted time spent on the Internet
	Adolescent rebelliousness/Adolescent problems and coping methods/Behavioral disorder symptoms/Strengths and difficulties		Place of access to the Internet Age of introduction to the Internet/Age of first Internet use
	Personality types/Personality traits		Social media usage habits
Individual	Neuroticism	Objects	
	Autistic temperament traits/Temperament traits		
	Sense of positive control		
	Psychological autonomy/Social-emotional health/Psychological robustness/Psychological resilience		
	Psychological symptoms/Mental disorders		
	Rumination level		
	Social anxiety/Anxiety		
	Social phobia		
	Fear of missing out in social environments		
	Feelings of guilt and shame		
	Constant anger/Aggression		

| Physiological | Neck pain/ Physical complaints (e.g. pain in back, lower back, head, hands, wrists, arms, eyes)
Physical activity
Smoking
Sleep quality/Insomnia/Daytime sleepiness
Body weight
Eating habits
Exhaustion | Relationships/Skills | Peer bullying/Cyber bullying
Dissociative experiences
Parental attitudes/Dysfunctional family
Perceived parental psychological control
Parental relations/Peer relations/Loneliness/ Having a romantic partner
Marital accord
Negative daily life events
Communication skills/Negative social skills/ Negative social behaviors
Problem solving skills/Conflict resolution approach/ Dysfunctional ways of coping/ The need to think and express feelings
Quality of life/Low quality of life/Life satisfaction/ Satisfaction with values and life
Time management skills |
| Other | Academic achievement/Low academic achievement/Grades/ Grade point average/Academic procrastination
Confidential information management
Knowledge of cyber crimes
Internet enjoyment
Cyber victimization
Purpose of Internet use | Demographic | Family structure/Divorced parents/Parents alive
Father's educational attainment
Gender
Occupation/Parental occupation
School level/Grade/Type of school
Age
High income/Income level |

Table 3 presents the variables found to be associated with Internet addiction, divided into the two categories of internal and external variables. The internal variables were further divided into individual, physiological and other subcategories; and the external variables into objects, relationships/skills, and demographics subcategories.

Table 4

Variables not Found to be Associated with Internet Addiction

	Internal Variables		**External Variables**
Individual	Level of perceived social support Attachment styles/Paternal attachment style Self-esteem Self-sufficiency/Level of perceived social competence Mental issues/Depression Shyness	Objects	Number of books at home Duration/frequency of Internet use
Physiological	Body mass index Nicotine addiction Obesity Smoking/drinking/substance use	Relationships/Skills	Parental attitudes Sensitivity to cyber-bullying Loneliness Life satisfaction
Other	Academic performance Level of physical activity Being a licensed athlete School achievement	Demographic	Parental educational attainment Monthly income/SES Gender Number of siblings Grade Age

Table 4 presents the variables not found to be associated with Internet addiction, divided into the two categories of internal and external variables. Internal variables were further divided into individual, physiological and other subcategories; and external variables into objects, relationships/skills, and demographics subcategories.

Table 5

Variables Found to Vary Significantly with Internet Addiction

	Internal Variables		**External Variables**
Individual	Satisfaction with peer relations Perceived parental attitudes Attachment style Anxiety Feelings of loneliness	Objects	Ownership of a computer/Having a computer at home/Having access to the Internet Purpose of Internet use Duration/frequency of Internet use/Time spent per day on the Internet Type of games played Accessing gaming and educational web sites Social media usage habits/Social media use/Frequency of Facebook use/Having a social media account/The most frequently used social network
Physiological	Headaches, blurred vision, hearing difficulties Body mass index Habitual consumption of fast-food Smoking, drinking	Relationships / Skills	Spending time with family Family relations Relations with teachers Romantic relationship
Other	Grades/ academic achievement Perceived academic achievement Mother's level of participation in sports Exercise	Demographic	Family income level/Monthly income Mother's level of educational attainment/Parental educational attainment Father's occupation/ Father's age Gender Marital status Type of school/Grade/Major/Educational attainment Age

Table 5 presents variables found to vary significantly with Internet addiction, divided into the two categories of internal and external variables. The internal variables were further divided into individual, physiological and other subcategories; and the external variables into objects, relationships/skills, and demographics subcategories.

Table 6 presents the variables found not to vary significantly with Internet addiction, divided into the two categories of internal and external variables. The internal variables were further divided into individual, physiological and other subcategories; and the external variables into the objects, relationships/skills, and demographics subcategories.

The prevalence of Internet addiction reported in graduate theses written in Turkey on Internet addiction varies between 0.2% and 25.8%. The prevalence of Internet and social media addiction was reported to be 21.8%, risky/addictive Internet use to be 20%, problematic Internet use to vary between 2.1% and 7.1%, pathological Internet use to vary between 0.66% and 1.4%, gaming addiction to be 3%, and online gaming addiction to be 1.8%. Some of the studies, on the other hand, identified no participants with Internet addiction or pathological Internet use.

Table 6

Variables Found not to Vary Significantly with Internet Addiction

	Internal Variables		External Variables
Individual	Attachment styles ADHD types	**Objects**	Time spent a day on the Internet Setting in which social media is used Having a computer at home
Physiological	Smoking Perceived weight issues	**Relationships/Skills**	Parental attitudes Supervision of internet use
Other	Academic procrastination Academic achievement Reason for exercising Purpose of Internet use	**Demographic**	Family structure/Parents together/Marital status/Relationship status Parental educational attainment Gender Parents' occupation Parents'/Mother's employment status Educational attainment Income level Employment status Number of siblings School level/Grade Age

Theses on Internet addiction identify adolescents with ADHD, people with ADHD, obese individuals and men as the groups at most risk. The risk factors related to Internet addiction, on the other hand, included parental attitudes, weak social responsiveness, Internet use from an early age onwards, consumption of energy drinks, being diagnosed with a psychiatric condition, having an Internet connection at home, divorced parents, using a computer to access the Internet, first Internet use at age 10 or younger, using the Internet within one hour of waking up in the morning, spending an average of 2 hours or more on the Internet on a daily basis, not limiting one's Internet use and the presence of social phobia. The theses examined report that higher levels of Internet use are associated with lower levels of self-esteem and emotional intelligence, and with higher levels of pathological Internet use, social anxiety, loneliness, social phobia, depression, perceived social loafing and educational attainment. The most common words and phrases encountered in the titles of theses on Internet addiction were depression, loneliness, social support, self-esteem, obesity, adolescents, students, parental attitudes, attention deficit, academic (achievement/ motivation/ procrastination/ performance), attachment, life, gaming and prevalence.

Higher levels of Internet addiction are associated with higher levels of tendency toward violence, anger, aggression, hostility, eating addiction, depression, depressive tendencies, loneliness and psychological resilience, and with lower levels of academic achievement, life satisfaction and self-esteem. Moreover, higher levels of Internet addiction are associated with lower scores on the exploitativeness/entitlement dimension of narcissism, and higher scores on the leadership/authority dimension. Higher levels of problematic Internet use are associated with lower levels of problem-solving skills, perceptions and the adaptability of the ego functions. Higher levels of Internet addiction are associated with higher levels of parental educational attainment, the variety of games played on the Internet, loneliness, household income and social appearance anxiety, and with lower levels of physical activity. Moreover, higher levels of Internet addiction were associated with younger age and lower levels of academic achievement.

Discussion, Conclusion and Recommendations

There is an increasing number of studies conducted in Turkey on the subject of Internet addiction. Conducting studies on Internet addiction would serve to draw attention to the issue so that the necessary measures can be taken. This study aims to evaluate the graduate theses conducted to date in Turkey on Internet addiction. This study makes use of a document analysis, as a qualitative research method. The sampling criterion used was that the theses had to be graduate theses on Internet addiction, and archived by the NTC of the Turkish Council of Higher Education. For the in-depth analysis, a total of 279 theses on Internet addiction identified in the NTC archive were included in the study. Only the abstracts were included in the analysis, as time limitations prevented scrutiny of the entire texts of the theses. A search of the NTC website was conducted using the search term "Internet bağımlılığı" in all fields (title, subject, index terms and abstract) and in all thesis types. The search turned up a total of 279 master's, PhD and medical specialty theses on Internet addiction.

A total of 279 theses written on Internet addiction were examined, of which 74.9% were master's theses, 46% were written in graduate schools of social sciences, 46.9% were conducted in the Marmara region and 95.4% used quantitative research methods. The findings revealed an increase in the number of theses written over the years. The smaller number of theses on Internet addiction in 2019 when compared to 2017 and 2018 may be attributed to the lag between the completion of a thesis and its inclusion in the NTC database, which can take some time.

Moreover, given that most theses on Internet addiction were master's theses written by young researchers, a larger number of studies on the topic can be expected in the future. Internet addiction relates to multiple academic disciplines, but the treatment of the addiction is of particular concern in health sciences. That said, there were few medical specialty theses on Internet addiction, indicating that more studies are needed in health-related fields, including medical specialty theses. The number of PhD dissertations on Internet addiction was also small when compared to the other types of theses, which may be attributed to the fact that PhD programs take longer to complete, and there may be ongoing researches at the time of the writing of this article. As is the case with medical specialty theses, more studies on Internet addiction at a PhD level are needed. Moreover, according to NTC data, a much greater number of master's theses were completed between the years 1983 and 2012 compared to PhD dissertations and medical specialty theses. For example, there were a total of 25,813 master's theses completed in 2012, compared to 4,506 PhD dissertations and 4,228 medical specialty theses (Çetinsaya, 2014). This may be another reason why most graduate theses on Internet addiction are master's theses.

The theses on Internet addiction were written to fulfill degree requirements in a large number of programs in social, natural, educational and health sciences. This finding shows that "Internet addiction" is a multi-dimensional topic that concerns many disciplines, and one that can be approached from different perspectives. A plurality of these theses were written in social sciences programs, most likely because "Internet addiction" is a natural area of study for the behavioral sciences, which deal with human behavior and social phenomena. Over the years, many different concepts have been used to describe Internet addiction, and many studies have been conducted in international literature diagnosing Internet addiction, and developing criteria for diagnosis (APA, 2013; WHO, 2019; Young, 1999). Furthermore, many relational and experimental studies have been conducted at the stage of identifying criteria for diagnosis, as well as at later stages, exploring the causes and symptoms of Internet addiction. Studies providing definitions of Internet addiction, and identifying the symptoms, causes and diagnosis of Internet addiction are followed by studies of treatments (Murali and George, 2007; Öztürk et al., 2007). More studies are needed on the prevention and treatment of Internet addiction, as well as non-pharmacological approaches to treatment, although health sciences programs had the smallest number of theses written on this topic, underlying the need for more studies in this field in particular. For this reason, it is recommended that researchers conduct studies on the prevention of internet addiction and the treatment of internet addiction.

Research is defined as a rigorous and careful examination of a topic (Glesne, 2014), in that rigor and care are needed in a research design, similar to other stages of the research process. At this stage, researchers decide which design to employ in their study, and most of the theses examined in the present study opted for a quantitative design rather than other approaches. Positivism has been the dominant

approach in the development of social sciences (Kuş, 2007), and has been defined as "a positive approach similar to natural sciences, aiming to unearth reliable knowledge with strong foundations needed to bring about positive change in the social world" (O'Reilly, 2005) that has been adopted by many social scientists in their studies (Glesne, 2014). The positivist approach is reflected in the use of quantitative designs in social sciences research projects (Kuş, 2007). A plurality of the theses examined in the present study were written within programs offered by social sciences graduate schools. The dominance of quantitative designs in the theses on Internet addiction may be attributed to the strong preference for quantitative designs in social sciences in general.

Most of the theses examined in the present study involved adolescents as the participants, which is understandable, given that Internet addiction is more common among adolescents (Chirita, Chirita, Stefanescu, Ilinca and Chele, 2007; Lin and Tsai, 2002). Behavioral addictions (e.g. internet, gaming, gambling) begin during childhood and adolescence (Derevensky, Hayman and Gilbeau, 2019). That said, it also means that other age groups may have been overlooked. As such, there is a relative lack of studies on Internet addiction in early childhood and among children with disabilities, the long-term hospitalized, people with chronic illnesses, people in specific occupations, pregnant women, retired people and the unemployed, among others, which constitutes a shortcoming in the current body of literature in this field. Internet addiction is not limited to adolescents, and affects more than an individual's school life. Internet addiction is seen also among adults, and can also affect one's working and social lives (Young, 2007). For example in one study, prevalence rate of internet addiction in healthcare professionals (n=1818) was 9.7% (Buneviciene and Bunevicius, 2021). As such, more studies of Internet addiction should be conducted with different types of participants.

The structure of the Turkish language makes it an ideal language for scholarly works (Vargelen, 2012), although a distinction needs to be made between the teaching of a foreign language and education conducted in a foreign language. The small number of theses written in foreign languages is only to be expected, given the limited number of universities in Turkey offering education in a foreign language.

As of 2013, 68.8% of master's students and 69% of PhD students in Turkey are enrolled in programs offered by universities in the Marmara and Central Anatolia regions (Çetinsaya, 2014). Accordingly, the finding that most theses on Internet addiction were written in universities located in the Marmara and Central Anatolia regions is consistent with the geographical distribution of students. Among the public universities, those offering the largest number of places to graduate students are found in the larger cities (Çetinsaya, 2014). Most graduate theses on Internet addiction were thus written in the cities with the largest populations and those with the largest numbers of universities.

The theses examined in the present study report a prevalence of technology-related addictions of between 0.2% and 25.8%. The variance in the reported prevalence rates can be attributed to the measurement instruments used to measure Internet addiction, the participant characteristics, the timing and location of the measurement, and the methods of calculation. In addition, given that technology keeps changing, some of the variance may be attributed to differences in access to Internet-enabled devices and frequency of use. However, according to a study in which a systematic review and meta-analysis of the epidemiology of internet addiction was conducted, the prevalence of internet addiction was higher than other addictions or disorder (e.g. gaming disorder) (Pan, Chiu and Lin, 2020).

The most common variables mentioned in the titles of theses on Internet addiction were those related to depression, loneliness, social support, self-esteem, obesity, adolescents, students, parental attitudes, attention deficit, academic life, attachment, life, gaming and prevalence. In another review of studies on Internet addiction in Turkey, depression, social support, academic achievement and family relations were found to be the most commonly studied variables (Boyacı, 2019).

Studies on internet addiction have generally focused on specific issues such as depression, loneliness, social support, self-esteem. However, internet addiction have associated with non-suicidal self-injury (Tang et al., 2020). For this reason, internet addiction has a legal dimension. Studies on internet addiction should also be considered from a legal perspective. In addition, the comorbidity of internet addiction with the other addiction such as alcohol, drug and cigarette addiction can also be examined by researchers.

Internet, electronic devices and internet-based technologies have brought significant benefits to internet users. However, increasing use of Internet is associated with increasing number of people experiencing problems (WHO, 2014). Internet addiction is a global health problem (Kuss, Kristensen and Lopez-Fernandez, 2021). Hence, it needs to be worked at municipal, global, national and regional levels.

The variables found to be associated with Internet addiction by the largest number of theses were depression, anxiety, attachment, gender and time spent on the Internet. The variables found to be unassociated with Internet addiction by the largest number of theses were gender and age. The variables found to vary significantly with Internet addiction by the largest number of studies were gender, grade and income. The variables found not to vary significantly with Internet addiction by the largest number of theses were gender, parental educational attainment, income and age. The theses sometimes reported conflicting findings. For example, the variables found to be associated or to vary significantly with Internet addiction in one thesis were not found to be so in another thesis. These differences may be attributed to many factors, including the rapid technological advances. Each new generation grows up with a different technology, and changes that took place over two or three decades in the past now take five to ten years. The Internet is open to constant change, and technology keeps advancing, meaning that the same technology may have different effects on users today when compared to five or ten years ago, with different indicators, problems and relationships. Today, we can access the Internet through many devices, not just through computers, and these factors are probably the main reason behind the different results reported by the theses. These factors also underline the importance of up-to-date data in studies on behavioral addictions, including Internet addiction. Hence, longitudinal studies are needed to determine variables associated with Internet addiction.

This study has focused on Internet addiction, as examined in graduate theses written in Turkey, but has also made an examination of the theses themselves. It was found that the findings reported in some of the theses may have been affected by the mistakes made by the researchers. Notable mistakes included the following: administering scales that are inappropriate for the age group of the participants; making causal arguments based on correlations; failure to mention the prominent findings of the study in the abstract; use of indirect tools of measurement, even though direct measurement is possible (e.g. using the food addiction scale as an indicator of obesity instead of body mass index), inconsistencies between the terms used in the title and the body of the thesis, and failure to describe the participant characteristics.

This study examined all of the graduate theses on Internet addiction conducted in Turkey to date. Repeating this study at regular intervals would make it possible to assess the progress of studies into Internet addiction over time. The findings of this study are limited to the graduate theses included in the NTC database.

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Appendix A.

Thesis Conducted in Turkey on Internet Addiction (2003-2019).

Nesibe Aydın
Educational Institutions

Nesibe Aydın
JEF

The Descriptive Content Analysis of Theses with the Topic of Metacognition Published in Turkey on Mathematics Education

Rüveyda Kandal*   **Fatih Baş****

Abstract

In this research, it was aimed to investigate the graduate theses with metacognition theme on mathematics education according to their structural properties (publication year, method, study group, data collection tools and data analysis technique) and study topics. 80 graduate theses were reached within the scope of the research. At a result of the descriptive analyses, it was noticed that the number of theses has increased until recent years except from 2009, 2014 and 2017 and the highest number of conducted researches were in 2019. It was determined that generally the quantitative research approach was employed in the studies; accordingly, it was focused on descriptive and experimental studies. It was also found that most of the researches were carried with secondary school students, mostly questionnaires/ open-ended questionnaires/ scales/ tests were applied and mostly t-test, descriptive statistics and correlation tests were used in the analyses process. In addition, it was reached to the conclusion that mainly metacognitive awareness, metacognitive skill/experience and metacognitive learning/self-regulation strategies were studies in terms of the study topic.

Keywords: Metacognition, mathematics education, descriptive analysis

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Türkiye'de Matematik Eğitimi Alanında Yayınlanan Üstbiliş Konulu Tezlerin Betimsel İçerik Analizi

Rüveyda Kandal[*] **Fatih Baş**[**]

Öz

Bu araştırmada matematik eğitimi alanındaki üstbiliş temalı yapılan lisansüstü tezlerin yapısal özellikleri (yayım yılı, yöntem, çalışma grubu, veri toplama araçları, veri analiz yöntemi) ve çalışma konusuna göre incelenmesi amaçlanmıştır. Araştırma kapsamında 80 adet lisansüstü teze ulaşılmıştır. Yapılan betimsel analizler sonucunda; tezlerin 2009, 2014 ve 2017 yılları hariç son yıllara doğru bir artış gösterdiği ve yapılan araştırmaların en çok 2019 yılına ait olduğu görülmüştür. Çalışmalarda genellikle nicel araştırma yaklaşımı benimsenmiş olup buna bağlı olarak da betimsel ve deneysel çalışmalar üzerinde yoğunlaşıldığı belirlenmiştir. Araştırmaların büyük bir bölümünün ortaokul öğrencileri ile gerçekleştirildiği, en fazla anket/açık uçlu anket/ölçek/test kullanıldığı ve analiz sürecinde en fazla t testi, betimsel istatistik ve korelasyon testlerine başvurulduğu tespit edilmiştir. Ayrıca konu alanında daha çok üstbilişsel farkındalık, üstbilişsel beceri/deneyim ve üstbilişsel öğrenme/öz-düzenleme stratejileri üzerinde çalışıldığı sonucuna ulaşılmıştır.

Anahtar Sözcükler: Üstbiliş, matematik eğitimi, betimsel analiz

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Introduction

One of the goals tried to be reached with the competencies dealt with in the mathematics curriculum is to educate individuals, aiming self-learning, being aware of what and how they learn and can arrange and direct this process (The Ministry of National Education, 2018). To achieve the relevant purposes, it is one of the remarkable points that students should have the metacognitive knowledge and skills and can take responsibility for the learning process (Çiltaş, 2011). Accordingly, the person, who added the metacognition concept first to the literature by substantiating with a study on meta-memory in the 1970s, is Flavell. According to Flavell (1979), metacognition is defined as a concept that individual can arrange and control the activities by following the activities in the learning process related to the functioning of intelligence such as knowing, understanding, perceiving and being aware of etc. In addition, it is noticed that metacognition is defined as the skill of an individual to create and evaluate mental abilities for his/her cognition (Brown, 1987), awareness of the individual for learning (Doğanay and Kara, 1995) and determining the methods that individual can use during the learning process, determining where and how these methods that s/he will use, reviewing each step to progress within the framework of the process; also, the ability to change the method or strategy that s/he use (Özsoy, 2007). Besides, according to Akın (2006), it is known that several concepts such as executive control, executive cognition, metacognition, self-regulation etc. are used instead of metacognition concept in the literature. The sequence of these concepts according to the frequency of use in the literature of our country is as metacognition, metacognitive, beyond cognition, cognitive awareness and executive cognition (Mert, 2018) and this sequence was determined as in this way even in the reviewed theses in this research.

As the literature was analyzed, it is seen that the metacognition generally consisted of two structures including metacognitive knowledge and cognitive regulation (Aydın, 2007; Brown, 1987; Demircioğlu, 2008; Desoete and Roeyers, 2006; Ifenthaler, 2012; Panaoura and Philippou, 2003; Schraw and Dennison, 1994; Schraw, 1998; Cited: Erdoğan, 2013). Although it describes the knowledge that an individual has about his/her mental function, metacognitive knowledge consists of three headings as how an individual will successfully perform a task (procedural knowledge), what information s/he will use in the conditions encountered during performing this task, (situational knowledge) (Flavell,1979), the knowledge of what factors are effective in an individual's ability to perform the given task (declarative knowledge) (Schraw and Moshman, 1995)

Türk (2011) refers that cognitive regulation, which is another element constituting metacognition, is called in different ways in the literature such as executive strategy, metacognitive control, self-regulation and self-assessment. In addition, factors that support control of an individual's mental factors or learning can be defined as the metacognitive arrangement or metacognitive control (Schraw and Moshman, 1995). The individual expresses positive or negative thoughts that occurred related to fulfilling the given tasks with these strategies (prediction); determines the actions that can be used to complete the task (planning); focuses on the progress between the determined actions (tracing) and transfers all the experiences that s/he had during the task to subsequent actions (assessment) (Gourgey, 1998). In addition, metacognitive experiences emerge as a result of the interaction between metacognitive knowledge and metacognitive regulation. Individuals use the metacognitive experiences into renewing, categorizing or improving their knowledge (Aktürk and Şahin, 2011).

Students' skill to uncover metacognitive awareness related to their learning can be ensured with teaching with considering metacognition; that is active participation in the process and controlling the process (Özsoy, 2008). Thus, according to El-hindi (1996), improving the metacognitive skills can be realized with teaching maintained with students' knowing where, when and how to use the required strategies and being active in the process. In the conducted researches, the necessity, that most social support environments should be established by benefiting frequently with strategies such as asking reflective questions, interactive problem solving, providing feedback, judging situation information, using checklists, was noticed (Özsoy, 2008). In teaching these strategies, four approaches, in which direct teaching of metacognitive skills to students is considered in the development of students' metacognitive skills (direct teaching), the teaching of metacognitive skills with structured, effective communication and prepared content within a determined plan is adopted (constructivist practical teaching), consisting of direct explanation, encouragement and mutual dialogue (cognitive guidance),

in which metacognitive skills are taught along with various cooperative learning techniques (collaborative learning) are mentioned (Gelen, 2003).

It is suggested that the level of maturity in children has an important role in the acquisition of metacognitive skills; however, age level progress in parallel with metacognitive development (Özsoy, 2008). The use of strategy consisting of three steps in general in the solution of the encountered problems is mentioned. These are the first periods including the first five years strategies for any purpose could not be used or teaching function could not be provided, the second period consisting of the ages between 6 and 9 at which the strategy for solving the problem can be used but the new strategy cannot be put forward by the individual and the third period, which approximately corresponds to the 4th-grade level, at which the strategy to be used can be assimilated and the strategy that is suitable for solving the problem can be selected (Senemoğlu, 2005). In addition, it is noticed that the awareness of individuals about their learning is higher in adults depending on their life and experience, and also adults can transfer information about their cognition better than young people (Mclnerney and Mclnerney, 2002: 114, Cited: Demirsöz, 2014).

The trends of 136 studies on the metacognition in the field of education and published as articles in Turkey between 2002 and 2016 were analysed by Baş and Özturan- Sağırlı (2017). As a result of the analysis, it was claimed that the number of metacognition themed studies has increased gradually throughout the years except for 2013 and demonstrated a rapid increase in recent five years, that a great number of the studies were carried with pre-service teachers, the researches were designed quantitatively and descriptively, so mainly the quantitative data collection tools were applied. In addition, the researchers also stated that mostly hypothesis and correlational tests were used in the analysis process; on the other hand, the correlations between a metacognitive feature and different features and variables that can affect a metacognitive feature are the most discussed topics. Finally, it was determined that the study focused on general characteristics of the participants such as their awareness of metacognition or a particular aspect of metacognition, strategies, and levels of use. In Turkey, there are many studies with the theme of metacognition and graduate theses have an important place in these studies. As a matter of fact, examining postgraduate thesis studies in a field allows to determine the boundaries of the subject in the field and to look at the subject from a broad perspective (Karadağ, 2009). In the light of the reviewed literature, no study was found in which metacognition m themed theses were analyzed and evaluated in mathematics education. From this point of view, in this study, it is aimed to determine the characteristics and tendencies of metacognition themed thesis in the field of mathematics education, to present them to educators and researchers and to contribute to mathematics education by creating a basis for new studies. Accordingly, the study aims to review the metacognition themed graduate and doctoral theses in the field of mathematics education within the scope of structural features and topics. According to this purpose, these research questions were asked.

1. What is the distribution of metacognition themed thesis in the field of mathematics education in Turkey according to their structural features (publication year, method, study group, data collection tools and data analysis technique)?

2. What is the distribution of the metacognition themed theses in the field of mathematics education in Turkey according to their topics?

Method

The descriptive content analysis method was employed in this research. This method is a content analysis type in which a general trend is observed by analysing and organising quantitative and qualitative research that is presented differently from each other, in this way, it has a characteristic of a significant resource for future studies in the literature (Cohen, Manion and Morrison 2007; Çalık & Sözbilir, 2014; Selçuk, Palancı, Kandemir and Dündar, 2014).

Collection of the Data

In data collection process, at first, scanning was done with the keywords as metacognition, metacognitive, beyond cognition, metacognitive awareness and executive cognition, using the electronic scanning page of the National Thesis Centre of CoHE. As a result of the scanning, 88 theses conducted between 2005 and 2019 were reached. 8 theses with access restriction were omitted and the

rest 80 theses were recorded. 61 of the 80 theses were graduate theses, 19 were doctoral theses. The theses were coded as T1, T2, T3… in the download order.

Analysis of the Data

The descriptive analysis technique was used in the analysis of the collected data. According to this technique, data are summarised and interpreted according to the formerly determined themes. The purpose of this sort of analysis is to present gathered findings in an arranged and interpreted way (Yıldırım and Şimşek, 2018, p.239). Accordingly, the data analysis pattern prepared by Baş and Özturan-Sağırlı (2017) was taken as the base in data analysis. The most significant points taken into consideration in the analysis process can be summarised as:

• In coding related to the used method, the method expressed by the researcher was taken into consideration.
• Coding related to the study group was performed according to the framework determined in today's education program based on 12-year formal education. For instance, fifth-graders were coded as the secondary school level.
• In coding related to the data collection tools, only the tools applied to measure a metacognitive feature were included in the analysis.
• In coding related to the data analysis technique, only the analysis methods applied for a measure related to metacognition were analysed in the relevant studies.
• In coding related to their topics, each feature related to the metacognitive feature was taken as an analysis unit and in this way, the features within the scope of a study were coded separately.

Cooperative work was done with an academic expert in metacognition and qualitative data analysis in collecting examining and analysis process, arrangements were done according to the feedback and recommendations from the expert within the scope of the processes. For instance, in T5 coded research, the scale, used as the data collection tool, measured a metacognitive structure was determined and corrected according to the feedback by the expert, whose metacognitive structure was measured.

In order to ensure the reliability of the coding process in the analyzes, 40 of the theses were randomly selected and recoded by the researcher after about three months. The agreement between the two encodings was found to be 90%. When the difference between the two encodings is examined; It was seen that 4 theses, which were examined according to the subject tendencies, were coded differently by the researcher in the second coding. In line with expert opinions, the relevant codes were left as they were in the first coding. For example, the research on the effect of problem posing practices in mathematics on the problem posing skills and metacognitive awareness levels of pre-service teachers was coded as a metacognitive skill in the second coding process according to the subject tendency. However, in line with the expert opinion, this research was coded as metacognitive awareness as it was in the first coding. The frequency and percentage values for the data were calculated, gathered findings were presented with tables and graphs.

Findings

Findings gathered within the scope of sub-problems are presented respectively in this section.

Findings Related to the First Sub-problem

The analysis results of the metacognition themed theses on mathematics education in Turkey according to their structural features (publication year, method, study group, data collection tools and data analysis techniques) are presented orderly below.

Distribution According to Years

Findings of the distribution of the numbers of the reviewed theses according to years are presented in Figure 1.
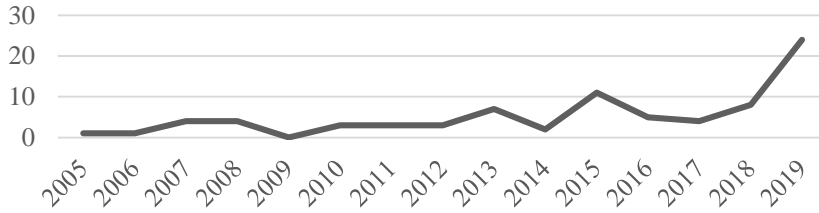
Figure 1. *Distribution of the Numbers of Reviewed Theses according to Their Publication Years*

As it is presented in Figure 1, metacognition-themed articles were started to be conducted in Turkey by the year 2005. It was determined that the number of theses reviewed has maintained its changes with one study in 2005 and 2006, four studies in 2007 and 2008, and three studies in 2010, 2011 and 2012, and that studies have increased through the last years, except for 2009, 2014 and 2017. However, it was observed that the highest number of studies were conducted in 2019 with 24 pieces of research, followed by 11 studies in 2015. On the other hand, it was found that there was no study on the relevant topic in 2009.

Distribution According to Method

Findings of the distribution of the reviewed numbers of theses according to their methods are presented in Figure 2.

Figure 2. *Distribution of the Number of Reviewed Theses according to Their Methods*

As it is presented in Figure 2, 66 % of the reviewed theses were designed quantitatively, 19% qualitatively and 15% mixed approach. It is observed that 51% of the quantitative studies are descriptive 36% experimental and 73% of the qualitative studies were designed with the case study method.

Distribution According to Study Group

Findings of the distribution of the reviewed numbers of theses according to their study groups are presented in Figure 3.
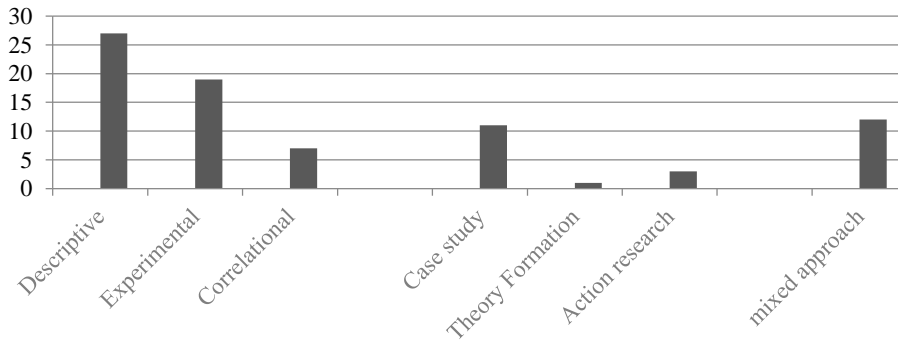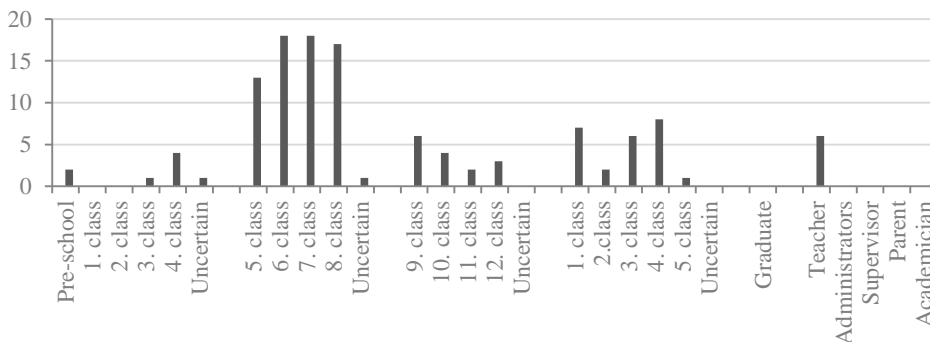

Figure 3. *Distribution of the Number of Reviewed Theses according to Their Study Groups*

As it is presented in Figure 3, it is observed that the theses conducted on the topic of metacognition in mathematics education in Turkey were carried at the level of secondary school, high school and undergraduate. It was determined that there were more studies at 6th and 7th class level at secondary school, 9th class at high school and 1st, 3rd and 4th class level at the undergraduate level. While the number of theses at the primary school and the pre-school level was low, the density at the primary school level is at the 4th class level. As teachers were included in 6 theses, postgraduate students, administrators, parents, supervisors and academicians were not included in any studies.

Distribution According to Data Collection Tools

Findings of the distribution of the reviewed numbers of theses according to their data collection tools are presented in Figure 4.

Figure 4. *Distribution of the Reviewed Numbers of Theses according to Their Data Collection Tools*

As it is presented in Figure 4, it is seen that as the data collection tools applied in the metacognition themed theses on mathematics education in Turkey, questionnaires/open-ended questionnaires/ scales/ tests were distinctly more than others (65); however, interviews (22) and observations (11) were preferred than the others. It is also noticed that video (4), mathematics diaries (2), behaviour cards (2), checklists (2), ranking scale (1), metacognitive skill feedback form (1) and metacognitive evaluation form (1) were preferred less in general. The data collection tools classified under the heading of 'others' (5) were game and activity papers.

Distribution According to Data Analysis Techniques

Findings of the distribution of the reviewed numbers of theses according to their data analysis techniques are presented in Figure 5.
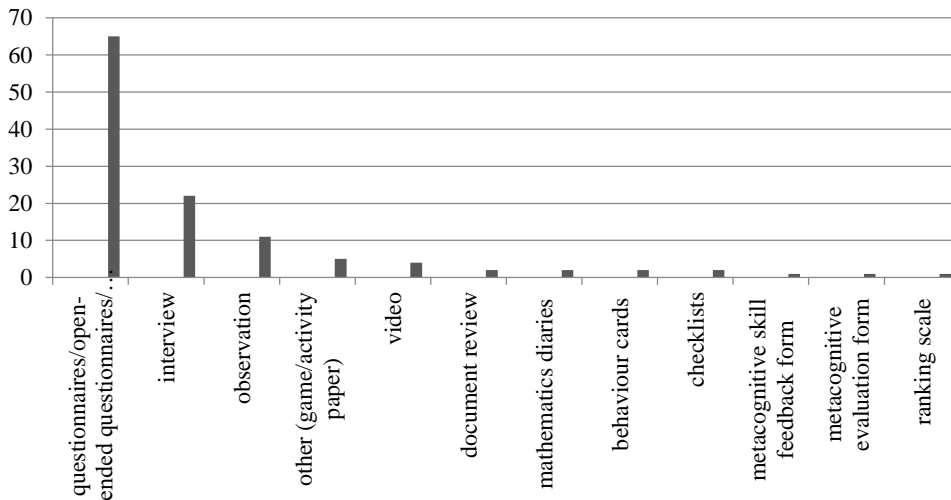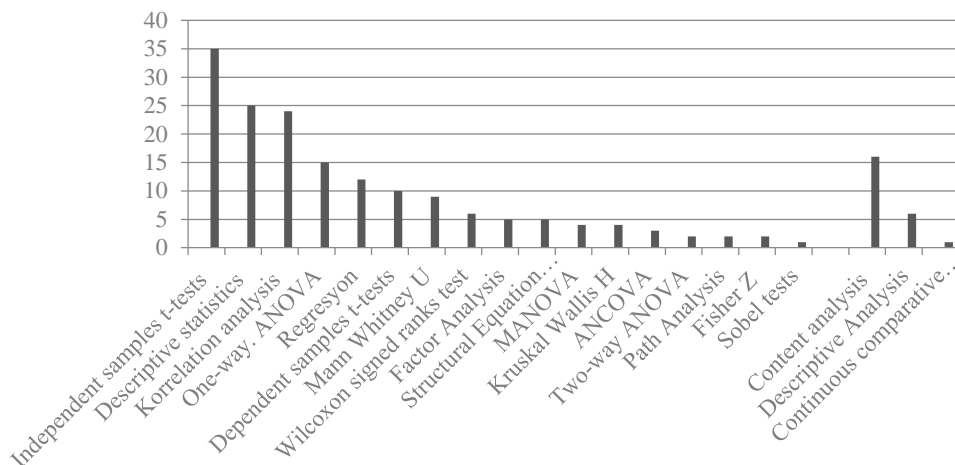
Figure 5. *Distribution of the Reviewed Numbers of Theses according to Their Data Analysis Techniques*

As it is presented in Figure 5, it is determined that mainly the independent samples t-tests (21%), descriptive statistics (15%) and correlation analysis (approximately 13%) were used in the analysis of the quantitative data. On the other hand, the content analysis (8%) was applied most in the analysis of the qualitative data.

Findings Related to the Second Sub-problem

Findings related to the distribution of the metacognitive themed theses on mathematics education in Turkey according to their topics are presented respectively in Table 1, 2, 3, 4 and 5.

The distribution of the features associated with metacognitive features in the reviewed theses is presented in Table 1.

Table 1

Features Associated with a Metacognitive Feature in the Reviewed Theses

Metacognitive Feature	*Other Associated Feature*	*f*
Metacognitive Awareness Level	Mathematics achievement scores	6
	Mathematics anxiety	2
	Mathematical metacognitive awareness	2
	Life experiences	1
	Model and modelling	1
	Mathematical problem-solving levels	1
	Report card scores	1
	Reflective thinking related to problem-solving	1
	Problem posing performances	1
	Social anxiety	1
	Positive belief	1
	Cognitive awareness	1
	Uncontrollability and danger	1
	Cognitive confidence	1
	Mathematics oriented risk-taking behaviour	1
	Mathematical thinking skills	1
	Anxiety towards teaching mathematics	1
	Mathematics course anxiety	1
	Mathematics practise anxiety	1
	Calculation anxiety	1

	Academic achievement	4
	Problem-solving	2
	Attitude towards mathematics course	1
Metacognitive Skill/Experience	Attitude towards educational mathematics games	1
	Problem-solving strategies	1
	Mathematical self-efficacy	1
	Self-regulation skills	1
	Inhibition	1
	Substructures of metacognition	1
	Problem-solving achievement	3
	Mathematical reasoning skills	2
Metacognitive Learning/Self-regulation Strategies	Problem-solving skill perceptions	1
	Self-efficacy perceptions	1
	Academic achievement	1
Total		48

As it is presented in Table 1, metacognitive awareness is associated with 20 features, metacognitive skill/experience with 9 and metacognitive learning/self-regulation strategies with 5. It is noticed that the highest associated skills are as mathematics achievement scores (6), academic achievement (4) and problem-solving achievement (3). In addition, it was determined that academic achievement is associated both with metacognitive skill/experience and metacognitive learning/self-regulation strategies.

Findings related to determining a metacognitive feature or situation in the reviewed theses are presented in Table 2.

Table 2

Metacognitive Features or Situations Determined in the Reviewed Theses

Determined Metacognitive Feature	*f*
Metacognitive awareness level	9
Metacognitive strategy use	3
Metacognitive behaviours in problem-solving	2
Metacognitive behaviours in problem posing	2
The accuracy level of metacognitive tracking	1
Comparing of the online and offline methods used in the metacognition measurement	1
Metacognitive skill and self-regulation level	1
Mathematical metacognition levels	1
Comprehension awareness of teachers related to problem-solving and metacognition issues	1
Metacognitive knowledge and skill levels in activities in which mathematical software can be used	1
Metacognitive structures used for mathematical modelling in technology-supported environments	1
Secondary school teachers 'behaviours to activate students' metacognition in problem-solving environments	1
Educational status designed to influence metacognitive behaviour	1
Metacognitive behaviours of primary school graduate Turkish students towards PISA 2003 mathematics literacy	1
Metacognition and self-regulation behaviours in mathematical measurement processes	1
Metacognitive skills in algebraic non-verbal problem solving	1
Total	28

As it is presented in Table 2, mostly the level-determining studies related to metacognitive awareness (9) metacognitive strategy use (3), metacognitive behaviours in problem-solving (3) and metacognitive behaviours in problem-posing (3) were conducted by the researchers. Other 12 metacognitive features are analysed within the scope of one each research.

Findings related to a metacognitive feature being dependent and independent variable in the reviewed theses are presented in Table 3.

Table 3

The Status of a Metacognitive Feature as a Dependent and Independent Variable in the Reviewed Theses

Dependent Variable	Independent Variable	f
Metacognitive awareness	Collaborative learning	2
	The game supported mathematics teaching	1
	Project-based learning	1
	Mathematics diary use	1
	Problem posing studies	1
	Differentiated teaching	1
Metacognitive skill	Metacognitive strategy use	1
	Writing activities	1
	Metacognition focused problem-solving support program	1
	Algebraic verbal problem teaching	1
	Metacognitive strategy teaching	1
	Teaching related to multiple intelligences	1
	Collaborative learning	1
	Reflective question-based wiki environments	1
Academic achievement	Metacognitive strategy use	1
	Metacognition supported collaborative learning	1
	Metacognition awareness level	1
	Metacognitive str.learn. and self-regulation skills	1
Attitude	Metacognitive strategy use	1
	Metacognition supported collaborative learning	1
Metacognitive behaviours	7e model	1
Metacognitive strategies	Education year	1
Problem-solving process	Metacognitive strategy use	1
Conceptual knowledge development	Metacognitive strategy use	1
Operational knowledge development	Metacognitive strategy use	1
Total		25

As it is presented in Table 3, it is seen that metacognitive awareness, metacognitive skills, academic achievement, attitude, metacognitive behaviour, metacognitive strategies, problem-solving process, conceptual and operational knowledge development were investigated as dependent variables in experimental theses and metacognitive skills (9) was focused mostly in the studies. It is realised that t metacognitive strategy use (6) and cooperative learning (4) is the most studied topics as independent variables. In some of the reviewed theses, the predicting status of a metacognitive feature alone or with different features, or their status of being predicted were investigated. Gathered findings are presented in Table 4.

Table 4

Features Predicting a Metacognitive Feature and a Metacognitive Feature is Predicted in the Reviewed Theses

Predicting Feature		Predicted Feature	f
Metacognitive awareness		Problem-solving skills	2
		Mathematics achievement	1
		Mathematics achievement	1
	+ Perception assoc. with problem-solving skill	Self -efficacy perceptions towards the teaching profession	1
		Problem-solving skill perception	1
		Self-efficacy levels for the teaching	1

Feature			f
		Thinking styles	1
		Mathematics achievements	1
		Mathematics self-concept scores	1
Metacognitive strategies	+ problem-solving skill perceptions + self-efficacy perceptions + university entrance exam scores	Mathematics achievement	1
Metacognitive skills		Mathematics achievement	1
	+ inhibition	Mathematics achievement	1
Problem-solving skills		Metacognitive awareness	1
metacognitive str+metacognitive experience+metacognitive knowledge	+ cognitive str	Mathematics achievement	1
Total			**15**

As it is presented in Table 4, it is seen that a feature related to metacognition predicts 14 features with single or various variables (6). The feature, whose predicting status was investigated most is metacognitive awareness with the frequency of 7. The feature, which was predicted most, is mathematics achievement with the frequency of 6. No research, in which a metacognitive feature (metacognitive awareness) was predicted with a different feature (problem-solving skill), was encountered. In some of the reviewed theses, it was investigated whether demographic variables are effective on a metacognitive feature or not. Findings related to these studies are presented in Table 5.

Table 5

Variables whose Effects on a Metacognitive Feature are Investigated in the Reviewed Theses

Feature	Variable	f	Feature	Variable	f
Metacognitive Awareness	Gender	18	Metacognitive skills	gender	2
	Class level	9		Mother's education level	1
	Age	4		Father's education level	1
	Academic achievement	3		School type	1
	Graduated school type	2		Different teaching methods	1
	Mother's education level	2	Metacognitive learning and self-regulation strategies	Gender	2
	Father's education level	2		Mathematics achievement	1
	School type	2		Score type of uni. entr. exam (ÖSS)	1
	Studied university	2		School type	1
	Graduation status	1		Years of education	1
	Professional rank	1		Department of education	1
	Achievement perception	1	Metacognitive experience	Mathematics achievement	1
	Income level	1		Gender	1
	Mathematics achievement	1		School type	1
	Mother's profession	1		Problem difficulty level	1
	Father's profession	1		Student's group level	1
	Field of graduation	1	Metacognitive strategy use frequency	Problem difficulty level	1
	Geographic region	1		Student's group level	1
	Group of education	1	Possessed metacognitive knowledge	Student's group level	1
Mathematical metacognition awareness	Gender	2			
	Class level	1			
	Studied department	1			
	Branch	1			
	Number of the book read	1			

As it is presented in Table 6, it is seen that totally the effects of 81 variables on 7 features, consisting of metacognitive awareness related to metacognition, mathematical metacognitive awareness, metacognitive skills, metacognitive learning and self-regulation strategies, metacognitive experience, frequency of metacognitive strategies use, and possessed metacognitive knowledge. It was determined that the metacognitive awareness was studied most among the metacognitive features (54); besides, the variable whose effect was investigated most was gender (25). Some of the other variables were orderly as class level (10), school type (5), age (4), mother's education level (3), father's education level (3), academic achievement (3), mathematics achievement (3), student group level (3) and graduated school type (2).

Discussion, Conclusion and Recommendations

In this study, the metacognition themed theses on mathematics education in Turkey were reviewed in terms of their publication year, used method, study groups, data collection tools, data analysis techniques and topics. Results gathered in terms of each review topic are summarised below.

It was found that the metacognition themed theses on mathematics education in Turkey were begun to be conducted in 2005, the number of theses has increased in recent years except for 2009, 2014 and 2017. In addition, it was reached that most studies were conducted in 2019. This result of the research, even if the metacognitive studies that started in the 1970s were reflected in our country later, as Baş and Özturan-Sağırlı (2017) suggest, supports the view that it is still more popular today.

It can be stated that the quantitative approach was employed and the researchers focused on the descriptive/experimental studies in most of the reviewed theses. This result of the research demonstrates a similarity with the study conducted by Baş and Özturan-Sağırlı (2017). On the other hand, it was realised that in the researches, in which the qualitative approach was employed, the case study method was applied. Case study, which provides the opportunity to investigate and interpret a group, event or correlation in-depth, is one of the qualitative research methods (Cohen et al., 2007). This case can be expressed as the researchers try to investigate the metacognition concept in mathematics education in depth from different perspectives in Turkey.

As it was taken into consideration in terms of the study groups, it was noticed that the theses were conducted mostly at the secondary school 6th, 7th and 8th class levels, at graduate 1st, 3rd and 4th class levels and high school 1st class levels; however, the number of studies was low at the primary and pre-school periods (except for 4th class).

This result of the study supports the view of Senemoğlu (2005), who refers that metacognitive development begins in children approximately in the fourth grade and they can understand the strategy and choose the appropriate strategy. In addition, it can be stated that the view in the study by Demirsöz (2014), cited by Mclnerney and Mclnerney (2002) that individuals' awareness of their learning is higher in adults depending on their life and experience, also, supports this view that adults are better able to convey information about their cognition than young people. In addition, it can be thought that the respectively low number of studies at the high school level is because of students taking the university entrance exams at upper-class levels. Furthermore, it was found that sub-study was conducted with teachers, but no study with graduate students, administrators, supervisors or academicians were encountered. Considering that the development of students' knowledge and skills is closely related to the teaching process, it can be stated that teachers have a critical role in providing this integration (Jaworski, 2006), and in this context, the number of studies with teachers is low. It is known that it is impossible to reach different results by applying similar methods in a dynamic structure like the school system. As it is known that school administrators can develop different strategies when they encounter new and different situations by using metacognitive skills (Blakey and Spence, 1990), that no research was conducted in this field is regarded as a deficiency.

It was determined that mostly questionnaires/ open-ended questionnaires/ scales/ tests were applied as data collection tools. It can be stated that this result originates from that the reviewed theses within the scope of the research were analysed with a quantitative approach. This result of the study is parallel with the study conducted by Baş and Özturan-Sağırlı (2017). In addition, it was observed that interview and observation were secondly applied data collection tools.

As the data analysis techniques were evaluated, the most applied data analysis techniques in the theses were determined as t-test, descriptive statistics, correlation and one way ANOVA analyses. The reason why these analyses were applied in the reviewed theses can be referred as that there are many studies in which metacognitive features were associated, descriptive results were derived from the observation values obtained about metacognition, and variables that may affect metacognitive features were analysed.

As it was handled within the scope of study topics, it was observed that in association-based theses, metacognitive awareness, metacognitive skills/experience, and metacognitive learning/self-regulation strategies were mostly studied and associated with academic achievement features. In the theses in which metacognitive feature level was determined, it was also found that the studies in which metacognitive awareness was investigated were more. In studies, in which metacognitive feature is the dependent variable, mostly the effect of teaching strategies on metacognitive skills was investigated; in the studies, in which metacognitive feature is the independent variable, mostly the effect of metacognitive strategies use on the features such as cognitive knowledge development, attitude, academic achievement, problem-solving process and metacognitive skills, was investigated. In prediction studies, it was noticed that the feature, in which the predictive status was investigated most, was metacognitive awareness, and the most predicted feature was mathematics achievement. In studies, in which the effect on a metacognitive feature was investigated, the effect of variables on metacognitive awareness was investigated most. Furthermore, gender, class level and school type were the most studied variables whose effects on metacognitive features were studied most.

Considering these results;

- The number of studies on metacognition topic in the field of mathematics teaching at high school level and with teachers can be increased, studies consisting of school administrators can also be conducted.
- Studies, on metacognition topic in the field of mathematics education in which demographic variables whose effects on metacognitive features are investigated and considered as a whole can be conducted.
- Studies, in which a metacognitive feature is associated with epistemological understanding and belief, can be conducted in the field of mathematics education.

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Pedagogy-driven Design Fundamentals of 21st Century Primary Schools' Physical Learning Environments

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Abstract

Today, it is widely acknowledged that the quality of physical learning environments is directly related to the quality of education. Hence, the structure and characteristics of school buildings and physical learning environments are determined by the requirements of pedagogy. This study is considered to be important in terms of understanding pedagogical fundamentals that shape the physical learning environments of 21st-century primary schools. This study aims to provide a holistic perspective on the pedagogical foundations that guide the building design and physical learning environments of primary schools. The pedagogical foundations of primary school buildings were subsumed under two main categories, i.e. 'child-friendly design' and 'design for learning'. Appropriate designs of the physical learning environment concerning these pedagogical principles were spaces that are child-scale, interactive open, purposed as teaching tools, flexible, and community-connected. Some suggestions were introduced to rethink the physical learning environments of primary schools. Learning environments should be designed by social interaction and different learning objectives, in various sizes, and including common areas where the whole school community will come together. Schools' learning environments should be flexible to meet the expectations of developing pedagogy. Physical learning environments should take learning beyond classrooms and be functional. The open spaces of the schools should be interactive and host community-based events.

Keywords: School design, physical learning environment, pedagogy, 21st century skills

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21. Yüzyıl İlkokullarında Fiziksel Öğrenme Ortamlarının Pedagojiye Dayalı Tasarım Temelleri

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Öz

Günümüzde, fiziksel öğrenme ortamlarının kalitesinin doğrudan eğitimin kalitesiyle ilişkili olduğu yaygın biçimde kabul görmektedir. Bu nedenle, okul binalarının ve fiziksel öğrenme ortamlarının yapısı ve özellikleri, pedagojinin gereksinimlerine göre belirlenmektedir. Bu çalışmanın 21. yüzyıl ilkokullarının fiziksel öğrenme ortamlarını şekillendiren pedagojik temelleri anlamak açısından önemli olduğu düşünülmektedir. Bu çalışma, ilkokulların bina tasarımına ve fiziksel öğrenme ortamlarına rehberlik eden pedagojik temellere bütünsel bir bakış açısı getirmeyi amaçlamaktadır. İlkokul binalarının pedagojik temelleri, 'çocuk dostu tasarım' ve 'öğrenme için tasarım' ana kategorileri altında toplanmıştır. Bu pedagojik temellerle ilgili olarak fiziksel öğrenme ortamının uygun tasarımları; çocuk ölçeğinde alanlar, etkileşimli açık alanlar, öğretim araçları olarak amaçlanan, esnek ve toplumla bağlantılı alanlardır. İlkokulların fiziksel öğrenme ortamlarını yeniden düşünmek için bazı öneriler getirilmiştir. Öğrenme ortamları, sosyal etkileşim ve farklı öğrenme hedeflerine göre, çeşitli boyutlarda ve tüm okul topluluğunun bir araya geleceği ortak alanları içerecek biçimde tasarlanmalıdır. Okulların öğrenme ortamları, gelişen ve değişen pedagojinin beklentilerini karşılayacak biçimde, uyarlanabilir olmalıdır. Fiziksel öğrenme ortamları, öğrenmeyi sınıfların ötesine taşımalı ve işlevsel olmalıdır. Okulların açık alanları etkileşimli olmalı ve toplum temelli etkinliklere ev sahipliği yapmalıdır.

Anahtar Sözcükler: Okul tasarımı, fiziksel öğrenme ortamları, pedagoji, 21. yüzyıl becerileri

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Introduction

Classrooms with limited movement space in the form of boxes lined up on either side of the long, narrow, dark main hallway... In these classrooms, twenty or more students sit at their desks, lined up one behind the other... A school bell rings later the forty minutes of learning and teaching... Children young and old run down the stairs to the playground to use their allotted time for fun. The on-duty teacher waits in the garden to maintain control and order. The schoolyard welcomes the students with its cold concrete floor. Students play and run here. In the hidden places of the school, fights and bullying between students occur from time to time. There are no private areas in the school reserved for visitors. There is an irregular traffic flow inside the school. However, the national vision for education foresees the training of individuals with the skills needed in the information and technological age. Advanced pedagogical approaches are used in instructional programs.

This description illustrates teaching in a typical public school in Turkey in 2022, which may be familiar to educators in many parts of the world. Schools typically provide the infrastructure to support learning with the features of the physical environment. Yet, there can be a discrepancy between progressive pedagogical approaches and learning environments (Higgins, Hall, Wall, Woolner, & McCaughey, 2005). Primary schools are the first settings where children meet and socialize independently of their families (O'Donnell, 2012). Children's experiences of primary schools as enchanting places contribute to their positive attitudes toward school (Adıgüzel, 2012). Children experience school in four domains as "spatial, psychological, psycho-sociological, and behavioral" (Nair & Fielding, 2013, p.7). Therefore, the quality of schools in the 21st century is related to their ability to serve as spaces that meet the child's experiences in these areas. Restructuring schools as spaces that are attractive, safe, and suitable for children to learn, and making them accessible to all children, is one of the priority issues in education in the international arena.

While until the late 1970s only the basic standards (temperature, lighting, acoustics, ventilation, and others) of the school were addressed, later it began to be understood that the physical environment has various effects on student behavior (Weinstein, 1979). Thus, the term "learning environment" was used referring to various factors (visual, auditory, and kinesthetic) enhancing the physical aspects of human comprehension (Kopec, 2006). In the 1970s, the factory school model evolved into the open school model, which has its roots in Montessori education (Cole, 2011). Weinstein (1979) outlined that open space and open-plan schools have two different meanings. Accordingly, open space refers to meaningful and exploratory learning approaches. There are interest centers in the classrooms where students can work in groups. Open-plan schools refer to the building structure. Open-plan schools do not have interior walls. Because open-plan schools allow for flexible room layouts, they also have the potential to increase learning by improving teacher-student interaction and allowing for teamwork (Weinstein, 1979).

School architecture and physical learning environments did not change radically until the 2000s. In the 21st century, the relationship between learning environment characteristics and educational quality has been better understood (Craissati, Devi Banerjee, King, Lansdown, & Smith, 2007). As part of the expansion of the definition of learning with the knowledge economy, the 21st century learning framework highlighted to integrate with basic academic subjects. In this context, life and professional skills, knowledge, media and technology skills, and learning and renewal skills are among the most important goals of educational institutions (Çiftçi, Sağlam, & Yayla, 2021). Since the 2000s, the profile of an educated person has been redefined as a global citizen who effectively uses information and communication technologies and is responsible for his or her own learning (Fırat, 2021). Understanding the new human profile has led to rethinking the physical environments of educational institutions. In 2002, the OECD organized the International Seminar on Education Infrastructure, and many countries addressed various issues such as the integration of technology into the educational environment, sustainability, and safety (Mahony, Hextall, & Richardson, 2011). The UK Design Council has also addressed the need for learning environments to keep pace with the rapid changes in learning (UK Design Council, 2005). The widespread belief that traditional schools could not meet learning expectations and developments in their curricula, and that it was a futile attempt to incorporate new insights in pedagogy into old classes, provided the impetus for innovative initiatives in school architecture (De Gregori, 2011; Leiringer & Cardellino, 2011). The 21st Century Schools

(CABE/RIBA, 2004) and the Building Schools for the Future Program [BSFP] in England are good examples of these initiatives (Leiringer & Cardellino, 2011). Another initiative is the Priority School Building Program, which was launched in the UK in 2011 (Education & Skills Funding Agency, 2016). The international trend toward developing effective learning environments and designing innovative school structures has continued since the early 2000s (OECD, 2015).

The changing nature of education has profound implications for the characteristics of the physical learning environment. The 21st century learning environments include physical environments, digital learning environments, and social interaction environments (EDUSPACE21, 2016). The main goals of these learning environments are to develop cognitive (critical thinking, problem solving), interpersonal (cooperative working, intercultural skills), and internal skills (skills such as self-management, self-regulation) of 21st century learners (The American National Research Council [NRC], 2011). In addition, school buildings and classroom designs vary across countries, depending on educational attitudes and philosophies and financial resources (Woolner, 2010). Today's educational approaches aim to educate students to become individuals who explore and use knowledge effectively. One of the indicators of the quality of education is the physical facilities that enable students to acquire 21st century skills such as "collaboration, critical thinking, effective communication, and entrepreneurship" (Gökçe & Erdem, 2019, p.67). Leiringer and Cardellino (2011) suggest that the philosophy of education guides the design of physical learning spaces, but that there must be a balance between the realities of education and economy in designing school buildings. For example, if a school does not have enough flexible space to accommodate more students, some changes must be made in the teaching methods used.

Referring to the situation in Turkey, primary education is serving the largest student population. In the 2019-2020 academic year, there were a total of 24 thousand 790 primary schools, 5 million 279 thousand 945 students (Republic of Turkey Ministry of National Education, 2020a). The number of primary-school-age children is rapidly increasing in Turkey. In addition to meeting the school and classroom needs of children, there are extensive efforts to enhance the quality of learning environments. However, the budget deficiency allocated for the reconstruction of buildings is among the most fundamental problems of primary education (Sarıbaş & Babadağ, 2015; Deveci & Aykaç, 2019). This situation also affects students' academic achievement. Regarding this issue, according to the results of the Program for International Student Assessment [PISA] 2015, there is a linear relationship between the education budget allocated for education and student achievement in countries with an education expenditure of less than $50,000 per student in the 6-15 age group (OECD, 2018). Increasing the budget allocated for the infrastructure of schools in developing countries such as Turkey and reorganizing the 21st century physical learning environments are key factors that enhance student learning. In this context, student-oriented, technologically enriched and individualized learning environments are needed for the acquisition of 21st century skills, and thus, library, workshops, laboratories and active learning classes where students can activate their self-learning, 4C (cooperative, communicative, critical and creative) thinking skills (Çiftçi, Sağlam, & Yayla, 2021).

Current Trends in Physical Learning Environments of Primary Schools in Turkey

In line with international trends, numerous studies have been conducted in Turkey at different levels to improve the quality of school buildings and standards have been developed to determine suitable learning environments. One of them is the Directive on Standards for Private Educational Institutions, which was updated in 2020. In this guideline, the mandatory spaces in elementary schools are indicated as follows: "principal's office, teachers' lounge, student affairs office, archive and records room, guidance and assessment room, classrooms, gymnasium, library, recess room, music instruction room, fine arts instruction room, playground, dining room, prayer room, restrooms." Other optional areas include "the office of the deputy principal, a classroom for preschool education, a multipurpose room, a science laboratory, a health room, a kitchen, a canteen, a teachers' room, a room for support staff, a room for parent meetings, and a swimming pool" (Ministry of Turkey Ministry of National Education, 2020b, pp.7-8). However, it can be seen that the aforementioned spaces are incomplete or insufficient in many primary schools, especially since the classrooms and playgrounds

cannot meet the needs of young students and are far from these standards (Akbaba & Turhan, 2016; Gültekin & Özenç-İra, 2021; Radmard, Karataş, & Öksüz-Gül, 2019; Yılmaz, 2012).

In addition, "school buildings, gardens, gymnasiums, laboratories, and other such facilities" are identified as priority needs in the Turkish Ministry of Education's Strategic Plan for 2019-2023 (Republic of Turkey Ministry of National Education, 2019). The Eleventh Development Plan (2019-2023) states that "educational buildings are designed with architecture that is compatible with technology and the environment, safe, economical, aesthetic, accessible, with high standards and quality" (Presidency of Turkey, Presidency of Strategy and Budget, 2019, p.34).

The Aim of the Study

This paper aims to contribute to the debate on the relationship between pedagogy and learning environments and what kind of school design should be promoted by governments that serve 21st century learners. Many studies in the international literature focus on school design standards. The result can be a complicated view of what constitutes pedagogically oriented learning environments. Therefore, this article focuses primarily on 21st century skills and modern approaches to learning and teaching. Integrating the pedagogically oriented design ideas that are the focus of these studies can present the relationship between pedagogy and physical environment from a more holistic perspective. Another consideration of this study is that there is little evidence on how school design initiatives (in educational policy or academic studies) improve pedagogy or on what pedagogical principles these studies are based. This issue is critical because the factor that determines student progress is not only the change in the physical learning environment, but also the regulation of that change according to 21st century skills and pedagogical needs (Ayre, 2017). The paper also focuses on child development because this provides an interesting insight into debates about school design, especially since a number of issues such as ethical, cultural, intellectual, and aesthetic development that are not directly related to the pedagogical design foundations of schools are overlooked in this context. Hence, in this study, an attempt was made to answer the question: 'What is design principles based on pedagogy that reflects the characteristics of the physical learning environment of primary schools in the 21st century?' Nowadays, architectural design teams of schools are composed of students, teachers, educators, architects, engineers, and administrators (Bardone & Gargiulo, 2014). It is expected that this study will contribute to the pedagogical foundations of schools to be designed in the future and help design teams combine their disciplinary perspectives.

Methodology

In this study, studies on pedagogical design foundations of primary schools (educational policy reports, articles, dissertations) were examined using the technique of document analysis. Document analysis is a method that examines written materials that contain information about the studied cases (Şimşek & Yıldırım, 2011). Studies including keywords "school design, school architecture, pedagogy, schools in the 21st century, learning spaces, and physical learning environments" were included in the review with no year limit to avoid data loss. Later, studies eliminated to have appropriate content for the research question. The reviewed studies were analyzed using the content analysis method. First, the data were collected, then the unit of analysis was defined, categories and themes were determined, and the results were reported (Tavşancıl & Aslan, 2001). The two researchers first worked independently to create the codes, themes, and categories and then came together to reach a consensus.

Studies Included in the Review

When the studies on this topic are examined (Ayre, 2017; Bosworth, Ford, & Hernandez, 2011; Brkovic, Pons, & Parnell, 2015; Cole, 2014; Cutter-Mackenzie, 2009; Darmody, Smyth, & Doherty, 2010; EDUSPACES21, 2016; Fisher, 2010; Fisher, Godwin, & Seltman, 2014; Flores, 2008; Foster et al., 2006; Giraldo-Henao, 2017; Göçen, Eral & Bücük, 2020; Hanovar Research, 2011; Higgins et al, 2005; Leiringer, & Cardellino, 2011; Luna-Scott, 2015; Milo-Shussman, 2017; Nair & Fielding, 2013; O'Donnell, 2012; Rigolon & Alloway, 2011; Sigurðardottir & Hjartarson, 2011; Sutherland & Fischer, 2014), the design of the physical learning environment was considered in the context of the pedagogical foundations that guide 21st century primary schools were subsumed under two main

categories of 'child-friendly design' and 'design for learning'. The design principles for the physical learning environment under these categories are adressed.

Child-friendly Design

For many young children, primary school is a new environment in which they need to adapt. Some physical provisions in schools will ease children's transition to primary school. It is necessary to create an attractive, friendly, healthy and safe environment where children can learn and play together. Uludağ and Odacı (2002, p.154) stated that physical learning environments should have four characteristics: They should be functional, reflect the intensity of emotions, be flexible, and have an aesthetic value that can serve different learning purposes.

Child-scale Area

This concept refers to the design of physical learning environments in primary schools with the perspective of the child and different sizes for the development of children in all aspects. Physical learning areas should include different sizes, such as large areas for physical development, medium areas for student work, and smaller areas for social contact. However, it is recommended to pay attention to the size of these areas (Rigolon & Alloway, 2011, p.69): "Small sizes can give the impression of overcrowding and limit the diversity of school areas; too large dimensions can weaken students' sense of control and also cause children to lose their sense of direction in school."

O'Donnell (2012) suggested metaphorical environments such as houses, neighborhoods, and villages that gradually scale to accommodate elementary students to a broader learning community. To this end, for example, the same grade levels can join together to form neighborhoods. Later, neighborhoods can join together and become a learning village. Public areas of the school (hallways, school garden, etc.) can be considered streets or shopping areas. Tables and chairs outside the classroom can extend learning into the living areas of the building. All students can gather in a town square where school events are held. When designing the classroom, any surface of the classroom, especially the walls, but also the ceiling and floor, can be incorporated into the learning process. However, care should be taken to ensure that the objects on the floors, such as the walls to be used, are within the scale of the children.

Interactive Open Spaces

When school open spaces are interactive, they can support the development of children's personal and interpersonal skills (Foster et al., 2006; Rigolon & Alloway, 2011). In this sense, the educational goals of school gardens are as follows (Foster et al., 2006, p.13):

- Allow children to participate
- Provide outdoor teaching spaces that are sheltered, safe and secure
- Layout space and facilities for all forms of play
- Stimulate creativity
- Contribute to pupils' health and well-being
- Create places where nature may thrive
- Celebrate diversity
- Encourage responsibility through citizenship
- Provide opportunities for enriching the curriculum
- Provide sports facilities of a suitable standard
- Be located at the heart of the community

To achieve these accomplishments, it is recommended that sustainability be considered in the fields and that safe, healthy, functional, and esthetic areas be created (Foster et al., 2006). Playgrounds can also provide a unique opportunity to provide students with experiences of intercultural learning. School garden activities can enhance children's social development, teach them about the environment, and even improve their intercultural skills, as can be cited an example The Multicultural Schools Gardens program (Cutter-Mackenzie, 2009). This program was implemented in low-income primary schools to implement a culture-based environmental education program. Through this program, students designed their gardens as part of a learning community. This program resulted in a

strong sense of belonging among students and provided opportunities to learn languages and connect with the local environment.

Design for Learning

The development of learning and teaching approaches that enhance 21st century skills (Hanovar Research, 2011), the advancement of educational technology (Sutherland & Fischer, 2014), initiatives for disadvantaged students in education (Flores, 2008; Sigurðardottir & Hjartarson, 2011) contribute to the redesign of physical learning environments. School physical learning environments should enable collaborative work to develop 21st century skills in individuals, including creativity, leadership, communication, teamwork, and other interpersonal skills. Besides, learning approaches such as flipped learning and project-based learning require more movement space and flexible and adaptable classroom spaces (Luna-Scott, 2015). The ideal size of physical learning environments can vary.

Spaces as teaching tools

In this concept, every corner of the school is a learning space (Darmody et al., 2010). Accordingly, it is about making all areas of the school suitable for learning. By making the school structure environmentally friendly, students can acquire environmental knowledge (for example, The Teaching Green School Building, Cole, 2014). The school's ceilings and floors can facilitate learning for math, science, and art. For example, the classroom doors and cabinets can be designed to include different shapes or patterns to teach geometry in mathematics (Sigurðardottir & Hjartarson, 2011). However, it should be considered that using more visual stimuli in classrooms may not be associated with more learning, but rather distracting (Fisher, Godwin, & Seltman, 2014; Milo-Shussman, 2017). Another approach that takes classrooms out of their traditional use is themed learning areas. These areas can be a kitchen, a theatre room, etc. For example, in the kitchen, students can learn math while baking number-shaped cookies (EDUSPACE21, 2016).

Flexible spaces

Flexibility refers to the arrangement of physical spaces to meet students' diverse learning needs (Hanovar Research, 2011). Flexible learning spaces allow students to make their own decisions regarding their learning needs (Ayre, 2017). For this reason, flexibility and adaptability are among the fundamental design principles of 21st century schools. Classes should be large and flexible enough to allow for the use of many teaching methods, including group work, self-discovery learning, and play (Darmody et al., 2010; Higgins et al., 2005). Physical learning environments include school gardens and indoor and outdoor courtyards where students can collaborate (Hanovar Research, 2011).

The rapid development of educational technologies requires that physical learning spaces integrate educational technologies (Fisher, 2010). The role of digital technologies in facilitating formal and informal learning is more emphasised. Digital technologies are expected to change the nature of physical and virtual learning spaces in the future (Sutherland & Fischer, 2014). Extraordinary situations that affect all of humanity, such as the outbreak of a disaster, can add a new dimension to learning spaces with educational technologies. Digital learning environments allow learners to access educational content at any time. Besides, because they allow for formative assessment, student development can be tracked during the instructional process (EDUSPACE21, 2016). The integration of technologies into the classroom environment must be flexible and adaptable (Göçen, Eral, & Bücük, 2020). This requires that physical areas-from computer labs to classrooms-can be easily adapted to productive use and have furniture that is suitable for the use of laptops and other mobile technologies (O'Donnell, 2012). However, special attention should be paid to the fact that these technologies promote active learning in the classroom (Darmody et al., 2010; Fisher, 2010).

Community-connected spaces

School interactivity with the community is associated with a more qualified education and a strong social bond (Nair & Fielding, 2013). It can also contribute to the perception of schools as safer areas by students (Bosworth et al., 2011; Brkovic et al., 2015). Strong interaction between family and school can also strengthen learners' social-emotional development, self-control, and belonging (The

National Academies of Sciences, Engineering, & Medicine, 2020). These close ties with the community can support both social and ethical development (Rigolon & Alloway, 2011). Schools should be in a position where students can engage in activities with the community in the open areas of the school (Brkovic et al., 2015; Nair & Fielding, 2013). In particular, to facilitate the participation of parents in school life, allocated spaces for parents to meet during school days are needed (Darmody et al., 2010).

Discussion, Conclusion and Recommendations

It is not possible to provide a single prescription for the physical learning environments of 21st century primary schools. The sociocultural characteristics and needs of society, the demographics and needs of learners, the economic conditions of the school, the social image and role of the school, and even the esthetic tastes of teachers can all contribute in unique ways to the design of physical learning spaces. In addition, the changing profile of 21st century students and their views of learning require effective use of all areas in and around the classroom and school to make these environments more productive. The physical environments of schools should accommodate the following learning approaches (Nair & Fielding, 2013, p.19), i.e., "independent learning, peer tutoring, teamwork, one-on-one instruction with teachers, project-based learning, technology-based learning with mobile computers, distance learning, performance- and music-based learning, seminar-based instruction, community service learning, naturalistic learning, social/emotional learning, arts-based learning, learning by building." In addition, physical learning environments should have adequate technological equipment and learning centers that allow for group and individual work to take advantage of individualized learning approaches. Indeed, the function of learning spaces leads to some outcomes based on psychosocial and behavioral elements as well as learning and pedagogy. When the function of physical spaces and pedagogical goals are not compatible or the purpose and messages of learning spaces are not clear, many negative interrelated outcomes can occur in the learning and teaching process, such as undesirable student behavior, safety issues, areas that are less supportive of learning and teaching, lower student achievement, etc. Therefore, it is important to take pedagogical concepts and principles as the basis for designing functional areas. In this study, the basic pedagogical principles that guide elementary schools were elaborated under the themes of child-friendly design and design for learning needs. The pedagogical design principles for the physical learning environments were child-friendly and esthetic (or according to children's tastes), interactive, open, intended as a teaching tool, flexible, and connected to the community.

The learning spaces of the school should guide the transition of children to a broader learning community through areas that scale. Consequently, using objects suitable for their physical dimensions and using adaptable furniture for various purposes, setting up the classrooms as a learning scene; above all, it makes it necessary to move all areas of the school beyond traditional use. Correspondingly, having spaces in schools that allow community participation as public spaces and organizing activities that let effective utilization of these spaces can help children develop their sense of social belonging, also learn social, cultural and ethical behaviors.

The studies evaluating the physical conditions of the school building point out many quantitative and qualitative issues in Turkey. These are as follows: inadequate provision of education and training needs of the various spaces of the school (Akbaba & Turhan, 2016; Yılmaz, 2012), technological equipment deficiency in schools (Göçen, Eral, & Bücük, 2020), because of the crowd schools' sacrificing libraries, sports halls, laboratories or narrow closed circulation areas to create classrooms (Köse & Barkul, 2012), the inability of schools to provide the necessary spatial conditions due to the unsuitable settlement and grounds where primary schools (Köse & Barkul, 2012), lack of special regulations for people with disabilities (Akbaba & Turhan, 2016), playgrounds consisting of concrete floors, and no suitable area for children to play, do sports and physical activities (Akbaba & Turhan, 2016; Işıkoğlu-Erdoğan & Şimşek, 2014). All these mentioned problems prevent the use of physical structures and spaces that will support the development of learners in the most effective ways today. In this respect, there is a need for newly designed schools that will increase the learning motivation of children in primary schools and support their physical, social and cultural development. Taken together, the pedagogical design principles for elementary schools in the 21st century can be described as follows:

- The pedagogy should be consistent with the design of physical learning environments.
- Learning environments should be flexible and adaptable to meet indivudialized learning approaches.
- Classrooms should have focal points of interest, and physical space should allow for group work. Therefore, classroom equipment (e.g., furniture, presentation aids, and technical equipment) must be adaptable.
- Physical learning environments should take learning beyond classrooms and be functional.
- Class size should be appropriately determined and arranged according to the needs of learners and the size of the physical environment.
- There should be centers of interest in classrooms, and physical arrangements should allow group work. Thus, the equipment of the classrooms (such as furniture, presentation tools, and technological devices) must be adaptable.
- Learning environments should be organized for social interaction in a variety of sizes and should include communal areas where the entire school community gathers.
- Furniture and materials must be appropriate for the developmental characteristics and interests of elementary school-aged children.
- The school's playground should allow for community participation and various activities such as sports, games, gardening, and recreation.
- The perspective of children must be considered when designing the physical learning environment.

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