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# Educational Academic Research

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# Investigating Documentation and Assessment Practices of Early Childhood Teachers

## Okul Öncesi Öğretmenlerinin Dokümantasyon ve Değerlendirme Uygulamalarının İncelenmesi

Aslı ELDEN<sup>1</sup>

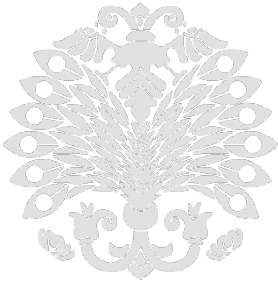


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### ABSTRACT

This study aimed to investigate early childhood teachers' experiences of documentation and assessment practices. The study was conducted with 15 early childhood teachers. Semi-structured interview protocol was used for the data of study, in which the phenomenological design was utilized with an exploratory nature. The participant teachers' observation and documentation processes and practices, planning through assessment, and sharing assessment data were the major themes of the findings of this study. It was found that there were important differences in teachers' assessment practices. Teachers' use of assessment in their daily routines provided important messages about their professional understanding of teaching and learning. Although observation was a key aspect of teachers' practices, which they mostly conducted during free play times, teachers' use of observation and assessment data indicated differences. The study concluded with a discussion on suggesting developing teachers' documentation and assessment skills through effective professional learning.

**Keywords:** Early childhood education, assessment, documentation, formative assessment, data-driven planning

### Öz

Bu çalışma, okul öncesi öğretmenlerinin dokümantasyon ve değerlendirme uygulamalarına ilişkin deneyimlerini araştırmayı amaçlamıştır. Araştırmaya 15 okul öncesi öğretmeni katılmıştır. Fenomenolojik desenin kullanıldığı bu çalışmanın verilerini yarı yapılandırılmış görüşmeler oluşturmuş ve keşifsel bir süreç izlenmiştir. Katılımcı öğretmenlerin gözlem ve dokümantasyon süreçleri ve uygulamaları, planlama ve değerlendirme ve değerlendirme verisinin paylaşımı bu çalışmanın bulgularının ana temalarını oluşturmuştur. Öğretmenlerin değerlendirme uygulamalarında önemli farklılıkların olduğu görülmüştür. Öğretmenlerin günlük uygulamalarında değerlendirmeyi kullanmaları, öğretme ve öğrenme anlayışları hakkında önemli bilgiler vermektedir. Gözlem, öğretmenlerin çoğunlukla serbest oyun zamanlarında uygulamalarının önemli bir boyutu olsa da, öğretmenlerin gözlem ve değerlendirme verilerini kullanma durumları farklılıklara işaret etmektedir. Bu çalışma ile etkili mesleki gelişim yoluyla öğretmenlerin dokümantasyon ve değerlendirme becerilerinin geliştirilmesine ihtiyaç duyulduğu çıkarımına ulaşılmıştır.

**Anahtar Kelimeler:** Erken çocukluk eğitimi, değerlendirme, dokümantasyon, biçimlendirici değerlendirme, veriye dayalı planlama



## Introduction

Since early years cover a complex and rapid period, there has been a surge of practices and research exploring the value of assessment for learning while educating young children (Dunphy, 2008). The key reason for this situation is that it is not possible to carry out the assessment process in early childhood with traditional and summative methods (Epstein, et al. 2004; Karaman & Karaman, 2017). Children's development and learning processes are quite extensive and include different learning styles. Assessment of these different development and learning styles and processes necessitates an assessment process that is very systematic and intertwined with the teaching process (Aras, 2019).

Assessment of the development and learning processes of children constitutes an indispensable link in the teaching cycle in early childhood education. Traditional assessment methods in early childhood are not suitable for the developmental levels and needs of children, and therefore alternative assessment methods come to the fore. With this assessment method, the development and learning processes of children are continuously evaluated with process-oriented, multiple, and various observation recording tools (Dunphy, 2008). Well-designed formative assessment should be able to guide how learning environments and learning processes should be modified, as well as suggest to the teacher what children know and can do (Bennett, 2011). Formative assessment is asserted to be valuable in optimizing teaching practice in ways that support children's learning (Yan & Cheng, 2015). For this reason, it is valuable in terms of the quality of assessment to monitor and document children's progress, to determine how much of their educational needs are met, and to modify implementations (Epstein et al., 2004). While preparing the education program, it is the basis of the success of the program that the teacher provides children with qualified and supportive development and learning environments in line with the data driven from assessment data, considering the individual differences, and considering the development of the children in a holistic manner.

Assessment in early childhood is an important building block that affects children's agency and takes an important place in teachers' decision-making process for further plans and successful teaching strategies (Bowman et al., 2001; Karaman & Karaman, 2017). Formative assessment takes place in the development, learning, and teaching process and constitutes one of the basic steps of the program. Formative assessment is called as "a fundamental professional skill for teachers" (CCSSO, 2018). The National

Association for the Education of Young Children (NAEYC) calls for the effective implementation of formative assessment in early childhood settings and states that early childhood educators "understand that effective, evidence-based teaching is informed by thoughtful, ongoing systematic observation and documentation of each child's learning progress, qualities, strengths, interests, and needs" (p. 15). While children are on task, teachers provide effective feedback to children in light of their observations, and support children's learning by asking appropriate questions (Black & William, 1998). These observation processes are documented with multiple and various tools. The information and evidence obtained from the children are interpreted and in line with these comments, the teacher has the opportunity to determine the development and learning levels of the children, to design appropriate teaching plans, to evaluate the teaching processes, and to inform the family about their children's development and learning with concrete data (Buldu, 2010; McAfee & Leong, 2004).

It is a key practice for teachers to make systematic observations, to listen to children effectively, to document the data obtained from listening and observations, to analyze these records at certain intervals, and to guide their future planning. Teachers' observation and documentation skills in these processes determine how effective assessment practices are. The decisions are expected to be made regarding the follow-up and documentation of children's development and learning processes, the sharing of learning experiences with children, teachers, and families with documentation tools, and the decisions taken about what children learn and how they learn to guide teachers in their practices (Aras, 2019; Buldu, 2010; Buldu et al., 2018). To reinforce children's learning, teachers focus on the constructive and directive aspects of the assessment process. A well-implemented formative assessment represents one of the most powerful teaching tools (Stiggins & DuFour, 2009). In the light of the sources reached, although there are studies on formative assessment in our country in the literature, there are not enough studies on assessment in early childhood education (Erdiller & McMullen, 2003; Turupcu, 2014). Studies in the literature draw attention to the fact that teachers do not use the formative assessment used to improve the learning process at a sufficient level (Wininger & Norman, 2005).

Although formative assessment is frequently emphasized theoretically in teacher education programs; the literature points out that teachers have difficulties applying formative assessment to support development and learning (Black &

William, 2005; Yin & Buck, 2019). Opportunities for the development and learning of the child may be missed if formative assessment is not used in the early childhood period (Navarrete, 2015). It is seen that there is a need for studies that will describe teachers' assessment practices, especially in Turkish literature. The national programs on preschool education put critical emphasis on the assessment of young children's development and learning. Research on documentation and assessment in early years has a short history in Türkiye. It is asserted within this research that more studies are needed to narrate teachers' practices regarding assessment and documentation (Aras, 2019; Özkan-Yıldız & Yılmaz, 2021). Therefore, it is important to investigate the documentation and assessment practices of teachers and to examine these practices in depth. This research, which is carried out with a phenomenological design, is important in terms of contributing to the literature at this point.

With this study, it is aimed at investigating early childhood teachers' documentation and assessment practices. To conclude the early childhood teachers' experiences, the following questions guided the research: (1) What are the early childhood teachers' experiences with documentation and assessment? (2) How and to what extent do early childhood teachers include formative assessment in their practices?

### Methods

This study was carried out with the phenomenology design, which is one of the qualitative research methods. The phenomenology design aims to study a phenomenon in which an idea is given in detail (Creswell, 2002). This study design explains how participants with a common essence have both subjective and objective experiences in common with other people. The main purpose of the phenomenology study is to make inferences from the individual experiences of the participants (Creswell, 2002; Van Manen, 1990). The researcher makes a general description with the data collected from the individual experiences of the participants. In this description, it consists of experiences that correspond to the questions of "what" and "how" (Creswell, 2002; Moustakas, 1994).

### Participants

With this research, it was aimed to examine the formative assessment practices of early childhood teachers. The study group of the research consists of 15 early childhood teachers. In determining the study group of the research, convenient sampling, one of the purposive sampling methods, was preferred (Creswell & Poth, 2016). Purposeful sampling methods allow for in-depth investigation of rich

sources of information and take place by selecting from the researcher's close environment and accessible (Patton, 2014). Demographic information related to participant teachers is provided in Table 1.

**Table 1.**  
*Demographic Characteristics of the Participants*

	Educational Background	Professional Experience	Number of the Children	Age Group Worked
T1	Undergraduate	20	22	60-72 Months
T2	High School	3	13	60-72 Months
T3	Undergraduate	5	11	48-60 Months
T4	Open University	9	10	60-72 Months
T5	Undergraduate	4	16	60-72 Months
T6	Undergraduate	8	20	60-72 Months
T7	Undergraduate	27	25	60-72 Months
T8	Undergraduate	15	13	36-48 Months
T9	Undergraduate	2	13	48-60 Months
T10	Undergraduate	7	17	60-72 Months
T11	High School	12	8	24-36 Months
T12	Undergraduate	7	25	60-72 Months
T13	Undergraduate	5	12	48-60 Months
T14	Undergraduate	11	14	Multi Age
T15	Undergraduate	15	12	48-60 Months

### Data Collection and Analysis

While examining documentation and assessment practices of early childhood teachers, the data were obtained through semi-structured interviews (Merriam, 2009). A semi-structured interview form prepared by the researchers was used as a data collection tool. To be answered by the teachers, the first four questions in the interview form are about demographic information and the remaining nine questions are about assessment, and thirteen open-ended questions are formed. Before starting the interview, permission was requested from the participants for the audio recording, and it was recorded with an audio recorder.

Content analysis with an exploratory nature was utilized to underly philosophical presuppositions of the phenomenological approach (Creswell, 2002). The data was allowed to understand the teachers' sense of assessment and their ways to practice in their classrooms. The interviews were audiotaped and transcribed verbatim. The researchers read the transcripts several times to make sense of the data and make interpretations based on data. The readings continued until no further points were noted. After reading each transcript and taking notes on the right margin, the transcripts of each participant were reunited to generate a list of themes that emerged and make connections between the themes.

### Validity and Reliability of the Study

There were some strategies used in this study for credibility and trustworthiness. Rich descriptions suggested by Lincoln and Guba (1985) and Creswell (2002) were included in the study in order to increase the readability of the data. The experiences of the teachers participating in the research were tried to be presented in detail. With this regard, the statements of the teachers who participated in the study were frequently included. A pilot study was also conducted for the research with the participation of three early childhood teachers. The pilot study was conducted to investigate the suitability of the interview questions in the research, and a change was made in one question in the light of the data obtained from the pilot study. In addition ethics committee approval was received for this study from the ethics committee of Baškent University (05.01.2018-17162298.600-139). The consent of the participants was also sought for the research, which was conducted within the framework of the principle of volunteerism.

## Results

Teachers' observation and documentation practices, planning through assessment, and sharing assessment data were the major themes of the findings of this study.

### Observation and Documentation Practices

As a result of the interviews with the teachers, important findings were obtained regarding the observation and documentation practices of the teachers. Observation and documentation have a critical phase during formative assessment practices, so there were some questions regarding this issue. When the interviews of the teachers were analyzed, it was determined that a bare majority of them conducted systematic observations during free play time. It was evident from the interviews that teachers prefer free play hours to observe children. The use of free play

times was their way of monitoring children's development and learning. Examples of teacher statements regarding this finding are as follows:

*"We have the chance to observe more children in free play time. Because at that time, children actually reveal themselves completely. Where is he playing, who is he playing with, is he playing alone, is he playing together with a friend, how is he sharing?" (T3).*

*"We do it more naturally with children. We have the chance to observe a lot in the free-play time activities because that's where children are most natural." (T12).*

In addition, a few of the teachers who stated that they observed in the free play time emphasized that they encountered difficulty in observing all the children in other times within the daily schedule. These teachers stated that they had little chance of making observations in the complexity of the day. Sample teacher statements on this subject are as follows:

*"In free time, it's a terrific observation. Apart from that, since we do not have an assistant and we include each child in individual classes, even if the number of classes is small, a hundred percent observation area is not formed while performing the activity." (T3).*

*"Because other activities are mostly structured activities, we have less chance to observe the child's behavior." (T4).*

Participants reported a wide range of areas on which they focused during their observations. Participant teachers stated that they focus on children's friendship relations, behaviors, and attitudes more clearly. While some of the teachers conducted their observations mostly to profile the behavior of the children, some of them said that their attention was on the children's developmental progress. In addition to teachers who indicate that observation should guide them on how to proceed, there are also teachers who observe the child's social relations and see whether the child understands the learning process.

*"While observing, we pay attention to their cognitive, physical, social-emotional development." (T2).*

*"We mostly observe the behavior of children because we are trying to correct their behavior." (T4).*

When the interviews with the teachers were examined, it was determined that there were differences in the practices of the teachers regarding the observation processes. Some of the teachers stated that they took notes on their observations. Most of the teachers who took notes emphasized that they mostly noted the problematic behaviors of the children.

*"I fill out the observation form twice during the semester.*

*Sometimes I also take notes on different papers. But if it's something that breaks the routine, if I'm observing an extra situation. Other than that, I don't write anything that goes normally." (T3).*

*"During the observation process, I sometimes write very important things in the notebook at that moment. It's very extreme." (T7).*

It is one of the important findings that a few of the teachers stated that they did not record their observations in any way.

*"I don't take notes. Because when the parent hears this, he objects. When they notice, they cause trouble." (T8).*

*"I don't take a lot of notes. There are those format files, frankly, I don't like them." (T15)*

### **Planning through Assessment**

Early childhood teachers were asked questions about how they use assessment data for their practices. The teachers' descriptions of their use of formative assessment provided an insight into their planning and data-driven decision-making practices. There have been some teachers who have stated that they use assessment to have information about children's development and learning processes and to incorporate this information into their next plans. The above extract portrays a structured approach to the use of formative assessments in decision making, representing the use of assessment data:

*"The assessment shows us where the child is. Where is it missing? If this is an assessment of a cognitive process, which concept has what is missing, what gains and indicators did he not understand, and what could he not complete? If this is something that needs to be supported individually, we try to help him by supporting individually. But if not, we usually look at the aggregate in the cognitive process. We are putting it into the next plan, making an activity by including it as an indicator, and re-evaluating it." (T3).*

Some of the teachers stated that they use assessment data in order to follow and assess the development and learning of children and to have information about teaching practices. In the extracts above, there is a sense of the teachers' transformation of data into a decision. It is evident that teachers make decisions to analyze children's needs and adjust practices using assessment data:

*"After an assessment process, whether that activity is suitable for the child, whether it attracts his attention, I write notes to see if he/she has completed it, below or above that achievement. Then, if he has achieved less than the gains of that day, I do not pass up, I transfer that gain to the next day." (T1).*

*"When we take a note of what the child can do at least at the beginning to see his progress, I use it to see what he has learned, what he has not learned, and where we hang out." (T13)*

Based on the pattern of the assessment data, teachers determine what instructional strategies are needed for the children who need help, as well as the next steps for those who have demonstrated understanding of the topic. Some of the teachers revealed a similar concern when transforming assessment data, explaining the way they evaluate their teaching approaches as they reflect on through formative assessment:

*"I determine how far the child's capacity can go and what they can do. If he took it, I leave it there, no problem. If not, I go to repetitions and continue that way. In other words, I plan according to the interests and needs of the children." (T8).*

There were also teachers who did not use assessment data for their further plans and prepared their own instructional plans. Some of these teachers stated that they used the plans they obtained from previous years or the internet. There were teachers who used ready-made plans offered by various publishers and introduced them with small changes. A few of the teachers stated that their education coordinators or principals prepared their plans. The fact that teachers are not involved in planning is among the striking findings. Examples of teacher statements are given below:

*"We usually adjust our plans in the seminar process at the beginning of September. We assess according to the physical environment. We download several plans from the Internet. We combine them and plan together. We download some publishers' plans. We combine and discard our plans, which have accumulated over the years." (T7).*

*"Usually, our training coordinators plan the process. They send us the plans one week in advance. We also practice. We don't have much of an impact on the plan." (T10).*

### **Sharing Assessment Data**

Teachers stated that they shared their observation notes with the stakeholders. Especially the teachers who took note of the problematic behaviors reported that they shared their observations with their families, counselors, and education coordinators.

*"We take notes of our observations. We also inform the family about this, we write every month, we send it somehow." (T2).*

*"I only record observations by writing. Then I call and discuss my observations with the family. If necessary, I*

*refer them to guidance when there are problems in some issues.” (T7).*

*“We take note of the situations we observe. We share our observations with our coordinators.” (T10).*

Some of the participant teachers stated that they shared the assessment practices with the families and involved them in their practices in this way. By providing family participation, teachers have included activities in order to support the development of children by families. The expressions of the teachers that will serve as an example for this finding are as follows:

*“Instead of keeping the family away as much as possible, I try to involve the family. By having them spend a pleasant and quality time together, both with homework and with different activities, by reading books. Sometimes they come here too. Or, at some event, we send the children home to see how much they can do.” (T15)*

The findings revealed that teachers only share assessment data with families when they deem it necessary. Especially in the question about what they did with the assessment data, there was no finding about maintaining the interaction with the families.

### Discussion

The findings obtained from this research, which aims to examine the experiences of early childhood teachers towards documentation and assessment with a qualitative research design, indicated that all teachers include assessment in their practices, albeit in different processes. A closer look at the teachers' experiences of documentation and assessment reveals a detailed picture of their observation and documentation practices, data use for further plans, and practice of sharing data. Participant teachers use observation during their daily routines. While assessing young children, they think that observing the natural state of children in free play time is the most productive and rich source of information. Similar to this finding, Buldu (2010) stated in his study that children's unique characteristics and individual differences emerge during play. Diffly (1994), on the other hand, in his research on early childhood teachers' beliefs and opinions about assessment based on teacher statements, concluded that observation is the primary assessment method used by teachers and can provide valuable information about children.

Although the teachers were aware of the critical side of free play for observing young children, their focuses of observation were quite limited, which mostly included

children's behaviors, developmental characteristics, and peer relationships. It is a key point for teachers to focus on what they will assess first, choose the learning outcome, and plan by exemplifying (McAfee & Leong, 2004; Stiggins & Conklin, 1992). Determining the focus of observation while making systematic observations turns the observation into a purposeful and systematic observation. Some of the teachers stated that they did not record their observations in any way. Recording assessment data supports the developmental process of the child, the desired goals in education, and a successful teaching focus (McAfee & Leong, 2004). This finding supports the research results of Trepanier-Street, McNair, and Donegan (2001), Turupcu (2014), and Buldu (2010). When Trepanier-Street et al. (2001) examined teachers' views on assessment, they stated that, as a different finding, early childhood teachers recorded their observations. They also emphasized the necessity of involving families in the assessment. After the teachers interpreted the observation data, they shared it with other teachers, families, and psychologists and stated that they should exchange ideas (Turupcu, 2014).

What comes to the fore in the analysis of teachers' experiences with data-driven decision making is that there are differences in teachers' data use. It is among the findings that teachers have different practices using assessment data. Most of the teachers stated that they use assessment data while planning for next steps. A vast body of research nowadays discusses the power of data use for effective teaching (Dunn et al., 2013). Whereas there were also teachers who stated that they use ready plans of integrated lessons offered by various publishers. Another striking finding is that some teachers have no connection with planning, or they cannot intervene in the planning process. They stated that the education coordinators or school principals provide them with the instructional plans. Similar to this finding, Burgazlı-Osanmaz and Akman (2018) examined the assessment dimensions in the plans used by early childhood teachers in their education programs. Although it was found that the teachers' statements were applied by making arrangements on ready-made plans, when the teachers' plans were examined by the researchers, no adjustments were found on the ready-made plans. While some of the teachers stated that they plan by taking into account the interests and needs of the children, only one teacher stated that they included the children in the planning and paid attention to choosing the areas that interested the children during the circle time. In the research of Yılmaz-Topuz and Erbil-Kaya (2016), a small number of teachers stated that they use the assessment data to organize the activities. Unlike this finding, Özkan-



Yıldız and Yılmaz, (2021) stated in their research that teachers adjust in their plans according to the feedback they receive from the children while planning the activities.

### Conclusion and Recommendations

With this study, it was aimed to examine the experiences of early childhood teachers towards documentation and assessment. When the findings of the study are examined, it is revealed that there are differences in teachers' practices. Teachers mostly observe children during free play; however documenting the observations is not a common practice. Teachers also encounter difficulties while observing children during activity times. It is revealed that there is a need to increase the tendency of teachers to use observation recording tools suitable for children's developmental levels, to manage documentation processes, to use assessment data in planning and teaching processes, and to use assessment as a guide for their implementation. It is important to raise awareness about the use of assessment in practice, to analyze the needs of teachers in this area, and to provide the necessary professional support. In this respect, it is important to provide the necessary professional support to teachers so that assessment is included in the teaching process and integrated into their daily routines.

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**Katılımcı Onamı:** Bu çalışmaya katılan tüm katılımcılar gönüllü olarak katılmışlar ve onam formu doldurmuşlardır.

**Hakem Değerlendirmesi:** Dış bağımsız.

**Yazar Katkıları:** Fikir-AE-SA; Tasarım- AE-SA; Denetleme- SA; Kaynaklar-AE-SA; Veri Toplanması ve/veya İşlemesi- AE; Analiz ve/ veya Yorum-AE; Literatür Taraması- AE; Yazıyı Yazan- AE-SA; Eleştirel İnceleme- SA.

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## Genişletilmiş Özet

### Giriş

Okul öncesi öğretmenlerinin değerlendirme uygulamaları son araştırmalarda önemli bir yer tutmaktadır. Biçimlendirici değerlendirme, öğretmenlerin planlama ve öğretim uygulamalarına rehberlik eden süreç odaklı ve programa gömülü bir değerlendirme yaklaşımıdır (Black & William, 2005; Shepard ve ark., 1998). Biçimlendirici değerlendirme, çocukların gelişimini ve öğrenme sürecini tanımak, ileri planlar için veriye dayalı karar vermek, bir öğretmen olarak öz değerlendirme yapmak ve çocukların kaydettiği ilerlemenin somut kanıtları aracılığıyla ailelerle bağlantı kurmak için yararlı bir kılavuздur (Black & William, 2009; Buldu, 2010; McAfee & Leong, 2004). Küçük çocukların gelişim ve öğrenme ihtiyaçlarının değerlendirilmesi, çocuklara anlamlı öğrenme deneyimleri sağlamak için gelişimsel olarak uygun, amaçlı ve sistematik bir süreçtir (Aras, 2019). Çocukların gelişiminin çoklu kayıt araçları ve veriye dayalı karar verme süreci aracılığıyla dokümantasyonu, biçimlendirici değerlendirmenin kritik bileşenleridir. Bu nedenle, okul öncesi öğretmenlerinin biçimlendirici değerlendirmeyi nasıl kullandıklarını anlamak için değerlendirme ve dokümantasyon uygulamalarının incelenmesi gerekmektedir. Biçimlendirici değerlendirme, öğretme ve öğrenme sürecinin temel birimi olarak kavramsallaştırılmaktadır. Öğretmenlerin günlük rutinlerinde değerlendirmeyi kullanmaları, daha sonraki etkinlikleri planlama konusunda mesleki anlayışları hakkında önemli mesajlar vermektedir. Güncel araştırmalarda biçimlendirici değerlendirmenin yararları önemli bir şekilde vurgulansa da öğretmenlerin bu konudaki uygulamaları Türkiye'de henüz yeterince araştırılmamış bir alandır. Okul öncesi öğretmenlerinin değerlendirme uygulamalarını tanımlayan ve gösteren daha fazla çalışmaya ihtiyacı duyulmaktadır. Bu bağlamda, bu çalışma okul öncesi öğretmenlerinin biçimlendirici değerlendirme uygulamalarına ilişkin deneyimlerini araştırmayı amaçlamıştır.

### Yöntem

Araştırma kapsamında, bireylerin bir olgu veya öze ilişkin bakış açılarını ve deneyimlerini incelemeye uygun olan fenomenolojik araştırma deseni kullanılmıştır (Merriam, 2009). Bu çalışmada okul öncesi öğretmenlerinin söyleme dayalı deneyimleri ayrıntılı olarak araştırılmıştır. Veriler okul öncesi öğretmenleri ile gerçekleştirilen yarı yapılandırılmış görüşmeler yoluyla toplanmıştır. Araştırmanın çalışma grubunun belirlenmesinde amaçlı örnekleme yöntemlerinden biri olan kolay ulaşılabilir durum örnekleme tercih edilmiştir (Patton, 2014). Bu çalışmanın katılımcılarını 15 okul öncesi öğretmeni oluşturmaktadır. Görüşme soruları öğretmenlerin sınıflarında biçimlendirici değerlendirmeyi nasıl kullandıklarına ilişkin deneyimlerine odaklanmıştır. Katılımcıların deneyimlerini analiz etmek için içerik analizi kullanılmıştır. Verilerin güvenilirliğini ve inanılabilirliğini sağlamak amacıyla Lincoln ve Guba (1985) ve Merriam (2009) tarafından önerilen akran sorgulaması, araştırmacı çeşitlemesi ve zengin betimleme stratejileri kullanılmıştır. Özellikle katılımcıların deneyimleri ile ilgili görüşleri ayrıntılı olarak kayıt altına alınmıştır. İlgili üniversitenin etik kurulu onayı alınmıştır.

### Bulgular, Tartışma ve Sonuçlar

Katılımcı öğretmenlerin gözlem süreçleri ve uygulamaları, sınıflarında kullandıkları gözlem ve değerlendirme araçları, değerlendirmenin sonraki planlara rehberlik etmesi için kullanılması ve değerlendirme verilerinin paylaşımı, araştırmanın bulgularının ana temaları olmuştur. Öğretmenlerin çoğunun serbest oyun süresi boyunca sistematik gözlem yaptığı bulgusuna ulaşılmıştır. Öğretmenlerden bazıları gözlemlerini not aldıklarını belirtmişlerdir. Katılımcı öğretmenler, programın önerdiği gözlem formu ve gelişim raporunu doldurduklarını belirtmişlerdir. Bazı öğretmenler, çocukların gelişimi ve öğrenme süreçleri hakkında bilgi sahibi olmak ve bu bilgileri sonraki planlara dahil etmek için değerlendirmeyi kullandıklarını belirtmişlerdir. Öğretmenlerin çoğu hazır plan kullandıklarını ifade etmiştir. Öğretmenlerin bir kısmı ise çocukların gelişimlerini ve öğrenmelerini izlemek, değerlendirmek ve öğretim uygulamaları hakkında bilgi sahibi olmak için biçimlendirici değerlendirme uygulamalarını kullandıklarını belirtmişlerdir.

Bu çalışmanın sonuçları, öğretmenlerin gözlem uygulamaları ve öğretmenler tarafından kullanılan gözlem kayıt araçları, biçimlendirici değerlendirmenin ileri planlardaki rolü, gözlem ve değerlendirme verilerinin paydaşlarla paylaşılması ile ilgili önemli bulgular ortaya koymuştur. Ayrıca, tüm öğretmenlerin farklı süreçlerde de olsa uygulamalarında biçimlendirici değerlendirmeye yer verdiklerini ortaya koyulmuştur. Okul öncesi öğretmenlerinin gözlem ve dokümantasyon teknikleri farklılıklar göstermiştir, ancak öğretmenlerin çoğu ulusal programın gerekliliklerini takip ettikleri edinilen bulgular arasındadır. Öğretmenlerin öğretimsel uygulamalarında değerlendirme uygulamalarının rolü, farklı bağlamlarda derinlemesine araştırılması gereken kritik bir bulgudur. Bu çalışmanın bulguları, okul öncesi öğretmenlerinin biçimlendirici değerlendirme uygulamaları açısından profesyonel desteğe ihtiyaçları olduğunu göstermiştir. Öğretmenlerin biçimlendirici değerlendirmenin uygulamadaki



yeri konusunda farkındalıklarının artırılması, bu alanda ihtiyaç analizi yapılması, öğretmenlerin ihtiyaçlarının belirlenmesi ve gerekli profesyonel desteğin sağlanması önemlidir. Bu doğrultuda öğretmenlere değerlendirmeyi öğrenme sürecine dahil etmeleri ve günlük rutinlerine yerleştirmeleri için gerekli profesyonel desteğin sağlanması önerilebilir. Uluslararası literatürde öğretmenlerin biçimlendirici değerlendirmede sınıf temelli mesleki gelişime önem verilmesi gerektiği vurgulanmıştır. Okul öncesi öğretmenlerinin değerlendirme uygulamaları detaylı olarak araştırılması gereken bir araştırma konusudur. Öğretmen uygulamalarının detaylı bir şekilde betimlenmesi amacıyla ülkemizin farklı bağlamlarından daha fazla veriye ihtiyaç duyulmaktadır. Bu çalışmaların sonuçlarının öğretmenlere mesleki destek sağlarken faydalı olacağı düşünülmektedir.

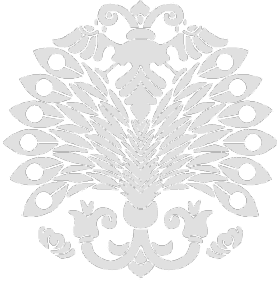
# Reconstruction of Pre-Service EFL Teachers' Conceptual Understandings About SLA and Language Pedagogy Through Experiential Tasks

İngilizce Öğretmen Adaylarının Dil Edinimi ve Dil Öğretimine İlişkin Kavramsal Anlayışlarının Deneyimsel Etkinliklerle Yeniden Yapılanması

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## ABSTRACT

The course on Second Language Acquisition (SLA), which is a component of language teacher education programs, includes consciousness-raising and experiential activities that prepare pre-service teachers for the profession. Pre-service English teachers need to have a well-grounded understanding of how SLA relates to language teaching to comprehend how SLA theories contribute to their language teaching processes. To address this need, this study examined the effects of an SLA course on pre-service teachers' conceptual changes and beliefs regarding language pedagogy. To identify the extent of their conceptual changes and awareness, a language-learning autobiography project was used to decode multifaceted processes and elements of their first and second language acquisition. Pre-service teachers were asked to describe their language acquisition processes before taking the SLA course and then to revise their autobiographies in line with the theories and concepts covered in the SLA course. Content analysis was used to compare the two versions gathered from 54 pre-service teachers, and emerging themes and concepts in both forms were identified. The overall findings indicate that their initial versions are limited to basic linguistic descriptions, whereas they have gained a rich repertoire of grounds and connections and an understanding of the relevance of SLA to language pedagogy. Relatedly, instructional implications were suggested to facilitate their professional stance and understanding of the relationship between SLA and language pedagogy.

**Keywords:** Language acquisition, experiential learning, pre-service English language teachers, conceptual changes

## ÖZ

Dil öğretmeni yetiştirme programlarının bir bileşeni olan İkinci Dil Edinimi dersi, İngilizce öğretmen adaylarının mesleki beceri ve yeterliliklerini artıran bilinçlendirmeyi ve deneyimsel etkinlikleri içermektedir. Dil edinim kuramlarının dil öğretim süreçlerine nasıl katkıda bulunduğunu anlamak için dil ediniminin dil öğretimiyle bağlantısına dair sağlam temelli bir anlayışa sahip olmaları da önem taşımaktadır. Bu çalışma bu ihtiyaca cevap vermek için dil edinimi dersinin öğretmen adaylarının dil öğretimine ilişkin kavramsal değişimleri ve inançları üzerindeki etkilerini incelemiştir. Kavramsal değişimlerinin ve farkındalıklarının kapsamını belirlemek için, birinci ve ikinci dil edinimlerinin çok yönlü süreçlerini ve öğelerini çözmek için bir dil öğrenme otobiyografi projesi kullanılmıştır. Öğretmen adaylarından dil edinim kuramları dersini almadan önce kendi dil edinim süreçlerini anlatmaları ve daha sonra dil edinimi dersinde işlenen teori ve kavramlar doğrultusunda otobiyografilerini gözden geçirmeleri istenmiştir. 54 öğretmen adayından toplanan bu iki versiyonun karşılaştırılmasında içerik analizi kullanılmış ve her iki metinde ortaya çıkan temalar ve kavramlar belirlenmiştir. Çalışma sonucunda, ilk versiyonların temel dilbilimsel açıklamalarla sınırlı olduğunu, gözden geçirilmiş metinlerde ise dil edinimi ve öğretimine dair bağlantıların ve öğretmen adaylarının dil edinim kuramlarınının

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kendi dil öğrenme yaşantıları ve dil öğretimine ilişkin bağlantılarla ayrıntılandırıldığı saptanmıştır. Sonuçlar ışığında İngilizce öğretmen adaylarının dil edinimi ve öğretimine yönelik ilişkileri kavramsallaştırmalarına yönelik öğretimsel öneriler paylaşılmıştır.

**Anahtar Kelimeler:** Dil edinimi, deneyimsel etkinlikler, İngilizce öğretmen adayları, kavramsal anlayışlar

## Introduction

### Experiential and Reflective Learning Tasks in English Language Teacher Education

Pre-service English language teachers' beliefs, conceptual understandings, knowledge, and practice are at the center of teacher training programs. Pre-service English language teachers need to cultivate optimistic mindsets and a strong dedication towards teaching, their subject matter, and their students, as well as their perspectives regarding the profession (Firestone & Pennell, 1993; Pennington, 1992). Most recent studies in the literature have focused on a fundamental inquiry regarding the degree to which teacher training programs have an impact on bringing about profound cognitive modifications in pre-service teachers (Cheng et al., 2009) and their conceptual understandings of language acquisition and learning. Several studies have also documented the impact of teacher training programs on pre-service teachers' belief systems and mindsets (Borg, 2011; Clark-Goff & Eslami, 2016; Kızıltan, 2011; Peter et al., 2012).

Teacher education programs should offer educational inquiry which "will require clear conceptualizations, careful examination of key assumptions, consistent understandings and adherence to precise meanings, and proper assessment and investigation of specific belief constructs" (Pajares, 1992, p. 307). To address these needs, pre-service teacher education programs offer a variety of courses. Language acquisition course is one of these courses delivered to provide pre-service teachers with the explication of the first and second language acquisition theories. Teacher trainers provide pre-service teachers with language acquisition processes and elucidate potential challenges that learners may encounter in their classes (Markham et al., 2017). As part of this course, teachers can gain advantages by reflecting on their personal experience of acquiring a new language (Ellis, 2009).

Previous studies have suggested that teacher training in language education could promote pre-service teachers' perspectives and mindsets to reflect on their past experiences as language learners and modify or validate their convictions regarding language acquisition (Brown &

McGannon, 1998; Peacock, 2001). The findings of previous research suggest that pre-service teachers' beliefs undergo a slow and occasionally noteworthy evolution throughout the teacher training program, while their participation in teaching activities appears to have a limited effect on the progression of their beliefs (Mattheoudakis, 2007). To challenge the aforementioned limitations, experiential learning can help teacher candidates develop the skills and knowledge needed to become effective language teachers (Gao, 2015; Richards & Farrell, 2005). Experiential learning pertains to "the ideals of active and reflective learning, building on previous learning experiences and requiring the personal involvement of the learner" (Knutson, 2003, p. 53).

Experiential learning tasks and reflective activities in English language teacher training programs promote a change in pre-service teachers' beliefs towards their profession (Angelova, 2005; Bartels, 2005; Busch, 2010; Mattheoudakis, 2007). Research suggests that pre-service teachers' pre-existing beliefs are flexible and can undergo development (Cabaroğlu & Roberts, 2000). Studies show that a course structure that facilitates pre-service teachers' self-regulated learning promotes positive growth in their beliefs by providing an early awareness of pre-existing beliefs which contribute to subsequent development (Cabaroğlu & Roberts, 2000). Kolb's (1984) model of experiential learning defines the learning process as a cycle that involves immediate experience, reflection, abstract conceptualization, and action (Kohonen et al., 2001, p. 27). According to Kolb (1984), abstract conceptualization takes the experience to a higher level and involves the creation and use of theoretical models and concepts (p. 43). Learners reflect on their experiences through guided observation and questioning, leading to further experimentation and practical learning stages. Overall, this model emphasizes the cyclic nature of the learning process, which involves learners reflecting on their experiences through guided observation and questioning to lead to further practical learning.

Several studies have examined the effectiveness of experiential learning tasks and reflective activities in teacher education programs. One line of research shows that pre-service teachers' beliefs change significantly (Macdonald et al., 2001; Mattheoudakis, 2007) yielding the internalization of SLA concepts through reflective and experiential learning

(Thompson & Erdil-Moody, 2015). Another line of research findings suggests that these beliefs do not change significantly (Peacock, 2001). To shed light on this issue, the effects of a variety of courses on the pre-service teachers' beliefs and assumptions were examined in the literature. For example, Nazari et al. (2022) found that a teacher education course centered on grammar instruction positively influenced in-service teachers' grammar beliefs and practices. In a recent study, Eslami and Fatahi (2019) explored project-based learning as an experiential learning task in an English language teacher education program in Iran, noting that it helped pre-service teachers develop their lesson planning, classroom management, and assessment skills. In a research article, Olson and Jimenez-Silva (2008) investigated how pre-service teachers' attitudes and beliefs towards English language learners changed after they took required ESL endorsement courses. The researchers observed that the ESL courses had a beneficial impact on the pre-service teachers' self-assurance and fundamental ideological beliefs about teaching ELLs. In a twelve-week SLA course, MacDonald et al. (2001) conducted a similar study. Also, they noted that pre-service ESL teachers' beliefs about English language learning were modified after taking second language acquisition courses. In contrast, no significant changes were observed in the control group who did not take the course. Previous research delved into the integration of reflective journals into the graduate-level SLA course content and documented a deeper understanding of SLA concepts and co-construction of knowledge about their language teaching and learning (Thompson & Erdil-Moody, 2015). In the Turkish context, pre-service teachers expressed positive attitudes about the significance of the SLA course on their future language teaching, nevertheless, they noted that their existing conceptual schemata were not sufficient for an SLA course (Kızıltan, 2011).

Overall, these studies suggest that experiential learning tasks and reflective activities can provide promising contributions to enrich pre-service English language teachers' critical understanding of the relationship between language acquisition theories and language pedagogy in teacher education programs. Nevertheless, further research is needed to explore the effectiveness of different types of experiential learning tasks and to identify potential affordances for specific teaching contexts and groups of pre-service teachers. Different from the existing research, this study investigates a process-oriented co-construction and reconceptualization of SLA and language pedagogy by pre-service English language teachers through their engagement with experiential tasks.

Before in-service training experiences, teacher education programs are required to equip pre-service teachers with opportunities to explore and understand significant social and cultural issues that greatly influence educational practices within specific contexts (Gao, 2015). This study was motivated by a need to raise questions about pre-service language teachers' language acquisition experiences and the use of experiential learning tasks to establish grounds and connections between language acquisition theories and future language teaching practice(s). The rationale behind carrying out this study is that language teacher education programs need to incorporate exercises for pre-service teachers to express their existing views on teaching and learning, as suggested by Farrell (2006). In light of this rationale, this study aimed to examine pre-service EFL teachers' initial conceptual understandings of SLA and language pedagogy and their reconstruction of these concepts through their engagements with experiential tasks provided as part of the Language Acquisition Course. Accordingly, the following research questions are formulated:

1. What are a group of pre-service EFL teachers' initially held conceptual understandings about SLA and language pedagogy?
2. How do their stances and understandings evolve through their engagements with experiential tasks provided as part of the Language Acquisition Course?
3. In the light of elicited concepts, how do these participants perceive the impacts of the Language Acquisition Course on their future language teaching?

## **Methods**

### **Research Design**

A phenomenological approach was adopted to reveal and present a composite description of the pre-service English language teachers' language acquisition experiences. A data-driven annotation and coding of the whole autobiographies were used for the exploration of the pre-service EFL teachers' conceptual understandings of SLA and language pedagogy. Based on the Transcendental Phenomenology "phenomenology seeks meanings from appearances and arrives at essences through intuition and reflection on conscious acts of experience, leading to ideas, concepts, judgments, and understandings" (Moustakas, 1994, p. 52). In light of this approach, the pre-service language teachers' first and second language acquisition processes were examined through inductive analysis and intertwining textural and structural descriptions of their experiences.

## Setting and Participants

The study was conducted as part of the Language Acquisition Course, which was delivered to 62 pre-service English language teachers enrolled in the second-year English Language Teaching Department. Of the 62 pre-service teachers who began filling out their language autobiography projects, 54 completed both the initial and revised versions. Before this course, the participants had taken a prerequisite introductory linguistics course and were familiar with basic linguistics concepts. The course introduced participants to first and second-language acquisition theories and the relevant perspectives regarding the underlying arguments. Specifically, the participants were introduced to the field of second language acquisition (SLA) by investigating language acquisition in general, explicating the theories of SLA, and focusing on the factors that contribute to SLA. Throughout the course, scenarios

were provided to students, and they were expected to relate the cases to language acquisition theories. Classroom discussions and group work were conducted on Padlet to elicit their understanding of language acquisition theories and their underlying positions. Additionally, a variety of scenarios and example cases regarding various features of learners' interlanguage were used to make the theoretical concepts more concrete and to facilitate the pre-service language teachers' conceptual schemata.

## Data Collection and Analysis

For data collection, Initial and Revised Language Learning Autobiography Projects were used. These projects were developed by Dr. Drew S. Fagan from the University of Maryland and they were used with the consent of the researcher through personal contact.

**Table 1.**

*Task Descriptions of Initial and Revised Language Learning Autobiography Projects*

Initial Language Learning Autobiography Project	Revised Language Learning Autobiography Project
<ul style="list-style-type: none"> <li>• A brief introduction of what you think it means to be a language learner</li> <li>• The languages other than your first language you have learned (formally and informally)</li> <li>• The conditions under which you have learned these languages</li> <li>• Some consideration of what factors you feel have most helped or hindered your learning of those languages beyond just how you were taught (provide specific examples).</li> <li>• A conclusion describing how you think your language learning experiences have affected your perceptions of how you think languages other than the first language are acquired.</li> </ul>	<ul style="list-style-type: none"> <li>• Specific theories that can be attributed to how you acquired the language(s).</li> <li>• The incorporation of different concepts learned throughout the course that can be attributed to helping and/or hindering you learning the language(s).</li> <li>• Revised Conclusion: change the conclusion to focus on how your understanding of your own learning of languages has evolved over this course and how that will specifically impact your future teaching of language learners.</li> </ul>

The task description for the Initial Language Learning Autobiography Project was shared with the participants in the first week of the course to elicit in-depth information about their language acquisition processes. These autobiographies consist of a total of 47,079 words. Upon the completion of the course and administration of the final exams, the task description for the Revised Language Learning Autobiography Project was shared with the participants. They were expected to incorporate language

acquisition concepts and theories covered throughout the semester into their previously formed reflections. These autobiographies consist of a total of 58,206 words. After the collection of autobiographies, an initial corpus analysis of the initial and revised language learning autobiography projects were carried out through the use of AntConc 3.5.9 to reveal an overall picture of repetitive and frequent multi-word units and frequent clusters. A sample visualization of four-word clusters is presented in *Figure 1*.

N-Gram Types 43865 N-Gram Tokens 47079 Page				N-Gram Types 54475 N-Gram Tokens 58206 Page Size			
	Type	Rank	Freq		Type	Rank	Freq
1	being a language learner	1	32	1	my language learning process	1	62
2	my language learning process	1	32	2	with the help of	2	32
3	a language learner means	3	23	3	I was able to	3	28
4	I started to learn	4	21	4	I was exposed to	4	26
5	I can say that	5	18	5	in my language learning	5	24
6	I was able to	5	18	6	On the other hand	6	23
7	learning a new language	5	18	7	I can say that	7	20
8	On the other hand	8	17	8	I started to learn	7	20
9	a language learner is	8	17	9	Krashen s Monitor Model	9	17
10	Being a language learner	10	16	10	language learning process I	9	17
11	I was exposed to	10	16	11	to learn a language	9	17
12	when I was in	10	16	12	I didn t know	12	15
13	to learn a language	13	15	13	the language learning process	12	15
14	I tried to learn	14	14	14	to learn the language	12	15
15	the language learning process	14	14	15	second language learning process	15	14
Initial language learning autobiography projects				Revised language learning autobiography projects			

**Figure 1.**

*Four-word Occurrences in the Initial and Revised Language Learning Autobiography Projects*

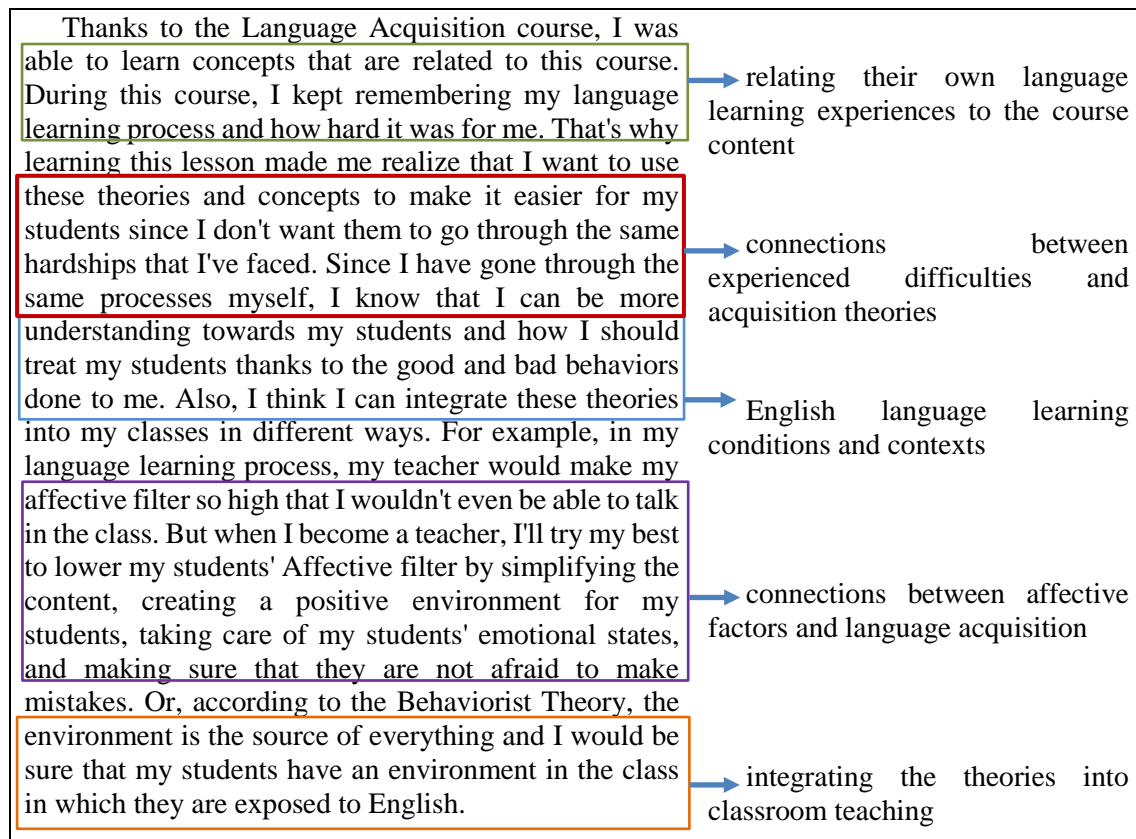
Following this step, an open-coding process was conducted using the prior codes that were derived from the review of literature on second language acquisition and learning theories. The data were then reduced using Moustakas' (1994) phenomenological reduction method, which involved bracketing the data and equalizing the value of each statement through horizontalization. The data was then read, re-read, analyzed, and coded to cluster them into themes. These themes were given a thematic label and represented the core themes of the experience, according to Moustakas (1994). Additional codes were added subsequently to the emerging themes in the thematic analysis and overall findings along with examples for each emerging theme and concept were presented. A sample qualitative data analysis is provided in *Figure 2*.

For the validity and reliability of the data analysis, the strategies suggested by Creswell and Poth (2018), Denzin (2017), and Moustakas (1994) were employed. Applying the principles and steps of the phenomenological method and

presenting a comprehensive overview of relevant literature was the first set of strategies. The documentation of confirming and disconfirming evidence in the data through reflective self-awareness was enabled. Individual coding and peer debriefing were used to enable an increasing agreement across the codes and themes revealed from the data analysis.

The study adhered to the guidelines recommended by the American Psychological Association (APA), including their principles and code of conduct. Additionally, ethics committee approval was obtained from Sinop University Human Research Ethics Committee (Date: 17.11.2022, Number: 2022/190-218). Written informed consent forms were obtained from the participants. To safeguard confidentiality, the survey responses and scenario cases were kept anonymous to prevent any collection of identifying information related to the respondents.





**Figure 2.**

*Sample Coding in the Qualitative Data Analysis*

## Results

The analysis of the elicited data revealed three emerging themes in their language learning autobiographies: (a) initial conceptualization of SLA and language pedagogy which are centered on characteristics of a language learner, learning conditions, and contexts, factors hindering and facilitating English language learning, (b) the evolution of their stances and understandings through experiential learning tasks, (c) perceived impacts of the language acquisition course on their future language pedagogy. Based on these themes, the participants' references to specific first/second language acquisition theories, incorporation of different concepts into their descriptions, conceptual changes in their understanding of learning languages, and elaborations regarding the impact on future teaching of language learners were presented concerning the emerging themes in the revised forms of their autobiographies.

### **Pre-Service English Language Teachers' Initial Conceptualization of SLA and Language Pedagogy**

Considering the first research question, the pre-service teachers shared perspectives regarding the characteristics of a language learner, language learning contexts, and

factors hindering and facilitating English language learning in their initial conceptualization of second language acquisition and language pedagogy.

First, the pre-service teachers elaborated on the features of a language learner and attributed adjectives such as difficult, enjoyable, thrilling, exciting, challenging, dynamic, confident, and curious to being a language learner. Regarding their detailed descriptions, personality traits, qualifications, and learning strategies were significant responses emerging from the data. Their discourse was situated around personal traits with a reference to self-confidence, empathy, motivation, ambition, enthusiasm, perseverance, curiosity, interest in learning, and ongoing personal development. These characteristics are exemplified in the following statement:

(1) Learning another language is different in many ways such as conscious effort, which is not in native language learning, to learn language from L1 acquisition. Thus, a language learner has necessary motivation, ambition, enthusiasm, and determination to acquire the target language (P41).

The pre-service teachers highlighted that cultural awareness is a prominent feature of being a language learner. They referred to willingness to learn/discover/explore other

cultures, being a citizen of the world, willingness to get in contact with different people, and not having stereotypical views about different cultures.

(2) Being a language learner means acquiring new cultural background knowledge, vocabulary, and structural characteristics of the target language (P37).

(3) Being a language learner is a part time abstract traveler. When you learn a language, you are not only acquiring the language that they speak but also you learn language's culture (P43).

Another recurrent theme in the autobiographies was a sense amongst participants that awareness of learning strategies is one of the language learner characteristics. These were overcoming barriers, having specific goals and purposes, having metalinguistic awareness, seeing and adopting new perspectives, and regulating their learning processes. These characteristics are echoed in the following extracts of the participants:

(4) I think interacting with the target language not just necessitates learning its grammar rules or vocabularies but exposing the target language by means of different techniques such as imitation, observation, memorizing, practicing etc. (P21).

Second, the pre-service teachers highlighted their English language learning conditions and contexts. The findings unfolded three important and yet polarized findings: (a) formal and informal language learning environments, (b) techniques, tools, and materials used in language education, (c) ways of exposure to different languages. Several pre-service teachers referred to formal environments, such as intensive language education in preparation classes, kindergartens, and workplace settings, and to informal environments, such as playgrounds, interaction with friends and family members, and computer games. These references to both formal and informal learning contexts were examined to better understand their impact on language learning outcomes.

(5) I have learned Arabic and English languages besides my mother tongue. And I have learned the Arabic language in an informal way by family and environment. This learning process took place daily life experience. While the learning Arabic, I was not trained by any professional, course or trainer. Learning had happened uncontrollably, casual, unplanned. Moreover, I did not receive any formal training for second language and I have spontaneously learned second language by living among speakers of language and interacting with them (P.11).

As for the techniques, tools, and materials, the pre-service teachers noted both challenges and effectiveness of language learning activities. They highlighted the insufficient number of teachers, classrooms, and tools, which can result

in a decreasing interest in language learning. Traditional English classes with a focus on memorizing words, explicit presentation of grammar structures, reading several texts, and using the Grammar Translation Method (GTM) were reported to be prevalent stumbling blocks in the language learning processes. Additionally, they underlined the tools and materials used in language education with a particular emphasis on the effectiveness of activities such as drama and discussion, as well as self-paced and designed learning conditions, including the use of technological tools such as Duo lingo. They also stressed the effectiveness of songs, movies, TV series, books, multimedia tools, and computer games like Minecraft, and articles, short stories, and blogs, their use of animes to learn Japanese words and videos, which are exemplified in the following extract:

(6) For example, while games assisted me in acquiring new vocabulary, viewing videos assisted me in understanding how to construct sentences. I could construct basic sentences despite having little knowledge of the grammatical principles essential for forming sentences, such as what is subject, verb, and object, since I was exposed to many instances while watching films and videos (P2).

(7) I benefitted from foreign sources that contribute to informal language learning-movies, TV series, music, books, foreign magazines, twitter and Instagram pages, foreign blogs, YouTube channels-contributes to the student's language learning outside of school (P52).

Further, they pinpointed ways of exposure to different languages by relating them to formal and informal learning environments. They reported having exposure to German, French, and Russian in formal settings, as well as exposure to Spanish, Korean, Japanese, Arabic, and Greek in informal contexts, which is echoed in the following extract:

(8) My first foreign language that I have learnt is Korean. I have been listening to K-pop since I was 8. At first, I was analysing and trying to imitate the Korean words, then I started to watch K-dramas in subtitled version. By this way, I have started to learn what they were saying and have a familiarity to their pronunciation. I have also joined a language community through KakaoTalk. I have learnt how to write Korean through their help (P19).

Finally, the pre-service teachers established grounds and connections among factors that hinder and facilitate English language learning. The factors hindering language learning are situated around the elements related to geographic location (i.e. living in a rural area), physical features of the classroom (i.e. language teaching in crowded classrooms), affective factors, L1 interference, inadequate and ineffective tools and materials, and English language teachers. The participants noted the role of affective factors regarding feeling insecure in speaking, demotivation,



anxiety, and fear of making mistakes. They also reflected on differences between their L1 and L2 by referring to different sentence structures, grammar rules, and pronunciation patterns between Turkish and English. Loaded assignments, the use of memorization, and no exposure to English outside the class were other reported overwhelming factors in English language learning processes. The participants explained these elements by stating:

(9) I was not aware when I was learning the language but I realized it later; there was a barrier that prevented me from acquiring language even though there was an appropriate input. I could not acquire the language because of emotions such as anxiety, negative attitudes, fear of the unknown, etc. (P31).

(10) I remember while performing dialogues, I would always think in Turkish, and it would cause me to make a negative transfer...For example, I would create sentences with the Turkish word order and transfer them into English, which caused me to make mistakes since the word order of these two languages is not transferable (P5).

Acknowledging these factors, the pre-service teachers pointed out that tolerance to mistakes, exposure to language, access to technology, affective factors, teacher support and positive attitudes, and rich English repertoire were factors facilitating language learning. More specifically, teachers with strong teaching skills, teacher feedback, motivation, and encouragement provided by the teacher, and their use of technological tools such as YouTube videos and games were reported to impact language learning positively. In addition, the use of authentic materials, using the language in real-life situations, recognizing similarities between/among languages, imitation, practice, and rich lexical knowledge were facilitating elements of language learning processes, which were highlighted in the example extracts below:

(11) I constantly practice and try to analyze my own speech. My learning environment was sufficient thanks to feeling relaxed, material support, being able to take effective feedback, guided discovery in the class, interaction and group work (P14).

The role of practice and memorization in language learning and relevant activities were reported to be critical for building fluency and developing essential language skills by the participants. Additionally, lifelong learning was considered to be essential for continued language acquisition, and the support of family and friends could play a crucial role in maintaining motivation and engagement in the learning process. In line with the aforementioned benefits, the pre-service teachers reflected on the use of a variety of activities and tools by stating:

(12) Activities such as theater performances, singing and word memorization competitions not only allowed us to have fun and loved the language, but also taught us the language in the best way possible (P36).

(13) Thanks to the internet, I was able to play online games. These games were highly competitive and played with teams like 5v5 or 3v3. Beyond the individual performance, team communication and harmony were critical. That made me start trying to speak and give orders to my teammates with broken English. In the moment of adrenaline and excitement of the games, I talked with zero anxiety about making mistakes (P33).

The essential key factors to successful language learning were also prevalent stressed elements in the participants' autobiographies. One of the key factors that influence language learning was an understanding of the culture and history of the target language which was considered to be crucial for developing a deep understanding of the language and its use in real-life situations. Positive language learning experiences were also essential for successful language acquisition as they were reported to lead to positive perceptions of the language, which in turn could increase motivation and the willingness to learn other foreign languages. Exposure to other language skills, beyond grammar and vocabulary, was also critical for developing a well-rounded set of language skills. Avoiding the cultivation of stereotypes was considered to be another essential element for successful language learning. The pre-service teachers noted that understanding and accepting other cultures and beliefs without judgment was important for developing a deep appreciation of the language and its cultural context as stated by the participants below:

(14) I studied academic listening by focusing on the larger frame of vocabulary with subject-specific expressions. As another example, I had an academic reading class that focused on aspects like vocabulary, content, and structural knowledge...our reading passages had a social and cultural context (P6).

(15) The new lexical chunks and frequent usages that I encountered many times build and shape my L2 variation. However, I had my head in the clouds in terms of discourse since I was exposed to informal and simplified speaking mostly (P. 17).

### **Pre-service Teachers' Evolving Stances and Understandings through Engagements with Experiential Tasks**

The second research question sought to document the evolution of stances and understandings throughout engagements with experiential learning tasks. The pre-service English Language Teachers established grounds and

connections between their prior language learning experiences and SLA concepts and theories. Different from their initially held conceptualizations, the pre-service teachers attributed key concepts to the role of mediation, scaffolding, object regulation, and self-regulation in their revised language learning autobiography projects. A newly arising idea they presented in their revised language learning autobiography project was their adoption of the term interlanguage to describe their evolving L2 system. These concepts can be facilitated by course instructors, teachers, family members, classmates, movies with subtitles, online tools, course materials, computer games, and feedback. Additionally, affective factors such as integrative and instrumental motivation, acculturation opportunities, communication with foreign friends, belonging to the language community, and passing classes were underscored as the influential elements of language acquisition in their experiential learning tasks. The example below illustrates one of the learners' connections among the concepts of language acquisition and pedagogy:

- (1) ...prominent theories in the field of education and especially in the field of language acquisition are not independent of my learning process. Although I cannot observe the effects of each theory in my process, the main highlights and their bullet points are active in my first and second language learning process... (P22)

As for the relevant theories and their underlying principles, the pre-service teachers mostly referred to parameter setting as an aspect that can affect language acquisition. According to their reports, the behaviorist perspective was emphasized because of the role of reinforcement and conditioning in learning. U-shaped development was also noted while referring to the dynamic nature of their language-learning processes. They were also found to form a connection among exposure to the target language, L1 transfer, macrosocial factors, and interaction due to their significant role in language acquisition. One of the emerging concepts was their emphasis on the Innatist perspective which they highlighted as part of the significance of comprehensible input, learning English word order. The impacts of the acquisition of sociolinguistic and sociocultural competence were also elaborated in their revised language learning autobiographies. Their stances were found to center on the significance of exposure to the target language through a variety of ways, which they considered as a crucial component of successful language learning. They linked exposure to lexical chunks and frequent usages due to their role in shaping their L2 variation. In these reports, they expressed an increased awareness regarding L1 and L2 acquisition, cognitive, affective, and social factors underlying the language acquisition procedures.

### **Perceptions about the Impacts of the Language Acquisition Course on Their Future Language Teaching**

Regarding the third research question, which sought to document the perceptions regarding the impacts of the Language Acquisition Course on their future language teaching, pre-service teachers drew attention to the complementary impacts of course topics and their personal language learning experiences on their future language teaching. The subjects that had the greatest impact on their beliefs were the ones that they deemed most applicable to their future teaching. These areas of focus included the duration required to acquire a language, the significance of cultural understanding, the role of grammar and vocabulary, the identification and correction of mistakes, and learning methods. Furthermore, they recognized the multifaceted and multi-layered nature of language acquisition. The participants also reported an increased awareness about the role of exposure to input, collaborative learning, the role of environment, mediation, feedback, acquisition order, affective factors, age of acquisition, interaction, L1 background among others. One of the participants elucidated this specific point:

- (1) In conclusion, my understanding of my own language learning has evolved over this course in a positive way. Thanks to this course, I've realized for the first time what I was going through while learning English. Before I take this course, I used to think that the second language was only learned through lessons at school, but after this course, I've found out that there are actually multiple different ways to learn a second language, and each person can learn it differently. (P49).

Regarding the impact of the SLA course on their perspectives and approaches to their future classroom instructions, the participants underscored their increased cognizance of the dynamics of classroom atmosphere and variables about teachers, students, and their individual differences. They reported that they gained familiarity with the language through practice, which in turn informed their understanding of the language learning process. Through the course, they emphasized their awareness of the sources of errors that arise in the classroom, enabling them to provide constructive feedback to students. Additionally, the importance of creating a positive classroom environment that encourages interaction, exploring cultural nuances, and engagement in negotiation was underscored ways of promoting effective language learning as stated by one of the participants:

- (2) While teaching grammatical structures, I will include games, role-plays, and dramas to lower their affective filter to make their comprehensible input more meaningful by creating a positive classroom environment (P7).

They also noted gaining insights into the nature and features of interlanguage, which were reported to help them better understand their students' individual learning processes and tailor their language pedagogy approach accordingly.

### **Discussion, Conclusion and Suggestions**

The main goal of this study was to decipher the pre-service English language teachers' perspectives on the characteristics of a language learner, their English language learning conditions and contexts, factors hindering and facilitating language learning, and the effect of language learning experiences on the second language acquisition process through experiential learning tasks, which were initial and revised language learning autobiography projects.

Based on the thematic analyses of these projects, the pre-service teachers provided detailed insights into how their participation in the language acquisition course affected their teaching approach towards language learners and the relationship between language acquisition and pedagogy. They elaborated on the characteristics of a language learner and attributed adjectives such as difficult, enjoyable, thrilling, exciting, challenging, dynamic, confident, and curious to being a language learner. The participants highlighted the importance of personal traits, cultural awareness, and learning strategies in the language learning processes. They also identified formal and informal learning contexts, techniques, tools, and materials used in language education, and ways of exposure to different languages. Their explanations in the autobiographies revealed that being a language learner requires motivation, self-confidence, empathy, ambition, perseverance, curiosity, and interest in ongoing personal development. Additionally, they highlighted the importance of cultural awareness and the ability to use effective learning strategies. Throughout the procedure, they put forth evolving

In these reports, pre-service teachers shared gaining an increased awareness regarding L1 and L2 acquisition, and cognitive, affective, and social factors underlying the language acquisition procedures. They specifically discussed their English language learning conditions and contexts, including formal and informal environments, techniques, tools, and materials used in language education, and ways of exposure to different languages. They noted both the challenges and effectiveness of language learning activities, including traditional English classes, multimedia tools, computer games, and exposure to different languages in formal and informal settings. Similar to these findings, previous research suggested that teachers' beliefs about

language instruction could change as they integrate what they have learned in the SLA course, drawing from their current teaching practices and personal experiences with language learning (Markham et al., 2017). This increased awareness and change in their perspectives were echoed in the previous research which reported pre-service teachers' developing a positive attitude towards the lesson and an awareness regarding linguistics concepts (Kızıltan, 2011) and a sense of awareness and acceptance of English language learners (Clark-Goff & Eslami, 2016).

Overall, the findings of the current study can be summarized as three-fold: (a) a facilitating impact of the experiential and reflective learning tasks on the pre-service teachers' grounds and connections between language acquisition and pedagogy and better conceptualization of the language acquisition concepts, (b) increased awareness and co-construction of what they have experienced as a language learner and what they would like to do as a teacher, (c) a positively reported and perceived impact of the language acquisition course on their future language teaching. These findings align with previous research that documented an increased willingness and readiness to modify their initial informal theories and intentions for language teaching based on the knowledge gained from relevant courses (Markham et al., 2017). As the revised language learning autobiography projects were gathered upon the completion of the course, "the campfire effect" refers to an overwhelming report of a positive effect on their beliefs immediately after completing the course (Olson & Jimenez-Silva, 2008, p. 247), maybe one of the reasons behind these findings.

As the teachers' beliefs have a crucial impact on their perceptions, judgments, and classroom behavior, it is necessary to provide them with professional preparation and teaching in the pre-service teacher training programs, nevertheless, it is difficult to challenge and change their deeply rooted ideas during the implementation of the program (Pajares, 1992). In this regard, incorporating experiential and reflective activities into professional coursework appears to be more effective in shaping belief systems than solely teaching declarative knowledge (Angelova, 2005; Bartels, 2005; Pennington, 1996). For this reason, experiential activities should occur early on in teacher education programs (Busch, 2010) to provide the pre-service teachers a platform to carry out reflective practices to establish connections between language acquisition and pedagogy. To respond to this relationship, previous research suggested the integration of innovative strategies such as incorporating teachers' perspectives,

their critical reflections, collaborations, and co-construction of knowledge (Gorsuch & Beglar, 2004). In this respect, teacher educators can adopt different roles such as being a transmitter of knowledge about SLA, mentors, and awareness raisers based on the specific needs of the pre-service teachers (Ellis, 2010). These roles along with the integration of experiential tasks will yield a promising contribution as an agent of change to teacher training programs.

Overall, several pedagogical implications could be integrated into pre-service English language teacher training contexts. First, experiential learning tasks could be integrated into pre-service teachers' courses to raise their awareness and co-construction of language acquisition and pedagogy. Their engagements with such tasks can effectively raise awareness among pre-service language teachers on the significance of fostering learners' self-confidence, motivation, and curiosity, as well as their awareness of effective learning strategies. Teacher training courses could incorporate such experiential tasks and reflective activities through drama, discussion, multimedia tools, and computer games so that pre-service language teachers can bridge the gap between their conceptual understanding and the practical effectiveness of various techniques, tools, and materials in language education as prospective English language teachers. Furthermore, these tasks can be used to help them become aware of the impact of both formal and informal learning environments on language learning outcomes, while also recognizing the significance of exposing learners to diverse languages and cultures. To achieve these goals, we need a process of restructuring teacher education programs, which involves continuous learning and collaboration between both teacher educators and pre-service teachers, resulting in mutual growth and development (Kaufman, 1996). Previous research has shown that by providing insights into the order in which students acquire phonological and grammatical features, pre-service teachers can reflect on their students' progress in English language skills more accurately and design appropriate instructional activities accordingly (Markham et al., 2017). Incorporating experiential learning tasks into the earlier years of pre-service teacher education could be a promising way to enhance their awareness and understanding of the conceptualizations of language acquisition and pedagogy. To create a well-rounded co-construction of English language learning and teaching, an explicit reference to the constructs and concepts of second language acquisition and future language teaching practices could be useful. This could be achieved by increased recognition of learners' diverse characteristics, continuous exposure of language input, support and feedback,

responsiveness to affective factors, and integration of formal and informal learning contexts, which are echoed prominently through pre-service teachers' engagements with experiential tasks provided as part of the Language Acquisition Course. To support this, we could start by recognizing the roles of such tasks and the multifaceted nature of the connection between language acquisition and teaching to help pre-service teachers grow a professional mindset.

Further research could be carried out by administering pre- and post-course beliefs surveys to pre-service language teachers. Building on the findings of the current study, tracking the beliefs of teachers over time, particularly as they begin practice teaching, would yield valuable insights into the lasting impact of consciousness-raising related to their initial professional education courses. A further study can be designed to explore the impact of language education courses on the beliefs of pre-service teachers. This study can be conducted in different educational contexts and with a large number of participants to increase its generalizability. Another potential study design is to use think-aloud protocols to examine the thought processes of language teachers as they engage in classroom instruction. This approach can provide insights into the beliefs and assumptions that underlie their instructional decisions. This study can also be conducted cross-nationally and cross-culturally to examine differences in teaching practices across different contexts. A longitudinal analysis of pre-service teachers' conceptualization of the grounds and connections between language acquisition and pedagogy will provide insightful contributions to the existing literature.

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## Genişletilmiş Özet

### Giriş

İngilizce öğretmen adaylarının dil edinim süreçlerine yönelik inançları, kavramsal anlayışları, bilgileri ve uygulamalarının geliştirilmesi öğretmen yetiştirme programlarının temelinde yer almaktadır. Öğretmen adaylarının iyimser bir bakış açısı ve öğretime, konu alanlarına ve öğrencilerine yönelik bir bağlılık geliştirmeleri ve mesleklerine ilişkin bakış açılarını geliştirmeleri gerekir. Alanyazında bu konuda yapılan çalışmalar deneyimsel öğrenme ve yansıtıcı etkinliklerin, öğretmen yetiştirme programlarında dil edinim kuramları ve dil öğretimi arasındaki ilişkiye yönelik öğretmen adaylarının eleştirel bakış açılarını geliştirmek için katkılar sağlayabileceğini göstermektedir. Bununla birlikte, farklı türdeki deneyimsel öğrenme etkinliklerini araştırmak ve belirli öğretim bağlamları ve öğretmen adayları grupları için katkılarını saptamak için daha fazla araştırmaya ihtiyaç vardır. Mevcut araştırmalardan farklı olarak, bu çalışma, hizmet öncesi İngilizce öğretmen adaylarının deneyimsel etkinliklerle etkileşimleri yoluyla dil edinimi ve öğretime ilişkin süreç odaklı bir gelişimi ve yeniden kavramsallaştırmasını incelemektedir. Bu bağlamda aşağıdaki araştırma soruları sorulmuştur:

1. İngilizce Öğretmen adaylarının dil edinimi ve öğretime ilişkin sahip oldukları kavramsal anlayışlar nelerdir?
2. Öğretmen adaylarının dil edinimi konusundaki deneyimsel etkinliklerle etkileşimleri yoluyla bakış açıları ve kavramsal anlayışları nasıl gelişmektedir?
3. Öğretmen adayları dil edinimine ilişkin kavramsallaştırmalarının ve deneyimsel etkinliklerinin gelecekteki dil öğretimleri üzerindeki etkilerini nasıl öngörmektedirler?

### Yöntem

Bu çalışma, İngilizce Öğretmenliği Bölümü ikinci sınıfta öğrenim gören 54 İngilizce öğretmen adayına verilen Dil Edinimi dersi bağlamında gerçekleştirilmiştir. Araştırmanın veri toplama aşamasında Başlangıç ve Gözden Geçirilmiş Dil Öğrenme Otobiyografi Projeleri kullanılmıştır. Bu projelerin içeriği Maryland Üniversitesi'nden Dr. Drew S. Fagan tarafından geliştirilmiştir ve araştırmacının izni doğrultusunda bu çalışma kapsamında kullanılmıştır. Başlangıç Dil Öğrenme Otobiyografi Projesi için etkinlik içeriği, dil edinim süreçleri hakkında derinlemesine bilgi edinmek amacıyla dersin ilk haftasında katılımcılarla paylaşılmıştır. Dersin tamamlanması ve yarıyıl sonu sınavlarının uygulanmasının ardından Gözden Geçirilmiş Dil Öğrenme Otobiyografi Projesi için etkinlik içeriği katılımcılarla paylaşılmıştır. Otobiyografilerin toplanmasının ardından başlangıç ve gözden geçirilmiş dil öğrenme otobiyografi projelerinin içerikleri karşılaştırılarak tekrarlayan ve sık kullanılan sözcük birimlerin ve kümelenen ifadelerin genel bir resmini ortaya çıkarmak için AntConc 3.5.9 kullanılarak gerçekleştirilmiştir. Bu analize ek olarak her bir araştırma sorusu kapsamında her iki veri toplama aracı ile toplanan veriler nitel olarak da karşılaştırılarak incelenmiş ve raporlanmıştır.

### Bulgular

Araştırmanın sonucunda İngilizce Öğretmen adaylarının önceki dil öğrenme deneyimleri ile dil edinim kavramları ve teorileri arasında bağlantılar kurarak aktardıkları bulgulanmıştır. Öğretmen adayları, başlangıçtaki kavramsallaştırmalarından farklı olarak, gözden geçirilmiş dil öğrenimi otobiyografi projelerinde dil edinim ve öğrenim süreçlerinde anahtar kavramlardan olan ara dil, yapı iskelesi (scaffolding), öz düzenlemenin rolüne değinmişlerdir. Gözden geçirilmiş dil öğrenimi otobiyografi projesinde sundukları yeni ortaya çıkan fikir, gelişen ikinci dil sistemlerini tanımlamak için ara dil terimini benimsemeleri olmuştur. Öğretmen adayları ders konularının ve kişisel dil öğrenme deneyimlerinin gelecekteki dil öğretimi üzerindeki tamamlayıcı etkilerine dikkat çekmişlerdir. Mesleki inançları üzerinde en büyük etkiye sahip olan konular dili edinimi için gereken süre, kültürel anlayışın önemi, dil bilgisi ve sözcük dağarcığının rolü, hataların belirlenmesi ve düzeltilmesi ve öğrenme yöntemleri yer almıştır.

### Sonuç ve Tartışma

Araştırmadan elde edilen bulgular üç boyutta özetlenebilir: (a) deneyimsel ve yansıtıcı öğrenme etkinliklerinin, İngilizce öğretmen adaylarının dil edinimi ve öğretimi arasındaki temeller ve bağlantılar üzerinde kolaylaştırıcı bir etkisi ve dil edinimi kavramlarının daha iyi kavramsallaştırılmasına etkisi olması; (b) bir dil öğrencisi olarak deneyimledikleri ve bir öğretmen olarak yapmak istedikleri konusunda artan farkındalık ve karşılıklı etkiye dikkat çekme, (c) dil edinimi dersinin gelecekteki dil öğretimleri üzerinde olumlu etkisinin paylaşılması bulgulanmıştır. Bu sonuçlara dayanarak deneyimsel etkinliklerin dil edinim süreçlerine ilişkin mesleki farkındalığı ve olumlu bakış açısı geliştirmek için İngilizce öğretmeni yetiştirme bağlamlarına dahil edilmesi önerilebilir. İlk olarak, deneyimsel öğrenme etkinlikleri dil edinimi ve öğretimi konusunda farkındalıklarını artırmak için hizmet

öncesi İngilizce öğretmen adaylarının derslerine dahil edilebilir. Bu tür deneyimsel etkinlikler aracılığıyla gelecekteki öğrencilerinin öz güvenini, motivasyonunu ve merakını desteklemenin önemi ve etkili öğrenme stratejileri konusunda farkındalıklarını etkili bir şekilde artırabilir. Öğrencilerin çeşitli özelliklerinin daha fazla tanınması, dil girdisine, desteğine ve geri bildirim öneminde ve duyuşsal faktörlere farkındalık kazanma ve sınıf içi ve sınıf dışı öğrenme bağlarının bütünleştirilmesiyle başarılabilir. Bunun için bu araştırmada kullanılan deneyimsel etkinlikler yoluyla öğretmen rollerini ve dil edinimi ile öğretim arasındaki bağlantının çok yönlü doğasını tanıyarak, hizmet öncesi İngilizce öğretmen adaylarının mesleki kimliklerinin geliştirilmesi de desteklenebilir.



# Opinions of Preschool Teachers on Climate Change

## Okul Öncesi Öğretmenlerinin İklim Değişikliğine İlişkin Görüşleri

Feyza BELGRAT<sup>1</sup>

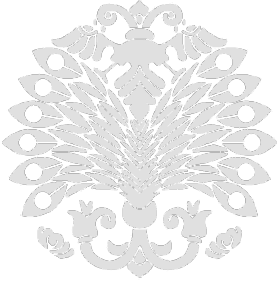


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### ABSTRACT

Climate change is defined as alterations in climate that degrade the environment on a global scale due to human activities, in addition to natural climate changes that occur over similar time periods. Since the consequences of global climate change are being felt more and more each day, this research aims to determine the opinions of pre-school education teachers working at the first stage of education regarding climate change. The research was conducted as a case study, one of the qualitative research methods that allows in-depth description and examination of a limited system. Semi-structured interviews were conducted with six preschool teachers. In the interview form, under the title 'Climate Change,' there are sections for causes, precautions, and comments on a related movie. As a result, teachers generally touched upon global warming and human activities regarding the cause and outcome of climate change and the precautions that can be taken. They emphasized that climate change awareness should be fostered during the preschool years.. In line with these results, suggestions have been made about what can be done in the preschool period in order to increase awareness about climate change.

**Keywords:** Climate change, preschool teachers, global warming

### ÖZ

İklim değişikliği, karşılaştırılabilir zaman dilimlerinde oluşan doğal iklim değişikliğine ek olarak, doğrudan veya dolaylı bir şekilde küresel atmosferin oluşumunun bozulduğu, insan aktivitelerinin sonucuyla iklimde oluşan değişiklikler olarak tanımlanmaktadır. Küresel iklim değişikliğinin sonuçları gün geçtikçe daha fazla hissedildiği için bu araştırmada iklim değişikliğiyle ilgili, eğitimin ilk kademesinde görev yapan okul öncesi eğitim öğretmenlerinin görüşlerinin belirlenmesi amaçlanmıştır. Araştırma sınırlandırılmış bir sistemin derinlemesine betimlenmesine ve incelenmesine olanak veren, nitel araştırma yöntemlerinden durum çalışması şeklinde yürütülmüştür. Altı okul öncesi öğretmeniyle yarı yapılandırılmış görüşmeler yapılmıştır. Görüşme formu iklim değişikliği üst başlığı altında; nedenleri, önlemler, ilgili bir filmin yorumlanması gibi başlıkları içermektedir. Sonuç olarak öğretmenler iklim değişikliğinin nedeni, sonucu ve alınabilecek önlemlerle ilgili genellikle küresel ısınma ve insan faaliyetlerine değinmişler, iklim değişikliği bilincinin okul öncesi dönemde kazandırılması gerektiğini belirtmişlerdir. Bu sonuçlar doğrultusunda iklim değişikliği konusunda bilinci artırabilmek için okul öncesi dönemde yapılabilecekleri içeren öneriler getirilmiştir.

**Anahtar Kelimeler:** İklim değişikliği, okul öncesi öğretmenleri, küresel ısınma

## Introduction

Climate change is a concept that takes place on many different platforms. It is important to raise public awareness about the effects of climate change, as the data indicating that it does not occur within natural limits highlights the impact of human factors. Climate change is defined as alterations in climate that degrade the environment on a global scale due to human activities, in addition to natural climate changes that occur over similar time periods (United Nations-UN, 1992). The conditions occurring as a result of the effects of global climate change are being felt gradually more and more one of the main factors that are responsible for this result is human activities. These effects have gone beyond surface-level issues and caused negative outcomes in the entire ecosystem by affecting air, water, and living organisms (Akbulut & Kaya, 2020). There are various facts proving these effects. Some of them are presented below:

- Global warming, which has reached the level of 1.5°C within a short period, will cause inevitable increases in multiple climatic risks and pose risks for ecosystems and humans (IPCC, 2022).
- The glaciers melting and gathering towards the poles, as well as the reduction of ice and snow cover on mountain peaks.
- The migration of tropical plants and fish, which prefer warm air and water, toward the poles.
- Increasing climate-related migrations and refugee issues.
- Decreases in bird species that are sensitive to air pollution.
- An increase in the growth rate of tree rings, which represent their ages (Akbulut, 2019)

Considering the growing concern about climate change, education has been identified as the target method for addressing the problem (UNEP, 2006). The United Nations Framework Convention on Climate Change, in Article 6, encourages climate change education that is based on education and community awareness, aiming to raise awareness among individuals (UN, 1992). UNESCO (2009) also advocates for the integration of climate education with local and scientific knowledge to adapt to and mitigate climate change.

Besides teaching individuals about the functioning of the environment, climate change education aims also to educate them on how they can ensure the sustainability of the ecosystem (Anderson, 2010). Although it has been acknowledged that education is very important in the fight against climate change, this instrument is not made use of at its full potential (UNESCO, 2015). Gürsoy (2022) stated

that countries started to include climate change in their education programs upon the call of UNESCO. He also stated that adaptation to changes that have occurred and may occur due to climate change is also the subject of education. In order to emphasize the importance of early education on climate change, Cengizoğlu (2013) aimed to examine how preschool children perceive the human-environment relationship through an education program on sustainable development. The 4-week research carried out with 60-66-month-old children in an eco-school in Ankara revealed that the children's perceptions of deforestation, biodiversity, and climate change have changed.

Our innate abilities and individual skills begin to develop and take shape during the preschool period, which is considered the earliest years of life. It is also a time of rapid development and children learn fast and have high learning capabilities in this period (Gülay, 2011). Therefore, starting climate change education in early childhood, during the preschool years, is crucial because the knowledge and skills acquired during this period would probably stay with individuals for a lifetime (Demircioğlu, 2019). Early education on climate change can instill a sense of responsibility in individuals and contribute to their awareness of climate change-related risks in the future. Educating individuals having a high level of awareness facilitates efforts during critical moments and helps fight potential climate change dangers in the following years. At this point, teachers have important responsibilities. The higher the awareness of teachers regarding climate change, the easier it is for them to transmit their knowledge and experience to children (Akbulut, 2019). A research conducted on this topic examined the environmental awareness of preschool teachers, the initiatives taken in schools for environmental education, and the extent to which teachers incorporate environmental concepts into their activities. In this research, which involved 300 teachers, it was determined that preschool teachers had insufficient environmental awareness and did not have sufficient ideas regarding environmental protection (Buhan, 2006).

Examining the studies involving preschool teachers and teachers from other grades and different fields (such as natural sciences, social sciences, elementary school, chemistry, and geography) and examining their opinions regarding climate change, it was noted that the number of those studies is very limited. However, it was also observed that the number of studies has started to increase as of the year 2020. Among the relevant studies conducted to date, those that specifically include preschool teachers (Duran, 2023; Karabulut, 2023; Saraç et al., 2022; Seguido &

Moreno, 2023; Siron et al. 2021) reveal that teachers perceive themselves as having knowledge gaps and misconceptions about climate change. They are aware of the problems and potential solutions, consider it important to educate children on this topic, and score lower on climate change-related concepts compared to teachers from other disciplines."

Considering the limited number of studies in the literature, the present research aims to determine the opinions of preschool teachers regarding climate change and the communicability of climate change to preschool children. During the data collection process, it was aimed to ensure that teachers provided detailed opinions, as well as evaluating the preschool education program they implement in terms of raising awareness about climate change. In conjunction with existing studies in the field, this research can provide insights for future investigations, suggest various activities for children, and develop educational content and materials related to climate change, thereby contributing to the ongoing discourse on this topic.

## Methods

A qualitative research method known as a case study was employed in the present research. A case study involves an in-depth examination of a bounded system, and it is preferred due to the need for understanding, exploring, and interpreting. In this process, the focus is on a specific event, program, or phenomenon, and a rich and intensive description is provided in order to help the reader understand that phenomenon better (Merriam, 2013). In this research, researchers conducted interviews with preschool teachers using interview questions prepared by the researchers it was aimed to determine their views on climate change. In addition to interview questions, preschool teachers were shown a short film about climate change, and their opinions about the film were also collected.

### Research Group

The participants in this research consisted of preschool teachers, who were willing to participate. From this aspect, the selection of participants falls within the category of easily accessible sampling. The participants were working as preschool teachers in Ankara, Aydın, Batman, Diyarbakır, and Mardin provinces. Five of the teachers are female, and one is male. Their professional experience ranges from 3 to 15 years.

### Data Collection

Data was collected by using a semi-structured interview form prepared within the scope of this research. In the preparation of the interview form, the literature was first reviewed, and draft questions were prepared. These questions were then sent to two experts, one in the field of natural sciences and one in the field of education sciences, who had previously worked on climate change, to obtain their opinions. Based on the feedback from the experts, the questions were finalized and made ready for use in the research. At this point, ethical approval was obtained from Aydın Adnan Menderes University's Ethics Committee for Educational Research (Date: 14.10.2022, Decision No. 2022/10-1). Consent was obtained from the participants.

Through the semi-structured interview form, teachers were directed to answer questions related to the causes and consequences of climate change, how to mitigate climate change, and the role of preschool education in raising awareness of climate change. Moreover, a short film "Climate Change" about climate change, produced by an institution (Alegria Activity S. L., n.d.) that had previously worked on climate change in collaboration with UNICEF, was shown to the teachers, and their opinions about the film were also obtained. The film addresses themes such as "energy waste, overconsumption, environmental pollution, industrialization, urbanization, melting of glaciers, and scarcity". Since the participants were living in different cities, the interviews were conducted online. The responses of the teachers were recorded and later transcribed for analysis.

### Data Analysis

Descriptive analysis was used in data analysis. Descriptive analysis is a type of qualitative data analysis that involves examining and interpreting data collected through various means according to specific themes (Özdemir, 2010). After the data was collected and transcribed, it was observed that the teachers provided responses incorporating general concepts related to climate change found in the literature. Therefore, the descriptive analysis technique was deemed appropriate. In this context, both the main topics of the questions prepared by the researchers and the concepts within the overarching topic of climate change in the literature (IPCC, 2014; IPCC, 2022; UN, 1992; UNESCO, 2009) were utilized.

## Results

The findings of the present research examining the preschool teachers' opinions on climate change are presented in Table 1. Table 1 presents code examples and

quotations from interviews related to the first theme, "Definition of Climate Change".

**Table 1.**  
*Preschool Teacher Opinions on What Climate Change is*

Theme	Code Examples	Quotations from Interviews
Definition of Climate Change	greenhouse gases	
	seasonal changes	<i>"..I think greenhouse gases have an effect."</i>
	temperature increases	<i>"Because although we are in a country that experiences all four seasons clearly, we experience all seasons at extreme extremes compared to the past."</i>
	global warming	<i>"Climate change is the change of weather and natural events."</i>
	weather changes	

When examining Table 1, it can be seen that preschool teachers primarily focus on concepts such as greenhouse gases, seasonal changes, temperature increases, global warming, and weather changes when defining climate change. Consequently, the teachers' opinions on climate change closely align with the actual definition.

Table 2 provides code examples and quotations from interviews related to the second theme, "Causes of Climate Change".

**Table 2.**  
*Preschool Teachers' Opinions on the Causes of Climate Change*

Theme	Code Examples	Quotations from Interviews
Causes of Climate Change	chemical use	<i>"The reason is global warming."</i> <i>"I think it is generally caused by human factors."</i>
	global warming	<i>"Air pollution, toxic wastes, chemical wastes..."</i>
	human factors	<i>"..the first thing that comes to my mind, as I said in the other question, is the effect of greenhouse gases."</i>
	environmental pollution	
	greenhouse gases	

When examining Table 2, teachers identified the causes of climate change as chemical use, global warming, human factors, environmental pollution, and greenhouse gases. Participants mentioned both individual waste and industrial chemical waste regarding the category of chemical use. Therefore, it was observed that teachers generally attributed the cause of climate change to the consequences of human activities.

Table 3 provides code examples and quotations from interviews related to the third theme, "Prevention of Climate Change".

**Table 3.**  
*Preschool Teacher Views on Preventing Climate Change*

Theme	Code Examples	Quotations from Interviews
Prevention of Climate Change	keeping the environment clean	
	paying importance to recycling	<i>"...recycling is important."</i> <i>"If it's a short distance, I walk or bike."</i>
	saving energy	<i>"It could be increased controls on factories, hydroelectric power plants and dams."</i>
	controlling factories/dams	
	using natural energy sources	<i>"..I have students that I can educate, and I am doing something for climate change through them.."</i>
education		
	using natural products	<i>"...I prefer to use natural products."</i>

When examining Table 3, it shows that teachers expressed statements related to what can be done to prevent climate change, such as keeping the environment clean, paying importance to recycling, saving energy, controlling factories/dams, using natural energy sources, education, and using natural products. As seen in Table 3, which presents what can be done to prevent climate change and the practices of teachers to prevent climate change together, it can be seen that teachers use similar expressions for what can be done and what they do.

Table 4 provides code examples and quotations from interviews related to the fourth theme, "Who is Responsible for Preventing Climate Change".

**Table 4.**

*Teacher Views on Who is Responsible for Preventing Climate Change*

Theme	Code Examples	Quotations from Interviews
Who is Responsible for Preventing Climate Change	people	"Everyone has a responsibility to prevent climate change."
	politicians	"Political leaders of countries should make policies on this issue."

As seen in Table 4, preschool teachers agreed on the answer "All people" to the question, "In your opinion, who is responsible for preventing climate change?" In this research, some preschool teachers also pointed out politicians, emphasizing the need for legal regulations.

Table 5 presents themes, code examples, and quotations from interviews resulting from discussions with teachers after watching a short film about climate change.

Table 5 contains teachers' views on the short film shown during the interviews. All teachers stated that their views were in line with what was presented in the short film. When asked from which aspects their views aligned, teachers mentioned energy waste, deforestation/urbanization, unconscious use of natural resources, excessive consumption, and the consequences of climate change (melting glaciers, animals becoming displaced from their homes, decrease in the Earth's lifespan).

**Table 5.**

*Teacher Views on the Short Film on Climate Change*

Theme	Code Examples	Quotations from Interviews
Agreeing with the themes of the short film	energy waste	"...waste of water and energy."
	deforestation/urbanization	"I think it explains very well what the unconsciousness of human factors may cause in the future.."
	unconscious use of natural resources	"We must use our natural resources carefully. We must reduce energy consumption. In this respect, it is compatible with my views."
	excessive consumption	"Children may say; "Oh, so our world is becoming like this because adults do these things."
Gaining awareness/aged period	the consequences of climate change	"I think it will of course have an impact on children because it is like animation."
	acquire/gain knowledge art activities	"It can be integrated with activities such as art and drama."
	drama activities	"It can be integrated with activities such as Turkish language and science."
Integrability of the short film with activities	art activities	"I think the experiment about melting glaciers will attract the attention of children."
	drama activities	"It may be related to observation and learning by experimenting."
	Turkish language activities	"It can be paired with the achievements of remembering what you perceive, explaining what you watch, and expressing yourself."
	science activities	
The achievements that can be associated with the short film	mathematics activities	
	cognitive development	
	language development	
	socio-emotional development	

When asked how they evaluated the preschool children's potential to gain awareness of climate change after watching the short film, there was unanimous agreement that "Yes, they can acquire/gain knowledge." Teachers mentioned that the short film would attract attention since it is animation and that children could understand the cause-and-effect relationships from the film.

Regarding the achievements that can be associated with the

short film, teachers mentioned that the film could be associated with cognitive development (K3, K5, K8, K19), language development (K7, K8), and socio-emotional development (K3, K10). However, it is remarkable that teachers did not mention the relevant achievement (K17: Establish cause-and-effect relationships) in the cognitive development field, despite their justification for why there should be cause-and-effect relationships in the short film.

**Table 6.**

*Preschool Teachers' Opinions on the Share of Climate Change in the Preschool Education Program (PEEP)*

Theme	Code Examples	Quotations from Interviews
	cognitive development	
Achievements	language development	<i>"Generates solutions to problems and offers solution suggestions."</i>
	socio-emotional development	<i>"Frankly, I could not see anything related to this in the achievements and indicators."</i>
Activity types	Turkish language activities	<i>"It can be discussed within the scope of science activities. Because environmental issues are already discussed in science activities. Therefore, it may be related to science activities."</i>
	science activities	
	mathematics activities	
	art activities	
	drama activities	

When examining Table 6, it can be seen that teachers believe that some of the achievements under cognitive development (K17, K19), language development (K6), and socio-emotional development (K6, K10, K16) in the Ministry of Education's 2013 preschool education program (PEEP) can be associated with climate change, despite stating that none of the achievements in the program are directly related to climate change. It is noteworthy that all teachers, in their opinions, include cognitive development and science activities as common elements.

### Discussion

In this research, which aims to examine the opinions of preschool teachers on climate change, semi-structured interviews were conducted with 6 preschool teachers, who voluntarily participated in the research, from different cities. The interviews with the teachers were transcribed and analyzed within the framework of themes that were identified. As a result of these analyses, it was observed that teachers cited concepts such as greenhouse gases, seasonal changes, temperature increase, global warming, and climate change in their definitions of climate change. Given the definition of "climate change" by the United Nations (1992),

it is seen that this definition includes observed natural changes, changes in the composition of the atmosphere, and the relationship between these changes and human activities. Therefore, the teachers' opinions on climate change were seen to closely align with the actual definition. In a research carried out with university students, climate change was most commonly defined as "changes of seasons" (Gülsoy, 2018). In a research carried out by Oluk and Oluk (2007) on university students' views on climate change, it was determined that most students associated climate change with global warming, and some tried to explain climate change by comparing current weather conditions to those of previous years. In another research carried out by Ay and Erik (2020) with university students, students were asked to define climate change with a single concept; most of them described it as the disruption of the natural balance. In this research, participants also referred to similar concepts commonly associated with climate change in previous research.

In response to the question of what the causes of climate change are, teachers mentioned concepts such as chemical use, global warming, human factors, environmental pollution, and greenhouse gases. It should be noted that



only one teacher mentioned global warming as a response. It was observed that teachers generally attributed the cause of climate change to the consequences of human activities. Similarly, in a research carried out by Atik and Doğan (2019) on high school students' views on climate change, most students cited environmental pollution as a cause, some pointed to the unconscious behavior of individuals, and a few mentioned global warming and greenhouse effects. As reported in another research, university students cited the causes of climate change as air pollution, deforestation, and ozone layer depletion, among others (Ay and Erik, 2020). In a research by Tetik and Acun (2015), university students stated that climate change was most affected by air pollution, the increase in fossil fuel use, and deforestation, followed by an increase in greenhouse gases, and migration and unplanned urbanization had the least impact. Gülsoy's research (2018) with university students also found that students primarily attributed climate change to human activities and some considered it a natural process. In this research, it is noteworthy that one participant regarded global warming as the sole cause of climate change.

When asked about "What should be done to prevent climate change?" and "What are you doing to prevent climate change?", teachers responded with answers such as keeping the environment clean, paying importance to recycling, saving energy, controlling factories/dams, using natural energy sources, education, and using natural products instead of chemical products. Teachers emphasized that everyone has a responsibility to prevent climate change, and besides that, politicians and governments should also take responsibility. As seen in findings, which presents what can be done to prevent climate change and the practices of teachers to prevent climate change together, it can be seen that teachers use similar expressions for what can be done and what they do. Therefore, it can be considered that teachers act consistently with their views. Based on this finding, it can be assumed that teachers provide recommendations based on their own practices to prevent climate change. In addition, it can also be seen that some preschool teachers draw attention to education at this point. The view of teachers aligns with Atik and Doğan's (2019) statement in their research with high school students that "Education plays an important role in increasing individuals' knowledge and awareness of climate change." One teacher responded to the question about what can be done to prevent climate change by saying, "Or we can develop systems that work with solar energy instead of electronic products we use. I think we should develop technology in this direction," drawing attention to technology. This is thought to be due to the frequent

technological developments in various fields in the century we live in. Similarly, Albayrak and Atasayan (2017) found in their research that participants relied on technology as a solution to climate change. Oluk and Özalp (2007) stated in their research that 7<sup>th</sup>-grade students emphasized the need for people to be conscious and to use technology in solving this problem.

As seen in findings, preschool teachers agreed on the answer "All people" to the question, "In your opinion, who is responsible for preventing climate change?" In a research carried out by Atik and Doğan's (2019), participants believed that the most important reasons for global climate change were environmental pollution and unconscious behaviors of individuals. In this research, some preschool teachers also pointed out politicians, emphasizing the need for legal regulations. Similarly, in a research on climate change, the majority of participants stated that the government was the most effective actor in implementing climate change policies at the local level (Albayrak & Atasayan, 2017).

During the interviews, teachers were asked to watch a short film that was prepared to draw attention to climate change, which had received awards, and provide their opinions on whether it aligned with their views, the potential contributions of children from this film, and the types of activities and outcomes that could be integrated with the short film. Teachers generally reported that the short film aligned with their views and could be effective in raising awareness among children about climate change. The teachers stated that the short film watched to them would attract attention because it was in the form of animation and that children would be able to infer cause and effect from the movie. Cartoons are the content that interests children the most and influences them (Gençer, 2018). In this parallel, in a research examining the effect of technology support in environmental education, it was found that preschool children showed more interest in technology-supported environmental education and, therefore, their learning was more permanent (Altınsoy, 2018).

They mentioned art, drama, Turkish language, science, and mathematics activities as types of activities that could be combined with the short film, and cognitive development, language development, and social-emotional development as potential outcomes. In their views on the integrability of the short film with activities, teachers associated the film with art, drama, Turkish language, science, and mathematics activities. The reason why teachers mentioned science, drama, Turkish language, art, and mathematics activities primarily is thought to be the themes in the short film.

Finally, regarding the types of activities and outcomes related to climate change that teachers perceived, they mentioned Turkish language, science, mathematics, art, and drama activities. Besides that, although there were no direct outcomes related to climate change, they stated that some of the outcomes in the cognitive, language, and social-emotional development areas could be related. In this research, teachers' inclusion of cognitive development and science activities aligns with the results reported by Gezgin and Kılıç (2015), who stated in their research on preschool teachers' evaluation of science activities that teachers aimed to enhance cognitive skills more in science activities, thus preferring achievements related to cognitive skills.

According to teachers' views, Turkish, science, mathematics, art, and drama activities among the activity types in the Ministry of Education's 2013 preschool education program (PEEP) are suitable for the contents related to climate change. These views are supported by Aydın and Aykaç's (2016) research, which examined the effect of creative drama activities on children's environmental awareness. It was observed in their research that environmental education provided through drama activities positively affected children's awareness. In a research examining teachers' views on the effect of science and nature activities on children's environmental awareness in the preschool period, it was reported that teachers most frequently resorted to science and nature activities to instill environmental consciousness in children, and they believed that science activities were more effective in raising environmental awareness (Yağlıkara, 2006). Teachers stated that these types of activities are suitable, emphasizing that preschool children learn by doing and experiencing. To ensure productive and lasting learning in the preschool period, experiential learning should be encouraged (Aydın and Aykaç, 2016). In addition, regarding the science activities, one teacher mentioned that science activities already address environmental issues. Similarly, in a research carried out by Özkan (2017), a teacher stated that environmental education is generally integrated into science activities. An interesting point here is that the participating teachers did not express any opinions about games. Güzelyurt and Özkan (2017) found in their studies that game-based education played an effective role in environmental awareness. In the present research, it was observed that participating teachers did not explicitly refer to game activities, and this is considered to be an interesting finding.

### Conclusion, and Suggestions

In this research, it can be said that the participating teachers generally addressed concepts related to climate

change, believed that the issue involved both individual and social responsibilities, thought that individuals could be made aware of this issue starting from the preschool period, and held the opinion that the preschool education program could influence children's awareness of climate change through various associations and adaptations.

Given the results achieved in the present research, the following suggestions can be given:

- Since teachers mentioned that there are no direct outcomes related to climate change within the learning objectives, it is considered that including relevant exemplary outcomes or indicators in the preschool education program can guide teachers.
- Moreover, it is considered that the ways of conveying the topic to the relevant age group can be examined and observed through the preparation and observation of activities that teachers will develop within the scope of climate change.
- Considering teachers' opinions about whether the film is suitable for children and outlining the general concept of climate change, it is thought that such animation films and technological content suitable for children can be prepared and integrated into school activities in order to help children understand climate change.

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**Katılımcı Onamı:** Katılımcılardan onam alınmıştır.

**Hakem Değerlendirmesi:** Dış bağımsız.

**Yazar Katkıları:** Fikir-FB-NBB; Tasarım- FB-NBB; Denetleme- FB-NBB<sup>2</sup>; Kaynaklar- FB-NBB; Veri Toplanması ve/veya İşlemesi-FB; Analiz ve/veya Yorum- FB-NBB; Literatür Taraması-FB; Yazıyı Yazan- FB-NBB; Eleştirel İnceleme- FB-NBB.

**Çıkar Çatışması:** Yazarlar, çıkar çatışması olmadığını beyan etmiştir.

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## Genişletilmiş Özet

### Giriş

İklim değişikliği pek çok farklı platformda karşımıza çıkan bir kavramdır. Doğal sınırlar içerisinde gerçekleşmediğine ilişkin veriler, insan faktörünün etkisini ortaya koyduğu için, insanların iklim değişikliği üzerine etkileri ile ilgili farkındalıklarının artması önemlidir. Nitekim farklı kurumlar tarafından yapılan iklim değişikliği tanımlarında insan faktörü yer almaktadır. Birleşmiş Milletler (BM) tarafından yapılan tanımda iklim değişikliği, karşılaştırılabilir zaman dilimlerinde oluşan doğal iklim değişikliğine ek olarak, doğrudan veya dolaylı bir şekilde küresel atmosferin yapısının bozulduğu, insan aktivitelerinin sonucuyla iklimde oluşan değişiklikler olarak yer almaktadır (BM, 1992) ve bu sorunun çözümü için hedeflenen yöntemlerden birisi de eğitim olarak belirlenmiştir (UNEP, 2006). Ancak eğitim bu konuda yeterli seviyede kullanılmamaktadır (UNESCO, 2015).

Okul öncesi dönemde, bütün yaşamımızca bizimle olacak yeteneklerimiz ve bireysel becerilerimiz oturmaya başlar ve çocukların öğrenmeleri hızlı ve öğrenme becerileri yüksektir (Gülay, 2011). Bu nedenle iklim değişikliği eğitiminin bireylere erken yaşlarda vermeye başlanmasıyla edindiğimiz kazanımlar belki de hayat boyu bizimle olacakları için önem arz etmektedir (Demircioğlu, 2019). Bu noktada eğitimi verecek olan öğretmenlere büyük sorumluluk düşmektedir. Öğretmenlerin iklim değişikliği ile ilgili bilinçleri ne kadar yüksek olursa bilgi ve deneyimlerini çocuklara aktarmaları o derece kolay olmaktadır (Akbulut, 2019).

Hem okul öncesi eğitim kademesi öğretmenlerinin hem de diğer bazı kademelerde ve farklı branşlardaki (fen bilimleri, sosyal bilgiler, sınıf öğretmenliği, kimya, coğrafya) öğretmenlerin katılımcı oldukları, iklim değişikliğine ilişkin görüşleri kapsamında yapılan çalışmalara bakıldığında, ilgili çalışma sayısının oldukça sınırlı kaldığı görülmekle birlikte, 2020 itibariyle artışa başladığı tespit edilmiştir. İlgili çalışmalardan okul öncesi öğretmenlerini kapsayacak şekilde yürütülmüş olanları incelendiğinde (Duran, 2023; Karabulut, 2023; Saraç ve ark., 2022; Seguido & Moreno, 2023; Siron ve ark., 2021) öğretmenlerin kendilerinde iklim değişikliği konusunda bilgi eksiklikleri ve kavram yanlışları olduğunu belirttikleri; sorunları ve neler yapabileceklerini takip ettikleri ve çocukları bu konuda bilgilendirmeyi önemli gördükleri; diğer branşlarla karşılaştırdıklarında iklim değişikliğiyle ilişkili kavramlarda daha düşük puanlar aldıkları şeklinde sonuçlar elde edilmiştir.

Bu çalışmada, alan yazındaki sınırlı çalışma sayısı da göz önünde bulundurularak; okul öncesi öğretmenlerinin iklim değişikliğiyle ve iklim değişikliğinin okul öncesi dönem çocuklarına anlatılabilirliği ile ilgili görüşlerinin belirlenmesi amaçlanmıştır ve daha sonra yapılabilecek olan araştırmalara, çocuklara yönelik hazırlanabilecek etkinliklere, eğitici içeriklere, materyallere fikir verilebileceği, böylece konu kapsamındaki çalışmaların devamlılığına bir katkıda bulunulabileceği düşünülmektedir.

### Yöntem

Araştırma nitel araştırma yöntemlerinden durum çalışması deseninde gerçekleştirilmiştir. Durum çalışması, sınırları bulunan bir sistemin detaylarıyla incelenmesidir ve kavrama, keşfetme ve yorumlama ihtiyacından dolayı tercih edilir. Bu süreçte belli bir olay, program ya da olguya odaklanılıp zengin ve yoğun şekilde betimlemesinin yapılmasıyla okuyucunun o olguyu daha iyi anlaması (Merriam, 2013) sağlanmaya çalışılır. Bu doğrultuda bu çalışmada araştırmacılar tarafından hazırlanan görüşme soruları aracılığıyla okul öncesi öğretmenleri ile görüşmeler gerçekleştirilmiş ve iklim değişikliğine ilişkin görüşleri belirlenmeye çalışılmıştır. Bu görüşme sorularının yanı sıra iklim değişikliği ile ilgili bir kısa film öğretmenlere izletilerek bu film ile ilgili görüşleri de alınmıştır.

**Çalışma Grubu:** Çalışmanın katılımcıları araştırmacılar tarafından ulaşılabilen ve çalışmaya katılmaya gönüllü olan altı okul öncesi öğretmeninden oluşmaktadır. Bu yönüyle katılımcıların belirlenmesi, kolay ulaşılabilir örneklem kapsamına girmektedir.

**Verilerin Toplanması:** Veriler araştırma kapsamında hazırlanan yarı yapılandırılmış görüşme formu ile toplanmıştır. Görüşme formunun hazırlanmasında ilk olarak literatür taranmış ve taslak sorular hazırlanarak biri fen bilimleri alanında biri eğitim bilimleri alanında olmak üzere daha önce iklim değişikliği konusunda çalışmaları bulunan iki uzmana gönderilerek görüşleri alınmıştır. Uzman görüşlerinden gelen dönütlere göre sorulara son şekli verilip uygulamada kullanılmaya hazır hale getirilmiştir. Bu aşamada Aydın Adnan Menderes Üniversitesi Eğitim Araştırmaları Etik Kurulu'ndan etik kurul izni alınmıştır (2022/10-I nolu karar).

**Verilerin Analizi:** Verilerin analizinde çeşitli yollarla toplanan verilerin belirli temalara göre incelenip yorumlanmasını gerektiren betimsel analiz kullanılmıştır (Özdemir, 2010). Analizlerde, araştırmacılar tarafından hazırlanan sorulardan ve literatürde iklim değişikliği üst başlığı içinde yer alan kavramlardan (BM, 1992; IPCC, 2014; IPCC, 2022; UNESCO, 2009) yararlanılmıştır.

## **Bulgular**

Okul öncesi öğretmenlerinin iklim değişikliğine ilişkin görüşlerinin incelendiği çalışmanın verileri analiz edildiğinde İklim Değişikliğinin Tanımı, İklim Değişikliğinin Sebepleri, İklim Değişikliğinin Önlemesi, İklim Değişikliğinin Önüne Geçmede Sorumluluk Sahipleri, Kısa Film Hakkında Görüşler, Okul Öncesi Eğitim Programında (OÖEP) İklim Değişikliğinin Yeri temaları oluşmuştur.

## **Sonuç ve Öneriler**

Öğretmenlerin iklim değişikliğinin tanımında sera gazları, mevsim değişikliği, sıcaklıkların artışı, küresel ısınma, hava değişimi kavramlarına değindikleri; iklim değişikliğinin sebepleri olarak kimyasal kullanma, küresel ısınma, beşeri faktörler, çevre kirliliği ve sera gazları kavramlarını belirttikleri görülmüştür. İklim değişikliğinin önüne geçebilmek için ise çevreyi temiz tutmak, geri dönüşüme önem vermek, enerji tasarrufu yapmak, fabrika/barajların kontrol edilmesi, doğal enerji kaynakları kullanmak, eğitim, kimyasal ürünler yerine doğal içerikli ürünler kullanmak cevaplarını vermişlerdir. Öğretmenler iklim değişikliğini önlemede tüm insanlara sorumluluk düştüğünü bunun haricinde politikacılar ve hükümetlerin sorumluluk alması gerektiğini belirtmişlerdir. Öğretmenler görüşme esnasında izlemeleri istenen "İklim Değişikliği" isimli, ödüllü film hakkında ise genel olarak görüşleriyle uyduğuna ve çocukların iklim değişikliği ile ilgili bilinçlenmelerinde etkili olabileceğini belirtmişlerdir. Okul Öncesi Eğitim Programı açısından ise iklim değişikliği konusuyla Türkçe, fen matematik, sanat ve drama etkinliklerinin ilişkilendirilebileceğini belirtmişlerdir. Kazanımlar içerisinde doğrudan iklim değişikliği ilgili kazanım bulunmuyor olmasının yanı sıra bilişsel, dil ve sosyal duygusal gelişim alanlarındaki kazanımlardan bazılarının ilişkilendirilebileceği görüşünde oldukları belirlenmiştir.

Çalışmanın sonuçlarına göre; okul öncesi eğitim programında ilgili örnek kazanımlara veya göstergelere yer verilmesinin öğretmenlere rehberlik edebileceği düşünülmektedir. Ayrıca öğretmenlerin iklim değişikliği kapsamında hazırlayacakları etkinliklerin incelenmesi ve gözlemlenmesi aracılığıyla konuyu ilgili yaş grubuna aktarma şekillerinin incelenebileceği düşünülmektedir. Son olarak, çocuklara uygun animasyon filmlerinin ve teknolojik içeriklerin hazırlanabileceği ve çocukların iklim değişikliğini kavramaları amacıyla okulda yapılan etkinliklere entegre edilebilecekleri düşünülmektedir.

# Occupational Health and Safety Self-Efficacy's Impact on The Quality of Work Life Among Teachers in Educational Organizations: A Cross-Sectional Study in Konya

## İş Sağlığı ve Güvenliği Öz Yeterliliğinin Eğitim Kurumlarındaki Öğretmenlerin İş Yaşam Kalitesine Etkisi: Konya'da Kesitsel Bir Çalışma

Kemal Ferit  
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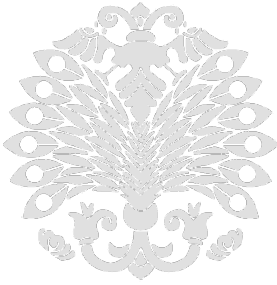


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### ABSTRACT

Teachers' occupational health and safety (OHS) self-efficacy stands out as an important factor that can enable them to have a positive quality of work life in the work environment. The aim of this study is to systematically analyze the effect of teachers' OHS self-efficacy on the quality of work life (QWL) and to better understand this relationship. A cross-sectional study was conducted with 382 teachers in Konya province, using the Occupational Health and Safety Self-Efficacy Scale and the QWL Scale. Data were analyzed using linear regression, examining the relationship between OHS self-efficacy and QWL. Participants included 62.0% male, and 87.7% married teachers. Notably, 23.0% reported experiencing OHS issues. While no significant differences were found in work-life quality scores based on demographics, a significant decrease was observed among those facing health or safety issues. Correlation analysis revealed weak positive correlations between Occupational Health and Safety Self-Efficacy sub-factors and work-life quality. Linear regression identified Fall-Slip, General Knowledge, and Maintenance-Repair as positive predictors, and health or safety issues as a negative predictor, explaining 18.9% of work-life quality variance. This study underscores the interconnectedness of workplace safety and QWL, emphasizing the need for comprehensive OHS programs in educational institutions. Implementing these recommendations can create safer and more supportive working conditions, ultimately enhancing the QWL for teachers.

**Keywords:** Quality of work life, occupational health and safety, teacher well-being; workplace safety

### ÖZ

Öğretmenlerin iş sağlığı ve güvenliği (İSG) öz yeterlikleri, çalışma ortamında olumlu bir çalışma yaşamına sahip olmalarını sağlayabilecek önemli bir faktör olarak öne çıkmaktadır. Bu çalışmanın amacı, öğretmenlerin İSG öz yeterliklerinin iş yaşam kalitesi üzerindeki etkisini sistematik olarak analiz etmek ve bu ilişkiyi daha iyi anlamaktır. Konya ilinde görev yapan 382 öğretmene İş Sağlığı ve Güvenliği Öz Yeterlik Ölçeği ve İş Yaşam Kalitesi Ölçeği uygulanarak kesitsel tipte bir çalışma yapılmıştır. Veriler doğrusal regresyon kullanılarak analiz edilmiş ve İş Sağlığı ve Güvenliği Öz Yeterliği ile İş Yaşam Kalitesi arasındaki ilişkiler incelenmiştir. Katılımcıların %62.0'ı erkek, %87.7'si evli öğretmenlerden oluşmaktadır. Özellikle, %23.0'ü İSG sorunları yaşadığını belirtmiştir. Demografiye dayalı iş hayatı kalite puanlarında anlamlı bir fark bulunmazken, sağlık veya güvenlik sorunları yaşayanlar arasında anlamlı bir düşüş gözlenmiştir. Korelasyon analizi, İş Sağlığı ve Güvenliği Öz Yeterlik alt faktörleri ile çalışma yaşam kalitesi arasında pozitif yönde zayıf korelasyonlar olduğunu ortaya koymuştur. Doğrusal regresyon, Düşme-Kayma, Genel Kültür, Bakım-Onarım'ı pozitif yordayıcı, sağlık veya güvenlik konularını negatif yordayıcı olarak tanımlamış; iş yaşam kalitesi varyansının %18,9'unu açıklamıştır. Bu çalışma, eğitim

kurumlarında kapsamlı İSG programlarına duyulan ihtiyacı vurgulayarak, işyeri güvenliği ve iş yaşam kalitesinin birbirine bağlılığının altını çizmektedir. Bu önerilerin uygulanması, daha güvenli ve daha destekleyici çalışma koşulları yaratabilir ve sonuçta öğretmenler için iş yaşam kalitesini geliştirebilir.

**Anahtar Kelimeler:** Çalışma yaşamının kalitesi, iş sağlığı ve güvenliği, öğretmen refahi, iş yeri güvenliği

## Introduction

The quality of working life has become one of the organizational issues in the modern age. This concept examines the human dimensions of the relations between employees and the total working environment, as well as their technical and economic quality. The notion of Quality of Work Life (QWL) encompasses the provision of support to employees for conducting their tasks in a conducive and healthy workplace environment. This involves raising awareness about the significance of work for employees, enabling them to recognize their capabilities, and fostering a work environment conducive to skill development (Turner & Garvis, 2023).

Coined in the 1950s, the term "quality of work life" originally denoted stress arising from suboptimal work conditions. While its early developments were primarily observed in the United States and the United Kingdom, its influence quickly extended to Western Europe (Netherlands), Northern Europe (Norway), South Asia (India), and East Asia (Japan). The period from the 1950s to the 1970s witnessed a substantial emphasis on the QWL, gaining significance as a subject of research in both academic and civil society spheres (İlğan et al., 2008). Enhancing the QWL correlates with heightened job satisfaction, life satisfaction, engagement in leisure activities, and economic well-being of employees (Kermansaravi et al., 2015; Rostami et al., 2021). Positive contributions from work life extend to elevating job satisfaction and contentment in various life dimensions.

A study by Nasl-Saraji and Dargahi (2006) aimed to gauge the positive and negative attitudes influencing the quality of life of employees in Tehran University Hospitals. Their findings indicated that Occupational Health and Safety (OHS) practices significantly contributed to enhancing the QWL. Similarly, Erdem and Kaya (2013) endeavored to identify factors impacting the QWL in the hospitality sector, revealing physical working conditions, working hours, technology utilization, training opportunities, and work-life balance as pivotal aspects. Dayan and Öngel (2016) found that organizational efforts addressing ergonomic and psychosocial deficiencies positively impact employee well-being, encompassing both mental and physical dimensions.

Acknowledging the positive influence of OHS practices on the QWL, Ünlü and Aydoğan (2015) asserted that a secure working environment can elevate employee motivation, allowing them to demonstrate their skills and enhance their QWL.

Today, increasingly harsh working conditions and employers' desire to achieve more efficiency have brought about occupational accidents, deaths and injuries. Thus, the concept of OHS, which is emphasized with sensitivity today, has emerged (Güler et al., 2018).

OHS studies carried out by the Ministry of National Education in Turkey are based on the Occupational Health and Safety Law No. 6331 and related regulations. These laws and regulations mandate the implementation, supervision and control of OHS activities in all workplaces in general, including government public institutions and schools, as well as in the private sector. Within the framework of OHS Law No. 6331, OHS activities carried out by the employer or the employer's representative in the private sector are implemented by the administrative unit in state public institutions. In schools, this responsibility belongs to the school principals, who are the highest-level officials of the administrative unit. School principals are responsible for carrying out, supervising and controlling OHS activities. In this context, school principals are responsible for taking measures in accordance with OHS standards and carrying out the necessary inspections in order to ensure the health and safety of students and employees. In this way, it is aimed to maintain a healthy and safe working environment in schools (Canoğlu et al., 2023).

Although educational institutions are not as open to OHS risks as industrial organizations, they may encounter dangerous situations, especially in vocational and technical schools (Çetin, 2019). Occupational health and working conditions emerge as the highest average dimensions of the quality of working life in educational organizations (Usha & Rohini, 2018). In the education sector, teachers perceive a safe environment as a key indicator of quality, given their responsibilities to students, programs, parents, the physical school environment, and the community (Ata-Yüzügüllü et al., 2018). However, the safety and health of students are often not reflected in accident statistics, creating a distorted perception (Ustaoğlu, 2020). In addition, the post-2020 shift



to online education has led to a decrease in recorded OSH-related incidents, and the lack of health rooms and staff in many educational institutions can cause delays in interventions in risky situations (Casida et al., 2019). As a result, teachers' perceived OHS problems and coping self-efficacy emerge as important factors affecting the QWL. Researches indicate that perceived occupational risks harm both physical and mental health, consequently increasing stress in the workplace. Additionally, the literature has focused on the effects of perceived health and safety risks on job satisfaction and productivity. However, the concept of QWL encompasses much more than this. QWL not only examines the job itself but also how it can improve the lives of employees (Ilgan et al., 2015; Karamık & Şeker, 2015; McLellan, 2017; Sapmaz, 2013). Regarding this, there has been no study found in the domestic and foreign literature on the impact of OHS self-efficacy on QWL in teachers. Our study is significant in being the first to focus on the education sector and analytically examine the impact of healthy and safe working environments on the quality of working life.

The aim of this research is to investigate the impact of teachers' OHS self-efficacy and its sub-dimensions on QWL.

## Methods

### Type of Research

This research was descriptive and cross-sectional in nature.

### Research Design

This study was designed using a correlational survey model to determine the relationship between teachers' OHS self-efficacy and levels of quality of working life. The correlational survey model is a quantitative research method used to determine if there is a relationship between variables, and if so, to ascertain the direction and magnitude of this relationship (Lodico et al., 2006).

### Population and Sample

The study's population comprises teachers in public schools affiliated with the National Education Directorate in Konya province. With a total of 16,681 teachers in all schools and assuming parameters of  $p = .50$ ,  $\alpha = .05$ , and  $d = .05$ , the minimum sample size is determined as 376. Although 418 individuals participated, responses from participants suspected of careless marking or providing incomplete or inconsistent answers were excluded, resulting in a sample size of 382.

### Data Collection Instruments:

**Descriptive Information:** An introductory form collected participant information including age, gender, marital status, workplace, and school level.

### Occupational Health and Safety Self-Efficacy Scale

The scale was developed by Taşdemir and Gür in 2021. In the process of developing the scale by the authors; First of all, a pool of substances has been created. A draft scale consisting of 60 items was created by consulting expert opinion. Factor analysis was performed to reveal the construct validity of the developed scale and to determine and classify the factor loads of the items in the scale. "Rotated Principal Component Analysis" was used to gather information about the construct validity of the scale. The suitability of the data for principal component analysis was examined using the Kaiser-Meyer Olkin (KMO) coefficient and Bartlett's Test of Sphericity. The KMO coefficient was found to be .927, Bartlett's Sphericity test yielded a result of 8100.811, and  $p < .05$ . Cronbach's Alpha coefficients were calculated for reliability calculations of the factors. The factor loads for the 32 items in the scale ranged from .90 to .56. As a result of statistical analysis, 6 items were grouped in the first factor, 6 in the second factor, 5 in the third factor, 6 in the fourth factor, 4 in the fifth factor, 2 in the sixth factor, and 3 in the seventh factor. Since the items grouped in the first factor were generally aimed at revealing the level of knowledge, this factor was named "General Knowledge Level". Looking at the items in the second factor, these items consist of expressions that should be made for some current practices in schools to continue healthily. Therefore, it was deemed appropriate to name this factor "Maintenance and Repair". Since the items grouped in the third factor consisted of expressions aimed at preventing chaos and overcrowding in emergencies in schools, this factor was deemed appropriate to be named "Emergency". Looking at the items in the fourth factor, it is seen that all consist of expressions related to falling, slipping, and bumping. Therefore, it was deemed appropriate to name this factor "Falling and Slipping". Looking at the items in the fifth factor, it is generally seen that they consist of expressions aimed at detecting and warning of a possible fire in schools. Therefore, it was deemed appropriate to name this factor "Fire". Since the items grouped in the sixth factor consist of expressions related to lightning rods in schools, it was deemed appropriate to name this factor "Grounding". Finally, since all the expressions in the seventh factor are related to legal processes, it was deemed appropriate to name this factor "Legislation". The reliability coefficients were calculated for the factors and the overall scale ranged between .938 and .805. The overall reliability coefficient

(Cronbach's Alpha) of the scale was calculated as  $\alpha = .882$  (Taşdemir & Gür, 2021). In this study, this coefficient was found to be .883.

### Quality of Working Life Scale

The Quality of Working Life Scale was developed by Laar et al. (2007) and adapted into Turkish by Akar and Üstüner (2017) for use in educational institutions. It consists of a total of 23 items and 6 dimensions (job career satisfaction, overall well-being, job control, job-related stress, working conditions, and family-life balance). The scale includes job career satisfaction (items 1,2,3,4,5,6), overall well-being (items 7,8,9,10,11,12), job control (items 13,14,15), job-related stress (items 19,20), working conditions (items 16,17,18) and family-life balance (items 21,22,23). The items that need to be reverse-scored on the scale are items 7, 9, and 19. The scale is scored on a 5-point Likert scale (1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree). The total Cronbach's Alpha coefficient for the Quality of Working Life scale was found to be .93 (Akar & Üstüner, 2017). For this research, this value was found to be .87.

### Data Collection Process

Surveys were administered via Google Forms to school administrations and teachers. Participation was voluntary, allowing respondents to skip or leave questions blank.

Ethics committee approval was received from Yozgat Bozok University Social and Human Sciences Ethics Committee (Date: 18.05.2023. Number: 03/07). Written informed consent was obtained from the teachers participating in this study

### Data Analysis

Data was transferred from Google Forms to Excel and then to the SPSS 26 program, and the statistical analysis process started. Missing data were reviewed, and codings were renewed according to the analyses. After descriptive variables were expressed as numbers and percentages, the dependent variable, Total Score of Quality of Working Life, underwent univariate statistical analysis. The assumption of normality was checked with the Kolmogorov-Smirnov test. Student's t-test and one-way ANOVA analyses were used for univariate comparisons. Then, Pearson correlation analysis was employed to examine the relationship between the variables of the study. Pearson correlation analysis is used to evaluate the degree and direction of the relationship between two variables and helps determine possible relationships between variables. Additionally, simple linear regression analysis was used in the research. Regression analyses are used to examine the extent to which one or

more independent variables predict a dependent variable (Büyükoztürk, 2020).

That is, it is used to understand the effects of more than one independent variable on the dependent variable, to determine which variables are more effective, and to predict these effects. In other words, linear regression analysis is used to understand the effects of multiple independent variables on the dependent variable, determine which variables are more influential, and predict these effects. For linear regression analysis, some descriptive findings (marital status, workplace, perception of a health or safety issue at the workplace, and the level of the school where the task is performed) that are predicted to have a relationship with the dependent variable according to the literature were used as independent variables, and the Occupational Health and Safety Self-Efficacy Scale was used as the independent variable, and the Total Score of Quality of Working Life was used as the dependent variable. Marital status (Single: 0, Married: 1), Workplace (District: 0, Provincial center: 1), Perception of a health or safety issue at the workplace (No: 0, Yes: 1), and the Level of the school where the task is performed (High school: 1, Other: 0) were converted into dummy variables. The statistical significance level was set at  $p < .05$ .

## Results

Of the teachers who participated in our study, 62.0% were male, 87.7% were married, 68.8% were working in the city center, and 43.0% were providing education at the high school level. Additionally, 23.0% expressed experiencing OHS issues in their working environment (Table 1).

**Table 1.**

*Evaluation of the Distribution of Introductory Variables*

Descriptive Variables	Number (n)	Percent (%)
<b>Age</b>	$\chi^2=43.4 \pm 0.4$ (min=22. max=64)	
<b>Gender</b>		
Woman	145	38.0
Male	237	62.0
<b>Marital Status</b>		
Single	47	12.3
Married	335	87.7
<b>Workplace location</b>		
District center	119	31.2
Provincial center	263	68.8
<b>The level of school where you work</b>		
Preschool	35	7.7
Primary school	115	25.3
Secondary school	109	24.0
High school	196	43.1
<b>Experiencing health and safety problems in the workplace</b>		
No	294	77.0
Yes	88	23.0

While there was no statistically significant difference found in the total scores of Work Life Quality among participants based on gender, marital status, workplace, and the level of the school where they worked, a statistically significant

decrease in the total score of Work Life Quality was observed in those who reported experiencing health or safety issues in the workplace ( $p < .05$ ) (Table 2).

**Table 2.**

*The Difference Between Some Introductory Variables and Quality of Work Life Score in Teachers*

Descriptive Variables	Arithmetic Mean	Standard deviation	t/F p
<b>Gender</b>			
Woman	86.3	13.6	1.621
Male	88.5	12.9	$p = .106$
<b>Marital Status</b>			
Single	88.5	12.7	.482
Married	87.5	13.2	$p = .630$
<b>Where you work</b>			
District center	87.4	13.3	.241
Provincial center	87.8	13.1	$p = .810$
<b>The level of school where you work</b>			
Preschool	88.2	1.4	
Primary school	88.8	2.0	.381
Secondary school	86.8	1.1	$p = .767$
High school	88.0	1.1	
<b>Experiencing health and safety problems in the workplace</b>			
No	88.6	13.5	$p = 2.690$
Yes	84.4	11.5	.007

According to the results of the correlation analysis, a weak positive correlation was found between all sub-factors (General Knowledge, Maintenance-Repair, Emergency Situation, Fall-Slip, Fire, Grounding, Legislation) of the Occupational Health and Safety Self-Efficacy Scale (OHSES)

and the Total Score of Work Life Quality. Additionally, a moderately negative correlation was found between the perception of health or safety issues in the workplace and Work Life Quality (Table 3).

**Table 3.**

*Pearson Correlation Findings Between Variables*

	QWLS _ Total	OHSES _ General Knowledge	OHSES _ Maintenance and Repair	OHSES _ Emergency	OHSES _ Fall-Slip	OHSES _ Fire	OHSES _ Grounding	OHSES _ Legislation	Gender	Marital Status	Workplace Location	Workplace Health & Safety	School Level
QWLS_Total	1.000*	.331*	.365*	.302*	.354*	.301*	.312*	.339*	.078	-.025	.012	-.137*	-.062
OHSES General Knowledge		1.000*	.524*	.487*	.375*	.377*	.384*	.688*	.197*	.100**	.039	-.062	.141*
OHSES _ Maintenance and Repair			1.000*	.537*	.541*	.580*	.544*	.575*	.074*	-.015	.147*	-.100**	.032
OHSES _ Emergency				1.000*	.544*	.449*	.432*	.544*	.198*	.031	.088**	-.016	.045*
OHSES _ Fall-Slip					1.000*	.503*	.512*	.481*	.133*	.035	.126*	-.062	-.138
OHSES _ Fire						1.000*	.547*	.494*	.010	-.020	.209*	-.081	.027
OHSES _ Grounding							1.000*	.534*	.215*	.011	.092**	-.063	-.023
OHSES _ Legislation								1.000*	.209*	.081	.069	-.036	.127*
Gender									1.000	.232*	-.037	.009	.099**
Marital Status										1.000	.178*	.035	-.001
Workplace Location											1.000	.086**	.115**
Workplace Health & Safety												1.000	-.006
School Level													1.000

Linear regression analysis revealed that among the sub-dimensions of the OHSES. Fall-Slip ( $\beta = .198$ ). General Knowledge ( $\beta = .167$ ). Maintenance-Repair ( $\beta = .161$ ) most significantly and positively predicted work-life quality, while

having a perception of health or safety issues in the workplace ( $\beta = -.098$ ) negatively predicted work life quality. The identified predictors explained 18.9% of the variance in the total score of Work Life Quality (Adj  $R^2 = .189$ ) (Table 4).

**Table 4.**

*Results of Linear Regression Analysis of Factors Affecting Quality of Work Life Score in Teachers*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	53.210	3.995		13.321	.000	45.356	61.065
OHSES _ General Knowledge	.507	.166	.167	3.051	.002	.180	.834
OHSES _ Maintenance and Repair	.458	.172	.161	2.667	.008	.120	.796
OHSES _ Fall-Slip	.598	.167	.198	3.577	.000	.269	.927
Workplace Health & Safety Problem	-3.066	1.453	-.098	-2.111	.035	-5.923	-.210

## Discussion

In this study, the effect of OHS self-efficacy on teachers' quality of work life was investigated. The hazards and risks present in professional environments constitute a significant concern for employees across all sectors (Jonathan & Mbogo, 2016; Tesfaye et al., 2023). Working in healthy and safe environments enables employees to fulfil their responsibilities with higher focus and motivation. Given the considerable time spent in the workplace, positive feelings about the work environment play a role in enhancing individuals' quality of life. In this regard, institutions and organizations have educational and regulatory roles. Individuals are willing to seek support from institutions to make their work environments healthier and safer (Annan et al., 2015; Gökgöz et al., 2019). Ultimately, positive work environments are associated with high levels of well-being in individuals (Ünlü & Aydoğan, 2015).

Significant research has been found indicating safe working environments as one of the determinants of quality of work life. Moreover, addressing this focal point is not entirely new. For instance, Walton has been one of the researchers emphasizing this issue since the 1970s. In the same period, the QWL conference was held in Toronto, and the International Council for Quality of Work Life was established. Over time, all sectors have embraced this concept and endeavored to increase workplace productivity through healthy and safe working environments (Jimenez & Bregenzer, 2018; Linnan et al., 2019; Valarmathi & Bhalakarishnan, 2013; Walton, 1973).

The Centers for Disease Control and Prevention's National

Institute for Occupational Safety and Health (CDC/NIOSH) aims to increase workers' well-being by actively supporting regulations and policies through the Total Worker Health program, thereby promoting safe and healthy working environments (Schill, 2017). Similarly, the approach of EU OSH experts suggests organizing workplace health and safety policies to enhance employees' well-being (Gagliardi et al., 2012).

Educational institutions are considered risky environments in terms of occupational health and safety, and numerous studies have indicated concerns among employees in this regard. Various units such as laboratories and technical departments are sensitive areas more commonly addressed in the literature. According to our legislation, schools have been defined as workplaces under Law No. 4857, and regulations related to occupational health and safety have begun to be implemented. While making regulations in a more planned and organized manner, the awareness of teachers, who serve as role models for students and society, is also crucial. In our study, besides the high awareness of teachers, it is noteworthy that one-fourth of teachers reported issues related to occupational health and safety in their workplaces. The finding that this perception is associated with low QWL suggests that teachers take this issue seriously. Teachers tend to perceive occupational health and safety deficiencies as improvable and predominantly controllable factors in improving working conditions (Mufidah & Tejamaya, 2019).

It is reported that a safe working environment can lead to increased health and job satisfaction, contributing to success in the workplace (Okros & Virga, 2023). Studies

interpreting quality concepts in working life associated with providing healthy and safe environments have noticed that some focus on safe physical conditions while others focus on organizational safety conditions (Cihan, 2022; Sivacılar, 2021). In this study, a positive relationship was found between all subdimensions of OHS self-efficacy (General Knowledge, Maintenance-Repair, Emergency Situation, Falls-Slips, Fire, Grounding, Legislation) and QWL score (Table 3). Similar studies conducted in different sectors have similarly identified a positive relationship between positive OHS practices in organizations and increased QWL, emphasizing its role as a factor influencing employee welfare (Çınar & Gündoğdu, 2019; Dayan & Öngel, 2016; Tatlı et al., 2021). Furthermore, it is noted that safe workplace environments are associated with positive health outcomes for employees and increased organizational commitment (Muhammad et al., 2020). Regulations made in many sectors and countries to improve workplace health indicate an awareness of the contributions that can be made to individuals' adaptation to working life (Rojatz et al., 2017).

The concept of school safety is expressed as teachers', students', and staff' feeling of physically and psychologically comfortable and peaceful. Teachers feeling competent in OHS issues are an important step in creating a safe school environment (Çay & Eratay, 2019). A study found that educational organizations did not adequately support OHS policies, which was identified as a significant problem (Min et al., 2019).

Safety issues in educational institutions can also disturb students and their families. In this regard, teachers' knowledge and experiences will also affect student success. Schools encompass a wide range of security threats. Some studies report that teachers find organizational support for OHS policies inadequate (Min et al., 2019). Generally, limited resources are the most common reasons given. This inevitably leads to potential accidents and injuries. While schools often report sports-related and firearm injuries, in our country, the most reported type of accident is slip-related injuries (Fowler et al., 2017; Räsänen et al., 2018; Van & Koç, 2020; Yılmaz & Yıldırım, 2022). In this study, the regression analysis results showed that the self-efficacy perception in falls and slips, one of the sub-dimensions of OHS in teachers, increased the quality of work life by approximately 2 times. This indicates teacher sensitivity to this common safety issue. The emergence of OHS general knowledge and maintenance-repair sub-dimensions as factors increasing the quality of work life in teachers may also indicate that occupational risks are taken seriously by teachers.

According to EUROSTAT statistics, maintenance and repair work is presented as a fatal occupational safety factor responsible for approximately 38% of chemical accidents worldwide, ranging from 15-20%. Our Ministry of Labor and Social Security has stated that maintenance and repair work involves challenging risks across a wide range (ÇSGB, 2014; Hasanhanoglu, 2022). Therefore, in addition to general competence, high self-efficacy perception regarding health and safety in maintenance and repair work is expected to increase teachers' perceptions of quality in their work life.

According to the research results, factors such as gender, marital status, workplace, and the level of the school where teachers work do not have a significant impact on QWL. This finding is consistent with previous studies by the other studies which also demonstrate that gender, workplace, and school level do not significantly affect QWL (Ak et al., 2023; Cihan, 2022; Sari-Karadaş, 2020). These studies similarly suggest that different and more determinant factors are important in determining QWL. Therefore, it is essential to consider these factors in policies and practices aimed at improving the quality of work life.

### Conclusion and Recommendations

In this study, we explored the relationship between OHS and the QWL among teachers, as well as various demographic factors. Our findings highlight that a significant proportion of teachers perceive OHS issues in their workplaces, with a corresponding negative impact on their overall work-life quality. The results underscore the importance of addressing OHS concerns in educational settings to enhance the well-being of teachers.

The weak positive correlation observed between teachers' self-efficacy in OHS and their work-life quality indicates that an increased sense of competence in handling safety-related tasks may contribute to a better work-life experience. Notably, specific sub-dimensions of OHS, such as Fall-Slip, General Knowledge, and Maintenance-Repair, emerged as significant predictors positively influencing work-life quality. This suggests that targeted interventions to enhance self-efficacy in these areas could potentially improve the overall well-being of teachers.

Our study aligns with existing literature emphasizing the interconnectedness of workplace safety and the QWL. It further supports the idea that a secure working environment is crucial for fostering positive work experiences and employee satisfaction. The findings contribute to the growing body of research on OHS in



educational institutions, shedding light on the unique challenges faced by teachers in maintaining a high QWL.

Educational institutions should prioritize the implementation of comprehensive OHS programs. These programs should address specific concerns identified in our study, such as Fall-Slip, General Knowledge, and Maintenance-Repair, to empower teachers with the necessary skills and knowledge for a safer work environment.

Organizations and educational authorities should invest in training and education initiatives aimed at improving teachers' self-efficacy in OHS. By providing targeted training in areas identified as significant predictors, such as Fall-Slip and Maintenance-Repair, educators can be better equipped to handle potential risks and challenges in their workplaces.

Schools and educational institutions should foster a culture of safety where both teachers and administrators actively participate in creating and maintaining a secure working environment. This includes promoting awareness of potential hazards, encouraging reporting of safety concerns, and implementing proactive measures to prevent accidents.

Regular assessments of OHS conditions in educational settings should be conducted. Periodic evaluations can help identify evolving risks and allow for the timely implementation of preventive measures, contributing to the sustained improvement of work-life quality for teachers.

While our study provides valuable insights, further research is warranted to explore additional factors that may influence the QWL among teachers. Longitudinal studies and in-depth analyses of specific OHS interventions will contribute to a more comprehensive understanding of the dynamics at play in educational environments.

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**Katılımcı Onamı:** Bu çalışmaya katılan öğretmenlerden yazılı onam alınmıştır.

**Hakem Değerlendirmesi:** Dış bağımsız.

**Yazar Katkıları:** Fikir-SY, KFT; Tasarım-SY, KFT; Denetleme-SY; Kaynaklar-SY, KFT; Veri Toplanması ve/veya İşlemesi-KFT; Analiz ve/veya Yorum-SY; Literatür Taraması-SY, KFT; Yazıyı Yazan-SY, KFT; Eleştirel İnceleme-SY

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**Ethics Committee Approval:** Ethics committee approval was received from Yozgat Bozok University Social and Human Sciences Ethics Committee (Date: 18.05.2023. Number: 03/07).

**Informed Consent:** Written informed consent was obtained from the teachers participating in this study.

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## Genişletilmiş Özet

### Giriş

Bu çalışma, öğretmenlerin iş sağlığı ve güvenliği öz-yeterliliğinin, iş yaşam kalitesi üzerindeki etkisini araştırmayı hedeflemektedir. İş yaşam kalitesi (İYK), çalışanlara uygun ve sağlıklı bir işyeri ortamında görevlerini yerine getirme desteği sağlama kavramını içerir. Bu, çalışanların işin önemini anlamalarını, yeteneklerini tanımlarını ve beceri geliştirmeye elverişli bir çalışma ortamını teşvik etmeyi amaçlar.

1950'lerde ortaya çıkan "iş yaşamının kalitesi" terimi, başlangıçta yetersiz çalışma koşullarından kaynaklanan stresi ifade ediyordu. Bu kavramın gelişimi, özellikle Amerika Birleşik Devletleri ve Birleşik Krallık'ta başlamış, ardından Batı ve Doğu Avrupa, Güney Asya ve Doğu Asya'ya yayılmıştır. İYK'nin geliştirilmesi, iş tatmini, yaşam doyumu, boş zaman etkinliklerine katılım ve ekonomik refah gibi unsurlarla ilişkilidir.

İSG uygulamalarının İYK üzerinde olumlu bir etkisi olduğunu belirten araştırmalar bulunmaktadır. Örneğin, Tahran Üniversitesi Hastanelerinde yapılan bir araştırma, İSG uygulamalarının İYK'yi olumlu yönde etkilediğini göstermiştir. Eğitim sektöründe, öğretmenlerin güvenli bir çalışma ortamını kalitenin temel bir göstergesi olarak gördüğü belirtilmiştir.

Çalışmanın, öğretmenlerin algıladıkları İSG sorunları ve başa çıkma öz-yeterlilikleri ile İYK arasındaki ilişkiyi anlamak için önemli bir katkı sağlamayı amaçladığı vurgulanmaktadır. Bu, eğitim kurumlarında güvenli bir çalışma ortamının önemini vurgulayarak, öğretmenlerin genel refahını iyileştirmeye yönelik müdahaleleri destekleyebilecek değerli bilgiler sunmaktadır.

### Yöntem

Bu kesitsel araştırma, Konya ilindeki Milli Eğitim Müdürlüğü'ne bağlı devlet okullarında görev yapan öğretmenler arasında yürütülmüştür. Araştırmanın evrenini tüm okullardaki toplam 16.681 öğretmen oluştururken,  $p = .50$ ,  $\alpha = .05$  ve  $d = .05$  parametreleri göz önüne alınarak belirlenen minimum örneklem büyüklüğü 376 olarak belirlenmiştir.

Veri toplama araçları, katılımcıların tanımlayıcı bilgilerini içeren bir tanım formunu içermektedir. Ayrıca, İş Sağlığı ve Güvenliği Öz Yeterlik Ölçeği (İSGÖÖ) ile İş Yaşam Kalitesi Ölçeği (İYK) de kullanılmıştır.

Veri toplama süreci, anketlerin Google Formlar aracılığıyla okul yönetimlerine ve öğretmenlere uygulanması şeklinde gerçekleşmiştir. Katılım gönüllülük esasına dayalı olup, katılımcıların soruları atlamasına veya boş bırakmasına izin verilmiştir.

Verilerin analizi için, doğrusal regresyon modelinin varsayımlarını incelemiştir. Çalışmada bağımlı değişken olarak İYK belirlenmiş, İSGÖÖ ve tanımlayıcı bulgular ise bağımsız değişken olarak kullanılmıştır. Kategorik değişkenler için kukla değişkenler oluşturulmuş ve geriye dönük Wald yöntemi kullanılarak anlamlılık düzeyi  $p < .05$  olarak belirlenmiştir. Ayrıca, normal dağılım, doğrusallık ve artıkların bağımsızlığını kontrol etmek için çeşitli kontroller yapılmıştır.

### Bulgular

Araştırmaya katılan öğretmenlerin profili incelendiğinde, katılımcıların %62,0'sinin erkek, %87,7'sinin evli, %68,8'inin il merkezinde çalıştığı ve %43,0'ünün lise düzeyinde eğitim verdiği görülmüştür. Ayrıca, katılımcıların %23,0'u çalışma ortamlarında İş Sağlığı ve Güvenliği (İSG) sorunları yaşadığını ifade etmiştir.

İstatistiksel analizlerde, cinsiyet, medeni durum, işyeri ve çalışılan okul düzeyine göre İş Yaşam Kalitesi toplam puanlarında anlamlı bir fark bulunmazken, işyerinde sağlık veya güvenlik sorunu yaşadığını belirtenlerde Çalışma Yaşam Kalitesi toplam puanında anlamlı bir düşüş gözlemlenmiştir ( $p < .05$ ).

Korelasyon analizi sonuçlarına göre, İSGÖÖ'nün alt faktörleri ile Çalışma Yaşam Kalitesi Toplam Puanı arasında pozitif yönde zayıf bir ilişki belirlenmiştir. Ayrıca, işyerinde sağlık veya güvenlik konularının algılanması ile iş yaşam kalitesi arasında orta düzeyde negatif bir ilişki tespit edilmiştir.

Doğrusal regresyon analizi, İSGÖÖ'nün alt boyutlarından Düşme-Kayması, Genel Kültür, Bakım-Onarım'ın iş yaşam kalitesini pozitif yönde anlamlı şekilde yordadığını göstermiştir. İşyerinde sağlık veya güvenlik konularına ilişkin algının ise iş yaşam

kalitesini olumsuz yönde etkilediği belirlenmiştir. Belirlenen yordayıcılar, İYK toplam puanındaki varyansın %18,9'unu açıklamaktadır.

### **Sonuç ve Öneriler**

Bu çalışma, öğretmenler arasında İSGÖÖ ile çeşitli demografik faktörler arasındaki ilişkiyi ve İYK üzerindeki etkilerini incelemektedir. Araştırmanın bulguları, öğretmenlerin önemli bir kısmının işyerlerinde İSG konularını fark ettiğini ve bu durumun genel iş yaşam kalitelerini olumsuz etkilediğini ortaya koymaktadır. Çalışmanın sonuçları, öğretmenlerin refahını artırmak için eğitim ortamlarında İSG endişelerine odaklanmanın önemini vurgulamaktadır.

Öğretmenlerin iş sağlığı ve güvenliği konusundaki öz yeterlilikleri ile iş yaşam kaliteleri arasındaki pozitif yönlü zayıf ilişki, güvenlikle ilgili görevleri yerine getirme konusundaki yeterlilik duygusunun artmasının daha iyi bir iş hayatı deneyimine katkıda bulunabileceğini göstermektedir. İSGÖÖ'nün alt boyutlarından Düşme-Kayma, Genel Kültür ve Bakım-Onarım'ın, çalışma yaşam kalitesini olumlu yönde etkileyen önemli yordayıcılar olduğu belirlenmiştir.

Çalışmanın önerileri arasında İSG programlarının uygulanması, eğitim ve öğretim girişimleri, güvenlik kültürünün teşvik edilmesi, işyeri güvenliğinin periyodik olarak değerlendirilmesi ve daha fazla araştırma yapılması yer almaktadır. İSG programları, öğretmenleri daha güvenli bir çalışma ortamı için bilgilendirme ve yetkilendirme amacıyla Düşme-Kayma, Genel Bilgi ve Bakım-Onarım gibi özel endişeleri ele almalıdır. Eğitim ve öğretim girişimleri, öğretmenlerin İSG konusundaki öz yeterliliklerini geliştirmeye yönelik olmalıdır. Güvenlik kültürünün teşvik edilmesi, öğretmenlerin ve yöneticilerin etkileşim içinde olduğu bir ortamı desteklemeyi amaçlamaktadır. İşyeri güvenliğinin periyodik olarak değerlendirilmesi, gelişen riskleri belirleyerek önleyici tedbirlerin zamanında uygulanmasına olanak tanır. Ayrıca, daha fazla araştırma, öğretmenler arasında yaşam kalitesini etkileyebilecek ek faktörleri anlamak için yapılmalıdır. Boylamsal çalışmalar ve belirli İSG müdahalelerinin analizleri, eğitim ortamlarında rol oynayan dinamikleri daha iyi anlamamıza yardımcı olacaktır.

# Pre-Service Early Childhood Teachers' Emotive Reasoning about an Environmental Issue: Using Well-Defined Environmental Cases in Environmental Education

Okul Öncesi Öğretmen Adaylarının Bir Çevre Konusuyla İlgili Duygusal Akıl Yürütmeleri: Çevre Eğitiminde İyi Tanımlanmış Çevresel Vakaların Kullanımı

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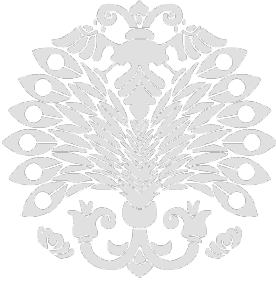
## ABSTRACT

Environmental education should empower learners to internalize the concept that their ecological niche is an integral component of the larger environment, nurturing a moral and ethical understanding of the reciprocity inherent in their relationship with nature. Emotive reasoning is a crucial aspect of this eco-ethical perspective. From this perspective, this study aims to explore pre-service early childhood teachers' (PECTs) emotive reasoning about an environmental issue. The researchers created a scenario about an environmental issue including ethical dilemmas of protecting wildlife and environment and human needs. The researchers listed nine possible options and asked the participants to choose one or more of these options and elaborate on their responses in their reflections. Fifty-three PECTs participated in this study. The researchers coded the participants' responses in each category and analyzed the participants' decision and elaboration levels in their reflections independently. The results indicate an accumulation mostly in the categories of diffusion of responsibility, compassion, anger, and righteous indignation. The results also revealed mostly a high level of judgment and a high and moderate level of elaboration in PECTs' emotive reasoning. The results suggest that pre-service teacher education should be revised to include well-defined environmental cases to examine pre-service teachers' emotive reasoning, thus increasing their environmental awareness in environmental education. This exploration is also important to understand their emotive reasoning about wildlife issues and enable them to effectively incorporate this understanding into their teaching practices.

**Keywords:** Pre-service teachers, emotive reasoning, environmental issue

## ÖZ

Çevre eğitimi, öğrencilerin ekolojik nişlerinin daha geniş çevrenin ayrılmaz bir bileşeni olduğu kavramını içselleştirmelerini sağlamalı ve doğa ile ilişkilerinde var olan karşılıklılığa dair ahlaki ve etik bir anlayışı beslemelidir. Duygusal muhakeme, bu eko-etik perspektifin önemli bir yönüdür. Bu perspektiften hareketle, bu çalışma okul öncesi öğretmen adaylarının (OÖÖA'lar) bir çevre sorununa ilişkin duygusal muhakemelerini keşfetmeyi amaçlamaktadır. Araştırmacılar, vahşi yaşamın ve çevrenin korunması ile insan ihtiyaçları arasındaki etik ikilemleri içeren bir çevre sorunu hakkında bir senaryo oluşturmuşlardır. Araştırmacılar dokuz olası seçeneği listelemiş ve katılımcılardan bu seçeneklerden birini veya daha fazlasını seçmelerini ve yanıtlarını yansıtımalarında detaylandırmalarını istemiştir. Bu çalışmaya elli üç OÖÖA katılmıştır. Araştırmacılar, katılımcıların her bir kategorideki yanıtlarını kodlamış ve katılımcıların yansıtımalarındaki kararlarını ve detaylandırma düzeylerini bağımsız olarak analiz etmiştir. Sonuçlar en çok sorumluluk dağılımı, merhamet, öfke ve haklı kızgınlık kategorilerinde bir yığılma olduğunu göstermektedir. Sonuçlar ayrıca, OÖÖA'ların duygusal akıl yürütmelerinde çoğunlukla yüksek düzeyde yargılama ve yüksek ve orta düzeyde detaylandırma olduğunu ortaya



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koymuştur. Bu çalışmanın sonuçları, hizmet öncesi öğretmen eğitiminin, öğretmen adaylarının duygusal muhakemelerini incelemek için iyi tanımlanmış çevresel vakaları içerecek şekilde revize edilmesi gerektiğini ve böylece çevre eğitiminde çevresel farkındalıklarının artırılması gerektiğini göstermektedir. Bu araştırma, öğretmen adaylarının yabancı hayati konularındaki duygusal akıl yürütmelerini anlamak ve bu anlayışı öğretim uygulamalarına etkili bir şekilde dahil etmelerini sağlamak açısından da önemlidir.

**Anahtar Kelimeler:** Öğretmen adayları, duygusal muhakeme, çevre sorunu

## Introduction

There is abundant evidence of an environmental crisis on the planet due to compounding issues of climate change, pollution, waste disposal, overpopulation, ocean acidification, and food and water shortages (Akinsemolu, 2020; Singh & Singh, 2017). Although there are numerous attempts to deal with this crisis, such as the efforts of non-profit organizations and people, as well as measures taken by international agreements, humans failed to take sufficient action to overcome the crisis. For instance, the Paris Climate Agreement aims to hold the increase in the global average temperature to well below 2 °C above preindustrial levels (United Nations, 2015). However, Geiges et al. (2020) stated that the improvements made for the 2030 targets are deficient to reach *Paris Climate Agreement* goals. There are at least nine hazards known as planetary boundaries (Steffen et al., 2015) for the stable operation of global ecosystems, including ocean acidification, novel entities, land-system change, and freshwater change, and the climate crisis is one of these (Jimenez & Kabachnick, 2023). Therefore, dramatic changes are necessary for the sustainability of life. The United Nations Development Programme (2015) took a step in this direction and announced a universal call to action with seventeen interconnected goals, often referred to as the Sustainable Development Goals. In order to attain the Sustainable Development Goals, it is vital to educate individuals who possess an understanding of the prevailing issues and their interconnections among these issues (Echegoyen-Sanz & Martín-Ezpeleta, 2021). Education is one of the most powerful tools to create such a change. In order to cope with the current environmental crisis, there is a greater need than ever for an education that promotes a sustainable future, enhances individuals' awareness about the environment and nature, and change the unsustainable ways that contribute to the current environmental crisis (Gwekwerere, 2019). In other words, an ecological curriculum, which equips students with the skills to comprehend and resolve environmental challenges, fosters their comprehension of ecological matters, and promotes a sustainable life is much more important today than before. However, there needs to be created new conceptualizations

of an ecological curriculum, such as ecojustice (Dentith et al., 2022).

Ecojustice is a movement that focuses on the cultural roots of the ecological crisis, argues that disadvantaged groups such as the poor, working-class, or minorities are unequally affected by the ecological crisis, and aims at cultural change (Martusewicz et al., 2021). The focus of the Eco-justice approach is to raise awareness and provide solutions to the ecological crisis by addressing the current local problems of the students or the ecological conditions of the region they inhabited in the relatively recent past (Martusewicz et al., 2010). From this perspective, eco-justice stands apart from traditional environmental education. Instead of simply exploring natural surroundings, factories, or power plants, it involves examining the repercussions of adverse conditions stemming from these establishments on marginalized communities within a cultural and historical framework and generating sustainable solutions for such challenges.

Social, economic, and ecological sustainability and justice are interdependent because of human-induced environmental problems (UNESCO, 2016). Benzce and Carter (2020) proposed that our current world is characterized by injustice, where unfair distribution of incomes leads to environmental damage primarily affecting the less affluent individuals in society. They argued that science education needs to focus on promoting ecojustice to address issues stemming from climate change, including the loss of species, the destruction of habitats, and the emergence of human diseases. This eco-ethical perspective requires eliciting students' emotive reasoning about environmental issues. Empathizing with and caring for people or living things who suffer from inequities or injustices is one of the components of emotive reasoning (Herman et al., 2020; Zeidler et al., 2019).

The achievement of the Sustainable Development Goals (Ito & Igano, 2020) and the development of strong emotive links between students and nature (Herman et al., 2020) are facilitated by place-based environmental education framework. Therefore, Herman et al. (2020) suggested that students should be allowed to engage in place-based environmental education. They argued that presenting socioscientific issues (SSI) in the context of a place-based



environmental issue could facilitate their emotional responses. Furthermore, Anufrieva (2020) argued that environmental education should provide scientific insights into the societal underpinnings of global environmental issues. They also noted that problems of the interplay between nature and society are closely intertwined with a wide range of ethical and aesthetic considerations; therefore, environmental education should create an ecocentric type of environmental awareness, in which harmony, interrelationship, interaction, and mutual development are emphasized with human attitudes to the environment. This paper argues that environmental awareness requires understanding and reasoning about the interrelationships between ecological systems and environmental degradation caused by humans. In order to develop the learners' awareness, therefore, it is necessary to develop their ecological reasoning, not only related to place-based issues, but also to general environmental problems that may arise in different regions of the world.

Wildlife has a significant impact on ecological processes. It is therefore necessary to raise public awareness of wildlife preservation. However, persuading decision-makers and the public to support conservation requires communication and education. Hao (2014) also stressed the importance of increasing cultural concern about the environment in terms of ecological preservation and sustainable development. In a study on the Rajiv Gandhi National Park, one of the global biodiversity hotspots in India's Western Ghats, Nautiyal and Nidamanuri (2012) investigated the effects of conservation policies on the ecosystem and livelihoods of local people. They found that the policies were highly unpopular, with less than 5% of people in favor of them, and a staggering 94% strongly against them. Reasons for this negative attitude included restrictions on agriculture, livestock rearing, and grazing, as well as bans on non-timber forest collection, and exclusion of local and indigenous communities from conservation programs and tourism activities. They stressed the need for an integrated science-policy research approach to examine the complicated link between nature and society. On the other hand, in a more recent study, Shi et al. (2021) investigated local herders' preferences towards increasing wildlife populations to preserve the grassland ecosystem in the Inner Mongolia region of China. The results revealed that herders were against increasing the wildlife population on the grassland which would cause loss of welfare. Researchers have proposed that support for wildlife conservation should be gained through education. We also argue that it is necessary to include education in this integrated approach. Education in this approach should involve both reasoning about the livelihood of people and

the loss of biodiversity and ecosystem deterioration.

Ferguson and Bramwell-Lalor (2023) propose that both lower and higher education deserve attention, emphasizing the importance of instilling environmental education in students from a young age. Furthermore, they advocate for an increased focus on integrating environmental education within higher education, particularly for students coming from non-science backgrounds.

Sadler et al. (2007) argue that learning experiences on SSI should help students cope with complex issues. The aforementioned topics are too extensive to be addressed solely through cognitive means within learning contexts. Beniermann et al. (2021) emphasized that decision-making on controversial scientific issues such as climate change and vaccination also depends on emotional processes. For this reason, a learning intervention that focuses on controversial issues must also encompass emotional aspects. Emotional reasoning is among the forms of reasoning that individuals use when dealing with controversial, complex, and ethically challenging scientific issues (Herman et al., 2020). Emotive reasoning involves sentiments like compassion, empathy, anger, passion, guilt, and emotive reasoning allows students to emotionally examine the issue from multiple perspectives in their decision-making processes. Lee et al. (2013) stated that students were able to deal with the moral dimensions of controversial issues and empathize with stakeholders. From this perspective, the incorporation of emotive reasoning within instructional processes and especially when dealing with controversial scientific issues, holds considerable significance in terms of facilitating decision-making that considers multiple emotional facets of the topic. Given that, pre-service teachers educate future citizens who should have environmental awareness, it is also necessary to examine their emotive reasoning about wildlife issues, such as the interrelationship between different species in nature. Furthermore, considering the important role of pre-service early childhood teachers in fostering environmental awareness in young children, it is critical to understand their emotive reasoning about wildlife issues and enable them to effectively incorporate this understanding into their teaching practices.

### **Purpose of the Study**

Based on the ecojustice approach to environmental education (Benzce et al., 2015; Herman et al., 2018; Reis et al., 2015), Herman et al. (2020) used authentic place-based environmental SSI learning experiences in Yellowstone to explore undergraduate students' emotive reasoning when engaging in environmental issues. This experience includes

the following case: A wolf escaped from a National Park, went to a nearby farm, and attacked sheep and cattle. Then the farmer killed the wolf. A similar case happened in Turkey in April 2019, when Turkish newspapers reported that a wolf had escaped from the National Park in the southern region of the country. A few days later, the same newspapers published another story about citizens in a district who had seen and photographed the wolf while it was seeking food. In May of the same year, the search for the wolf was terminated. The researchers of this study decided to use this case to explore participants' emotive reasoning, as it is not only a place-based environmental issue, but also a wildlife issue that can occur in different regions of the world. Büssing et al. (2019) argued that wildlife issues can be effectively used as a context for environmental education because they inherently include ecological, economic, and social aspects, facilitating connections to real-world phenomena. They suggested using wolf cases to teach wildlife issues. They also stressed the importance of including emotional factors in teacher training to encourage a more holistic approach to environmental education.

Research on early childhood environmental education primarily focuses on the ecological literacy, cognitive, social, and emotional development of children (Ardoin & Bowers, 2020). In addition, future leaders must be well-prepared to address environmental challenges. Therefore, teachers play a crucial role in assisting their students to understand their responsibility as environmental stewards (Uraliovich, 2023). However, Ginsburg and Audley (2020) noted that most preschool teachers struggle to focus more on pedagogies that increase children's responsibility as active agents of change in the future. Therefore, it is necessary to investigate the reasoning and decision-making processes of PECTs regarding environmental issues in order to reassess environmental education in preschool teacher education programs.

This paper argues that it is important to explore PECTs' emotive reasoning and their level of reasoning about an environmental issue to develop environmental education in teacher education. The reasoning level was examined in two categories, including judgment and elaboration in the current study. The participants' judgment was analyzed to assess whether their decisions about the issue depended on the sound arguments. Their elaboration was examined to monitor whether they critically discussed the relationship between the aspects of the issue by giving further examples. This study explored the emotive reasoning of pre-service early childhood teachers, as they will be responsible for educating and shaping the environmental awareness of future global citizens who will critically reason about

environmental issues. It is also significant to ask PECTs to elaborate on their responses by giving similar examples to investigate the level of their reasoning during making their decision about the given issue.

The use of cases in environmental education helps to promote environmentally friendly behaviour as well as a theoretical understanding of environmental issues (Rudyshyn et al., 2021). The authors of the current study also argue that environmental cases can also be used to elicit people's emotive reasoning. Although the Yellowstone case was used as a place-based environmental SSI in earlier studies, it is also a general wildlife issue because national parks are found in many regions of the World. Therefore, this example can be used in further investigations in teacher education about environmental SSI. Furthermore, it provides a valuable tool to examine the participants' emotions regarding the wolf and the farmer. While a similar case happened in Turkey, the wolf was not found. The participants in the current study may be employed by schools in different regions of the country and experience similar situations in the future. In addition, the Yellowstone example case provides a richer opportunity to explore the issues from both the wolf and livestock perspectives. From this perspective, this example is used as a case in the current study to probe into the PECTs' emotive reasoning in environmental SSI. Specifically, the current study addressed the following research questions:

- What types of emotive reasoning do the PECTs reflect on an environmental issue?
- In which level do the PECTs reason to make their decisions about an environmental issue?

## **Theoretical Framework**

### **Emotive Reasoning about Environmental Issues**

Research investigating individuals' informal reasoning on environmental issues focus primarily on socioscientific reasoning. Sadler and Zeidler (2005) stated that students show evidence of intuitive, emotive, and rational forms of informal reasoning. Individuals often utilize emotive reasoning elements such as righteous indignation, empathy, and moral sensitivity, along with cognitive processes, when they are confronted with ethical quandaries in scientific contexts (Zeidler, Herman & Sadler, 2019). Therefore, science educators should emphasize the importance of emotive factors and socio-scientific reasoning on any publicized SSI (Bell and Lederman, 2003). Informed decision-making based on scientific knowledge is essential for various individuals and groups within society (Ha, Park & Song, 2022). Educators responsible for instructing community members must arrange and organize these decision-making

procedures, while also coordinating evidence-based decision-making initiatives for their students. SSIs are the topics that provide important opportunities for educators to implement evidence-based decision-making. However, to deal with SSI, students need to cultivate more complex thinking skills (Karahana, 2023). Due to the complex, multidisciplinary, open-ended, and controversial nature of SSI, they call for the attributes of informal reasoning rather than formal reasoning (Sadler & Zeidler, 2005). The decision-making process involving informal reasoning also encompasses moral, ethical, and emotive reasoning. In order to raise responsible citizens who can make informed decisions, it is necessary to address SSI at an early age (Özden, 2020). Hence, research on decision-making and reasoning within pre-service teacher education holds significance. Although emotive factors influence students' decision-making processes (Herman et al., 2020), studies focusing on students' and PECTs' emotive reasoning are rarely found. Therefore, it is necessary to examine emotive reasoning in socioscientific environmental issues to create effective teaching experiences.

Emotive reasoning can be defined as informal reasoning that people experience about complex controversial scientific issues (Herman et al., 2020) and is characterized by a care perspective such as empathy and concern (Sadler and Zeidler, 2005). This reasoning also includes understanding the others' feelings and empathizing with their well-being on complex and challenging scientific issues involving ethical dilemmas.

Extreme weather conditions, air pollution, climate change (Evans, 2019), unsustainable farming practices (Owens et al. 2019), pesticide contamination, and coal mining are a few examples of the numerous environmental issues that people are responsible that involve ethical dilemmas. According to Fang et al. (2019), learners first employ intuitive reasoning, which is unconscious, biased, and emotion-influenced prior experiences before switching to analytical reasoning, which is deliberate, logical, and abstract. Although learners use both types of reasoning, Venville and Dawson (2010) demonstrated that when making decisions about real-life issues, learners appeal more to emotive and intuitive reasoning. A study by Han-Tosunoğlu and Özer (2022) examined the informal reasoning and decision-making of pre-service biology teachers about COVID-19 and found that students used not only rational reasoning, but also emotive reasoning when making decisions. Evagorou et al (2012) found that some students relied on emotive rather than rational reasoning, despite sufficient evidence. Science educators frequently emphasize logic and evidence for

reasoning. However, intuitive and emotive reasoning has a crucial role in prompting students' moral sensitivities and engaging them in the issue (Kahn and Zeidler, 2019). Therefore, it seems crucial to examine how people acquire a sense of environmental morality (Collado and Sorrel, 2019). We argue that people's emotive reasoning about environmental issues reflects their understanding of environmental morality. PECTs will probably be the first adults who introduce children to environmental issues. Therefore, eliciting their emotive reasoning is crucial (Choi et al, 2011; Ladachart & Ladachart, 2021; Lee, 2013).

Recent literature has emphasized children's moral reasoning, understanding and awareness of environmental issues (Rios et al., 2021; Spiteri; 2021). Spiteri (2021) also argued that moral reasoning is shaped in early childhood and may be subject to situational influences. She pointed to the need for appropriately designed environmental education programs to discuss the reasons for protecting the environment in ways that are relevant and interesting to children, and to explore their understandings and misconceptions. Engaging children in environmental issues is, therefore, necessary for their personal empowerment and democratic pluralism in acting for the environment in society. PECTs play a crucial significant role in the design and implementation of these programs. Thus, it is essential to explore their emotional reasoning to enable them to communicate their reasoning to children.

### **Environmental Decision-Making**

Environmental decisions are complex because of the ecosystems going beyond the human-created technological systems (Harding, 1998). In today's globalized world, humans cause severe damage to the environment because of the decision made to control the nature. Human actions have created an increasingly unsafe and uncertain future for the environment and future generations. It is, therefore, an ethical responsibility for human beings to protect the environment and the future of life on earth. Environmental education is a very effective way to communicate this responsibility. Thus, one of the main goals of environmental education is to educate citizens to make thoughtful decisions about environmental issues (Arvai et al., 2010). In this regard, the interaction between individuals, society, and the state is crucial to guide public participation in decision-making regarding projects, policies, and the management of the natural sources and environment. The participation of individuals in this decision-making process also consolidates democracy in society (Rodríguez & Vargas-Chaves, 2018).

Freed (2017) found a positive correlation between decision-

making and pro-environmental behavior and suggested that we focus on understanding the mechanisms that underlie decisions in order to guide behavior that protects the natural world. Thus, it seems necessary to explore PECTs' decision-making as well as their emotive reasoning about an environmental case.

In the study, decision-making refers to the critical evaluation of an ethically complex environmental issue in order to reach a final judgment on the issue (Gresch & Bögeholz, 2013). Critical reasoning by constructing sound arguments and elaborating judgment by exemplifying the issue is required for the decision-making process. Decision-making was explored in the current study in two folds, judgment and elaboration.

## Methods

### Participants

Fifty-four PECTs were enrolled in the Early Childhood Environmental Education course in the Preschool Education Department of a private university in Turkey. However, 53 of them participated in the study. The participants were third-year undergraduate students, aged between their early twenties and mid-twenties, from middle-class socio-economic backgrounds. The participants were mostly the residents of a metropolis in Turkey and rarely came from Anatolia. They were predominantly female (52 female, 1 male) as usual in Turkey because the early childhood teaching profession is seldom preferred by Turkish males.

The researchers decided to gather data from the PECTs who had successfully completed the early childhood environmental education course, with the aim of evaluating the course's effectiveness in enhancing PECTs' emotive reasoning and decision-making concerning environmental issues. This inquiry aims to improve environmental education in early childhood teaching programs. The first researcher was the lecturer of the Early Childhood Environmental Education course, and the current study was conducted at the end of the semester in this course. The reflection form, which was used as the data collection tool in the study, was distributed to the participants online and they submitted their answers online again.

Turkish university entrance examination consisted of four parts including (1) Turkish Language and Literature and Social Sciences I; (2) Social Sciences II; (3) Mathematics; (4) Science. The students in the preschool education departments were responsible for answering the first and second parts of this exam. They completed the basic pedagogy and teaching methods courses and science education in early childhood but, they did not take any

course to provide them opportunities to engage in argumentation in environmental and SSI.

### Research Design

The current study conducted a case study, descriptive research to explore the PECTs' emotive reasoning on an environmental issue. In line with this purpose, the researchers presented the Yellowstone example to the PECTs and listed the types of emotive reasoning. They then distributed a reflection form and asked participants to identify and justify one or more types of emotions they had about this scenario, feeling free to add more options to the list if needed. The participants' reflections of their emotions on this environmental case were the data of the study.

### Data Collection Tool

The participants were given the following instructions to reflect on:

Based on the following case study for human activities that threaten sustainable life, indicate which option about the event reflects your feelings and thoughts and discuss why.

Case Study: National parks are parks established on semi-natural or developed for wildlife sanctuary. It is known that these parks also have importance for tourism in the country. A wolf escaping from a national park went to a nearby farm and attacked sheep, cattle, and other ovine and bovine animals there and the farmer killed the wolf.

- a. I am not passionate about joining a movement or starting anything related to environmental issues. I am not very interested in farms and wolves.
- b. I realize that people's actions cause environmental problems and harm both nature and the human species, but I am not very sure what I should do about these problems. National parks are necessary, but farmers also need to protect their animals. I don't know what is right or wrong.
- c. Although we think that we should preserve the natural balance in the ecosystem, in some cases, we may need to kill some animals and other living things. The farmer in this case may have to kill a wolf attacking the animals on his farm.
- d. Although we think that we should protect the natural balance in the ecosystem, it is difficult to say with certainty how we should behave in the circumstances we may find ourselves in. For example, I cannot know what I should do in the example of the farmer and the wolf he killed

without experiencing that situation and having knowledge about it.

- e. Sometimes I feel responsible for the environment, but I think everyone has a responsibility in this regard. People should act more collectively in this regard. In the example of the farmer and the wolf, the state should do its duty to protect the environment and support the farmer whose animals are damaged with the taxes paid by the citizens by adjusting the budget. Considering the wolf's right to life, the authorities should take the necessary measures to establish the national park away from settlements.
- f. When I empathize with the farmer, I think about the damage suffered by the farmer whose animals were attacked by the wolf and I feel sorry for him / It makes me feel bad that the wolf was taken from its natural environment and brought to the national park.
- g. I feel guilty about it. I do not do much because I feel that the measures to be taken for environmental protection will cause me inconvenience or discomfort. I feel that I should do something about it. I feel bad because I have never been interested in issues such as the establishment of the national park elsewhere or the damage caused to farmers.
- h. I am very angry about the damage that people do to the natural world and the environment. People don't even care about the damage their own activities cause to the environment. Was the national park supposed to be built close to that farm or is there no way to compensate the farmer for the damage he has suffered?
- i. People are selfish beings who do not think about the consequences of their behavior before they experience them. However, it is necessary to think about the social and ethical dimension of an event. For example, when we bring a wolf to the national park near the farm, we need to think about the damage to the farmer before the tourists who will come to the park.
- j. Other (you can share your other feelings and thoughts on the subject).

The options were created by the researchers of this study. The participants were asked to choose one or more options to reflect on their thoughts and feelings and explain the reason for their choice. Thus, we could analyze whether

their explanation reflect the correct option and examine the level of their reasoning.

### Data Analysis

The researchers independently analyzed whether the participants' selected choices reflected their explanations. If they did not, then the researchers did not code their choices. If they explained a different thought or feeling from described in the option they chose, then the researchers coded it as a different option. The participants were free to select and explain more than one option. Because categorizing emotions based on pre-defined options, this approach might limit the depth of understanding of participants' emotions. However, this option might lead the participants to make biased selections. Therefore, they were also informed that they were free to reflect on other emotions or ideas not included in the list. They were also asked to explain their emotions in an open-ended way to gain a deeper insight into their emotive reasoning. Both researchers independently analyzed the participants' reflections in case of biased framing and ensured that they interpreted and coded the participants' responses consistently. They identified and coded their responses into the following types of emotional reasoning listed by Herman et al. (2020):

- 1) Apathy (In reflection option a)
- 2) Passive care (In reflection option b)
- 3) Moderated concern including
  - a. Value judgment (In reflection option c),
  - b. Helplessness (In reflection option d), and
  - c. Diffusion of responsibility (In reflection option e).
- 4) Forms of empathetic dissonance including
  - a. Compassion (In reflection option f),
  - b. Guilt (In reflection option g),
  - c. Anger (In reflection option h), and
  - d. Righteous indignation (In reflection option i).

There is an agreement among science education researchers that individuals must be able to construct sound arguments and make informed decisions on complex real-world problems (e.g. Owens et al., 2017; Sabel et al., 2017; Zeidler et al., 2005). However, Brosch (2021) emphasized that emotions play a significant role in shaping perceptions and actions related to climate change and that emotional communication can promote sustainable behavior. Therefore, the researchers of the current study developed a rubric to assess the participants' ability to reason emotionally, specifically in the categories of judgment and elaboration. The judgment category evaluated the participants' critical evaluation of the case based on sound arguments. The Elaboration category assessed the



participants' ability to express their emotions by reflecting the interrelationship between people and the environment.

The participants' responses were coded independently by the researchers and were classified into one or more categories based on their explanations. The initial percentage agreement of each researcher's coding on emotive reasoning and reasoning levels were 79% and 88% respectively. Following their first analysis, they discussed their conflicts until they reached a full consensus on the coding.

The researchers independently coded the participants' explanations in each level for both judgment and elaboration categories once again. They then included quotations exemplifying participant responses for each category. The researchers used pseudonyms for student names when using quotations. Following coding the participants' responses in each of the categories listed above, the researchers also analyzed the PECTs' reflections to identify the level of their reasoning while making their decisions by using a rubric they developed.

The ethical process in the study was as follows:

- Ethics committee approval was obtained from Istanbul Aydin University University Social and Humanitarian Ethics Committee (Date: 27.09.2021, Number: E-45379966-050.06.04-25307)
- Informed consent has been obtained from the participants.
- The informed consent form stated that participants could withdraw from the research if they felt uncomfortable about environmental issues or questions.

- After completing the research, the participants were informed that they could seek assistance from the researchers regarding the research results or institutions to address any issues that arise during the implementation.
- Pseudonyms were used in the paper instead of the real names of the participants to ensure the confidentiality and anonymity of the participants.
- The topic was not initially discussed in the environmental education course to avoid influencing the participants.
- The research results are disseminated to the participants through an online seminar on environmental education, which is open to all pre-service teachers at the university.

## Results and Discussion

### Research Question 1: Types of Emotive Reasoning that the PECTs Reflect

The researchers aimed to examine how pre-service preschool teachers reflect their emotive reasoning on an environmental issue in the first research question. None of the participants explained their thoughts and feelings that should be coded in a category other than the given options. Thirty-four out of the 53 participants chose more than one option, while 19 of them chose only one option. The explanations and the examples for each category and level are shown in Table 1.

**Table 1.**

*The Rubric of Reasoning Levels*

	<i>High</i>	<i>Moderate</i>	<i>Low</i>
<i>Judgment</i>	<p><i>Explanation:</i> The participant made his/her decision on the issue by critically evaluating the scenario and constructing sound arguments.</p> <p><i>Example:</i> Show compassion and empathy for the wolf and/or the farmer by explaining the reasons for the wolf's native habitat and the farmer's husbandry.</p>	<p><i>Explanation:</i> The participant clearly and rationally explained his/her position but did not provide sufficient justification during making his/her decision.</p> <p><i>Example:</i> Clearly express feelings about the issue without justifying them.</p>	<p><i>Explanation:</i> The participant did not provide any justification to support his/her decision.</p> <p><i>Example:</i> -</p>
<i>Elaboration</i>	<p>The participant elaborated his/her position by giving further examples and discussing the relationship between the aspects of the issue critically.</p> <p><i>Example:</i> Clearly express feelings and thoughts on the topic by explaining the interrelationship between people and the environment and giving further examples.</p>	<p>The participant clearly elaborated his/her position on the issue by discussing the relationship between the aspects of the issue critically but without giving further examples.</p> <p><i>Example:</i> Clearly express feelings and thoughts on the subject, explaining the relationship between man and the environment, without giving further examples.</p>	<p>It is not clear why the participant chose this option.</p> <p><i>Example:</i> -</p>



Table 2 lists the participants' reflections coded in categories, subcategories, and definitions that we obtained from the participants' emotive reasoning.

**Table 2.**

*Categories and Subcategories of Emotive Reasoning*

<i>Categories of emotive reasoning</i>	<i>Subcategories of emotive reasoning</i>	<i>Definition</i>
<i>Passive care</i>		Emotive statements that prioritize and care about the well-being of the environment and people
<i>Moderated concern</i>	Value judgement	Emotive statements identifying that people are responsible for the environmental issue
	Helplessness	Emotive statements illustrating of desperation for resolving the issue
	Diffusion of responsibility	Emotive statements shifting the burden from themselves to a larger society such as policymakers for the environmental issue
<i>Empathetic dissonance</i>		An emotive response to the adverse consequences experienced by living things about the environmental issue
	Compassion	Feeling empathy towards the problems of the people and living things who suffer from the environmental issue without questioning the cause of the suffering
	Guilt	Feeling shame or regret because of not acting on environmental issues
	Anger	Felling rage towards the identified cause of environmental issues
	Righteous indignation	An emotive response toward people or living things who suffer from inequities or injustices

**Passive care:** The participants' comments emphasizing that they cared about people and the environment but were unsure of how to address the current environmental issue were categorized as passive care. The following quotations display the participants' responses coded as passive care:

*Natalie: We harm the environment with our actions. Our actions harm environment not only for us but also for its cohabitants. I am aware of this fact, but I am not sure how to handle it.*

*Elizabeth: National parks are valuable resources for our nation, but in this particular case, I side with both the farmer and the wolf. Consequently, I am at a loss on what to do.*

**Moderated Concern:** The participants' responses that include expressions of concern about preserving the natural balance and explanations to ensure the well-being of people were classified as moderated concerns. This category includes three sub-categories which are value judgment, helplessness, and diffusion of responsibility.

**Value Judgement:** We classified emotional statements arguing that individuals are responsible for the environmental problems in the value judgement subcategory. The following participants moderated their concern by justifying the necessity of harming other living things when it is necessary:

*Emma: Although the wolf's slaughter may seem brutal, I do not think it is unethical to kill the wolf to protect the farmer's livestock.*

*Sophie: The farmer has made a correct decision to protect the existence of his animals in line with his own interests. The wolf is a threat to both farmer and cattle. The farmer's decision to kill the wolf to maintain the welfare of his family is understandable.*

**Helplessness:** The participant comments arguing that the ecosystem's natural balance should be preserved but were unsure what to do in a similar situation were categorized as helplessness. The following quotations are the examples of this subcategory:

*Elizabeth: With a superficial judgment, we can declare that we would not kill the wolf if we were the farmer. However, we do not stand in the farmer's shoes. We cannot know how to act until we actually face the same problem.*

*Yara: I do not know how to act in such a situation because my environmental education background is insufficient to make an informed decision about the issue.*

**Diffusion of Responsibility:** The participant responses that moderated their concerns by shifting the burden for the environmental issues from themselves toward a larger society such as lawmakers were coded as diffusion of responsibility. The quotes that describe this scenario are presented below:

*Alison: Environmental problems are social. If the government does not develop policies regarding environmental issues, the society will not adopt and implement it. Establishing a national park close to the settlements is the fault of the policymakers.*

*Bella: Because we cause the environmental issues, we may solve these problems together. A portion of the collected taxes can be spent on solving this problem.*

**Empathetic Dissonance:** Empathetic dissonance refers to the emotive responses of the participants to the adverse consequences experienced by living things about environmental issues. The subcategories of compassion, guilt, rage, and righteous indignation were used to analyze these incompatibilities.

**Compassion:** We coded the states of the participants' sympathy towards the problems of the stakeholders of the environmental issue as compassion.

*Tracy: I am against moving wolves from their native habitat and placing them in new locations where they may cause harm. I feel sorry for the wolf.*

*Zara: I do not confirm what the farmer did but most probably killing an animal was not what we wanted. When I put myself in his shoes, I felt bad for both the moral discomfort that he experienced and the financial damage that he faced.*

**Guilt:** The participant responses that expressed difficulty in acting on environmental issues or regret over not acting were categorized as guilt. The first quotation includes the

awareness of the necessity of taking action to solve environmental issues, but they felt bad about it because they were afraid of the challenges. The second is an example of feeling guilty because of indifference to environmental problems.

*Nicole: I do not do much because the actions needed to protect the environment will impose on me. I feel guilty because of it.*

*Simone: I feel guilty because I have never thought about such issues before.*

**Anger:** We identified anger as a strong negative emotional response to those who pave the way for environmental issues, and decision-makers. Two quotes that perfectly exemplify the participants' anger are as follows:

*Mary: People merely use the ecosystem's natural cycles for their benefit and create their misery. Enormous amounts of water are wasted in farms without considering the water scarcity in some other regions of the planet.*

*Nadia: I am furious because everyone is so selfish. Others' rights are not respected in any way. Landscaping is important while establishing a settlement or national park. We have to leave nature alone.*

**Righteous Indignation:** We coded the participants' responses such as the right to live of other living things, the priority of protecting the natural environment, climate justice and the access of future generations to the environment as righteous indignation. The following quotations of two participants exemplify these responses:

*Frances: People act only for their benefit. They operate in self-centeredly without respecting other people, animals, the natural world, and the environment. It is selfish to pick flowers, use deodorant, pour trash, cause forest fires, and prefer private vehicles. These behaviors cause the extinction of some species as well as other environmental problems, but those people do not even care.*

*Irene: Unfortunately, innocent people pick up the bill for some big mistakes. We cannot just put all the blame on the government and step aside. We must become conscious. This world is not solely ours, we borrowed it from earlier generations, and we will leave it on to future generations.*

**Table 3.***Categories and Subcategories of Emotive Reasoning*

<i>Categories of emotive reasoning</i>	<i>Subcategories of emotive reasoning</i>	<i>Frequency</i>
<i>Passive care</i>		4
<i>Moderated concern</i>	Value judgement	7
	Helplessness	32
	Diffusion of responsibility	25
<i>Empathetic dissonance</i>		4
	Compassion	
	Guilt	22
	Anger	
	Righteous indignation	19

Table 3 presents the frequencies of responses included in each subcategory. Consequently, we reported the descriptive findings for each category and subcategory along with quotations in the order presented in the table.

The explanations categorized in the passive care category indicate a general concern for the welfare of people and nature in their responses, but these participants did not provide a detailed explanation of the detrimental consequences of environmental problems on people and nature. These explanations may also point out the unfamiliarity of the situations in national parks, demonstrating the need to discuss such cases in environmental courses to increase familiarity and awareness of environmental issues.

The participants' responses in the value judgement category considered the farmer's perspective without considering the wolf's natural habitat. This type of explanation indicated a human-centered perspective on environmental problems.

The explanations in the helplessness category did not reflect an ecocentric position either. These participants either showed compassion or empathy for the farmer or directly preferred not to decide the matter.

The responses in the diffusion of responsibility category again reflected a human-centered perspective. For example,

Alison correctly discussed the proximity of national parks to settlements but considered only allowing the park to be established close to settlements, rather than the other way around. This explanation may reflect a human-centered rather than an eco-centered approach to environmental problems.

The participants, whose responses were categorized in empathetic dissonance, empathized with the farmer who lost his only source of livelihood and the wolf that was killed. Although these participants showed compassion for the affected parties as well as guilt, anger, and righteous indignation, they did not engage in an in-depth analysis of the causes of the problems. Some examples also reflected a misunderstanding of national parks. For example, Tracy seemed to have never visited a national park and might have considered these parks as zoos.

As shown in Table 2, the PECTs rarely demonstrated a passive care for the given environmental issue. Considering the category of moderated concern, they seldom made explanations included in value judgment and helplessness while more than half of them expressed their emotions in the diffusion of responsibility subcategory. In the empathetic dissonance category, more than half of the participants gave the motive responses of compassion, anger, and righteous indignation. This result is promising because of the awareness that PECTs have about the diffusion of responsibility for humans as well as the empathetic dissonance that many participants have for the improvement of pro-environmental behaviors. It is interesting to note that they rarely feel guilty about the given environmental issue. This result might be related to the conditions they live in. None of these participants live on farms and have experience in the presented scenario. Only those participants whose explanations are categorized in righteous indignation used equality and justice. They also seemed to tend to adopt an ecocentric perspective because of mentioned species other than humans. This result suggests that PECTs must be encouraged to reason at this level.

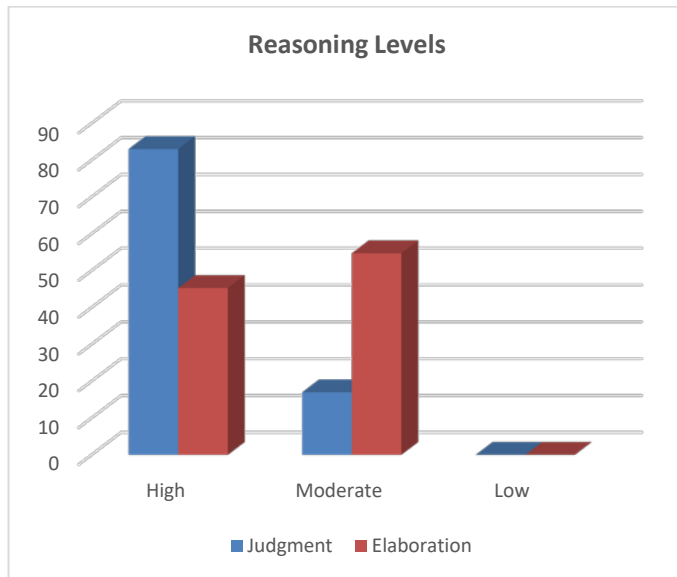
### **Research Question 2: The Level that the PECTs Reason to Make Decisions**

The second research question addressed PECTs' reasoning levels on the environmental issue. Figure 1 shows the participants' reasoning levels in the categories of judgment and elaboration.

Although the participants who made a high level of judgment clearly explained and justified their judgments,

these explanations again provide evidence for the participants' misconception about national parks. These participants overlooked that the wolf was still in its own habitat and behaving naturally. These results again reveal their lack of ecocentric perspective and knowledge of nature and the environment. The participants who made moderate judgments explained why they felt that way or what to do to solve the problem but did not justify their emotions and beliefs. It can be inferred that the participants did not adopt an ecocentric perspective, even when they made moderate or high levels of judgment.

Although both high and moderate levels of elaboration examples included the explanations of human's responsibility to protect the environment and the importance of pro-environmental behaviors, they again reflect the human-centered way of looking at the environmental issues, rather than an ecocentric approach.



**Figure 1.**  
Reasoning Levels

The following quotations are classified as high levels of judgment because these participants make their judgment by constructing sound arguments and justifying their positions. They mostly seem to have considered both the farmer and the wolf during making their explanations:

*Barbara: If I were the farmer, I would be upset because of my loss. Animal husbandry is a difficult work. Furthermore, removing animals from their native habitat is like putting them in a cage. This might have caused the wolf to behave violently.*

*Zoey: I feel sorry for both the farmer and the wolf.*

*The farmer suffered from losing his/her cattle and the wolf is dead just because it was removed from its native habitat.*

The following participants explained their emotions and positions clearly; however, without justifying their judgment. Therefore, their judgment was classified as moderate level.

*Betty: I feel myself very guilty about this issue. I do not do much about environmental issues because I feel burden or troubled about these issues. I think I should do something about it, but I do not.*

*Dalila: All of us are responsible for the environment and we must act collectively. We will keep having such bad consequences unless we act collectively, and the government do not encourage the protection of environment.*

High level of elaboration required PECTs to give further examples to explain their emotions and judgments as well as indicating the relationships between these examples and ideas about the issue. The following examples revealed such an elaboration as they gave various examples of human actions that cause environmental problems and provided solutions to deal with these problems:

*Belle: As humans, we cause the biggest harm to the environment and ruin the balance of ecosystems. So, we have the biggest responsibility for Earth. Many human actions are the causes of many environmental problems, such as increasing carbon dioxide in the atmosphere, polluting water, deforestation, destroying habitats, etc.*

*Brenda: I feel responsible for the environment, and I think I act pro-environmentally. I prefer using recyclable products, saving electricity and water, using public transportation, etc. However, environmental issues cannot be solved individually. Protecting environment and sustainability requires supporting environmental organizations and acting collectively.*

The following quotations are the examples of moderate level of elaboration because they include clear explanations of the participants' positions and discussions on interrelationships among different aspects of the issue; however, with a lack of further example:

*Rebecca: Protecting environment and nature is a responsibility rather than a choice. There are species*

*on Earth other than us who have right to live. Governments should consider settlements before establishing national parks.*

*Olivia: The government is responsible for the restitution of the farmer's harm because the authorities should not have allowed establishing national parks close to settlements in the first place.*

The results showed that most of the PECTs (83.02%) made a high level of judgment about the environmental issue and nearly half of them (45.28%) elaborated their judgment by giving further examples and discuss the relationship between the ideas critically. It is interesting to note that few participants (16.98%) made a moderate judgment by clearly and rationally explaining their positions but did not provide sufficient justification, while many participants (54.72%) elaborated their responses in moderate level by giving further examples. It is evident from this result that nearly half of the PECTs are challenged to elaborate on their arguments by giving further examples on an environmental issue regardless of their judgment level.

Twenty-three out of 44 participants who judged the environmental problem at a high level also elaborated their judgment at a high level, while 21 of them elaborated their judgment at a moderate level. Interestingly, only one out of 9 participants made her judgment at a moderate level, while elaborating her explanation at a high level. The other 8 participants made both their judgments and elaborations at a moderate level. This result provides evidence for the need for a high level of judgment to produce a high level of judgment in general, implying that a critical level of reasoning is a prerequisite for a high level of judgment.

Although the participants saw mucilage on Marmara Sea, they rarely gave this example to elaborate on their judgments about the human impact on the environment. In fact, they seldom used current examples such as wildfire, deforestation, acidification of the seas, reflections of global warming to support their judgments. This result indicates that the participants are not well-equipped to elaborate on their judgment on an environmental issue by connecting it to other environmental issues to make an informed decision about the environmental issues in general. On the other hand, it is promising that none of the PECTs made a low judgment or a low elaboration on the scenario that they were given.

## Conclusion

Eco-ethical perspectives of environmental education necessitated investigating learners' emotive reasoning about environmental issues (Herman et al., 2020; Zeidler et al., 2019) to promote ecojustice. Morrison (2018) argued that reframing Westernized culture takes time and requires both intellectual and emotive and psychological reasoning, and personal internalization is needed before practical application. The students construct their arguments on SSI by utilizing not only scientific knowledge but also human behavior, emotion, social and political agenda. This complexity of decision-making on SSI highlights the necessity of reasoning and discussion of real-life situations into teaching settings (Kim et al., 2014). The current study was an attempt to bring a real-life problem by providing PECTs with an environmental issue and explore their emotive reasoning.

Bussing et al. (2019) highlighted the importance, attitude, enjoyment, and perceived behavioral control of pre-service teachers' motivation to teach environmental issues, focusing on their positive attitudes towards environmental education contexts. The Yellowstone example was used in the current study to focus the PECTs' emotive reasoning on a wildlife issue. The PECTs reflected different types of emotive reasoning. However, they mostly explained their reasons in a more human-centered way and rarely emphasized an ecocentric approach to wildlife conservation. As the research was conducted with the participants studying in a metropolitan city, who are disconnected from nature, it is understandable that their perspective on natural life is human-centered. Yerbury and Weiler (2020) stated that connectedness to nature can contribute to an ecocentric perspective on wildlife, which allows people to realize their impact on wildlife. Therefore, incorporating outdoor activities into preschool teacher education programs and encouraging PECTs to design activities that take place in nature can be beneficial in this regard.

The results of this study indicated the absence of apathy in PECTs' reflections and most of the PECTs reflected more than one type of emotive reasoning by expressing especially empathetic dissonance. More than half of the participants moderated their concern about the impact of wolf on human life. However, they rarely expressed guilt about the environmental issues. Herman et al. (2020) concluded similar results and suggested that the place-based SSI instructions are useful contexts to focus on emotive reasoning to resolve environmental issues. They also argued



the necessity of authentic contexts and a well-defined framework to improve the affective and cognitive connection. However, the results of the current study suggest that using well-defined cases and scenarios about environmental issues elicited the PECTs' emotive reasoning about environmental issues. The major contribution of the present study is, thus, indicating the participants' emotive reasoning by using well-defined cases and scenarios about environmental issues to examine their emotive reasoning on an environmental issue. Environmental SSI education in teacher training should include discussions on well-defined, real cases and scenarios to examine pre-service teachers' emotive reasoning about these issues. Further studies on PECTs' emotive reasoning in different environmental cases and scenarios, especially those that are related to their daily life may bring new light on this topic.

Dunlop and Rushton (2022) stated that emotions are strongly linked to actions and education plays a significant role in altering environmental emotions. We found that the participants of this study were unlikely to take action to resolve the issue. Some of them even did not seem to have known of national parks. Zummo et al. (2020) analyzed letters written by American youth to the next president after worldwide climate strikes and found that global climate change triggered a variety of emotive reasoning, such as an apocalyptic scenario. These findings suggest that a community that feels environmental problems closely is more prone to emotive reasoning and activism regarding the problem. Similarly, some of the participants in this study reflected that the current scenario provided an opportunity to think about the environmental issue and was a catalyst for them to act. These findings indicate the necessity of not only providing students with opportunities to express their emotions on environmental issues by using such scenarios in classes but also encouraging them to research about the topic.

Incorporating emotive reasoning into environmental education seems to have the potential to elicit learners' emotive reasoning to create educational environments that allow them to think pro-environmentally. Tsevreni (2021) found that nature journaling supports students' connection to the more-than-human world. Similarly, the current study is an attempt to enhance PECTs' connection to the environment, which includes not only humans but also other species by exploring their emotive reasoning in a real case. However, the results of this study showed that the PECTs mostly reflected a human-centered approach to environmental problems rather than an ecocentric approach. Further studies promoting PECTs' reasoning on well-defined real environmental problems with an

ecocentric approach might broaden our perspective on this issue.

Citizens' participation in decision-making in environmental policies and management is significant for establishing democracy and environmental sustainability (Rodríguez & Vargas-Chaves, 2018). The individuals need to have high reasoning skills for an effective participation. The findings of the present study indicated high and moderate levels of reasoning in the participants of this study. However, some of the PECTs were challenged to make decisions by both critically evaluating the issue and providing justification to their arguments or elaborating their positions with further examples. Although place-based SSI teaching elicited PECTs' diverse perspectives including moderated concern and empathetic dissonance (Herman et al., 2020), the results of this study also indicate the necessity of promoting PECTs' level of reasoning during moral and ethical judgments on an environmental issue. Further research investigating PECTs' emotive reasoning on various environmental issues may broaden our perspectives to improve teacher education programs regarding environmental education.

Environmental issues, such as climate change is not only an ethical issue, but also a political issue (Bazzul, 2020). Therefore, it is necessary to equip PECTs with the ability to make informed decisions about environmental issues by providing justified arguments and elaborating their judgment with further examples even during emotive reasoning. Providing crucial examples in their teaching designs depends on their level of reasoning. Environmental education is important in particularly early childhood, where environmental learning and attitude are just being formed (Basile, 2000). To achieve this purpose, educators should focus on training teachers and find ways to improve PECTs' reasoning skills by enabling them to discuss their emotions on various environmental issues and relate them to each other to make coherent judgments.

According to McGimpsey et al. (2023), the disconnection of environmental problems' complex social, cultural, aesthetic, and political effects from the curriculum indicates formal education's contradictions. In contrast, environmental activism prioritizes these dimensions and has charted its course. However, a planned and programmed pedagogical approach would be beneficial for environmental education to address such activism, in which young people are active. The research findings emphasize the importance of a conscientious and human-centered approach to environmental issues, particularly among young people. An alternative pedagogical approach of this type could provide a suitable basis for transforming the current framework.



The main limitation of the current study is that the data were collected from the participants who attended the Early Childhood Environmental Education course in a private university in a metropolitan city in Turkey. Therefore, considering that the results of the present study cannot be generalized to all PECTs, the findings suggest the need for further implementations of environmental cases in different contexts of teacher education. The use of different well-defined cases and scenarios to elicit and improve PECTs' emotive reasoning and decision-making skills will bring new insight into the development of environmental education in early childhood education programs.

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## Genişletilmiş Özet

### Giriş

İklim değişikliği, kirlilik, atık bertarafı, aşırı nüfus artışı, okyanus asitlenmesi, gıda ve su kıtlığı gibi sorunların bir araya gelmesi nedeniyle gezegende bir çevre krizi yaşandığına dair çok sayıda kanıt bulunmaktadır (Akinsemolu, 2020; Singh & Singh, 2017). Bu nedenle, iklim kriziyle başa çıkmak ve Sürdürülebilir Kalkınma Hedeflerine ulaşmak için, mevcut sorunlar ve bu sorunlar arasındaki bağlantıları anlayan bireyler yetiştirmek hayati önem taşımaktadır (Echegoyen-Sanz & Martín-Ezpeleta, 2021). Eğitim, böyle bir değişim yaratmak için en güçlü araçlardan biridir. Mevcut çevresel krizle başa çıkabilmek için, öğrencileri çevresel zorlukları anlama ve çözme becerileriyle donatan, ekolojik meseleleri kavramalarını teşvik eden ve sürdürülebilir bir yaşamı destekleyen ekolojik bir müfredat bugün her zamankinden çok daha önemlidir.

Sürdürülebilir Kalkınma Hedeflerine ulaşılması (Ito & Igano, 2020) ve öğrenciler ile doğa arasında güçlü duygusal bağların geliştirilmesi (Herman ve ark., 2020), yer temelli çevre eğitimi çerçevesi ile kolaylaştırılmaktadır. Bu makalenin argümanı, çevre bilincinin ekolojik sistemler ve insanların neden olduğu çevresel bozulma arasındaki karşılıklı ilişkileri anlamayı ve muhakeme etmeyi gerektirdiğidir. Bu nedenle, öğrencilerin farkındalığını geliştirmek için, yalnızca yer temelli konularla ilgili olarak değil, aynı zamanda dünyanın farklı bölgelerinde ortaya çıkabilecek genel çevre sorunlarıyla ilgili olarak da ekolojik muhakemelerini geliştirmek gerekmektedir. Yaban hayatının ekolojik süreçler üzerinde önemli bir etkisi vardır. Bu nedenle, yaban hayatının korunması konusunda kamu bilincinin artırılması gerekmektedir. Ancak, karar vericileri ve halkı korumayı desteklemeye ikna etmek iletişim ve eğitim gerektirmektedir.

Çevre eğitimi, öğrencilerin ekolojik nişlerinin daha geniş çevrenin ayrılmaz bir bileşeni olduğu kavramını içselleştirmelerini sağlamalı ve doğa ile ilişkilerinde var olan karşılıklılığa dair ahlaki ve etik bir anlayışı beslemelidir. Duygusal muhakeme, bu etik perspektifin önemli bir yönüdür. Bu perspektiften hareketle, bu çalışma okul öncesi öğretmen adaylarının (OÖÖA'lar) bir çevre sorununa ilişkin duygusal muhakemelerini keşfetmeyi amaçlamaktadır. Araştırmacılar, vahşi yaşamın ve çevrenin korunması ile insan ihtiyaçları arasındaki etik ikilemleri içeren bir çevre sorunu hakkında bir senaryo oluşturmuşlardır. Çevre eğitiminde ekoadalet yaklaşımını (Benzce ve ark., 2015; Herman ve ark., 2018; Reis ve ark., 2015) temel alan Herman ve ark. (2020), lisans öğrencilerinin çevre sorunlarıyla ilgilenirken duygusal muhakemelerini keşfetmek için Yellowstone'da otantik yer temelli çevresel SGE öğrenme deneyimlerini kullanmıştır. Bu deneyim aşağıdaki vakayı içermektedir: Bir kurt Ulusal Park'tan kaçmış, yakındaki bir çiftliğe gitmiş ve koyun ve sığırlara saldırmıştır. Daha sonra çiftçi kurdu öldürdü. Benzer bir vaka Nisan 2019'da Türkiye'de yaşanmış, Türk gazeteleri bir kurdun ülkenin güney bölgesindeki Milli Park'tan kaçtığını yazmıştı. Birkaç gün sonra aynı gazeteler, bir ilçede kurdu yiyecek ararken gören ve fotoğraflayan vatandaşlarla ilgili başka bir haber yayınlamıştır. Aynı yılın mayıs ayında kurdu arama çalışmaları sonlandırıldı.

### Yöntem

Bu çalışmanın araştırmacıları, bu vakayı katılımcıların duygusal muhakemelerini keşfetmek için bir fırsat olarak kullanmaya karar vermiştir, çünkü bu sadece yer temelli bir çevre sorunu değil, aynı zamanda dünyanın farklı bölgelerinde ortaya çıkabilen bir vahşi yaşam sorunudur. Araştırmacılar dokuz olası seçeneği listelemiş ve katılımcılardan bu seçeneklerden birini veya daha fazlasını seçmelerini ve yanıtlarını yansıtma çalışmalarında detaylandırmalarını istemiştir. Bu çalışmaya elli üç OÖÖA katılmıştır. Araştırmacılar, katılımcıların her bir kategorideki yanıtlarını kodlamış ve katılımcıların yansıtma çalışmalarındaki kararlarını ve detaylandırma düzeylerini bağımsız olarak analiz etmiştir.

### Sonuç

OÖÖA'lar farklı duygusal muhakeme türlerini yansıtmıştır. Bununla birlikte, gerekçelerini çoğunlukla daha insan merkezli bir şekilde açıklamışlar ve nadiren yaban hayatının korunmasına yönelik ekosentrik bir yaklaşımı vurgulamışlardır. Sonuçlar en çok sorumluluk dağılımı, merhamet, öfke ve haklı kızgınlık kategorilerinde bir yığılma olduğunu göstermektedir. Herman ve ark. (2020) yürüttüğü çalışmayla tutarlı olarak, bu çalışmanın sonuçları, OÖÖA'ların düşüncelerinde ilgisizliğin olmadığını ve OÖÖA'ların çoğunun özellikle empatik uyumsuzluğu ifade ederek birden fazla duygusal akıl yürütme türünü yansıttığını göstermiştir. Katılımcıların yarısından fazlası kurdun insan yaşamı üzerindeki etkisine ilişkin endişelerini ılımlı bir şekilde dile getirmiştir. Ancak, çevre sorunları hakkında nadiren suçluluk ifade etmişlerdir.

Herman ve ark. (2020), duyuşsal ve bilişsel bağlantıyı geliřtirmek için otantik bağlamların ve iyi tanımlanmış çerçevenin gerekliliğini savunmuştur. Bununla birlikte, mevcut çalışmanın sonuçları, çevresel konularla ilgili iyi tanımlanmış vakalar ve senaryolar kullanmanın da bu tür bir katılımı kolaylařtırmak açısından yer temelli SBK eğitimi kadar faydalı olduğunu göstermektedir. Dolayısıyla bu çalışmanın en önemli katkısı, katılımcıların duyuşsal muhakemelerini analiz ederek çevresel SBK öğretiminde çevresel vakalar ve senaryolar kullanmanın faydalarını ortaya koymasındır.

Sonuçlar ayrıca, OÖÖA'ların duyuşsal akıl yürütmelerinde çoğunlukla yüksek düzeyde yargılama ve yüksek ve orta düzeyde detaylandırma olduğunu ortaya koymuştur. Bu çalışmanın sonuçları, hizmet öncesi öğretmen eğitiminin, öğretmen adaylarının duyuşsal muhakemelerini incelemek için iyi tanımlanmış çevresel vakaları içerecek şekilde revize edilmesi gerektiğini ve böylece çevre eğitiminde çevresel farkındalıklarının artırılması gerektiğini göstermektedir. Bu araştırma, öğretmen adaylarının yabancı hayatı konularındaki duyuşsal akıl yürütmelerini anlamak ve bu anlayışı öğretim uygulamalarına etkili bir şekilde dahil etmelerini sağlamak açısından da önemlidir.



# An Investigation of Universities' Public Relations and Corporate Twitter Use (Covid- 19 Process)

## Üniversitelerin Halkla İlişkileri ve Kurumsal Twitter Kullanımı Üzerine Bir Araştırma (Covid-19 Süreci)

Deniz GÖRGÜLÜ<sup>1</sup>

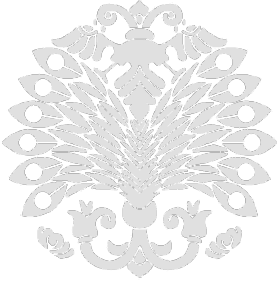


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### ABSTRACT

This study aimed to investigate the impact of corporate Twitter use on university public relations. The research employed a mixed design, using both quantitative and qualitative methods. The quantitative aspect utilized a cross-sectional survey model, while the qualitative part involved a case study design. The study included 1245 postgraduate students selected through stratified sampling. For the qualitative part, the sample consisted of one state and one foundation university from each region with the highest number of Twitter followers, identified using the purposive sampling method. The findings indicated that postgraduate students generally perceived university public relations to be at an acceptable level. Moreover, foundation university students held a more positive view of their institutions' public relations. Analyzing universities' corporate Twitter use revealed that Atatürk University had the highest number of posts. Furthermore, the analysis showed that universities mainly shared content to promote other public relations tools. The analysis also revealed a similar number of tweets from universities before and after the pandemic.

**Keywords:** Public relations, corporate Twitter, university

### Öz

Bu araştırmanın amacı, üniversitelerin halkla ilişkilerinde kurumsal Twitter kullanımının rolünü incelemektir. Araştırma eş zamanlı nicel ve nitel karma araştırma desenine göre tasarlanmıştır. Araştırmanın nicel boyutunda kesitsel tarama modeli, nitel boyutunda ise durum çalışması kullanılmıştır. Nicel boyutta katılımcılar tabakalı örnekleme yöntemi ile belirlenmiş ve 1245 lisansüstü öğrenci çalışmada yer almıştır. Nitel boyutta ise örneklem amaçlı örnekleme yöntemi ile belirlenmiş ve her bölgeden Twitter'da en fazla takipçiye sahip bir devlet ve vakıf üniversitesi çalışmaya dâhil edilmiştir. Araştırma sonucunda lisansüstü öğrencilerin algılarına göre üniversitelerin halkla ilişkiler anlayışının yeterli düzeyde olduğu tespit edilmiştir. Araştırmada vakıf üniversitelerinde okuyan öğrencilerin üniversitelerinin halkla ilişkilerine yönelik algılarının daha yüksek olduğu belirlenmiştir. Üniversitelerin kurumsal Twitter kullanımları incelendiğinde Atatürk Üniversitesi'nin en fazla paylaşımda bulunan üniversite olduğu görülmüştür. Üniversitelerin en çok diğer halkla ilişkiler araçlarını duyurmak amacıyla paylaşım yaptıkları tespit edilmiştir. Ayrıca üniversitelerin pandemi öncesi ve sonrasında benzer sayılarda tweet attıkları ortaya çıkmıştır.

**Anahtar Kelimeler:** Halkla ilişkiler, kurumsal Twitter, üniversite

## Introduction

The modern landscape of organizational competition is heavily influenced by the use of information. The majority of activities rely on informational resources, thus increasing the importance of information daily (Baytekin, 2012). In this dynamic paradigm, institutions engaged in knowledge production, notably universities, play a critical role. Universities are essential in generating, preserving, aggregating, and realizing knowledge (Şimşek, 2018). As knowledge hubs, universities have facilitated the dissemination of knowledge by relinquishing monopolistic control over it. However, the changing expectations of the information society regarding knowledge have implications for the role of universities (Snellman, 2015). Therefore, it is imperative for universities to continuously adapt and adopt structures that align with the demands of the contemporary world.

Public relations are a crucial management function that helps organizations meet the expectations of their audiences. Organizations benefit from bilateral relationships with their audience by cultivating and sustaining satisfaction, trust, and loyalty among their target audience (Cutlip et al., 2001; Çelebi, 2019). In the field of public relations, organizations strive to establish effective and diverse communication with their target group through various media channels (Kelleher, 2018). The target group's characteristics should guide the choice of communication tools in this process. Additionally, there is a focus on ensuring that the messages conveyed are clear and unambiguous, with a preference for using communication tools that have been proven to be effective in enhancing public relations efforts (Çetintaş, 2019).

Organizations typically use three main categories of methods in public relations: written, oral, and audiovisual tools (Sabuncuoğlu, 2013). Historically, written tools have played a predominant role in the evolution of public relations (Taş & Kestelloğlu, 2011). However, with modern information technologies, internet-based tools have become increasingly important in public relations practices (Hobbs, 2016). In particular, the widespread use of social media platforms such as Facebook, Twitter, and Instagram has prompted organizations to actively integrate these platforms into their public relations strategies (McCorkindale & Distaso, 2014).

Public relations serve as a strategic tool for universities to showcase their strengths and offerings to the public, as well as to engage with their target group (Sing, 2019) and implement initiatives aimed at enhancing students'

capabilities and securing governmental support (Bümen, 2017). As a result, universities strive to establish effective communication channels with current, alumni, and prospective students, as well as their families, leveraging social media platforms to strengthen institutional identity. This coordinated effort aims to position universities as preferred choices among students and academics, promote academic and student-oriented initiatives, and build public trust (Boumarafi, 2015; Peruta & Shields, 2017; Tanova & Amca, 2016).

Twitter, a widely observed social media platform, serves as a prominent avenue for individuals seeking news updates and expressing their opinions. The platform predominantly features posts about everyday life occurrences (Wang et al., 2021). Public relations specialists regard Twitter as an influential communication tool (Himmelboim et al., 2014). Leveraging its user-friendly interface for opinion dissemination, universities globally, alongside other organizations, extensively utilize Twitter as a cornerstone of their public relations endeavors (Köseoğlu & Köker, 2014).

Twitter's rapid news-sharing capability has been instrumental during crises, particularly during the COVID-19 pandemic, when universities extensively used the platform to distribute crucial information to students, academics, and staff members (Kanılmaz, 2021). Research by Ferrer-Serrano et al. (2020) emphasizes the significance of institutional Twitter accounts for universities during such extraordinary times. The study highlights that these accounts attracted increased public attention amid the pandemic, underscoring their pivotal role in communication and information dissemination.

The literature suggests that universities consider public relations to be a critical managerial function (Anngreni, 2018; Harder, 2019; Şimşek, 2021). However, there are indications that universities often lack a comprehensive and systematic approach to their public relations efforts (Akyüz, 2019; Doğan, 2019; Sultana et al., 2019). Observations reveal that universities significantly prioritize the use of corporate Twitter accounts (Bista, 2015; Kandemir, 2019; Veletsianos et al., 2017). Nevertheless, there is a shortage of research examining the use of corporate Twitter by universities, particularly during the COVID-19 pandemic. The pandemic's shift toward increased online public relations activities suggests that higher education institutions should critically examine universities' public relations strategies and their use of corporate Twitter.

## Purpose of the Study

The purpose of this study is to investigate the impact of

corporate Twitter use on universities' public relations strategies. To achieve this goal, the study states the following research questions:

1. What is the level of public relations at universities during the COVID-19 pandemic, according to postgraduate students' perceptions?
2. Is there a significant difference in postgraduate students' perceptions of universities' public relations based on variables such as age, gender, type of university, field of research, and type of graduate education?
3. To what extent and for what purpose do universities use institutional Twitter as part of their public relations activities?

### Methods

The investigation used a mixed research approach from the pragmatist paradigm as its methodology (Teddlie & Tashakkori, 2020). The selection of this method was significantly influenced by the principle of complementarity (Greene et al., 1989). We employed quantitative research to evaluate the public relations practices of universities and qualitative research to clarify the complexities involved in these institutions' use of corporate Twitter. Additionally, we chose a concurrent mixed research design for this purpose due to its proven efficacy in producing robust and validated findings.

In the quantitative phase of the study, we employed the cross-sectional survey model outlined by Erçetin & Açıkalın (2020). This model involves describing a current or past situation by delineating subgroups within larger populations. On the other hand, the qualitative aspect utilized a case study design, allowing researchers to delve deeply into a specific situation, event, process, or individual (Creswell, 2017). The case study method aims to categorize the problem scenario and derive meaningful insights from it (Hancock & Algozzine, 2006).

### Population and Sample

The quantitative aspect of the research focuses on postgraduate students enrolled in Turkish universities during the 2020–2021 academic year. This population was

chosen because postgraduate education is voluntary, and students pursue academic career aspirations, personal and professional development, and enhanced economic prospects (Karaman & Bakırcı, 2010). Their ability to make informed and objective judgments makes their perceptions valuable for this study. We determined the sample using a stratified sampling method, first categorizing the population based on research areas, and then selecting and combining samples using a simple random sampling approach. Table 1 presents the composition of participants in the study sample.

The data presented in Table 1 illustrates that 67% of the survey participants identified as female, with 33% identifying as male. Regarding age distribution, 27% of respondents fell within the 21–25 age range, 35% in the 26–30 age range, 23% in the 31–35 age range, 11% in the 36–40 age range, and 5% were 41 years old or older. Notably, 84% of the respondents received their education from state universities, while the remaining 16% attended foundation universities. In terms of academic fields, 9% of postgraduate students were in educational sciences, 52% in social sciences, 6% in health sciences, and 33% in scientific disciplines. Additionally, 53% of the participants were pursuing thesis-based master's programs, 12% non-thesis master's programs, and 35% doctoral programs.

The qualitative aspect of the research involved 127 public and 73 foundation Turkish universities that had institutional Twitter accounts as of December 20, 2020, when the content analysis began. The sample selection process used purposive sampling, including one state and one foundation university with the highest follower counts from each of the seven regions in Türkiye. It's important to note that, due to the absence of foundation universities in the Eastern Anatolian region, only state universities from that region participated in the research. Table 2 outlines the details of the research sample.

Gazi University, as a state university, had the highest number of followers overall, while Bilkent University had the most followers among foundation universities. In contrast, Avrasya University had the fewest followers. Additionally, Istanbul Bilgi University had the highest tweet count among the sampled universities.

**Table 1.***Information on the Participants in the Sample of the Study*

Variable		N	%
Gender	Female	832	67
	Male	413	33
Age	21-25 age	332	27
	26-30 age	438	35
	31-35 age	281	23
	36-40 age	132	11
	41 age and over	62	5
University type	State University	1043	84
	Foundation University	202	16
	Education Sciences	113	9
Graduate Program	Social Sciences	648	52
	Health Sciences	76	6
	Science	408	33
Type of Postgraduate Education	Master's degree with thesis	664	53
	Master's degree without thesis	153	12
	PhD	428	35

**Table 2.***Population and Sample of the Qualitative Dimension of the Study*

Region	City	Type	University	Twitter Followers	Total Number of Tweets
Mediterranean	Antalya	State	Akdeniz University	59.312	13.000
Mediterranean	Antalya	Foundation	Antalya Bilim University	16.215	4.037
Eastern Anatolia	Erzurum	State	Atatürk University	47.253	6.355
Aegean	İzmir	State	Ege University	123.126	1.919
Aegean	İzmir	Foundation	Yaşar University	14.261	9.185
Southeastern Anatolia	Gaziantep	State	Gaziantep University	42.893	12.100
Southeastern Anatolia	Gaziantep	Foundation	Hasan Kalyoncu University	14.509	8.788
Central Anatolia	Ankara	Foundation	Bilkent University	77.591	3400
Central Anatolia	Ankara	State	Gazi University	302.835	5.850
Black Sea	Düzce	State	Düzce University	18.890	8.834
Black Sea	Trabzon	Foundation	Avrasya University	1.413	174
Marmara	İstanbul	State	Boğaziçi University	114.720	5.443
Marmara	İstanbul	Foundation	İstanbul Bilgi University	71.700	13.200

**Data Collection Process**

In the quantitative dimension of the study, data collection commenced upon receipt of the "Ethics Commission Approval Notification Document" from the Hacettepe University Senate Ethics Commission, dated March 15, 2021, and numbered 00001499379. Afterwards, we administered the Public Relations in Postgraduate Education Scale (PRPES) online using a Google Form. The form explicitly stated the voluntary nature of research participation. Then, we invited postgraduate students to complete the form through various online platforms. The informed consent

form was also attached to this form.

In the qualitative dimension of the research, the initial step was to identify and compile a list of the institutional Twitter accounts of the chosen universities for analysis. Next, we gathered tweets from each university's institutional Twitter account using NCapture, an internet browser plug-in compatible with the NVIVO application for qualitative data analysis. Later, we methodically evaluated the tweets posted between September 1, 2019, and August 31, 2020.

## Data Collection Tools

Görgülü and Erçetin (2021) developed the PRPES for the quantitative aspect of the study, which evaluated universities' public relations practices from the perspective of postgraduate students. The scale sought to determine whether demographic variables influenced students' perceptions. We carried out an exploratory factor analysis (EFA) to investigate the underlying factor structure of the scale before conducting the analysis. The results revealed four sub-dimensions: information, distance education, academic reputation, and communication. Then, we conducted confirmatory factor analysis (CFA) on a sample of 200 postgraduate students to evaluate the model's fit. The item-total correlations, which ranged from .55 to .70 for the information dimension, .45 to .60 for distance education, .69 to .80 for academic reputation, .62 to .80 for communication, and .45 to .86 for the overall scale, demonstrated satisfactory validity.

The compliance values obtained from the confirmatory factor analysis (CFA), which included  $\chi^2 = 1544.08$ ,  $sd = 346$ ;  $\chi^2/sd = 4.46$ ;  $RMSEA = .065$ ,  $RMR = .897$ ;  $CFI = .922$ ; and  $NFI = .908$ , indicated good construct validity (Byrne, 2012). Additionally, the reliability of the scale and its sub-dimensions were assessed using Cronbach's alpha coefficient. The calculated coefficients were .88 for information, .85 for distance education, .91 for academic reputation, .88 for communication, and .84 for the overall scale, indicating high internal consistency and reliability.

Content analysis was applied for the qualitative part of the study to examine universities' use of corporate Twitter. Content analysis involves segmenting data into discrete units and subsequently categorizing these units (Merriam & Tisdell, 2015). We thoroughly reviewed tweets posted by the relevant universities between September 1, 2019, and August 31, 2020, twice in this study, noting the themes or topics they addressed. Then, we systematically coded all posts using a deductive approach and a closed code system. This process employed a code system that included categories like Announcing Other Public Relations Tools, Informing Students and Academic Staff, Announcing the Activities Conducted, Informing Potential Candidates and Alumni, Getting Closer to Society, Publicizing Relations Established with Stakeholders, and Enhancing Academic Reputation.

During the development of the codebook, as outlined in Table 3, the researcher worked with three field experts. To ensure that the coders were consistent, we used a single institutional Twitter account for pre-coding. Each coder

categorized the tweets independently. We then combined the pre-coding results to create the initial version of the codebook. Next, we examined another institutional Twitter account to find any differences in coding interpretations. We found that the 2nd and 4th categories had the most differences. To address these differences, the coders discussed and finalized the categories to ensure consistency. This iterative process helped the coders reach a consensus and improved the reliability of the coding framework.

It is crucial for coders to agree on the same interpretations in order to ensure the validity and reliability of research findings. Our research followed rigorous methodologies such as triangulation for data collection and analysis, extended participant observation, and external auditor assessments, as suggested by Creswell (2017), to strengthen the validity and reliability of the research. Additionally, the use of direct quotations and careful note-taking helped to support the transferability of the research findings.

## Analysis of Data

During the quantitative phase of the research, we initially imported data from Google Forms into SPSS 24 for analysis. We computed descriptive statistics, which included minimum and maximum values, mean values, standard deviations, and ranges. We also scrutinized the dataset and found no extreme values. On the other hand, we deemed no further action necessary due to the absence of adverse substances in the PRPES. Furthermore, participants fully completed all scale items, negating the need for loss data analysis.

Following the initial assessment, we examined the Skewness-Kurtosis values to evaluate the dataset's normality. Skewness values for both sub-dimensions and the overall scale ranged from -.434 to .253, while Kurtosis values ranged from -.739 to -.363. According to Tabachnick and Fidel (2013), these values fell within acceptable ranges for a normal distribution. However, we utilized the Kolmogorov-Smirnov test to further validate the normality assumption. Results from this test indicated non-compliance with the normal distribution condition, as supported by Bursal (2017). Furthermore, Bursal (2017) noted that the data failed to meet the normality assumption because it did not conform to the normal distribution across subgroups of the variables.

To address the first sub-problem of the study, we utilized descriptive statistics to analyze the data. We grouped the perceptions of postgraduate students into four categories based on their average scores: very insufficient (1.00–1.74),

insufficient (1.75-2.49), sufficient (2.50–3.24), and very sufficient (3.25–4.00). For the second sub-problem, we used non-parametric tests to identify the factors affecting graduate students' perceptions of university public relations. Specifically, we employed the Mann-Whitney U test for gender and university type, and the Kruskal-Wallis H test for age, type of postgraduate education, and research field.

To address the third sub-problem, which examines

universities' use of corporate Twitter, we used the NVIVO 12 program to analyze the data. We subjected posts from the universities' corporate Twitter accounts between September 1, 2019, and December 31, 2020, to thematic analysis within the framework of content analysis. During the coding process, we categorized tweets to enable their inclusion in multiple categories as needed. Afterward, we calculated the frequency and percentage values for each category and visually represented these findings through graphs.

**Table 3.**

*Codebook Used in Content Analysis*

Theme	Category	Code
Institutional Twitter Use of Universities	1. Announcing Other Public Relations Tools	1.1. Corporate Website
		1.2. Corporate Facebook Account
		1.3. Corporate Instagram Account
		1.4. Corporate YouTube Account
		1.5. University Online Newspaper
		1.6. Concert
		1.7. Panel
		1.8. Symposium
		1.9. Workshop
		1.10. Promotion Days
	2. Informing Students and Academic Staff	2.1. Informing Students
		2.2. Informing Academic Staff
	3. Announcing the Activities Conducted	3.1. Scientific Activity
		3.2. Artistic Activity
		3.3. Sportive Activity
		3.4. Cultural Activity
		3.5. Community Service
	4. Informing Potential Candidates and Alumni	4.1. Informing Potential Candidates
		4.2. Informing Graduates
	5. Getting Closer to Society	5.1. Celebrating Specific Days and Weeks
		5.2. Dealing with Social Problems
5.3. Doing Useful Things for Society		
6. Publicizing Relations Established with Stakeholders	6.1. Engaging in Activities with Stakeholders	
	6.2. Hosting Stakeholders as Guests	
	6.3. Visiting Stakeholders	
7. Enhancing Academic Reputation	7.1. University Achievements	
	7.2. Achievements of Academics	
	7.3. Students' Achievements	

## Results

In this section, the findings obtained from the research are discussed under sub-headings.

### Findings on Universities' Understanding of Public Relations According to the Perceptions of Postgraduate Students

In the first phase of the research, the primary objective was to investigate the following question: What is the level of public relations at universities during the COVID-19 pandemic, according to postgraduate students' perceptions? We calculated mean and standard deviation values as statistical measures to ascertain postgraduate students' perceptions regarding university public relations, and Table 4 details these findings.



**Table 4.**  
*Perceptions of Postgraduate Students on Public Relations of Universities*

Items	$\bar{x}$	S
1: ... keeps its website up to date.	3.38	.752
2: ... actively uses social media accounts such as Facebook, Twitter and Instagram.	3.04	.879
3: ... places the information needed on the web address in an easily accessible and understandable way.	3.22	.863
4: ... personalized information.	3.13	.937
5: ... prepares weekly or monthly bulletins on its activities.	2.79	.953
6: ... makes timely announcements on its website and social media accounts.	3.20	.807
7: ... provides information through the mobile student application it has developed.	2.46	1.072
8: ... units and officials can be easily reached by phone, e-mail and social media accounts.	2.88	1.030
9: ... responds quickly to questions directed to its social media accounts.	2.54	.930
10: ... The rector, dean, heads of departments, etc. provide information through administrators such as the rector, dean, heads of departments.	2.79	.946
11: ... makes distance education courses accessible to anyone who wants to listen to them.	2.23	1.071
12: ... organizes distance courses and trainings on topics that students need.	2.53	.995
13: ... continues its distance education activities in multiple languages.	2.27	1.029
14: ... organizes live broadcasts on its social media accounts.	2.34	1.036
15: ... conducts studies on current issues that society needs.	2.81	.966
16: ... is seen as a trusted authority in society.	2.97	.890
17: ... conducts scientific studies on the effects of crisis situations on society.	2.99	.871
18: ... academics provide information on important issues in visual, audio and written media.	2.98	.881
19: ... makes news in the visual, audio and print media with its work.	2.97	.859
20: ... increases its public prestige.	2,94	.879
21: ... organizes a satisfaction survey on its ongoing activities.	2.84	.965
22: ... announces the results of the satisfaction survey and takes steps accordingly.	2,38	.970
23: ... take into account student opinions on social media and develop practices accordingly.	2.49	.969
24: ... shares with students and stakeholders its predictions about social changes in the short and long term.	2.59	.930
Total	2.78	.614

Table 4 clearly shows that postgraduate students perceive universities' public relations as sufficient. This finding is consistent with the results of prior studies conducted by Karaca (2009) and Güven (2014). However, it is noteworthy that this contradicts the conclusions drawn in Yıldırım's (2020) study. The divergent findings in the literature signify a lack of consensus regarding the comprehension and implementation of public relations within universities.

An analysis of the scale items indicates that 1 item received a "very sufficient" rating, 17 items received a "sufficient" assessment, and 6 items received an "insufficient" valuation. Notably, the item "The university where I continue my

postgraduate education keeps its website up to date" received the highest mean score. This finding aligns with Koç's (2015) reported results. Conversely, the item "The university where I continue my postgraduate education makes distance education courses accessible to anyone who wants to listen to them." obtained the lowest mean score. This suggests that universities may not effectively utilize distance education as a public relations tool.

Table 5 outlines an evaluation of postgraduate students' perceptions of universities' public relations across the scale's sub-dimensions.

**Table 5.**  
*The Status of Postgraduate Students' Perceptions of Public Relations of Universities in the Sub-Dimensions of the Scale*

Sub Dimension	$\bar{x}$	SS
Information	2.94	.639
Distance Education	2.34	.768
Academic Reputation	2.94	.747
Communication	2.57	.823
Total	2.78	.614

The analysis of Table 5 shows that postgraduate students perceive universities as more successful in terms of information dissemination and academic reputation. This finding is consistent with existing literature, which suggests that universities prioritize public relations efforts to enhance their academic standing and provide informational resources (Doğan, 2019; Güngör, 2018; Özkanal, 2006). On the other hand, people perceive universities to be less successful in the distance education dimension than in other areas. The challenges inherent in universities' distance education initiatives may account for this difference. Genç et al. (2020) have conducted research supporting this notion, indicating that systemic issues impede the effective implementation of distance education. Furthermore, it is worth noting that the communication dimension scored below average. This observation implies that universities encounter difficulties in establishing effective communication channels with their target group during the public relations process. Several studies in the literature support this finding, emphasizing the challenges universities face in fostering meaningful communication with stakeholders (Can, 2017; Kimmons et al., 2017; Urban, 2021).

### Investigation of Postgraduate Students' Perceptions of Public Relations of Universities According to Some Variables

In the second sub-problem of the study, the inquiry sought to answer the question: Is there a significant difference in postgraduate students' perceptions of universities' public relations based on variables such as age, gender, type of university, field of research, and type of graduate education? We initially assessed the potential impact of the age variable on postgraduate students' perceptions of university public relations using the Kruskal-Wallis H test in this context. Table 6 presents the results of this analysis.

After reviewing Table 6, it is clear that there is no significant difference in postgraduate students' perceptions of university public relations across the dimensions of information, distance education, academic reputation, communication, and the overall scale based on the age variable. Therefore, we can infer that postgraduate students across different age groups have similar perceptions regarding university public relations.

**Table 6.**

*Kruskal-Wallis H Test Results for the Examination of Postgraduate Students' Perceptions of Public Relations of Universities Depending on Age Variable*

Dimensions	Age	N	sd	$\chi^2$	$p$	Difference
Information	21-25	332	4	7.764	.101	-
	26-30	438				
	31-35	281				
	36-40	132				
	41 and above	62				
Distance Education	21-25	332	4	6.549	.162	-
	26-30	438				
	31-35	281				
	36-40	132				
	41 and above	62				
Academic Reputation	21-25	332	4	8.310	0.81	-
	26-30	438				
	31-35	281				
	36-40	132				
	41 and above	62				
Communication	21-25	332	4	4.753	.314	-
	26-30	438				
	31-35	281				
	36-40	132				
	41 and above	62				
Total Scale	21-25	332	4	4.634	.327	-
	26-30	438				
	31-35	281				
	36-40	132				
	41 and above	62				

We also used the Mann-Whitney U test to see if the gender variable produces a significant difference in postgraduate

students' perceptions of university public relations. Table 7 presents the results of this analysis.

When reviewing Table 7, it is worth noting that there is no significant difference in postgraduate students' perceptions of university public relations based on gender in the dimensions of information, communication, and overall scale. However, we observed a significant difference in the

dimensions of distance education and academic reputation. Specifically, male students exhibited higher perceptions of university public relations in the distance education dimension, while female students demonstrated higher perceptions in the academic reputation dimension.

**Table 7.**

*Mann-Whitney U Test Results for the Examination of Postgraduate Students' Perceptions of Public Relations of Universities Depending on Gender Variable*

Dimensions	Gender	N	$\bar{x}$	U	z	p	r
Information	Female	832	2.95	177.708	.989	.323	.028
	Male	413	2.9				
Distance Education	Female	832	2.29	155.772	-2.698	.007	.076
	Male	413	2.43				
Academic Reputation	Female	832	2.97	184.742	2.174	.030	.061
	Male	413	2.87				
Communication	Female	832	2.58	176.707	.824	.410	.023
	Male	413	2.54				
Total Scale	Female	832	2.79	176.074	.714	.475	.020
	Male	413	2.76				

We used the Mann-Whitney U test to investigate whether the university-type variable leads to a significant difference

in postgraduate students' perceptions of university public relations. Table 8 displays the test's results.

**Table 8.**

*Mann-Whitney U Test Results for the Examination of Postgraduate Students' Perceptions of Public Relations of Universities Depending on the Variable of University Type*

Dimensions	University Type	N	$\bar{x}$	U	z	p	r
Information	State	1043	2.91	127.411	4.724	.000	.133
	Foundation	202	3.11				
Distance Education	State	1043	2.3	125.098	4.244	.000	.120
	Foundation	202	2.55				
Academic Reputation	State	1043	2.91	124.205	4.048	.000	.114
	Foundation	202	3.12				
Communication	State	1043	2.53	123.698	3.944	.000	.111
	Foundation	202	2.77				
Total Scale	State	1043	2.74	128.986	5.056	.000	.143
	Foundation	202	2.96				

Based on the findings in Table 8, it is clear that postgraduate students enrolled at foundation universities have higher perceptions of university public relations across the dimensions of information, distance education, academic reputation, communication, and the overall scale. Therefore, students attending foundation universities perceive their institutions as more proficient in public

relations activities. This observation is consistent with previous studies conducted by Karaca (2009) and Sultana et al. (2019). Foundation universities outperform state universities in public relations due to their proactive use of strategies like marketing, image enhancement, promotion, and advertising (Summak, 2016).

We used the Kruskal-Wallis H test to determine whether the variable in the research field causes a significant difference in postgraduate students' perceptions of university public relations. Table 9 outlines the results.

After reviewing Table 9, it is evident that the research field variable does not result in a significant difference in

postgraduate students' perceptions of university public relations across the dimensions of information, distance education, academic reputation, communication, and the overall scale. Therefore, we can infer that postgraduate students from various research fields have similar perceptions of university public relations.

**Table 9.**

*Kruskal-Wallis H Test Results for the Examination of Postgraduate Students' Perceptions of Public Relations of Universities Depending on the Research Area Variable*

Dimensions	Research Area	N	sd	$\chi^2$	<i>p</i>	Difference
Information	Education Sciences	113		1.588	.662	-
	Social Sciences	648	3			
	Health Sciences	76				
Distance Education	Science	408		2.837	.417	-
	Education Sciences	113	3			
	Social Sciences	648				
Academic Reputation	Health Sciences	76		2.585	.460	-
	Science	408	3			
	Education Sciences	113				
Communication	Social Sciences	648		.538	.910	-
	Health Sciences	76	3			
	Science	408				
Total Scale	Education Sciences	113		1.467	.690	-
	Social Sciences	648	3			
	Health Sciences	76				
	Science	408				

Additionally, we used the Kruskal-Wallis H test to investigate whether the variable of postgraduate education type significantly influences postgraduate students' perceptions

of university public relations. Table 10 presents the results of this analysis.

**Table 10.**

*Kruskal-Wallis H Test Results for the Examination of Postgraduate Students' Perceptions of Public Relations of Universities Depending on the type of Postgraduate Education Variable*

Dimensions	Type of Postgraduate Education	N	sd	$\chi^2$	<i>p</i>	Difference
Information	PhD	428		2.144	.342	
	Master's degree with thesis	664	2			
	Master's degree without thesis	153				
Distance Education	PhD	428		6.781	.034	1<3
	Master's degree with thesis	664	2			
	Master's degree without thesis	153				
Academic Reputation	PhD	428		2.460	.292	2<3
	Master's degree with thesis	664	2			
	Master's degree without thesis	153				
Communication	PhD	428		1.161	.560	2<1
	Master's degree with thesis	664	2			
	Master's degree without thesis	153				
Total Scale	PhD	428		1.716	.424	
	Master's degree with thesis	664	2			
	Master's degree without thesis	153				

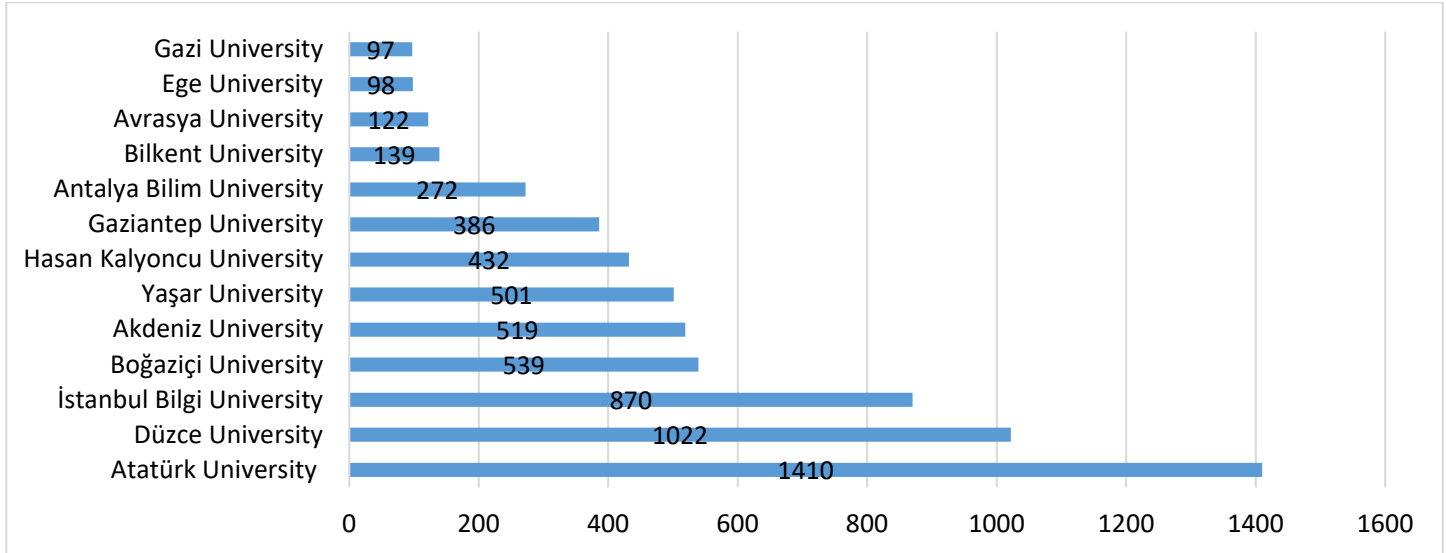
After reviewing Table 10, it is apparent that the type of education variable does not result in a significant difference

in postgraduate students' perceptions of university public relations across the combined dimensions of information,

academic reputation, communication, and the overall scale. However, it is worth noting that non-thesis master's students exhibit higher perceptions of university public relations in the context of distance education compared to master's and doctoral students with a thesis. Therefore, we can infer that students pursuing a non-thesis master's degree under pandemic conditions perceive distance education activities within the realm of public relations as more successful.

### Findings on Universities' Institutional Use of Twitter

The research investigated the question, "To what extent and for what purpose do universities use institutional Twitter as part of their public relations activities?" to address the third sub-problem. Figure 1 presents numerical data regarding the tweets shared by the respective universities between September 1, 2019, and August 31, 2020.



**Figure 1.**

*Institutional Twitter Use by Universities (September 1, 2019-August 31, 2020)*

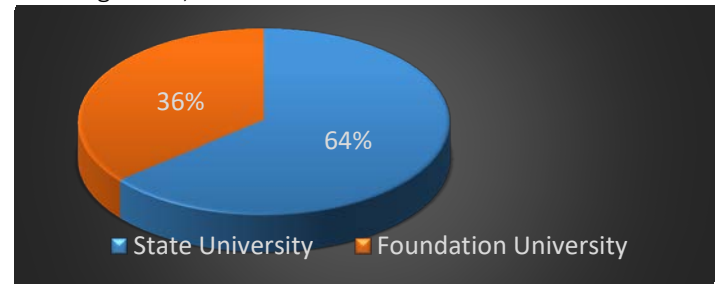
Figure 1 reveals that 13 universities posted a total of 6407 tweets within the specified timeframe. Notably, Atatürk University emerges as the most prolific contributor, followed by Düzce University, Istanbul Bilgi University, and Boğaziçi University. In contrast, Gazi University demonstrated comparatively minimal activity in terms of tweet frequency. This finding contradicts conclusions drawn in prior studies (Bingöl & Tahtaloğlu, 2017; Can, 2017; Yılmaz, 2015), which indicated Gazi University's active utilization of its corporate Twitter account.

Figure 2 illustrates the distribution of tweets posted by universities during the specified period, segmented by state and foundation universities.

As shown in Figure 2, the majority of tweets originated from state universities. While this observation aligns with findings from certain studies (Akyüz, 2019; Kandemir, 2019; Salur & Aydın, 2017), it differs from results obtained in other investigations (Çakaröz, 2018; Okmeydan, 2018; Yolcu, 2013). This discrepancy may be due to variations in university institutional Twitter use. Figure 3 depicts the current breakdown resulting from the categorization of tweets shared by universities between September 1, 2019,

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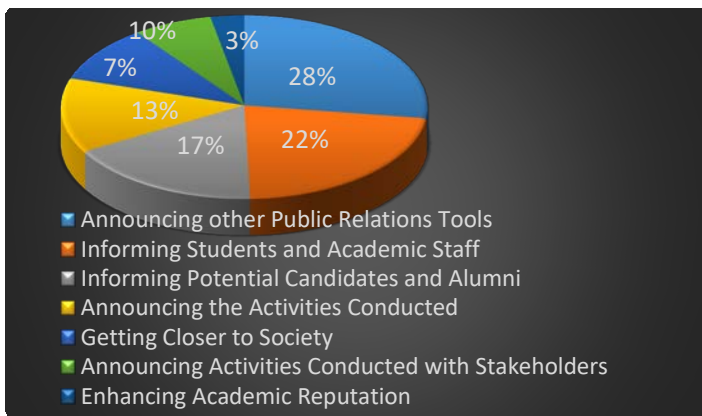
and August 31, 2020.



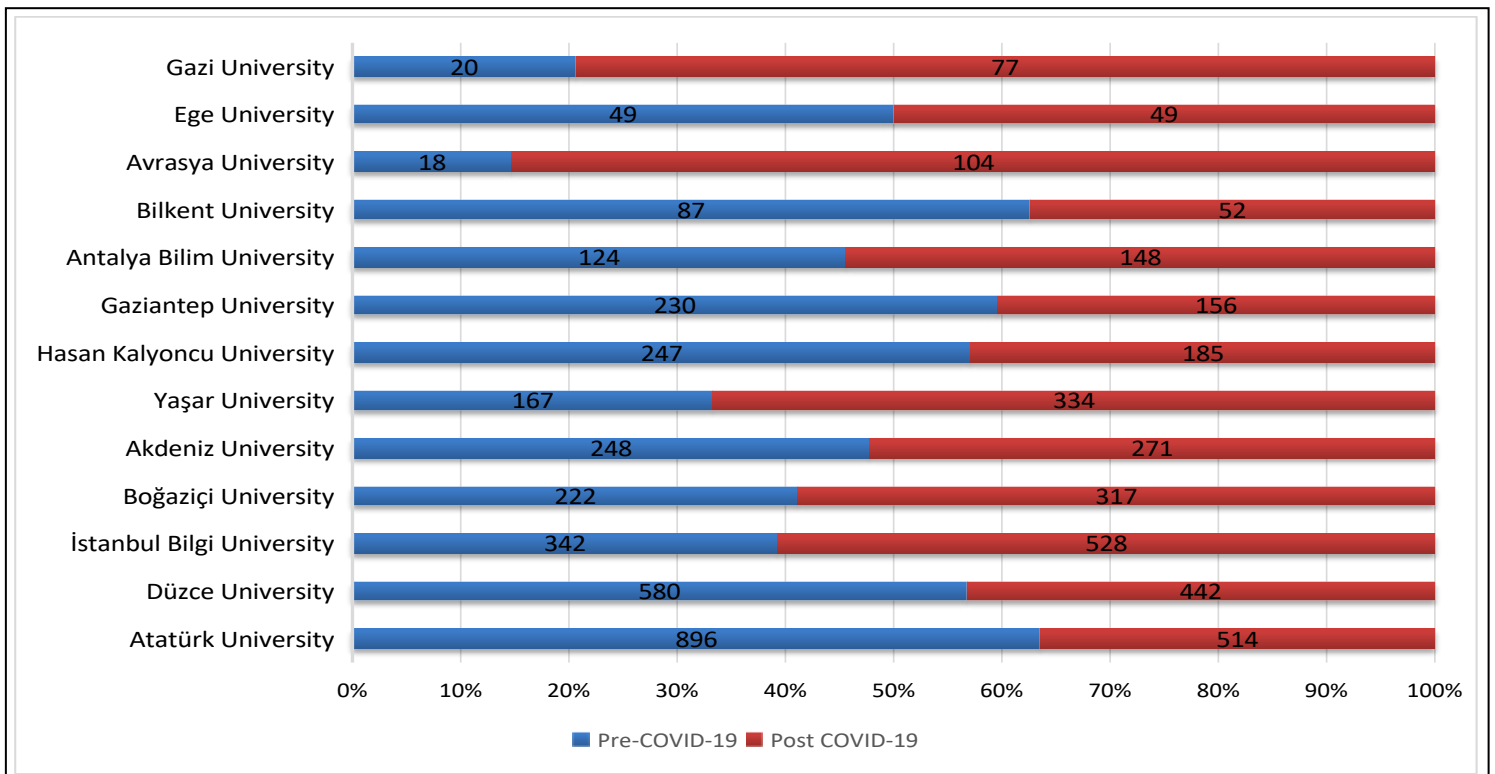
**Figure 2.**

*Distribution of Tweets by Universities Depending on State and Foundation Universities*

After analyzing Figure 3, it is evident that universities primarily use Twitter to share announcements about public relations activities, followed closely by using Twitter to inform students and academic staff about various activities. Therefore, we can conclude that universities mainly use their official Twitter accounts to provide information. This conclusion is supported by several studies (Çiftçi et al., 2014; Kandemir, 2019; Kimmons et al., 2017; Köseoğlu & Köker, 2014; Yılmaz, 2015). Furthermore, it is worth noting that universities engage less in sharing content aimed at enhancing their academic reputation.



**Figure 3.**  
*Categories Created from Tweets from Universities*



**Figure 4.**  
*Distribution of Tweets by Universities Pre- and Post-COVID-19*

The analysis of the data presented in Figure 4 revealed that universities demonstrated a comparable level of tweet activity before and after the COVID-19 pandemic. However, upon further examination of the tweet distribution, it became apparent that certain universities, such as Atatürk University, Düzce University, Hasan Kalyoncu University, Gaziantep University, and Bilkent University, displayed higher tweet volumes before the onset of the pandemic. Conversely, İstanbul Bilgi University, Boğaziçi University, Akdeniz University, Yaşar University, Antalya Bilim University, Avrasya University, and Gazi University demonstrated increased tweet activity post-COVID-19. Notably, Ege University maintained an equal number of

We divided the timeframe from September 1, 2019, to August 31, 2020, into two distinct periods: pre-COVID-19 and post-COVID-19, to evaluate the social media activity of universities before and after the onset of the COVID-19 pandemic. The pre-COVID-19 period covers the duration from September 1, 2019, to February 29, 2020, while the post-COVID-19 period extends from March 1, 2020, to August 31, 2020. Figure 4 provides insights into the sharing activities undertaken by universities during these delineated timeframes.

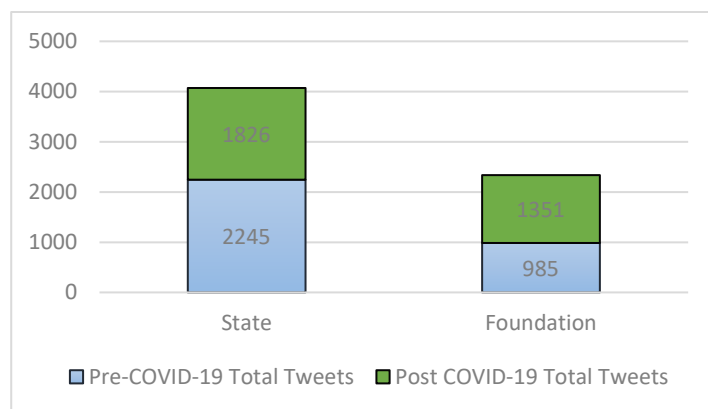
tweets before and after the pandemic. Moreover, it is noteworthy that Atatürk University exhibited the highest tweet frequency pre-COVID-19, while İstanbul Bilgi University emerged as the most active tweeting university post-COVID-19. Additionally, we identified Avrasya University and Ege University as the universities with the lowest tweet activity pre- and post-COVID-19, respectively.

Figure 5 provides further insights into the distribution of tweets among state and foundation universities before and after the pandemic.

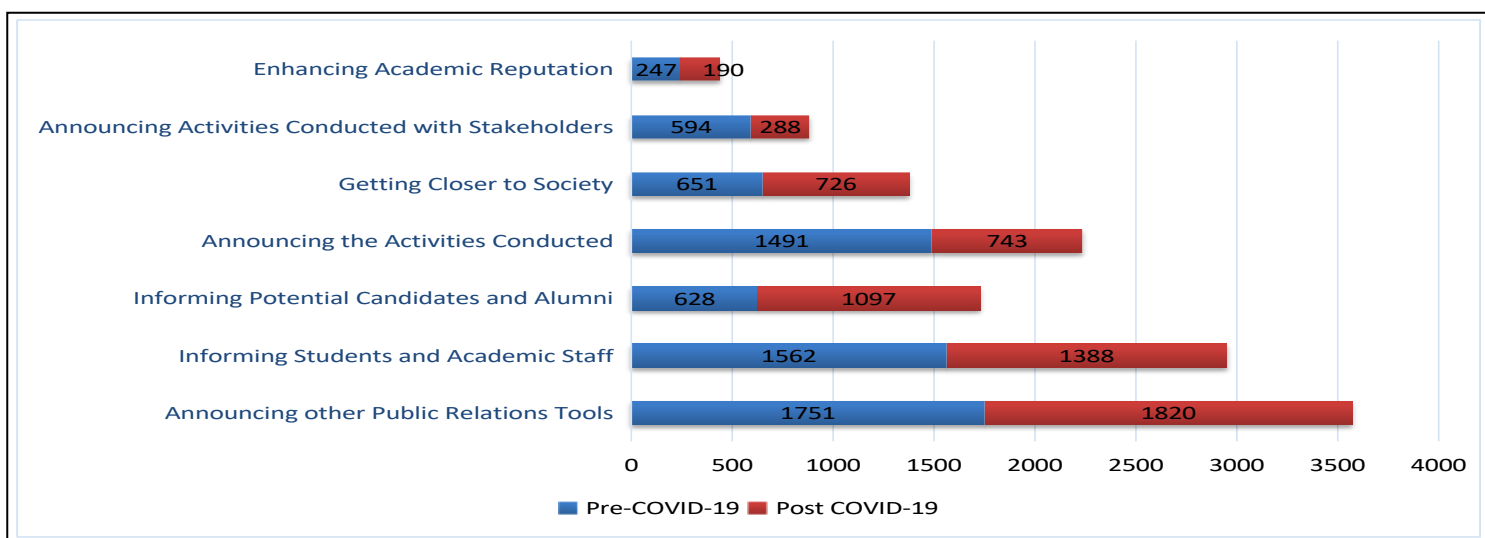


Based on the analysis of Figure 5, it is evident that state universities had higher tweet activity before and after the COVID-19 pandemic. However, there was a noticeable decrease in tweet frequency among state universities during the pandemic period. In contrast, foundation universities saw an increase in Twitter activity during the pandemic. This shift demonstrates a significant trend in social media engagement strategies between the two types of universities during the pandemic era.

Figure 6 illustrates the current distribution of tweets categorized through content analysis, segmented by the pre- and post-pandemic periods.



**Figure 5.**  
*Distribution of State and Foundation Universities' Shares Pre- and Post-COVID-19*



**Figure 6.**  
*Distribution of Categories Pre- and Post-COVID-19*

Based on the findings presented in Figure 6, an analysis of the current status resulting from the categorization of tweets by universities reveals several trends. Both before and after the COVID-19 pandemic, universities predominantly utilized their tweets to promote other public relations initiatives. Following this, there is a notable emphasis on disseminating information to students and academic staff. Furthermore, a consistent pattern emerges wherein universities allocate fewer tweets to enhance their academic reputation during both periods. However, during the pandemic, there has been a discernible increase in tweets aimed at promoting other public relations endeavors, informing prospective candidates and alumni, engaging with the community, and bolstering academic reputation. Remarkably, there is a significant decrease in the dissemination of tweets about activities during this period, likely attributed to the constraints imposed by the pandemic.

## Discussion

This study, which examined universities' public relations strategies and corporate Twitter use during the COVID-19 pandemic, revealed that postgraduate students found universities' public relations efforts adequate. However, a closer examination of the sub-dimensions reveals that postgraduate students primarily perceive universities as excelling in information dissemination and bolstering their academic reputation. The uniting of quantitative and qualitative data indicates a frequent emphasis on information dissemination by universities, a responsible strategy, particularly during tumultuous events such as the COVID-19 pandemic (Özen, 2021). Nonetheless, while such an approach is crucial for effective crisis communication, it is imperative to avoid its transformation into a prevailing corporate culture within the realm of public relations. Notably, the quantitative data revealed a subpar performance by universities in fostering communication

within the context of public relations, as well as a tendency for one-way information transmission in their institutional Twitter use. These findings underscore the importance for universities to embrace a dialogue-oriented approach in their public relations planning (Özkanal, 2006) and to adopt a bidirectional communication paradigm in their corporate utilization of Twitter (Veletsianos et al., 2017).

Examining universities' public relations approaches and their use of corporate Twitter reveals that the process relies heavily on information. On the other hand, research in the literature reveals that universities can also use their corporate Twitter accounts for purposes such as supporting education and training processes, branding, and marketing activities (Alhadid & Qaddami, 2016; Fomunyam, 2020; Junco et al., 2011; Mollett et al., 2011; Veletsianos et al., 2017). According to the findings of these studies, it is important for universities to use their institutional Twitter accounts to serve different purposes within higher education institutions.

In the quantitative phase of the study, as mentioned earlier, the academic reputation dimension emerged as one of the most positively perceived dimensions by postgraduate students. However, qualitative content analysis revealed that universities do not use their institutional Twitter accounts sufficiently to enhance their academic reputation. This suggests that factors other than social media presence can also significantly contribute to a university's academic reputation. For example, research shows that universities that have effective communication strategies, engage in social responsibility initiatives, and provide high-quality educational services tend to have positive academic reputations (Ensign & Woods, 2014; Güngör, 2018; Karaköse, 2007). Therefore, enhancing public relations efforts by increasing the dissemination of academic achievements and other relevant content through institutional Twitter accounts can potentially strengthen the academic reputation of universities.

According to postgraduate students' perceptions, distance education activities are generally not easily accessible to potential students. Moreover, students note live broadcasts from universities' social media accounts as attention-grabbing endeavors. However, in the qualitative aspect of the research, it is evident that universities, apart from Istanbul Bilgi University, Boğaziçi University, and Yaşar University, do not organize such educational activities or promote them via their corporate Twitter accounts. Consequently, it can be argued that the dissemination of open-access course applications, a practice commonly utilized in the United States and adopted by some

universities in Türkiye (Haymana & Dağhan, 2020; Tepgeç et al., 2021), may also prove beneficial in terms of enhancing public relations.

The study found that postgraduate students enrolled in foundation universities have more positive perceptions compared to those attending state universities. However, the qualitative analysis revealed that state universities are more active in using corporate Twitter accounts. Therefore, it is important to examine the factors that contribute to the positive perceptions of postgraduate students in foundation universities and to evaluate the impact of institutional Twitter use on university public relations.

Postgraduate students believe that universities effectively use their official social media accounts, but there is a noticeable difference in the use of institutional Twitter accounts. It's worth noting that Atatürk University, Düzce University, and Istanbul Bilgi University are actively engaged on their official Twitter accounts, while Gazi University, Ege University, and Bilkent University have minimal activity on their official Twitter accounts. This situation requires further investigation to understand the reasons for the varying use of institutional Twitter accounts by universities.

Upon examination of universities' institutional Twitter use, it is evident that there are comparable levels of activity both before and after the onset of the COVID-19 pandemic. Given that all activities shifted to online platforms during the pandemic, it is notable that universities did not demonstrate an increase in their social media presence during this period. We presume that the pandemic's disruptions are responsible for this phenomenon. Hence, universities need to develop a crisis communication plan in advance of similar events to ensure effective communication strategies (Mavnacioğlu, 2018).

This research is based on the PRPES, which examines the public relations of universities based on information, distance education, academic reputation, and communication during the COVID-19 outbreak, as well as the public relations of two universities selected from each region. Moreover, the study restricts its scope to the data shared from institutional Twitter accounts between September 1, 2019, and August 30, 2020. In this context, the research results suggest the following recommendations:

1. In public relations, universities can implement policies to develop distance education and communication dimensions.

2. Through distance education, universities can carry out effective public relations activities.
3. The research can be conducted in a more limited population of specific universities.
4. Examining the current situation following the COVID-19 pandemic allows for comparison.
5. The reasons for the differences in the use of corporate Twitter by universities can be investigated.

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## Genişletilmiş Özet

### Giriş

Halkla ilişkiler, kuruluşların hitap ettikleri kitlenin beklentilerini karşılamalarını sağlayan önemli bir yönetim fonksiyonudur. Halkla ilişkiler aracılığıyla kuruluşlar, hedef kitlenin memnuniyetinin, güveninin ve sadakatinin geliştirilmesini ve sürdürülmesini sağlar (Çelebi, 2019). Bu sayede kuruluş ile hedef kitle arasında karşılıklı fayda sağlayan ilişkiler kurulur ve sürdürülür (Cutlip et al., 2001). Halkla ilişkiler aracılığıyla üniversiteler mevcut potansiyellerini belirleyebilir ve sunduklarını kamuoyuna sunabilir. Ayrıca, üniversiteler halkla ilişkileri hedef kitleleriyle iletişim kurmak (Sing, 2019), öğrenci potansiyelini ve devlet yardımlarını artırmaya yönelik faaliyetler düzenlemek için kullanılabilir (Bümen, 2017). Bu vesileyle üniversiteler sosyal medya aracılığıyla mevcut, mezun ve aday öğrencileri ve aileleriyle etkili iletişim kurmayı, kurumsal kimliklerini geliştirmeyi, öğrenciler ve akademisyenler tarafından daha fazla tercih edilmelerine katkı sağlamayı akademik bağlamda öğrenci ve akademisyenlere katkı sağlamayı ve kamuoyunun güvenini kazanmayı amaçlarlar (Boumarafi, 2015; Peruta ve Shields, 2017; Tanova & Amca, 2016). Twitter, kriz durumlarında güncel haberlerin hızlı bir şekilde paylaşılmasına olanak tanıyan bir özelliğe sahiptir. Bu özelliği nedeniyle Twitter, COVID-19 salgını sırasında üniversiteler tarafından öğrencilere, akademisyenlere ve diğer personele ulaşmak için yoğun bir şekilde kullanılmıştır (Kanılmaz, 2021). Ferrer-Serrano vd. (2020) tarafından yapılan araştırmada, pandemi döneminde üniversitelerin kurumsal Twitter hesaplarının kullanımının çok önemli olduğu vurgulanmış ve bu dönemde üniversitelerin kurumsal Twitter hesaplarının kamuoyu tarafından daha yakından takip edildiği belirtilmiştir.

Bu araştırma, kurumsal Twitter kullanımının üniversitelerin halkla ilişkilerindeki rolünü incelemeyi amaçlamaktadır. Bu amaçla aşağıdaki sorulara yanıt aranmıştır:

- 1) Lisansüstü öğrencilerin algılarına göre COVID-19 pandemisinde üniversitelerin halkla ilişkileri ne düzeydedir?
- 2) Lisansüstü öğrencilerin üniversitelerin halkla ilişkilerine yönelik algılarında yaş, cinsiyet, üniversite türü, araştırma alanı ve lisansüstü eğitim türü değişkenlerine bağlı olarak anlamlı bir farklılık var mıdır?
- 3) Üniversiteler kurumsal Twitter'ı halkla ilişkiler faaliyetlerinin bir parçası olarak ne ölçüde ve hangi amaçla kullanmaktadır?

### Yöntem

Çalışmada yöntem olarak pragmatist paradigmanın bir ürünü olan karma araştırma yöntemi tercih edilmiştir (Teddlie & Tashakkori, 2020). Karma yöntemin tercih edilmesinde tamamlayıcılık ilkesi belirleyici rol oynamıştır (Greene ve ark., 1989). Üniversitelerin halkla ilişkilerinin ortaya çıkarılmasında nicel araştırma; üniversitelerin kurumsal Twitter kullanımının incelenmesinde ise nitel araştırma yöntemi kullanılarak problem durumu açıklanmaya çalışılmıştır. Araştırmanın nicel boyutunun evrenini 2020-2021 akademik yılında Türkiye’de lisansüstü eğitimlerine devam eden öğrenciler oluşturmaktadır. Araştırmanın nitel boyutunun evrenini ise içerik analizinin başladığı 20 Aralık 2020 tarihinde Türkiye’de kurumsal Twitter hesabı bulunan 127 devlet ve 73 vakıf üniversitesi oluşturmaktadır. Örneklem belirlenmesinde amaçlı örnekleme yöntemi kullanılmış ve Türkiye’nin 7 bölgesinden en fazla takipçi sayısına sahip birer devlet ve vakıf üniversitesi çalışmaya dâhil edilmiştir. Doğu Anadolu bölgesinde vakıf üniversitesi bulunmadığı için araştırmada sadece devlet üniversitesi yer almıştır. Çalışmanın nicel boyutunda lisansüstü öğrencilerin algılarına göre üniversitelerin halkla ilişkilerini incelemek ve öğrencilerin algılarının demografik değişkenlere bağlı olarak anlamlı bir farklılık gösterip göstermediğini tespit etmek amacıyla Görgülü ve Erçetin (2021) tarafından geliştirilen Lisansüstü Eğitimde Halkla İlişkiler Ölçeği (LEHİÖ) kullanılmıştır. Çalışmada üniversitelerin kurumsal Twitter kullanımını analiz etmek için nitel araştırma kapsamında kullanılan içerik analizi tekniği tercih edilmiştir.

### Bulgular

Araştırma sonucunda lisansüstü öğrencilerin algılarına göre üniversitelerin halkla ilişkilerinin yeterli düzeyde olduğu görülmektedir. Lisansüstü öğrencilerin algılarına göre üniversitelerin bilgilendirme ve akademik itibar boyutlarında daha başarılı görüldüğü dikkat çekmektedir. Lisansüstü öğrencilerin üniversitelerin halkla ilişkilerine yönelik algılarında yaş ve araştırma alanı değişkenlerine bağlı olarak bilgilendirme, uzaktan eğitim, akademik itibar, iletişim boyutlarında ve ölçeğin tamamında anlamlı bir farklılık olmadığı görülmektedir. Diğer yandan lisansüstü öğrencilerin üniversitelerin halkla ilişkilerine yönelik algılarında cinsiyete bağlı olarak bilgi, iletişim ve toplam ölçekte anlamlı bir farklılık olmadığı dikkat çekmektedir. Buna karşın uzaktan eğitim ve akademik itibar boyutlarında anlamlı bir farklılık söz konusudur. Bu bağlamda uzaktan eğitim boyutunda erkek öğrencilerin akademik itibar boyutunda ise kadın öğrencilerin üniversitelerin halkla ilişkilerine yönelik algılarının daha yüksek olduğu tespit edilmiştir. Buna ek olarak vakıf üniversitelerinde okuyan öğrencilerin üniversitelerini halkla ilişkiler faaliyetleri açısından daha başarılı buldukları tespit edilmiştir. Ayrıca eğitim türü değişkeninin lisansüstü öğrencilerin üniversitelerin halkla ilişkilerine



yönelik algılarında bilgi, akademik itibar, iletişim ve ölçek toplamında anlamlı bir farklılık yaratmadığı belirlenmiştir. Buna karşın uzaktan eğitim bağlamında üniversitelerin halkla ilişkiler faaliyetlerini tezsiz yüksek lisans öğrencilerinin, tezli yüksek lisans ve doktora öğrencilerine göre daha başarılı buldukları tespit edilmiştir.

Araştırmanın nitel boyutundaki veriler incelendiğinde 1 Eylül 2019-31 Ağustos 2020 tarihleri arasında 13 üniversitenin 6407 tweet gönderdiği görülmektedir. Bunun yanında en çok paylaşım yapan üniversitenin Atatürk Üniversitesi olduğu dikkat çekmektedir. Bu üniversiteyi Düzce Üniversitesi, İstanbul Bilgi Üniversitesi ve Boğaziçi Üniversitesi takip etmektedir. Buna karşın Gazi Üniversitesi en az paylaşım yapan üniversite konumundadır. Diğer yandan üniversiteler tarafından gönderilen tweetlerin çoğunluğunun devlet üniversitelerine ait olduğu görülmektedir. Aynı zamanda üniversitelerin diğer halkla ilişkiler araçlarını duyurmak için daha fazla tweet attığı dikkat çekmektedir. Üniversitelerin COVID-19 öncesi ve sonrası benzer sayıda paylaşım yaptığı tespit edilmiştir. Buna ek olarak devlet üniversitelerinin COVID-19 öncesi ve sonrasında daha fazla paylaşım yaptığı belirlenmiştir. Ancak pandemi döneminde devlet üniversitelerinin tweetlerinin azaldığı ve vakıf üniversitelerinin tweetlerinin pandemi döneminde artış gösterdiği dikkat çekmiştir.

### **Sonuç**

COVID-19 pandemisinde üniversitelerin halkla ilişkilerini ve kurumsal Twitter kullanımlarını incelemek amacıyla gerçekleştirilen bu araştırma sonucunda, lisansüstü öğrencilerin algılarına göre üniversitelerin halkla ilişkilerinin yeterli düzeyde olduğu görülmektedir. Ancak alt boyutlar incelendiğinde, lisansüstü öğrencilerin algılarına göre üniversitelerin bilgilendirme ve akademik itibar açısından daha başarılı olduğu görülmektedir.

Nitel ve nitel veriler birlikte değerlendirildiğinde üniversitelerin genel olarak bilgilendirmeye gereken önemi verdiği görülmektedir. Bu durum özellikle COVID-19 pandemisi gibi kaotik olaylarda kriz iletişimi açısından doğru bir yaklaşım olarak değerlendirilebilir (Özen, 2021). Ancak bu uygulamanın halkla ilişkiler açısından bir kurum kültürü hâline gelmesi istenen bir durum olarak görülmemektedir. Araştırmada üniversitelerin halkla ilişkiler bağlamında iletişim boyutunda ortalamanın altında bir seviyede olması ve üniversitelerin kurumsal Twitter kullanımının çoğunlukla tek yönlü bir bilgi aktarımından ibaret olması bu konunun yeterince ele alınmadığını gözler önüne sermektedir.

# Effectiveness of Guided Inquiry Based Laboratory Instruction on Prospective Science Teachers' Procedural and Conceptual Understandings

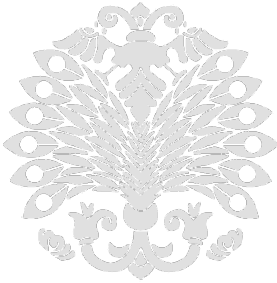
Rehberli Sorgulamaya Dayalı Öğretimin Fen Bilgisi Öğretmen Adaylarının İşlemsel ve Kavramsal Anlamalarına Etkisi

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## ABSTRACT

The purpose of this study was to interrogate the effectiveness of open guided inquiry laboratory approach on prospective science teachers' procedural and conceptual understanding of direct current circuits. The study was realized during the first year of teacher training program with participation of eight prospective science teachers (PST). Laboratory reports and observations notes were used as data collection instruments. The analysis, based on two fold effectiveness model considers what students do and achieve compared to what their teacher intended them to do and achieve. Inquiry based lab instruction was seen to be effective for nearly all PSTs in contributing to procedural understanding and conceptual understanding of a single loop circuit but not especially of a two-loop circuit containing resistors in parallel. It seems that activities in the domains of procedural and conceptual were improved depending on each other. Unavoidable scaffolding such as supplying experimental hardware and giving some hints by the lecturer during lab work contributed with varying amounts to the flow of activities and to learning outcomes from PSTs.

**Keywords:** Effectiveness, guided inquiry, direct current, circuit, prospective science teacher (PST)

## Öz

Bu çalışmanın amacı, doğru akım devreleri konusunda yürütülen açık rehberli sorgulama laboratuvar yaklaşımının fen bilgisi öğretmen adaylarının işlemsel ve kavramsal anlamaları üzerindeki etkilerini incelemektir. Çalışma, öğretmen yetiştirme programının 1.sınıfında öğrenim gören sekiz fen bilgisi öğretmen adayının katılımıyla gerçekleştirilmiştir. Veri toplama aracı olarak laboratuvar raporları ve gözlem notları kullanılmıştır. Toplanan veriler çift yönlü etkililik modeli kullanılarak adayların konuyla ilgili ulaştığı kazanımlar ile öğretim elemanının hedeflediği kazanımlar karşılaştırmalı olarak analiz edilmiştir. Sorgulamaya dayalı laboratuvar yaklaşımının öğretmen adaylarının hedeflenen kazanımlara ulaşmalarında seri bağlı devrelerde paralel bağlı devrelere göre daha etkili olduğunu göstermiştir. İşlemsel ve kavramsal alanlarındaki etkinliklerin birbirine bağlı olarak geliştiği görülmüştür. Laboratuvar çalışmaları sırasında sağlanan destek ve rehberliğin etkinliklerin yürütülmesine ve öğretmen adaylarının öğrenme süreçlerine değişen derecelerde katkıda bulunduğu gözlenmiştir.

**Anahtar Kelimeler:** Etkililik, rehberli sorgulama, doğru akım, devre, öğretmen aday

## Introduction

When schools began to teach science formally laboratory work became a characteristic feature of science education (Hofstein & Kind, 2012) and, at the beginning of twenty century, laboratory activities were used almost exclusively for illustrating information presented by the teacher and the textbook (Jenkins, 2002; Lunetta et al., 2007). With the reform in science education in the 1960s, the laboratory became the core of science learning and teaching processes (Hofstein & Lunetta, 1982) and the new curriculums planned to engage students in investigation, inquiry and hands-on activities (Lunetta et al., 2007). The aim of this approach was to have students understand science by performing activities in a school laboratory, such as designing experiments, collecting and processing data and reaching certain scientific relations. Studies during 1970–1980 showed that learning outcomes from school graduates did not quite match the proposed goals of science education (Lunetta et al., 2007), because teachers preferred a cook-book approach and teaching practice in the laboratory did not change much towards an open-ended style suggested by the reform (Tamir & Lunetta, 1981). In 1980-1990, there was little evidence about students being provided with opportunities to engage in the process of constructing knowledge by doing science in lab experience (Hodson, 1993; Tobin, 1990) and students failed to achieve the expected conceptual and procedural understandings. Hodson (2001) wrote that although essential outcomes for lab work were articulated in the past, the nature of student's performance in lab and related assessment practices remained relatively unchanged. After 1990s, rapid technological development calling for educational systems with high-quality science education required reforms in this area and provided support for inquiry learning (Bybee, 2000; Duit & Tesch, 2010; Hofstein & Kind, 2012). To offer students important opportunities such as investigative experience with which the students can construct scientific concepts, it was suggested that the school science laboratory should focus on inquiry (Hofstein & Lunetta, 2004). Because inquiry-focused teaching rests on the constructivist notion claiming that learning is a process in which the student actively constructs personal ideas and links them with other ideas in a complex network (Duschl & Grandy, 2008; Harlen, 2013). With scientific inquiry, it is expected that students are at least able to understand the rationale of an investigation and critically analyse the collected data (Lederman & Lederman, 2012).

In spite of changes occurred in science curriculums and teaching sources, many of the activities in the science

laboratory continued ritualistically according to 'cook-book' type lists of tasks (Hofstein & Lunetta, 2004; Kind et al., 2011; Lunetta et al., 2007; Royuk & Brooks, 2003). Although this type of laboratory instruction is the most popular, and yet the most heavily criticized (Wieman, 2015), teachers' implementation of practical work did not seem to have changed over the last century (Hofstein & Kind, 2012; Mamlok-Naaman et al., 2018). One of the reasons for this situation, according to Tiberghien et al. (2001), and Sere (2002), is that the objectives articulated for the laboratory (i.e. understanding theories, concepts, and laws; conducting experiments) were too numerous and comprehensive for teachers to address successfully in individual laboratory sessions. The other is that change or manipulation in the past and at present occurs in equipment but not in ideas is a problem related to teachers' fear of losing control in the classroom and assessment (Mamlok-Naaman et al., 2018; Millar & Abraham, 2009). Therefore, inquiry-type activities in science laboratory should be conducted in the context of and integration with concepts to be taught (Mamlok-Naaman et al., 2018) and limited by specific learning objectives (Abraham & Millar, 2008; Buning et al., 2018; Jenkins 1999; Sere, 2002).

'Inquiry' is one of the teaching and learning strategies that must be mastered to design courses and laboratories (Andersson, 2017; Forcino, 2013; Hofstein & Lunetta, 2004; Molohidis & Hatzikraniotis, 2018) and it is necessary to introduce prospective teachers to inquiry-based learning and affect epistemologies of PSTs (Crawford, 2000; Wilcox & Lewandowsky, 2016). Because inquiry as a learning strategy is interwoven with explicit instruction and well-scaffolding opportunities (Darling-Hammond et al., 2020), lab activities based on inquiry teaching approach can take multiple forms from teacher-lead to student-led processes as sometimes expressed by the degree of 'openness' (Hegarty-Hazel, 1986; Molohidis & Hatzikraniotis, 2018). The more responsibility students have for conducting an activity, the more "open" the inquiry; the more responsibility the teacher takes, the more "guided" the inquiry. For the students' gradual transition from verification to more open inquiry, the teacher should vary the amount of guidance (Eick et al., 2005; Molohidis & Hatzikraniotis, 2018): Verification inquiry indicates the closed lab approach to verify the theory and open inquiry corresponds to the open-ended lab procedure (Fitzgerald et al., 2019; Tiberghien et al., 2001). Due to its nature, an open-ended laboratory approach requires creativity, imaginative intelligence and experience and thus is challenging (Piaget, 1964; Toothacker, 1983) and open-ended experimental activities may only be learned in long-lasting step-by-step attempts

(Andersson, 2017; Duit & Tesh, 2010). In addition, minimal guidance in open inquiry may cause failure at acquisition of science content knowledge (Kirschner et al., 2006; Mayer, 2004).

Guided inquiry indicates the guided inquiry in which students are provided with the question and procedure but are requested to generate an explanation supported by the evidence they collected (Molohidis & Hatzikraniotis, 2018). In open guided inquiry students are provided with the research question, and sometimes with experimental setup, and are supposed to design the remaining steps. In this study lab activities on direct current circuits were conducted with open guided inquiry and their effectiveness on prospective science teachers' procedural and conceptual understanding of the subject was interrogated.

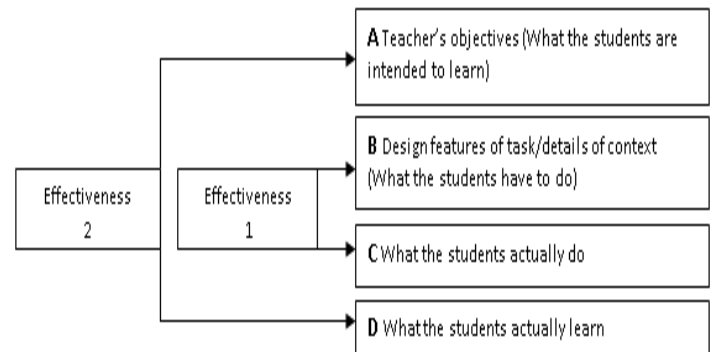
### Theoretical Framework

In order for an assessment to be effective it is necessary to consider conceptual understanding, procedural understanding and related skills (Reiss et al., 2012). Conceptual understanding means a knowledge base of substantive concepts such as the laws of physics which are underpinned by scientific facts (Duggan & Gott, 2002). Conceptual knowledge refers to patterns and interrelationships among the basic elements within a larger structure that enable them to function together. Conceptual knowledge and 'factual' knowledge together is named as 'declarative' knowledge about facts (Jiamu, 2001). Procedural understanding means 'the thinking behind the doing' of science and is complementary to conceptual understanding (Gott & Duggan, 1995). It includes decisions on measurements, ranges, patterns of data and the completion of the task (Duggan & Gott, 2002).

Many studies have been conducted to investigate the educational effectiveness of lab works in science education (Hofstein et al., 2008) and preferred to assess student's knowledge of conventional science facts and indicated that students enjoy laboratory works (Lunetta et al., 2007). But, it was emphasized that little attention was paid to searching the characteristics, such as cognitive development, of the student sample, the nature of laboratory teaching by teachers and their expectations and assessment practices (Hofstein & Lunetta, 1982; 2004) and the interrelationships between various instructional approaches and their impact on learning outcomes in different contexts (Hmelo-Silver et al., 2007). Although the potential of laboratory learning is valued, its effect on students' learning is still controversial (Ding & Harskamp, 2011) and research findings in the effectiveness of practical work in enhancing the development of conceptual understanding in science remain ambiguous (Abraham & Millar, 2008; Abrahams &

Reiss, 2012).

Although in literature a number of goals in laboratory instruction have been identified (Jenkins, 1999; Singer et al., 2006), the main purpose of all lab works for students should be to establish links between two 'domains' of knowledge: objects and observables and ideas (Tiberghien, 2000; Tiberghien et al., 2001). A useful model to develop and evaluate the effectiveness of laboratory work developed by Millar et al. (1999) is represented by Figure 1.



**Figure 1.**

*Models of the Process of Design And Evaluation of a Practical Task by Millar et al. (1999)*

The starting point, Box A, is the teacher's learning objectives, what the teacher wants the students to learn. The next step, Box B, is to design practical tasks that might enable students to achieve the desired learning objectives. Box C asks 'what the students actually do' and Box D, the final stage of the model, concerns 'what students learn as a result of the tasks'. This model distinguishes two category of effectiveness. Effectiveness 1 is the extent to which the students' actions match those intended by the teacher. A second and rather stronger measure of effectiveness 2 is the extent to which students' learning matches the learning objectives.

It is seen that this model will be a useful tool for us to assess the effectiveness of guided inquiry laboratory instruction in PSTs' procedural and conceptual understandings of direct current circuits. Effectiveness 1 is about procedural understanding and Effectiveness 2 is related to a better conceptual understanding resulting from different lab approaches (Lazarowitz & Tamir, 1995; Psillos & Niedderer, 2002). In effectiveness model, differently experimental studies, the relationship between the instructor's expectations from teaching and the learners' achievements is evaluated as effectiveness. Therefore, in this study, answers were sought for the following two research questions:

- How does guided inquiry based laboratory instruction contribute to prospective science

teachers' procedural understanding about direct current circuits?

- How does guided inquiry based laboratory instruction contribute to prospective science teachers' conceptual understanding of direct current circuits?

## Methods

### Context and Participants

Designed lab activities were conducted with prospective science teachers of the teacher training program in a state university. Because current scientific education curriculum encourages instructors to adopt inquiry-based teaching methodologies, integrating inquiry approaches into teacher training procedures is critical. PSTs graduated from primary and secondary schools with teaching programs which require designing learning environments to be based on inquiry. The PSTs participating in this study had some prior knowledge about DC circuits obtained in primary and secondary education.

In addition, science courses in the teacher training program of the university where this research was conducted are run using generally the didactic approach and the laboratory works are conducted using traditional approaches of verifying the facts taught in lectures or written in textbooks. The rationales for adopting this pedagogical approach have been examined in the context of various studies (e.g. Arslan et al., 2014; Feyzioğlu et al., 2014, Feyzioğlu, 2019): Limitations in time and resources such as tutors and materials and crowded classes naturally affected experimental activities which students were requested to complete step by step, reach certain results and write lab reports until the next session. Following the new regulations in accepting students to teacher training programs, a decrease in the number of prospective science teachers occurred. This decrease provided better opportunities for our participants to be engaged in inquiry-based lab approach.

This study was realized during the first year of teacher training program with participation of all the PSTs (eight PSTs) who attended the Physics II course, four hours in a week, and the Physics II Laboratory, two hours in a week. Although there were many subjects within the scope of this course, the subject of simple electric circuits appropriate for experiment was selected which is common in primary and secondary education programs with alternative conceptions (Engelhart & Beichner, 2004; Lee & Law, 2001). The subject of current and circuits was intentionally not taught

theoretically in the Physics II lectures until the activities in the lab ended because the researcher planned not to be involved in the subject before the lab instruction.

### Process

Because laboratory work includes a wide variety of tasks, to question the effectiveness of laboratory activities it is recommended that specific learning objectives (LO) be specified (Millar et al., 2002). During lab activities, participants were tasked with devising and constructing electrical circuit mechanisms aimed at elucidating the correlation between current and potential difference in both series and parallel circuits concerning electric current. To achieve this goal, a series of studies during five weeks was designed in a progressive manner.

Week 1: Setting up a simple electric circuit consisting of a single bulb and a battery, observing the brightness of the bulb, drawing the circuit diagram and measuring the current.

Week 2: Measurement of current in a series-connected circuit and exploration of the impact of varying potential difference on current.

Week 3: Measurement of current in a parallel-connected circuit and investigation of the influence of potential difference changes on current.

Week 4: Examination of potential values variations between different circuit elements in a series-connected circuit (between battery terminals, between individual bulb ends, and across the end points of the series combination), along with an analysis of how changes in potential difference affect these measurements.

Week 5: Evaluation of potential difference between the ends of different circuit elements in a parallel-connected circuit (between battery terminals, between individual bulb ends, and across the end points of the series combination), and an exploration of the impact of potential difference changes on these measurements.

Considering the general structure of inquiry-based activities, the inquiry process was carried out every week within the framework of the following steps:

Step 1: The first stage involves presenting the problem upon which the experimental setup is based.

Step 2: Following that, a comprehensive group discussion is



conducted to determine the characteristics of the electrical circuit that can be designed in accordance with the problem.

Step 3: Subsequently, each participant engages in the individual design and assembly of electrical circuits that are suitable for addressing the problem.

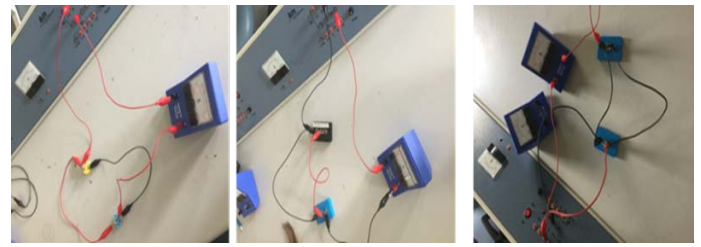
Step 4: During this step, the lecturer observes the students' work and provides guidance as needed.

Step 5: Finally, there is an evaluation of the completed experimental setups. In this phase, the instructor assesses the accuracy of the students' work. If any setup is found to be incomplete or incorrectly configured, the instructor asks probing questions to help the students identify and rectify the issues. For instance, if the lamp isn't lighting up, the instructor might inquire about the circuit's correct setup and potential mistakes, guiding the students accordingly. Depending on the specific situation, various forms of guidance are provided. For instance, students may be asked to draw a parallel-connected electrical circuit diagram first and then use it as a reference to construct the actual electrical circuit using real materials.

The difficulties observed during the inquiry process and the interventions are summarized below:

In the first week of the lab activities PSTs use of a power supply in setting up the required electric circuit was observed, with the result that the bulbs were not lighted, because inappropriate terminals on the power supply were used (Difficulties 1). For example, one end of the circuit was inserted in the port DC/1.5V while the other end was put in AC/1.5V or in DC/3V. The lecturer reminded PSTs to work with direct current (DC) quantities while the abbreviation AC stands for alternating current. A number of PSTs were observed to have some difficulties in measurement with an ammeter. In one of them some PSTs used the ammeter with mA (miliAmpere) scale instead of A scale and were not able to determine the current (Difficulties 2). The other difficulty aroused in estimating the current values corresponding to intermediate divisions on the ammeter (Difficulties 3). The lecturer supplied guidance on reading of the intermediate positions of the pointer and the fact that the current values would be too large for a mA device to measure.

In the first three weeks PSTs performed activities on current measurements in one and two loop circuits, reading the potential differences displayed on the supplying source without using a voltmeter. During the activities with two loop circuits the majority of ammeter connections were erroneous as exemplified in Figure 2.



**Figure 2.**

*Experimental Configurations set up by PSTs*

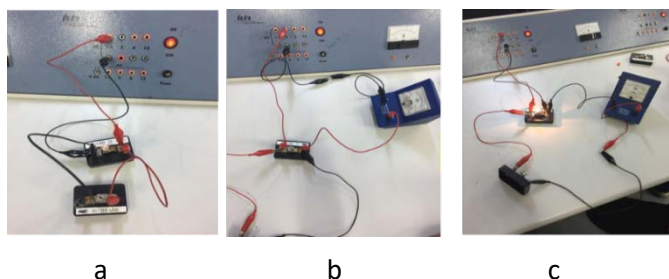
A tendency of PSTs to connect one end of the ammeter to the power source was observed which can be attributed to the effect of the connecting style used in a single loop, where it was valid (Difficulties 4). The very tendency may be seen in measuring the current through a single loop circuit with two bulbs in series, too, where one would normally expect to insert the ammeter between the two bulbs. But none of the PSTs carried out such a connection.

In the third week, it was observed that PSTs had difficulty mostly in connecting the ammeter in parallel-connection circuits to measure the currents through various bulbs (Difficulties 5). Most PSTs initially set up their parallel circuit as in Figure 3a and connected the ammeter as in Figure 2 and, following guidance from the lecturer, set up the circuit as shown in Figure 3b, thus were able to measure the current through the main branch (Difficulties 6). Similarly, they became able to connect the ammeter correctly and measure the currents through the second bulb as shown in Figure 3c. To measure the current through the bulb near the power supply they connected the ammeter as shown in Figure 3b which means a repetition of the measurement of the main current, and thus failed to measure the intended current. The lecturer drew attention to the connection points in the circuit diagram and suggested the use of additional connection cables in circuit as shown in Figure 3a, thus contributed to the measurement of the current through the nearby bulb.

In the last two weeks PSTs measured potential differences in circuits connected in series and in parallel using a voltmeter. Although at the beginning some PSTs were not able to connect the voltmeter correctly to the series circuit, afterwards they did not in general have difficulty in using the voltmeter (Difficulties 7). It was observed that PSTs measured potential differences only between the ends of the bulbs, but they did not measure the potential difference between the terminals of the battery while the battery was supplying current to the circuit (Difficulties 8). When they were asked why they did not, they stated that the potential difference (emf) of the battery or power supply was already



known!



**Figure 3.**

*Experimental Configurations set up by PSTs*

During the execution of the inquiry-based activities, prospective teachers were also required to maintain laboratory diaries. These diaries had to document the circuits they constructed, the accompanying diagrams, and the measurements they obtained. The purpose of these diaries was to facilitate reflection and self-assessment.

Throughout the teaching process, the instructor played a crucial role by reviewing these diaries. The instructor's primary goal was to identify elements that could hinder the PSTs' scientific learning, such as errors, difficulties, or mistakes. The instructor intervened constructively, aiming to help PSTs recognize and rectify their shortcomings during the learning process.

### Data Collection Instruments and Analysis

In this study, two sources were used as research data: the observation notes taken during practical exams were used to analyse participants' procedural learning and laboratory reports were used to analyse participants' conceptual learning.

Observations notes taken in the practical exam  
Observations notes were used both to see the activities of PSTs, provide guidance on the challenges they faced, and assess performances in the practical exam; this exam was carried out three weeks after laboratory activities. In this exam, participants were required to perform independent laboratory activities, similar to the ones they conducted previously during the laboratory process, without any external assistance (such as such as configuring parallel and serial circuits and conducting the requisite measurements).  
Laboratory Reports

The other data source was lab reports, important for researchers to make decisions about the next step in teaching, to assess and interpret student performance and the effects of laboratory experience on learning (Lunetta et

al., 2007). These reports, containing data obtained from all experiments and general results deduced from data, were written by PSTs following experimental activities. Data obtained from diaries and lab reports were analysed using deductive content analysis (Patton, 2002) with consideration of learning objectives. Firstly, data such as values of currents and potential differences in lab reports and diaries were compared for consistency and then diaries and lab reports together were analysed to understand how PSTs drew conclusions from their data. The laboratory reports encompass the data obtained by the PSTs from all the experiments they conducted throughout the entire instructional process and the results obtained by correlating these data with each other.

In summary, within these reports, PSTs are anticipated to establish the correlation between potential difference and current in a basic electrical circuit, as well as the correlation between potential difference and current in parallel and series-connected circuits.

Ethics committee approval was obtained from Giresun University Local Ethics Committee (Date: 28.04.2022, Number: E-50288587-050.01.04-87709). Written informed consent was obtained from pre-service teachers who participated in this study.

### Data Analysis

In this study, the 'effectiveness' within the adopted Effectiveness model is assessed in terms of the correspondence between the instructor's expectations and the learners' achievements. To this end, the study first established objectives set by the instructor, determined from the course content, encompassing both procedural and conceptual learning and subsequently, compared the PSTs' attainment of these objectives.

According to Hunt et al. (2012), practical lab skills should be assessed by observing what the students are actually performing in the laboratory rather than assessing written lab reports or written lab examinations. Data from observing the practical exam in the lab were analysed using deductive content analysis considering the activities targeted by the instructor, while data from observing activities were analysed using inductive content analysis. In this analysis, the performance of the participants in each experimental study according to the objectives of the course (Table 1) was described as successful or unsuccessful, and then the participants were individually evaluated.

**Table 1.**  
*Courses' Objectives Regarding Procedural Learning*

	Learning Objective	Successful / Unsuccessful
PLO <sub>1</sub>	Setting up a simple direct current circuit	
PLO <sub>2</sub>	Setting up an electric circuit with a series connection	
PLO <sub>3</sub>	Measuring current in a circuit with a series connection	
PLO <sub>4</sub>	Measuring potential differences in a circuit with a series connection	
PLO <sub>5</sub>	Setting up an electric circuit with a parallel connection	
PLO <sub>6</sub>	Measuring electric current through the main branch of a circuit with a parallel connection	
PLO <sub>7</sub>	Measuring electric current through the branches of a circuit with a parallel connection	
PLO <sub>8</sub>	Measuring potential differences in an electric circuit with a parallel connection	

Data obtained from lab reports were analysed using deductive content analysis with consideration of learning objectives. Based on the steps described by Patton (2002) regarding content analysis, at this stage, the Learning Objectives of the Physics II course, summarized below, were

taken into consideration and the achievement of the objectives was evaluated by examining the participants' reports.

**Table 2.**  
*Courses' Objectives Regarding Conceptual Learning*

	Learning Objective	Successful / Unsuccessful
CLO <sub>1</sub>	For the same resistor, increasing applied potential difference increases current, decreasing applied potential difference decreases current (Ohm's law)	
CLO <sub>2</sub>	For the same potential difference, a <b>series</b> combination of two resistors (bulbs) increases the equivalent resistance and decreases the electric current	
CLO <sub>3</sub>	In a circuit consisting of equivalent bulbs connected in <b>series</b> , the currents through the bulbs are equal	
CLO <sub>4</sub>	For the same potential difference, connecting a second equivalent resistor in <b>parallel</b> changes (decreases) the equivalent resistance and increases the current through the main branch	
CLO <sub>5</sub>	In a circuit consisting of equivalent bulbs connected in <b>parallel</b> , the currents through all bulbs are equal	
CLO <sub>6</sub>	In a circuit consisting of equivalent bulbs connected in <b>parallel</b> , the sum of the currents through the bulbs is equal to the current through the main branch	
CLO <sub>7</sub>	In a circuit consisting of equivalent bulbs connected in <b>series</b> , potential differences between the ends of each of the bulbs are equal	
CLO <sub>8</sub>	In a circuit consisting of equivalent bulbs connected in <b>series</b> , the sum of the potential differences between the ends of the bulbs is equal to the potential difference between the terminals of the battery	
CLO <sub>9</sub>	The potential differences between the ends of the bulbs connected in <b>parallel</b> are equal to each other	
CLO <sub>10</sub>	The potential difference between the ends of equivalent bulbs connected in <b>parallel</b> is equal to the potential difference between the terminals of the battery	

### Role of the Researchers

Lab activities were administered by one of the researchers alone without teaching assistants and technicians. The researcher was the complete participant taking on the role of an insider, becoming a member of the group being studied and spending a sufficient but not too long to cause bias a time with PSTs. Use of triangulation methods and assigning the researcher the role of a complete participant are known to contribute to the internal validity of the study. In this study, the second researcher was involved in the identification and categorization of learning objectives, as well as in the validation of data analysis. In this context, the

data analysis conducted by the first researcher was subjected to random verification, resulting in a high degree of consistency.

### Results

Findings about prospective science teachers are presented in three sections, procedural and conceptual understandings and holistic analysis of achievement.

#### Prospective Science Teachers' Procedural Understanding

In this section findings obtained from the activities of PSTs

in the practical exam, Effectiveness 1 which is related to procedural understanding, are presented in Table 3. According to Table, all of PSTs were able to set up a circuit containing a single bulb, circuits with two bulbs connected

in series and in parallel and measure the values of current in the series connection.

**Table 3.**

*Type of Activities in the Practical Exam and Successful PSTs*

Types	Type of activity	Succeeding PSTs
PLO <sub>1</sub>	Setting up a simple direct current circuit	8 PSTs
PLO <sub>2</sub>	Setting up an electric circuit with series connection	8 PSTs
PLO <sub>3</sub>	Measuring current in a circuit with series connection	8 PSTs
PLO <sub>4</sub>	Measuring potential differences in an circuit with series connection	6 PSTs
PLO <sub>5</sub>	Setting up an electric circuit with parallel connection	8 PSTs
PLO <sub>6</sub>	Measuring electric current through the main branch of a circuit with parallel connection	5 PSTs
PLO <sub>7</sub>	Measuring electric current through the branches of a circuit with parallel connection	5 PSTs
PLO <sub>8</sub>	Measuring potential differences in an electric circuit with parallel connection	6 PSTs

According to Table 3 a minority of PSTs were unable to measure the potential differences in series and parallel connections, the main current and branch currents in a circuit with parallel connections.

It is seen that all of PSTs, except PST4, PST7 and PST8, set up all circuitry needed and measured the values of current and potential differences. While PST4 did not carry out type 6 and type 7 activities, PST7 and PST8 did not carry out type 4, 6, 7 and 8 activities. These PSTs did not succeed in measuring the potential differences in a series circuit, the currents and potential differences in a parallel circuit.

The data obtained during practical exam observation indicate that certain difficulties previously identified and intervened during the practice course have been resolved (Difficulties 1-4). The ongoing difficulties that are still encountered in the practical exam are summarized below.

- Difficulties 5 about connecting the ammeter in parallel-connection circuits to measure the currents through various bulbs.
- Difficulties 6 relating to measuring the current through the main branch,
- Difficulties 7 on connecting the voltmeter correctly to the series circuit.
- Difficulties 8 about measuring the potential difference between the terminals of the battery while the battery was supplying current to the circuit.

### **Prospective Science Teachers' Conceptual Understanding**

In this section findings, obtained from reports, on Effectiveness 2 which is related to conceptual understanding giving the degree of matching between students' learning and the learning objectives, are presented (Table 4). The conceptual understanding would be known that the data obtained from the ammeter readings can be understood in terms of scientific ideas, i.e the flow of electric charge is conserved in a parallel circuit (Abrahams & Reiss, 2015).

Table 4 reveals that certain objectives (CLO5 and CLO7) were attained by every PST, while several (CLO1, CLO2, and CLO9) were nearly universally achieved by the participants. However, a few PSTs accomplished others (CLO4 and CLO10). The attainment of the remaining learning objectives is outlined as follows: (CLO3, CLO6, and CLO8).

It is seen that CLO5 and CLO7 are achieved by all PSTs who measured equal currents through identical resistances in a parallel circuit, for example:

Since  $i_1=i_2=0,4$  A in C-6, the currents through the bulbs are equal (PST3, lab report)

**Table 4.**  
*Learning Objectives and PSTs' Outcomes*

LO	Details of Learning Objective (number of succeeding PSTs)	Succeeding PSTs
CLO <sub>1</sub>	For the same resistor, increasing applied potential difference increases current, decreasing applied potential difference decreases current (Ohm's law)	7 PSTs
CLO <sub>2</sub>	For the same potential difference, a <b>series</b> combination of two resistors (bulbs) increases the equivalent resistance and decreases the electric current	7 PSTs
CLO <sub>3</sub>	In a circuit consisting of equivalent bulbs connected in <b>series</b> , the currents through the bulbs are equal	5 PSTs
CLO <sub>4</sub>	For the same potential difference, connecting a second equivalent resistor in <b>parallel</b> changes (decreases) the equivalent resistance and increases the current through the main branch	2 PSTs
CLO <sub>5</sub>	In a circuit consisting of equivalent bulbs connected in <b>parallel</b> , the currents through all bulbs are equal	8 PSTs
CLO <sub>6</sub>	In a circuit consisting of equivalent bulbs connected in <b>parallel</b> , the sum of the currents through the bulbs is equal to the current through the main branch	4 PSTs
CLO <sub>7</sub>	In a circuit consisting of equivalent bulbs connected in <b>series</b> , potential differences between the ends of each of the bulbs are equal	8 PSTs
CLO <sub>8</sub>	In a circuit consisting of equivalent bulbs connected in <b>series</b> , the sum of the potential differences between the ends of the bulbs is equal to the potential difference between the terminals of the battery	3 PSTs
CLO <sub>9</sub>	The potential differences between the ends of the bulbs connected in <b>parallel</b> are equal to each other	7 PSTs
CLO <sub>10</sub>	The potential difference between the ends of equivalent bulbs connected in <b>parallel</b> is equal to the potential difference between the terminals of the battery	1 PSTs

On the other hand, all PSTs could set up a circuit containing two equivalent bulbs connected in series and measure the related currents as well as potential differences between the ends of each bulb and thus achieved CLO7:

Because values of potential differences between the ends of the bulbs are  $V_1=V_2=0.5$  volts, potentials are equal in C-3 (PST6, lab report).

But only three PSTs, PST2, 3, and 6, achieved CLO8 which states that the sum of the potential differences between the ends of the bulbs is equal to the potential difference between the terminals of the battery in a circuit of resistors in series. PST6 stated that 'because the potential differences between the ends of bulbs ( $V_1=V_2=0.5$  volts) and this value is about half the battery voltage (1.5 V), the total potential difference across the chain of bulbs (1.0 V) will approximately be equal to the potential difference between the terminals of the battery in C-3'. While PST6 did not mention the reason of this difference, 0.5 volts, PST2 stated that the reason for this difference was either the internal resistance of the battery or the heat losses in the bulbs:

In C-4, the potential difference for the combined two bulbs is  $V = 2$  volts, the potential difference between the terminals of the battery is 3V. The sum of the potential differences between the ends of the resistors is approximately equal to the potential difference of the battery. The reason why the total potential difference is measured as 2V instead of 3V is due to internal resistance of the battery or heat loss in the bulbs (PST2, lab report).

It was determined that PST2, like other PSTs, did not

measure the potential difference between the terminals of the battery while the battery was supplying current to the circuit. They compared the potential difference between the terminals of the battery while the battery was not supplying current to the circuit with the potential difference between the ends of the chain of bulbs. The explanation of PST3, who had achieved CLO8, was based on a partition of voltage:

In C-4, the voltage values between the ends of individual bulbs are equal to half of the voltage of the battery. The voltage generated by the battery decreases inversely proportional to the number of bulbs connected in series. This causes the two bulbs connected in series to be less bright than a single bulb (PST3, diary).

PST3 explained using only the partition of the voltage of the battery by two bulbs, missing the effect of the decreasing current. Because of this reasoning, PST3 was not able to achieve CLO2 and CLO4 which are related to a change in the equivalent resistance and thus in the current. While all PSTs, except PST3, achieved CLO2, only two PSTs achieved CLO4. Whereas most PSTs, PST4, 5, 6, 9 and 10, measured the current through the main branch and determined an increase when an identical bulb is connected in parallel:

The currents in the main branches for C-2 and C-6 were, respectively,  $i_2 = 0.2$  A, and  $i_3 = 0.4$  A (PST4, diary).

The current for the main branches: in C-2,  $i_2 = 0.24$  A, in C-6,  $i_3 = 0.44$  A (PST5, Diary).

The current through the main branch of C-2 was increased

from 0.32 A to 0.52 A, in C-6 (PST7, diary).

The current through the main branch of C-2 was increased from 0.2 A to 0.4 A, in C-6 (PST8, diary).

Although these PSTs measured the correct current values during practical work, they were not able to achieve CLO4. Most of these PSTs, PST4, 5, 9, and 10, also were not able to achieve CLO6 targeting the equality of the sum of the currents through identical bulbs connected in parallel to the current in the main branch. CLO4, CLO8 and CLO10 were the learning objectives achieved by a small number of PSTs and the CLO3, targeting the equality of currents through identical bulbs connected in series, was achieved by half of PSTs as seen in Table 5. This table summarizes the total number of CLOs achieved by each PST and the achievement record (+, -) of each CLO.

### Holistic analysis of prospective teachers' achievement of learning goals

Within this section, the outcomes of individual analysis, focusing on each participant, concerning the attainment of procedural and conceptual course objectives through inquiry laboratory practices among PSTs, are presented.

**Table 5.**

*Prospective Science Teachers' Achievements of Learning Objectives*

PSTs	Procedural Learning Objective (PLO)								T
	1	2	3	4	5	6	7	8	
PST <sub>1</sub>	+	+	+	+	+	+	+	+	8
PST <sub>2</sub>	+	+	+	+	+	+	+	+	8
PST <sub>3</sub>	+	+	+	+	+	+	+	+	8
PST <sub>4</sub>	+	+	+	+	+	-	-	+	6
PST <sub>5</sub>	+	+	+	+	+	+	+	+	8
PST <sub>6</sub>	+	+	+	+	+	+	+	+	8
PST <sub>7</sub>	+	+	+	-	+	-	-	-	4
PST <sub>8</sub>	+	+	+	-	+	-	-	-	4

+ : Achieved LO; - : Not achieved LO

Upon examining the participants' attainment levels of the established objectives (Table 5), it becomes evident that the level of achievement for procedural learning objectives surpasses that of the conceptual learning objectives. Consequently, it is observed that a majority of the prospective teachers successfully met all of the procedural learning objectives, while only one PST managed to accomplish all of the conceptual learning objectives.

Table 5 and 6 also indicate that one PST successfully attained all of the course's (procedural and conceptual) learning objectives. Additionally, four of the participants achieved a total of 13 or more objectives; two prospective teachers

reached over half of the targeted objectives and one PST attained only half of the targeted objectives.

**Table 6.**

*Prospective Science Teachers' Achievements of Learning Objectives*

PSTs	Conceptual Learning Objectives (CLO)										T
	1	2	3	4	5	6	7	8	9	10	
PST <sub>1</sub>	+	+	+	+	+	+	+	+	-	-	8
PST <sub>2</sub>	+	+	+	+	+	+	+	+	+	+	10
PST <sub>3</sub>	-	-	-	-	+	+	+	+	+	-	5
PST <sub>4</sub>	+	+	+	-	+	-	+	-	-	-	5
PST <sub>5</sub>	+	+	+	-	+	-	+	-	+	-	6
PST <sub>6</sub>	+	+	-	-	+	+	+	+	+	-	7
PST <sub>7</sub>	+	+	+	-	+	-	+	-	+	-	6
PST <sub>8</sub>	+	+	-	-	+	-	+	-	+	-	5

### Discussion and Conclusion

In this study, data obtained from observations at the beginning of lab works showed that most of PSTs were able to set up simple electric circuits but had various difficulties for example in measuring with an ammeter and selecting the appropriate terminals on the power supply. These difficulties disappeared later and PSTs did not display problems of this type in the next weeks and in the practical exam. During lab activities, most PSTs were able to set up the electric circuits containing one or two resistors connected in series and measure the currents but they had difficulties in setting up the circuit with two resistors to be connected in parallel and in measuring the currents. In the following practical exam, it was observed that all PSTs were able to set up the circuit containing two resistors to be connected in parallel but three of them were not able to measure the currents in this circuit. Most PSTs also had difficulty in connecting the voltmeter to the circuit with series bulbs during activities, but in the practical exam, only two of them were unsuccessful in measuring the potential differences. This fact points out that lab activities contributed to all PSTs' procedural understanding of setting up the needed circuits and measuring the current in a single loop circuit. The same is not valid for all PSTs' procedural understanding of measuring potential differences in circuits with series and parallel resistors and the electric currents in circuits with parallel resistors, similar to the results of Kariotoglou (2002) emphasizing partial achievements in reaching the procedural knowledge. The lab activities carried out without circuit diagrams or instruction manuals to follow were generally effective in enabling PSTs to do with objects and materials in single loop circuits, but effective for only the majority of PSTs in a two-loop circuit containing resistors in parallel.



Effectiveness 2 related to conceptual understanding means the degree of matching of what PSTs are intended to learn and what they actually learn (Table 4). Findings showed that all of PSTs reached almost half or more of the learning objectives. The CLOs reached by a small number of PSTs are related to the decrease in equivalent resistance when the number of bulbs connected in parallel is increased, and the connection between potential differences across the bulbs and the battery in series and parallel circuits. PSTs observed that an increase in the number of bulbs connected in series increased the resistance and decreased the current reached CLO2. However, the fact that the brightness of bulbs remained unchanged when the number of bulbs was increased in a parallel circuit might mask the decrease in equivalent resistance although the currents through the battery and resistor branches were measured by PSTs. This reminds the fact that practical work may be ineffective in directing students to reach scientific conclusions depending on their observations and data, no matter how carefully these are guided and constrained (Abrahams & Millar, 2008; Abrahams & Reiss, 2012; Pardo & Parker, 2010; Solomon, 1994). Among the reasons for most of PSTs to miss the internal resistance of the battery, and accordingly the relevant CLOs, one can mention the possibility that PSTs did not learn or remember this concept in their previous education and the lecturer did not supply any guidance on the issue. This supports the result that theoretical knowledge may influence and direct some PSTs about the experimental activities (Kariotoglou, 2002). If PSTs had been given extensive scaffolding and guidance (Hmelo-Silver et al., 2007) about measuring and comparing the potential differences across the battery while current circuit was or was not flowing through, more PSTs might possibly achieve CLO8 and CLO10. This finding is parallel to other results (Alfieri et al., 2011; Kirshner et al., 2006; Mayer, 2004) expressing that minimally guided instruction in a learning context in which learners must discover themselves does substantially not benefit them in improving learning outcomes. It seems that multiple scaffolding such as organising activities, supplying experimental tools and giving hints by the lecturer during lab activities contributed to continuing the flow of activities and to achieving most CLOs by PSTs (Darling-Hammond et al., 2020; Hmelo-Silver et al., 2007; Puntambekar & Kolodner, 2005; Quintana et al., 2004). However, scaffolding did not affect all PSTs to the same extent in achieving learning goals, in other words, 'gains were not uniform over all learner profiles' (Fernandez, 2017; Kariotoglou, 2002).

In spite of the fact that laboratory instruction plays an important role in the achievement of learning objectives, practical activities alone may not be sufficient to develop a

fully scientific model of a circuit system (Hofstein & Lunetta, 1982; Sanches et al., 2016; Sanches et al., 2018; Van den Berg et al., 1994). Because the conceptual and procedural knowledge are not separated but intertwined so that students are led to the knowledge of one level by making use of the knowledge of the other (Millar, 1998; Séré, 1999), some PSTs had difficulties to develop a conceptual understanding of electric currents in parallel branches of an electric circuit in the domain of ideas, and they were not able to carry out the activities in a parallel circuit in the practical exam, the domain of observables. Although some studies using the twofold effectiveness showed that practical work was highly effective in the domain of observables because 'recipe style' tasks were widely used by teachers and less effective in the domain of ideas (Abrahams & Millar, 2008; Abrahams & Reiss, 2012) but in this study lab activities seemed to show similar effectiveness in both domains. The use of an effectiveness model by Millar et al. (1999) especially contributed to the awareness of the lecturer about the difficulties of PSTs in procedural and conceptual understanding and led to improvements in inquiry-based lab implementations. This situation supports the results of Nivalainen et al., (2013) pointing out that the instructors as well as preservice teachers need real experiences in implementing inquiry-based laboratory approaches.

Although PSTs did not carry out extensive pre-university practical work and did not yet face with theoretical background at the university on direct current circuitry, guided inquiry laboratory instruction is considered to be promising in improving the majority of PSTs' procedural and conceptual understanding of the chosen subject and achievement of most LOs.

This study supports previous research indicating that directed inquiry improves secondary school students' scientific process abilities (Sağdıç et al. 2019) and conceptual understanding (e.g., Kale & Güzel, 2022; Yetiş, 2023;). Other studies, too, reported that guided inquiring laboratory instruction was more effective compared to traditional and more structured-guided inquiry instruction in developing content knowledge and process skills (Blanchard et al., 2010; Bunterm et al., 2014).

Based on the results of this study, it is recommended that future studies use various styles of inquiry, such as structured and confirmation, to suit participants' characteristics. Furthermore, future studies may provide comparative analyses of learning settings that use various types of inquiry.



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## Genişletilmiş Özet

### Giriş

Öğretim ortamlarının tasarlanmasında kullanılması gereken stratejilerden biri olan sorgulamanın, öğrenenlere bilgi, beceri ve bilimsel düşünme gibi farklı alanlarda kazanım sağlaması nedeniyle öğretim faaliyetleri kapsamında kullanılması gerekmektedir (Andersson, 2017; Wilcox & Lewandowsky, 2016). Bir öğrenme stratejisi olarak sorgulama, açık uçlu uygulamalar ve öğretmen desteği ile iç içe geçmiş bir yapıda olduğundan (Darling-Hammond ve ark., 2020), öğrenmenin sorumluluğunun öğretmenden öğrenciye, ardından tekrar öğretmene geçtiği bir öğrenme ortamı gerektirmektedir (Molohidis & Hatzikraniotis, 2018). Bu geçişlerde yer alan rehberlik boyutu, öğrencilere neyin bırakılacağına göre değişkenlik gösteren bir destek olarak tanımlanmaktadır. Bir rehberlik sürecinin parçası olarak düşünülen sorgulamaya dayalı öğretim sürecinde, bir uça geleneksel öğretmen önderliğindeki öğretimle sınırlandırılan doğrulayıcı sorgulama bulunurken, diğer tarafta öğrencilerin keşfederek öğrenmelerine imkan sağlayan aktiviteleri içeren açık sorgulama yer almaktadır (Minner ve ark., 2010). Bu iki düzey arasında, rehberliğin seviyesine göre rehberli sorgulama çeşitleri bulunmaktadır (Herron, 1971; Martin-Hansen, 2002; Schwab, 1962). Bu sorgulama çeşitleri öğrenenlere işlemsel, kavramsal, epistemik ve sosyal olmak üzere farklı alanlarda katkı sağlamakla birlikte, sorgulamaya dayalı öğretimin etkililiği genellikle sorgulamanın kavramsal alanına odaklanan ve iki grubun öğrenme sonuçlarının karşılaştırıldığı deneysel çalışmalar olmaktadır (Furtak ve ark., 2012). Ancak sorgulama ile öğrenenlerin sadece belirli öğrenme sonuçlarına ulaşmaları değil aynı zamanda bilimsel sorular geliştirmeleri, sonuca varabilmeleri için gerekli verileri toplayabilecekleri planlamaları yapmaları ve uygulamaya koymaları beklenmektedir (Lederman & Lederman, 2012). Bu nedenle bu çalışmada sorgulamanın yönergeleri yürütme ve veri toplama gibi özelliklerle ilişki olan işlemsel alanı ve belirli öğrenme sonuçlarına ulaşma anlamına gelen kavramsal anlam alanlarına odaklanılmıştır. Çalışmanın amacı açık rehberli sorgulamaya dayalı laboratuvar etkinliklerinin fen bilimleri öğretmen adaylarının basit elektrik devreleri konusundaki kavramsal ve işlemsel anlamalarına etkisini incelemektir.

### Yöntem

Laboratuvar öğretimiyle ilgili literatürde pek çok amaç tanımlanmış olsa da (Singer ve ark., 2006) laboratuvar etkinliklerinin temel amacı 'nesnel ve gözlemlenebilen olaylar' ile 'fikirler' şeklindeki iki bilgi alanı arasında bağlantı kurmaktır. (Tiberghien et al., 2001). Bu çalışmada laboratuvar çalışmalarının etkinliğinin değerlendirilmesi için Millar ve ark. (1999) tarafından geliştirilen çift yönlü bir etkililik modeli kullanılmıştır. 2 farklı etkililiğin tanımlandığı bu modelde, işlemsel anlamayla ilgili Etkililik 1 öğrencilerin davranışlarının öğretmenin hedeflediği davranışlarla, kavramsal anlamaya odaklı Etkililik 2 ise öğrenci öğrenmesinin öğretmenin hedeflediği öğrenme ile ne ölçüde uyumlu olduğu anlamına gelmektedir (Psillos & Niedderer, 2002).

Çalışma kapsamında bir devlet üniversitesinin öğretmen yetiştirme programının ilk yılında öğrenim gören sekiz fen bilimleri öğretmen adayı Fizik 2 dersi kapsamındaki laboratuvar etkinliklerine katılmıştır. Basit elektrik devreleri konusunun teorik dersteki öğretiminden önce yapılan laboratuvar çalışmaları haftada 2 saat olmak üzere 5 haftada tamamlanmıştır. Laboratuvar etkinlikleri kapsamlı görevler içerdiğinden, bu çalışmaların etkinliğinin sorgulanması için belirli öğrenme hedeflerinin belirlenmesi gerekmektedir (Millar ve ark., 2002). Etkinlikler sırasında, katılımcılara, elektrik akımı ile potansiyel fark arasındaki ilişkiyi açıklığa kavuşturmayı amaçlayan elektrik devrelerini tasarlama ve oluşturma görevleri verilmiştir. Bu hedefe ulaşmak için, beş hafta boyunca aşamalı bir şekilde tasarlanmış deneysel çalışmalar yapılmıştır.

Çalışmada veri toplama aracı olarak uygulamaları sınav sırasında alınan gözlem notları ile laboratuvar raporları kullanılmıştır. Gözlem notları katılımcıların işlemsel anlamalarını, laboratuvar raporları ise kavramsal anlamalarını analiz etmede kullanılmıştır. Laboratuvarda gerçekleştirilen uygulama sınavından elde edilen gözlem verileri, öğretmenin hedeflediği etkinlikler dikkate alınarak tümdengelimli, adaylar tarafından yapılan etkinliklerin gözlemlenmesinden elde edilen veriler ise tümevarımsal içerik analizi kullanılarak çözümlenmiştir.

### **Bulgular ve Sonuç**

İşlemsel anlamayla ilgili Etkililik1 için elde bulgular başlangıçta adayların çoğunun basit elektrik devreleri kurabilme yeteneğine sahip olduğunu ancak bir ampermetre ile ölçüm yapma ve güç kaynağındaki uygun terminalleri seçme gibi zorluklar yaşadığını göstermiştir. Bu zorluklar sonraki haftalarda uygulamalı sınavda sergilenmemiştir. Laboratuvar faaliyetleri sırasında, çoğu adayın seri bağlı bir veya iki direnç içeren elektrik devrelerini kurabilme ve akımları ölçme konusunda yetenekli olduğu ancak iki direncin paralel bağlanmasını gerektiren devre kurulumunda ve akımların ölçümünde zorluklar yaşadıkları gözlenmiştir. Uygulama sınavında tüm adayların iki direnci paralel olarak bağlayabildikleri ancak üç adayın bu devrede akımları ölçemedikleri gözlenmiştir. Ayrıca, çoğu adayın süreçte seri bağlı devreye voltmetreyi bağlamakta zorlandığı fakat uygulamalı sınavda sadece ikisinin bu probleminin devam ettiği belirlenmiştir. Bu bulgu laboratuvar faaliyetlerinin tüm adayların gerekli devreleri kurma ve tek gözlü devrelerde akım ölçme konusundaki işlemsel anlamalarına katkı sağladığını göstermiştir. Aynı durum seri ve paralel dirençler içeren devrelerde potansiyel farkları ve paralel dirençler içeren devrelerde elektrik akımlarını ölçme konusundaki tüm adayların işlemsel anlamaları için geçerli olmamıştır. Devre şemaları veya yönergeler olmadan gerçekleştirilen laboratuvar faaliyetleri genellikle adayların tek gözlü devrelerde nesnel ve malzemelerle iş yapabilme becerisini sağlamada etkili olurken, dirençlerin paralel bağlandığı iki gözlü devrelerde daha az etkili olmuştur.

Kavramsal anlamayla ilgili Etkililik 2 için elde edilen bulgular, tüm adayların öğrenme hedeflerinin neredeyse yarısını veya daha fazlasına ulaştığını göstermiştir. Az sayıda aday tarafından ulaşılan öğrenme hedefleri paralel bağlanan lamba sayısı arttıkça eşdeğer direncin azalması ve seri ve paralel devrelerde lambalar arasındaki potansiyel farklarla pil arasındaki bağlantı ile ilgili olmuştur. Aktivitelerin düzenlenmesi, deneysel araçların sağlanması ve laboratuvar faaliyetleri sırasında ipuçları verilmesi gibi desteklerin her birey için farklı olmakla birlikte adayların öğrenme hedeflerine ulaşma sürecini sürdürmeye ve tamamlamaya katkıda bulunduğu görülmüştür.

İşlemsel ve kavramsal bilgi iç içe olduğundan öğrenenler bir alandaki bilgiyi diğer alandaki bilgiyi kullanarak analiz etmektedir. Bu nedenle laboratuvar etkinlikleri tek başına bir devre sisteminin bilimsel bir modelini geliştirmek için yeterli olamamaktadır. Bu nedenle, bazı adaylar fikrî olarak bir elektrik devresinin paralel kollarındaki elektrik akımlarının kavramsal bir anlayışını geliştirmekte zorluk yaşamışlar ve gözlemlenebilirler alanda paralel bir devredeki faaliyetleri de gerçekleştirememişlerdir. Etkililik 1-2 modelini kullanan bazı çalışmalar, yönerge doğrultusunda yapılan laboratuvar faaliyetlerinin öğretmenler tarafından yaygın bir şekilde kullanılması nedeniyle pratik çalışmanın gözlemlenebilirler alanında oldukça etkili olduğunu ve fikirler alanında daha az etkili olduğunu göstermiştir. Ancak, bu çalışmada açık rehberli laboratuvar etkinliklerinin her iki alanda benzer etkililik gösterdiği görülmektedir. Adaylar ders kapsamında doğru akım devreleri hakkında teorik bir arka planla karşılaşmamış olmalarına rağmen, rehberli sorgulama laboratuvarı yöntemi, seçilen konunun çoğu adayın işlemsel ve kavramsal anlamalarını geliştirmede ve çoğu öğrenme hedefine ulaşmada umut vaat edici olarak değerlendirilmiştir.



# Relationship among Teacher Performance, Organizational Loyalty, Charismatic Leadership

## Öğretmen Performansı, Örgütsel Sadakat, Karizmatik Liderlik Arasındaki İlişki

Sakine SİNCER<sup>1</sup>

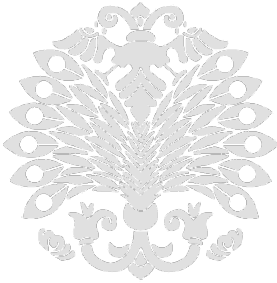


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### ABSTRACT

This study aims at examining the multidimensional relationships between teacher performance, organizational loyalty and charismatic leadership based on the opinions of primary teachers who were working in public schools in Ankara. The study utilized a quantitative research methodology with a correlational survey design. We used the stratified sampling method to determine the study sample. Accordingly, the sample consisted of 514 teachers working during the 2020-2021 Academic Year in Ankara. We used descriptive statistics, Pearson correlation and structural equation modelling to analyze the study data. The study findings revealed that charismatic leadership had a statistically significant direct impact on organizational loyalty, whereas organizational loyalty had a statistically significant direct impact on teacher performance. Furthermore, we found out that charismatic leadership indirectly affected teacher performance via the mediation of organizational loyalty. We discussed the study findings based on the related literature and offered some suggestions relying on the findings.

**Keywords:** Charismatic leadership, organizational loyalty, teacher performance

### ÖZ

Bu çalışmanın amacı, öğretmen performansı, örgütsel sadakat ve karizmatik liderlik arasındaki ilişkiyi Ankara ilindeki kamu ilköğretim okullarında çalışan öğretmenlerin görüşleri doğrultusunda incelemektir. Çalışmada nicel araştırma yaklaşımı ile ilişkisel tarama modeli kullanılmıştır. Çalışma örneklemini belirlemek için tabakalı örnekleme yöntemi kullanılmıştır. Buna göre, örneklem 2020-2021 akademik yılında Ankara'da görev yapan 514 öğretmenden oluşmuştur. Çalışma verilerini analiz etmek için betimsel istatistikler, Pearson korelasyonu ve yapısal eşitlik modellemesi kullanılmıştır. Çalışmanın bulguları karizmatik liderliğin örgütsel bağlılığı, örgütsel bağlılığın ise öğretmen performansını istatistiksel olarak anlamlı bir şekilde doğrudan etkilediğini göstermektedir. Bunun yanı sıra, öğretmen performansı ile karizmatik liderlik arasındaki ilişkide örgütsel sadakatin aracılık rolü olduğu ortaya çıkmıştır. Araştırma bulguları literatürdeki önceki bulgularla ilişkilendirilerek tartışılmış ve bulgulara dayanarak bazı öneriler sunulmuştur.

**Anahtar Kelimeler:** Karizmatik liderlik, örgütsel sadakat, öğretmen performansı



## Introduction

Teacher performance has always been a central concern in educational settings. Although there are quite many factors that affect to what extent educational goals are attained in a specific learning environment, teachers are the ones who play a crucial role in this sense. There is no doubt that teacher performance and student success are closely related (Darling-Hammond, 2000). In other words, a good performance of a teacher will in turn result in a good performance of students. In a broader sense, teacher performance is a key element contributing to school effectiveness (Özgenel & Mert, 2019). However, there seems to be a lack of consensus as to various constructs of teacher performance in the body of educational research. Despite the well-recognized importance of teacher performance in promoting school effectiveness and student achievement, there are still a number of challenges that prevent its improvement in educational settings. Furthermore, there is a need for empirical evidence on the antecedents of teacher performance. Because of this gap in the literature, we have only a limited understanding of how to enhance teacher performance, which in turn makes it impossible to develop evidence-based interventions to improve it. Therefore, teacher performance needs to be better acknowledged and understood if teachers are to better facilitate student learning, enhance the performance of students, and improve school effectiveness. To better understand teacher performance, in this paper, we examine the concept in more detail as we believe that the literature needs a more comprehensive and detailed body of research on the issue.

Considering the profound effect teachers can exert on student learning, educational researchers have been interested in analysing various factors regarding teachers (Darling-Hammond, 2000). Traditionally, outcomes of teacher performance have attracted considerable attention from scholars. The research within the related literature contended teacher performance is closely related to constructs such as student achievement, student learning and student engagement (Eberts et al., 2002; Xu et al., 2020). However, A significant portion of the related research concentrated on the factors influencing teacher performance, revealing that teacher performance is affected by individual, organizational and environmental factors such as teachers' professional capabilities and motivation (Arifin, 2015), their personal qualities (Barrick, Mount & Judge, 2001), school climate and principals' behaviours (Fitria, 2018).

In particular, existing research has presented evidence suggesting a positive and direct correlation between teacher performance and the leadership behaviors of principals, whether they are transformational, transactional or instructional leaders (Kuloba, 2010). However, the association between charismatic leadership and teacher performance has been neglected within the pertinent literature. Furthermore, there exists a gap in the literature concerning the comparative impacts of mediating variables on the connection between charismatic leadership and teacher performance. Recently, a rich body of research has identified organizational loyalty as an antecedent of teacher performance (Akman, 2017; Mathieu & Zajac, 1990). However, the literature has yet to offer an explanation regarding the mediating role of organizational loyalty in the association between charismatic leadership and teacher performance. To address bridge these gaps in the literature, we tried to explore the correlation between charismatic leadership and teacher performance in Türkiye, with a particular emphasis on the mediating effect of organizational loyalty. Thus, in this study, we seek answers to the research questions below:

RQ1: Does a significant correlation exist between charismatic leadership, organizational loyalty, and teacher performance?

RQ2: Does organizational loyalty act as a mediator in the association between charismatic leadership and teacher performance?

This study constitutes empirical evidence of how organizational loyalty as well as charismatic leadership play a role in shaping teacher performance. This study is original as it addresses two relatively new concepts that have been more popular among educational management and leadership (EDML) researchers. Although the concept of leadership has been extensively studied, charismatic leadership is a relatively new approach adopted more at schools nowadays. Similarly, organizational loyalty is a concept that has only recently attracted attention in educational settings. In addition, the relation between teacher performance and charismatic leadership has not received enough attention in EDML literature. Therefore, in-depth knowledge of this can contribute to an increased understanding of what it takes to achieve a high teacher performance. Such evidence will truly be helpful for practitioners and policy-makers to focus on constructs that can enhance teacher performance by raising awareness of what factors are influential in promoting it.

## Theoretical Background

This part of the study presents the theoretical background. Firstly, we discuss the underpinning theory that serves as a foundation to study the relationship among teacher performance, organizational loyalty and charismatic leadership. Then we discuss the conceptual meanings of the variables included in this study.

### Underpinning Theory

The variables that we focus on in the current study are teacher performance, organizational loyalty and charismatic leadership. The relationship among these variables relies on the Theory of Social Exchange, which was developed by American sociologist George C. Homans and is a widely recognized theory in organizational behaviour. This theory basically posits that social behaviour results from a process of exchange in which individuals get into interactions expecting to receive rewards and benefits while minimizing costs (Emerson, 1976). The social exchange theory can be applied to various contexts including workplace relationships such as schools. Within the framework of the Social Exchange Theory, charismatic leadership can be considered as a type of social exchange between leaders and followers. Charismatic leaders provide their followers with emotional support, vision and inspiration, and in return, they expect loyalty, commitment and effort. (Conger & Kanungo, 1987). On the other hand, organizational loyalty can be understood as the result of positive social interactions between a specific organization and its employees including teachers. When people holding leadership positions create a supportive work environment, employees are inclined to cultivate loyalty and commitment towards the organization. (Allen & Meyer, 1996). The Social Exchange Theory suggests that people working at an organization, including, teachers, feel motivated to put more effort in what they do if they believe that the organization recognises their contributions. Likewise, when teachers feel valued and supported, they tend to be highly engaged and perform better in their roles (Kyriakides & Creemers, 2008). By adopting the Social Exchange Theory as the basis, we aim to explore how charismatic leadership within educational organizations influences teacher performance and cultivates organizational loyalty among teachers.

### Charismatic Leadership

Leadership can be defined as a process of guiding and influencing people by effectively communicating instructions, equipping them with essential resources, and motivating them to act accordingly (Bass & Bass, 2008). Likewise, in an educational context, leadership refers to the ability of educational administrators or school leaders to

guide, inspire, and influence teachers, students, and other stakeholders to achieve common educational goals (Bush, 2006). In recent decades, charismatic leadership has turned out to be significant in educational settings. Charismatic leadership is accepted to be a multidimensional phenomenon which involves the interaction of various elements (Conger et al., 1997). This phenomenon is grounded on followers' perceptions about their leader's behaviours, which means that charismatic leadership relies on the properties attributed to the leader by followers as well as power-generated charisma (Conger & Kanungo, 1988).

In our study, charismatic leadership refers to a leadership approach in which the leader guides and inspires followers, awakens respect among them, encourages them to think positively about the future, gives them a sense of mission, and displays motivating behaviours for that purpose (Conger & Kanungo, 1988). In this study, relying on the model of charismatic leadership, which was developed by Conger and Kanungo, charismatic leadership is considered as a six-dimensional construct. Conger and Kanungo (1987) outline these dimensions as follows: (i) strategic vision, (ii) personal risk, (iii) extraordinary behaviors, (iv) sensitivity to member needs, (v) environmental sensitivity, and (vi) non-maintenance of the status quo. Strategic vision entails creating a future image that individuals can identify with and find exciting. Moreover, charismatic leaders dedicate themselves to the vision and foster a collective purpose by taking personal risks and displaying extraordinary actions. Also, charismatic leaders transform organizational goals into a vision of the future, while remaining attentive and demonstrating sensitivity to their followers' needs. In other words, they provide individual care to the members of the organization, address their needs, and foster their personal growth. When determining a vision and during the realization of the established vision, charismatic leaders also demonstrate environmental sensitivity by analysing the prevailing environmental conditions, opportunities and threats within the organization. Lastly, the term status quo refers to the existing state and conditions within a society or organization. Charismatic leaders prioritize moving towards a new objective rather than maintaining the current state. In this sense, non-maintenance of the status quo aligns harmoniously with the vision setting.

### Organizational Loyalty

In recent decades, studies on educational management and leadership have focused on the versatile consequences of organizational loyalty (Kim et al., 2020). This concept is nowadays attracting more attention than ever as it comes to the fore as a significant element affecting the attainment of

organizational goals. According to Vuong et al. (2021), organizational loyalty appears when members of an organization identify themselves with the organization. When they develop such a sense of connection with the organization, they prioritize the good of the organization rather than their own (Simon, 1991). In an educational context, organizational loyalty refers to the commitment and dedication of individuals, such as teachers, staff, and administrators, to the educational institution they are associated with (Miskel et al., 1979). It implies a strong feeling of allegiance besides devotion to school, as well as a willingness to support its mission, values, and objectives. Educational professionals who exhibit organizational loyalty are more likely to work collaboratively, stay committed during challenging times, and foster a positive work environment.

In our study, organizational loyalty refers to the steadfast commitment and dedication displayed by individuals towards a specific organization (Kang et al., 2007). The foundation of organizational loyalty was laid by Barnard (1938), and subsequently, developed by Hirschman (1970) as well as Farrell and Rusbult (1985). Hirschman (1970) presented a conceptual framework that includes the concept of loyalty as an organizational behaviour. In the model proposed by Hirschman, there are three options including exit, voice, and loyalty. Later, Farrell and Rusbult (1985) developed a new model of loyalty based on Hirschman's analytical framework. Within this approach, the model widely known as EVLN encompasses the options of neglect, loyalty, exit and voice as reactions to organizational situations. This study examines the dimensions of organizational loyalty in educational organizations, particularly schools. The study accordingly relies on the dimensions of organizational loyalty within the context of educational organizations including loyalty to managers, colleagues, and students as offered by Akman (2017). Firstly, Hoy and Rees (1974) state that teachers who demonstrate loyalty to their managers positively influence their own feelings and play a significant role in achieving educational objectives. Furthermore, Dooley and Fryxell (1999) emphasize that the loyalty held by teachers towards each other affects the quality of decisions made in line with educational objectives. Thus, loyalty that emerges among the members of a specific group becomes a factor that fosters a positive climate throughout the organization, which then increases efficiency. Lastly, the emergence of such positive emotions also influences students' relationships with teachers (Pianta & Stuhlman, 2004). In other words, loyalty including trust, appreciation, and healthy communication between teachers and students are

crucial in fostering positive teacher-student relationships.

### **Teacher Performance**

Teacher performance is a concept which has attracted attention of educational management and leadership researchers within the scope of school effectiveness. According to Özdemir (2014, p. 108), performance is considered to be a behaviour by its nature, and defines the concept as the sum of a member's behaviours and deeds in an organization. Considering the significance of the human resources possessed by organizations, teachers are considered the most valuable human resource in educational institutions. Therefore, teacher performance emerges as a professional concept that is influenced by numerous factors and has various outcomes. Indeed, Triwahyuni et al. (2014) state that teacher performance is a complex system with inputs, processes, and outputs. According to Triwahyuni et al., teacher performance stands out as a multidimensional process in which individual, collective, cultural, legal, and political principles interact to achieve educational goals. On the other hand, Martin (2018) defines teacher performance as the totality of attitudes and behaviours resulting in students' learning outcomes. According to Martin, there is a prevailing view that the better the students learn, the better the teacher's performance is. As evident from Martin's definition, teacher performance is approached in terms of the impact it creates on students' learning outcomes.

In our study, teacher performance refers to the results demonstrated by a teacher in the process of effectively and efficiently fulfilling the tasks assigned to them, considering their skills, experience, and the proper use of time (Fitria, 2018). This study relies on the dimensions of teacher performance as offered by Limon (2019), who lists the dimensions as (i) task performance, (ii) contextual performance and (iii) adaptive performance. Firstly, Yonghong and Chongde (2006) emphasize that task performance, in the context of the teaching profession, refers to the professional behaviours that a teacher is required to perform and have been predetermined. Yonghong and Chongde (2006) address task performance based on concepts such as the effectiveness of teaching, teacher-student interaction, and the value of teaching. Also, Borman and Motowildo (1993; 1997) define contextual performance as behaviours which have no direct contribution to the organization's objectives although they improve the organizational, psychological, and social environment. In this regard, contextual performance reflects the behaviours that highlight the teacher's autonomy and are decided to be performed independently.

Lastly, Pulakos et al. (2000) highlight that adaptive performance is increasingly becoming important as a result of today's dynamic professional life. Adaptive performance involves managing emergencies, dealing with work stress, finding creative solutions for problems, tackling uncertain or unpredictable cases at work, adapting to technology and innovations, establishing harmony among people, accommodating cultural differences, and physical fitness.

### **Organizational Loyalty and Teacher Performance**

It is evident that there are several factors that influence teacher performance, which is visible through student achievement. Some of these factors include organizational culture organizational commitment and job satisfaction (Taylor & Tyler, 2012). One of the factors influencing teacher performance is organizational loyalty. The effectiveness of a school and its teachers can be approached relying on the loyalty of teachers have towards their school and its leaders. In other words, organizational loyalty results in teachers' efforts to reach the goals of the educational institutions of which they are a part. Indeed, it is emphasized that teachers who possess a sense of organizational loyalty and commitment tend to exhibit improved performance (Kılıç, 2019; Mathieu & Zajac, 1990; Özdemir & Gören, 2017). Therefore, we propose the following hypothesis in the current study:

Hypothesis 1: Organizational loyalty will affect teacher performance in a positive direction.

### **Charismatic Leadership and Organizational Loyalty**

Organizational loyalty, which influences teacher performance, is also affected by various factors. One of the most significant determinants of organizational loyalty is thought to be the leadership behaviour exhibited by school administrators. In fact, Leithwood and Jantzi (2005) also mention a strong relationship between organizational loyalty and school leadership. Overall, leadership has a pivotal effect on fostering organizational loyalty by creating an environment where employees feel valued, engaged, and aligned with the organization's values and goals. At this point, Wu and Wang (2012) state that one of the leadership styles that influence the level of organizational loyalty among members is charismatic leadership. According to Wu and Wang, when any member of an organization perceives the leader as charismatic, they feel more committed and loyal to the leader and organization. Charismatic leaders are likely to inspire and motivate their employees through what they say and what they do. Thus, charisma can have a significant impact on organizational loyalty by creating a positive and engaging work environment that fosters strong connections between leaders and employees (House & Howell, 1992). Likewise, charismatic leadership can create a

positive effect on teachers' loyalty within educational settings (Arabacı, 2014). Charismatic leaders in education, such as school principals or administrators, who exhibit certain behaviours and traits associated with charisma can foster a sense of loyalty among teachers (Leithwood et al., 2004). Hence, we propose the next hypothesis in the current study:

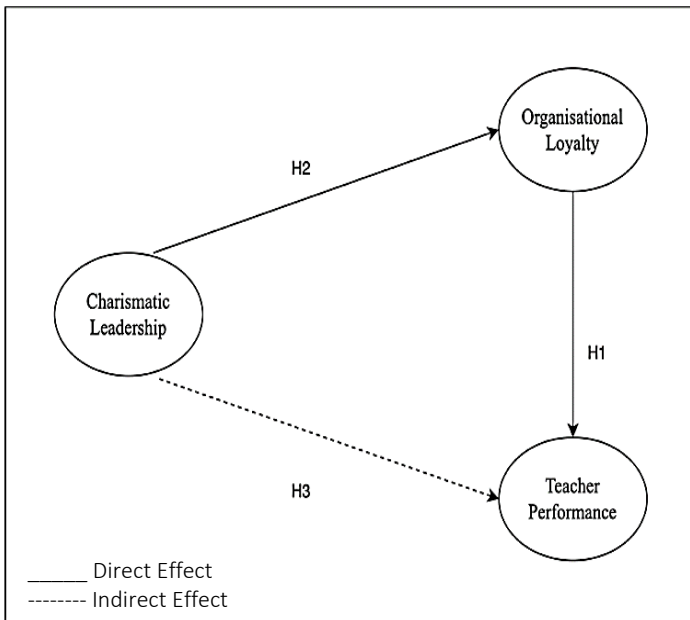
Hypothesis 2: Charismatic leadership will affect teachers' organizational loyalty in the positive direction.

### **The Mediating Role of Organizational Loyalty in the Relationship between Teacher Performance and Charismatic Leadership**

School leadership has both direct and indirect effects on achieving educational goals. A vital reflection of leadership is about teacher performance. Indeed, the leadership behaviour exhibited by school administrators is a crucial determinant of teacher performance. As mentioned above, charismatic leadership has various positive effects such as organizational trust (Tuti & Özdemir, 2024). Also, when school leaders display charismatic leadership behaviours, teacher performance improves as a result of the positive and engaging working environment created by the charismatic school leader (Patrick & Smart, 1998). However, the positive connection between charismatic leadership and teacher performance even gets stronger with the impact of organizational loyalty held by teachers. In other words, charismatic leadership creates a positive working environment, in which teachers start to have a sense of belonging and loyalty to the job. Hence, charismatic leadership increases teachers' level of organizational loyalty (Wu & Wang, 2012). When teachers have a strong sense of organizational loyalty, they tend to be more motivated to do well in their job, which has a positive impact on their performance (Mathieu & Zajac, 1990). Based on this, it is suggested that charismatic leadership improves teacher performance through the mediation of organizational loyalty. Hence, we propose the last hypothesis in the current study:

Hypothesis 3: Charismatic leadership will have a mediating effect on the relationship between teacher performance and organizational loyalty.

Figure 1 below shows the hypothesized model developed in the current study for the relationship among independent (charismatic leadership), mediating (organisational loyalty) and dependent (teacher performance) variables of the study.



**Figure 1.**  
*The Hypothesized Model*

### Methods

We employed the correlational model design in this study, which analyses the relationships among teacher performance, organizational loyalty and charismatic

leadership. In the current study, we hypothesized a model testing the mediating effect of organizational loyalty in the relation between teacher performance and charismatic leadership and then tested the model.

### Population and Sample

The current study population included 13,513 teachers teaching in 442 primary schools in nine districts in Ankara (Altındağ, Çankaya, Etimesgut, Gölbaşı, Keçiören, Mamak, Pursaklar, Sincan and Yenimahalle) during the 2020-2021 Academic Year. The selection of the sample schools was determined using the stratified sampling method, taking into account the number of teachers working in the districts. This method aims that the sub-groups within the population are represented in the sample in proportion to their weights within the population. In this study, each district within the study population was considered as a stratum. By taking into account the proportions of the districts in the target population, the number of teachers for the sample from each district was determined. The distribution according to the stratum weights, indicating the number of schools and teachers in the population, the number of teachers in the sample, the number of returned scales, and their proportion in the sample, is presented in Table 1.

**Table 1.**

*The Number of Public Primary Schools and Teachers in the Districts Comprising the Sample and Their Proportion in the Population Compared to Their Number in the Sample*

Districts	Number of State Schools	Number of Teachers	Number in the Sample	Proportion in the Sample	Number of Returned Scales
1. Altındağ	55	1425	39.33	6	31
2. Çankaya	80	1871	51.63	12.8	66
3. Etimesgut	32	1475	40.71	10.1	52
4. Gölbaşı	28	420	11.59	3.9	20
5. Keçiören	58	2545	70.24	21.6	111
6. Mamak	76	1912	52.77	22.4	115
7. Pursaklar	13	477	13.16	9.3	48
8. Sincan	43	1680	46.36	6.4	33
9. Yenimahalle	57	1708	47.14	7.4	38
<i>TOPLAM</i>	442	13513	373.93	100	514



As seen in Table 1, the sample of 374 teachers, which represents the population, was determined based on the proportion of the number of teachers working in the districts. It is also noted that as the sample size increases, the power of the analysis increases and the standard error decreases (Tabachnick & Fidell, 2012, p. 36). From this point of view, more scales were administered to the sample, considering possible data losses. Thus, the sample size came closer to the population size. Accordingly, the research sample included 31 teachers from Altındağ, 66 from Çankaya, 52 from Etimesgut, 20 from Gölbaşı, 111 from Keçiören, 115 from Mamak, 48 from Pursaklar, 33 from Sincan, and 38 from Yenimahalle.

Table 2 below presents the demographic information about the participant teachers.

**Table 2.**

*Demographic Information about the Participant Teachers (N=514)*

Variable	Sub-Groups	Frequency (n)	Percentage (%)
Gender	Female	395	76.8
	Male	119	23.2
Age	20-30	46	8.9
	31-40	179	34.8
	41-50	184	35.8
	51 and older	105	20.4
Educational Background	Bachelor's degree	442	86.0
	Graduate degree	72	14.0
Seniority (year)	<=5	43	8.4
	6-10 years	57	11.1
	11-15 years	91	17.7
	16-20 years	103	20.0
	>=21	220	42.8
TOTAL		514	100

As seen in Table 2, a total of 514 teachers participated in the current study. Of these participants, 395 were female and 119 were male teachers. Most of the teachers were in the age range of 41 to 50 (n=184). Additionally, 442 participant teachers held a bachelor's degree (86%).

## Data Collection Tools

Ethics committee approval was obtained from Hacettepe University Ethics Committee (Date: 30.09.2020, Number: 35853172-600). Written informed consent was obtained from participants who participated in this study. We collected the study data with the Conger-Kanungo Charismatic Leadership Scale (CK-CLS), the Organisational Loyalty Scale (OLS) and the Teacher Work Performance Scale (TWPS).

*Charismatic Leadership.* Conger and Kanungo (1994) developed the CK-CLS, while Özdemir and Pektaş (2020) adapted it into Turkish culture. The scale aims to evaluate the charismatic leadership behaviours of principals. CK-CLS has six sub-scales and 25 items in total. It is a 5-point Likert-type scale. The sub-scales are as follows: (i) setting and articulating a vision (6 items), (ii) showing environmental sensitivity (7 items), (iii) engaging in unconventional behavior (3 items), (iv) taking personal risks (4 items), (v) demonstrating sensitivity to member needs (3 items), and (vi) not maintaining the status quo (2 items). The sample item is given as follows: "S/he is an inspiring speaker." To test the structural validity, we conducted CFA in the current study. The results showed a good fit of the six-factor construct ( $\chi^2/df= 1.86$ , RMSEA=.04, AGFI=.97, NFI=.93, CFI=.96, IFI=.96). We also calculated the alpha coefficient of the scale to be .97.

*Organisational Loyalty.* The OLS, developed by Akman (2017), is a data collection tool aimed at determining the level of loyalty teachers have towards their schools. It consists of three sub-scales and 11 items in total. It is a 5-point Likert scale. The sub-scales are as follows: (i) loyalty to administrators (4 items), (ii) loyalty to colleagues (3 items), and (iii) loyalty to students (4 items). A sample item is as follows: "I tell my friends or colleagues about the competencies of my school principal." To test the structural validity, we conducted CFA. The results showed a good fit of the three-factor construct ( $\chi^2/df= 2.28$ , RMSEA=.05, AGFI=.99, NFI=.98, CFI=.99, IFI=.99). We also calculated the alpha coefficient of the scale to be .85.

*Teacher Performance.* The TWPS, developed by Limon (2019), is a data collection tool designed to measure teachers' performance through self-reporting. It consists of three sub-scales and 37 items in total. It is a 5-point Likert scale. The scale dimensions are as follows: (i) task performance (16 items), (ii) contextual performance (9 items), and (iii) adaptive performance (12 items). The sample item is given as follows: "I give importance to my professional development." To test the structural validity, we conducted CFA. The results showed a good fit of the

three-factor construct ( $\chi^2/df= 3.37$ , RMSEA= .06, AGFI= .93, NFI= .83, CFI= .87, IFI= .87). We also calculated the alpha coefficient of the scale to be .94.

**Procedures and Data Analysis**

We conducted all analyses in the current study by using the Mplus 8.3 package program. At first, we calculated the descriptive statistics as well as zero-order correlations between the independent, mediating and dependent variables. Before testing the hypothesized relationships between variables, we performed CFA for the model that we proposed in the current study to ensure construct distinctiveness among variables. Then we ran tests for the mediated effect of teachers’ organisational loyalty on the relation between charismatic leadership and teacher performance. We employed the bootstrapping method, which was suggested by Preacher and Hayes (2008, p. 880), to get the confidence intervals and significance levels for paths. We examined model fit with the Tucker-Lewis index (TLI), comparative fit index (CFI) and the root mean square error of approximation (RMSEA). CFI and TLI values of .90 or greater and .95 or greater indicate adequate and good fit respectively. RMSEA values of .08 or less and .05 or less indicate adequate and good fit respectively (Hu & Bentler, 1999, p. 6). We collected the study data from a single source (i.e., teachers). hence, we tried to diminish common method bias (MacKenzie & Podsakoff, 2012). In this line, we used the single-factor test suggested by Harman (1967, p. 23). The analysis revealed that the Harman’s single factor test result was 27.604% (less than 50%), which means that the current study showed no sign of common method bias.

**Results**

The current study investigated the relations among teacher performance, organizational loyalty and charismatic leadership, besides the mediating role of organisational loyalty in the relation between charismatic leadership and teacher performance.

**Descriptive Statistics**

Table 3 below gives the means, standard deviations, and Pearson correlations for the variables analysed in the study.

**Table 3.**

*Means, standard deviations and correlations (n=514)*

Variable	$\bar{X}$	sd	KL	OL	TP
CL	3.76	.76	-		
OL	4.17	.50	.55*	-	
TP	4.39	.36	.32*	.41*	-

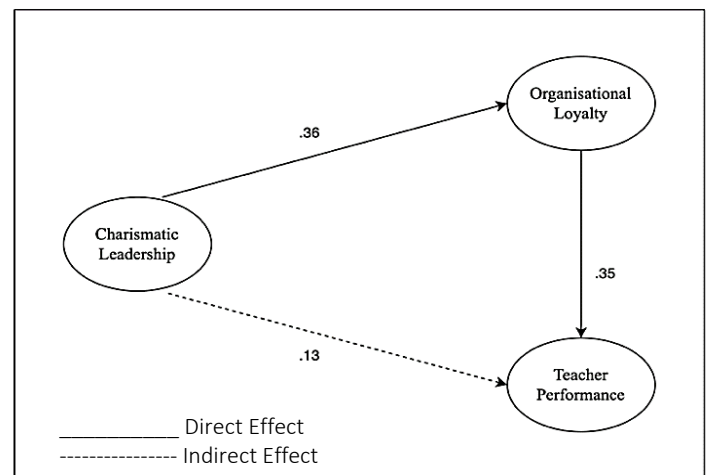
*Abbreviations:* CL, charismatic leadership, OL, organisational loyalty, TP, teacher performance

\* $p < .05$

As is clear in Table 3, the arithmetic mean values of charismatic leadership, organisational loyalty and teacher performance were at medium and high levels. The results indicate that school principals display charismatic leadership behaviours at schools where the current study was conducted, and teachers feel loyal to their schools and have high performance. In addition, the Pearson correlation coefficient values among charismatic leadership, organisational loyalty and teacher performance are below .85. This result shows that there was no multicollinearity problem in the study. Also, as is seen in Table 3, teacher performance is significantly and positively related to organisational loyalty ( $r= .51$ ,  $p < .05$ ). Furthermore, organisational loyalty is significantly and positively related to charismatic leadership ( $r= .55$ ,  $p < .05$ ). All these results provide preliminary support for the research hypotheses. In other words, these relationships observed among the variables of the current study present clues to support the conceptual model that charismatic leadership and organisational loyalty affect teacher performance, while the relation between charismatic leadership and teacher performance is mediated by organisational loyalty.

**Results Regarding the Structural Equation Model**

Figure 2 as well as Table 4 below show the SEM results of the theoretical model for the relationship among independent (charismatic leadership), mediating (organisational loyalty) and dependent (teacher performance) variables of the current study.



**Figure 2.**

*The Model of the Mediating Role of Organisational Loyalty in the Relationship between Charismatic Leadership and Teacher Performance*

**Table 4.**  
*Unstandardized Coefficients for Testing the Direct, Indirect and Total Effects (N=514)*

	Estimate	SE	LLCI*	ULCI*	<i>p</i>
Direct					
Effects					
CL--OL	.36	.02	.32	.40	**
OL--TP	.35	.04	.27	.42	**
CL--OP	.12	.07	.05	.02	**
Indirect					**
effect					
CL--OL--TP	.13	.01	.09	.15	**
Total					**
effect					
CL-OL-TP	.16	.02	.12	.19	**

*Abbreviations:* CL, charismatic leadership; OL, organizational loyalty; TP, teacher performance Note: \*\**p* < .05; \*LLCI, lower-level confidence interval; ULCI, upper-level confidence interval

In this study, Hayes' (2013) approach was used to test the hypotheses. In this line, we used 5000 bootstrapped samples to calculate indirect effects (CI=95%). Bootstrap analysis revealed that direct effect of organizational loyalty on teacher performance was significant ( $\beta = .35$ , 95% CI [.27 .42]). This finding confirmed Hypothesis 1 in the current study. It was also seen that direct effect of charismatic leadership on organizational loyalty was significant ( $\beta = .36$ , 95% CI [.32 .40]). This finding confirmed Hypothesis 2 in the current study. Mediation analysis revealed that the indirect effect of charismatic leadership on teacher performance via organizational loyalty was significant ( $\beta = .13$ , 95% CI [.09 .15]). This finding confirmed Hypothesis 3 in the current study. The model showed a good model fit ( $\chi^2/df = 4.00$ , CFI=.96, TLI=.92, RMSEA=.08). Confirming Hypothesis 3, the study results show that the relation between charismatic leadership and teacher performance was mediated by organisational loyalty.

## Discussion

The current study aims to investigate the relation among teacher performance, organizational loyalty and charismatic leadership relying on the views of 514 teachers working in public primary schools in nine districts in Ankara in 2020-2021 academic year.

### Discussion of Key Findings

In this study, we firstly investigated the effect of organizational loyalty on teacher performance. The study results indicated that teachers' perception of organizational

loyalty had a significant impact on their performance. This finding supports the results of the previous studies in the literature which concluded that a sense of loyalty to the organization affected teacher performance significantly (Hidayati et al., 2019; Wahyuni et al., 2014). The current study finding suggests that when teachers feel loyal to the schools where they work, they tend to perform better in teaching. This might result from the fact that loyalty fosters a sense of belonging, which encourages teachers to work cohesively and collaboratively with colleagues. Also, organizational loyalty often leads to increased intrinsic motivation among teachers. Through the intrinsic motivation, teachers find via organizational loyalty, they feel more connected to their school and its values, and they are more likely to find personal satisfaction in their work. These positive feelings all result in improved performance and a higher quality of teaching.

In the current study, we also examined the effect of charismatic leadership on organizational loyalty. The study results indicated that charismatic leadership had a significant impact on teachers' organizational loyalty. This study finding reinforces the previous study findings in the related literature which concluded that school principals' charismatic leadership behaviours positively affected teachers' perception of organizational loyalty significantly (Gündüz, 2021; Özdemir et al., 2023). The current study finding suggests that when teachers think that school principals display charismatic leadership behaviours, they are connected to their school with organizational loyalty. This might be because charismatic school leaders possess qualities that inspire and motivate teachers, which creates a sense of admiration, trust and loyalty among them. In this way, school principals who adopt a charismatic leadership style can influence teachers' dedication to the school and their commitment to their roles as teachers. Thus, charismatic leadership can improve organizational loyalty among teachers.

In our study, we lastly investigated the mediating role of organizational loyalty in the relation between charismatic leadership and teacher performance. The study results showed that charismatic leadership positively affected teacher performance via the mediating effect of organizational loyalty. This finding supports the previous studies in the literature which concluded that organizational loyalty had a mediating role in the relationships between various variables such as job satisfaction, job performance, employee empowerment and innovative behaviour (Khan et al., 2020; Sazkaya & Dede, 2018). The current study finding suggests that charismatic leadership behaviours of school principals enhance teachers' organizational loyalty, which in

turn increases their performance at school. This might be because charismatic leaders are skilled at creating a common vision and inspiring their followers in this direction mostly by building trust and rapport with their followers. Likewise, when teachers feel supported by charismatic leaders, they might feel more loyal to the school, which ultimately creates a positive work environment and enhance their performance in the classroom.

The three findings of our study specifically accentuate in Turkish culture. According to Hofstede's (1980) cultural dimensions theory, Türkiye is a relatively collectivist society. In such collectivist cultures, there is an emphasis on group harmony, loyalty and cooperation. Moreover, individuals are anticipated to prioritize the needs of the group above their own personal objectives. In that sense, Türkiye's collectivist tendencies might be reflected in the educational setting of the country through the interpersonal relationships between teachers and school leaders fostered by charismatic leadership. When charismatic leaders value the teachers at school, there arises a strong bond between them. Thus, teachers feel more loyal not only to their school principals, but also to colleagues and students, which in turn results in an enhanced performance. It is obvious that the emphasis on strong social relationships affects the Turkish education system as we found out in this study as a result of the collectivist tendencies of the country.

## Conclusion and Recommendations

### Implications for Theory

The current study reveals that charismatic leadership positively affects organizational loyalty, and organizational loyalty positively affects teacher performance, while charismatic leadership positively influences the work performance of teachers with the mediating effect of organizational loyalty. These findings have several implications for theory in the fields of leadership, organizational behaviour, and education. First of all, our findings support and validate the charismatic leadership theory. As one of the dimensions of charismatic leadership theory developed by Conger and Kanungo puts forth, leaders characterized by charisma create a vision for their followers and inspire and motivate them to perform beyond expectations. In line with the charismatic leadership theory, this study suggests that charismatic leadership indeed contributes to improved teacher performance, and this effect is mediated by the loyalty teachers feel toward the school. Also, our study underscores the multifaceted nature of charismatic leadership. Our findings imply that school leaders' charisma can indirectly create positive outcomes

through mechanisms like organizational loyalty. This provides a deeper understanding of how charisma operates beyond mere charm and enthusiasm. Lastly, our study underlies the importance of emotions in leadership and performance. Charisma often triggers emotional responses, and loyalty itself is an emotional commitment. This proves the importance of considering emotional factors in leadership theories. Thus, it seems possible to state that our study contributes to the development of a more comprehensive leadership model that incorporates both leadership traits such as charisma and organizational dynamics such as loyalty to explain how leadership impacts outcomes in an educational setting. Furthermore, the study enriches the existing literature by integrating emotional and relational aspects into the charismatic leadership paradigm. It provides empirical evidence supporting the mediating role of organizational loyalty, which adds a nuanced layer to our understanding of leadership effectiveness. By emphasizing the indirect pathways through which charismatic leadership influences performance, the research opens new avenues for examining the interplay between leadership qualities and organizational culture. Finally, this study's findings suggest practical implications for educational administrators aiming to enhance teacher performance through targeted leadership development programs.

### Implications for Policy and Practice

This study also has some implications for policy and practice. Firstly, our findings highlight the importance of organizational loyalty as a mediator between leadership and performance. This means that loyalty can act like a bridge which transforms the influence of charismatic leadership into tangible improvements in teacher performance. In other words, adopting charismatic leadership qualities and practices can positively affect teacher performance by promoting loyalty. This emphasizes the significance of fostering loyalty to enhance the effectiveness of leadership practices. Hence, our findings offer practical insights for educational leaders and administrators. In this line, we recommend school leaders to focus on professional development strategies to improve ways of effective communication, create a compelling and shared vision for the school, recognize and appreciate the efforts of teachers, and build trust and openness. Thus, they can create an environment where teachers feel comfortable expressing their opinions, sharing concerns and participating in decision-making processes, which will all strengthen teachers' sense of loyalty and connection to the school. The current study findings also have some implications for

policy-makers. They can take necessary steps to collaborate with school leaders for professional development. In this line, they can start leadership development programs which will provide school principals with training on effective communication, emotional intelligence, inspiration and vision sharing.

### Limitations

This study has various limitations even though it significantly contributes to the existing literature of educational leadership. Firstly, the current study design is cross sectional research, which means that the study aimed at describing a phenomenon at a single moment in time. Therefore, researchers can conduct longitudinal studies with data collected over an extended period of time. Moreover, in the current study, we conducted a model test to examine the mediating role of organizational loyalty in the impact of charismatic leadership on teacher performance. Research designs involving multilevel analyses that include variables like organizational citizenship, organizational identification, different leadership styles, and others can be adopted to investigate the issue in further detail. Also, the study data is limited to public primary schools in nine districts in Ankara. New research could be conducted using data collected from other districts of Ankara as well as from other cities in Turkey. In the current study, we examined the relationship among teacher performance, organizational loyalty and charismatic leadership according to the opinions of teachers. New research could be conducted by consulting the opinions of both school administrators and teachers to comparatively analyse the views of the two groups. Lastly, this study is limited to the perceptions of teachers teaching in public primary schools. Future research can compare the views of teachers teaching in public and private schools as well as at different educational levels.

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## Geniřletilmiř zet

### Giriř

ğretmen performansı eđitim ortamlarında her zaman zerinde durulan konulardan biri olmuřtur. Belirli bir đrenme ortamında eđitim hedeflerine ne lde ulařıldığını etkileyen pek ok faktr olmasına rađmen, đretmenler bu anlamda ok nemli bir rol oynamaktadır. Mevcut arařtırmalar, mdrlerin liderlik davranıřları ile đretmen performansı arasında olumlu ve dođrudan iliřkiler olduđunu gsteren kanıtlar sunmuřtur (Kuloba, 2010). Ancak, literatrde karizmatik liderlik ve đretmen performansı arasındaki iliřki ile ilgili olarak herhangi bir alıřmaya rastlanmamıřtır. Ayrıca, karizmatik liderlik ve đretmen performansı arasındaki iliřkide aracı deđiřkenlerin greliliğine iliřkin literatrde bir bořluk bulunmaktadır. Son yıllarda, rgtsel sadakatin đretmen performansının bir ncl olduđunu ortaya koyan ok sayıda arařtırma yapılmıřtır (Akman, 2017; Mathieu & Zajac, 1990). Ancak literatr, karizmatik liderlik ve đretmen performansı arasındaki iliřkide rgtsel sadakatin aracılık etkisine dair henz bir yanıt sunmamıřtır. Literatrdeki bu bořlukları gidermek iin, bu alıřmada Trkiye’de karizmatik liderlik ve đretmen performansı arasındaki iliřki, rgtsel sadakatin aracılık rolne odaklanarak arařtırılmıřtır. Bu dođrultuda, bu alıřmada ařađıdaki arařtırma soruları ele alınmaktadır:

1. Karizmatik liderlik, rgtsel sadakat ve đretmen performansı arasında anlamlı bir iliřki var mıdır?
2. rgtsel sadakatin karizmatik liderlik ve đretmen performansı arasındaki iliřki zerinde aracılık etkisi var mıdır?

### Yntem

Karizmatik liderlik, rgtsel sadakat ve đretmen performansı arasındaki iliřkileri inceleyen bu alıřmada iliřkisel tarama modeli kullanılmıřtır. Bu alıřmada, karizmatik liderlik ve đretmen performansı arasındaki iliřkide rgtsel sadakatin aracılık roln test eden bir model hipotezi oluřturulmuř ve model test edilmiřtir. Arařtırmanın evrenini 2020-2021 Eđitim đretim Yılında Ankara’nın dokuz ilesinde (Altındađ, ankaya, Etimesgut, Glbařı, Keiren, Mamak, Pursaklar, Sincan ve Yenimahalle) bulunan 442 devlet ilkokulunda grev yapan đretmen oluřturmaktadır. alıřmanın rneklemi ise, tabakalı rnekleme yntemiyle seilen ve gnlllk esasına gre alıřmaya katılan toplam 514 đretmenden oluřmaktadır.

### Sonuç ve Tartıřma

Arařtırma bulguları, đretmenlerin rgtsel bađlılık algılarının performansları zerinde nemli bir etkisi olduđunu gstermiřtir. Mevcut bulgu, đretmenlerin alıřtıkları okullara bađlılık hissettiklerinde, đretimde daha iyi performans gsterme eđiliminde olduklarını gstermektedir. Bir diđer arařtırma bulgusuna gre, karizmatik liderlik đretmenlerin rgtsel bađlılıđı zerinde anlamlı bir etkiye sahiptir. Bu bulgu, okul mdrleri karizmatik liderlik davranıřları sergilediđinde, đretmenlerin okullarına rgtsel bađlılıkla bađlandıklarını gstermektedir. Son olarak, bu arařtırmada karizmatik liderliđin rgtsel sadakatin aracılık etkisiyle đretmen performansını olumlu ynde etkilediđi bulgusuna ulařılmıřtır. Mevcut arařtırma bulguları, okul mdrlerinin karizmatik liderlik davranıřlarının đretmenlerin rgtsel sadakatini artırdığını ve bunun da okuldaki performanslarını artırdığını gstermektedir. Arařtırma bulguları zellikle Trk kltrne vurgu yapmaktadır. Hofstede’nin (1980) kltrel boyutlar teorisine gre Trkiye grece kolektivist bir toplumdur. Bu tr kolektivist kltrlerde grup uyumu, sadakat ve iř birliđine vurgu yapılır. Ayrıca, bireylerin grubun ihtiyalarına kendi kiřisel hedeflerinden daha fazla ncelik vermeleri beklenir. Bu anlamda, Trkiye’nin kolektivist eđilimleri, karizmatik liderlik tarafından teřvik edilen đretmenler ve okul liderleri arasındaki kiřilerarası iliřkiler yoluyla lkenin eđitim ortamına yansımaktadır. Karizmatik liderler okuldaki đretmenlere deđer verdiđinde, aralarında gl bir bađ oluřuyor. Bylece đretmenler sadece okul mdrlerine deđil, aynı zamanda meslektařlarına ve đrencilerine de daha sadık hissederler ve bu da performanslarının artmasıyla sonulanır. Gl sosyal iliřkilere yapılan vurgunun, lkenin kolektivist eđilimlerinin bir sonucu olarak bu alıřmada ortaya koyduđumuz gibi Trk eđitim sistemini etkilediđi aıktır.

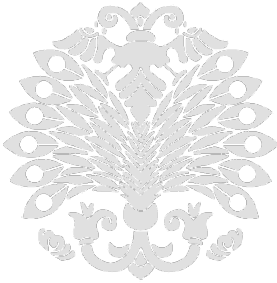
# Examining the Internet Usage Behavior of Adolescents After the Covid-19 Pandemic

## Covid-19 Salgın Süreci Sonrası Ergenlerin İnternet Kullanım Davranışlarının İncelenmesi

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### ABSTRACT

This study investigates adolescents' problematic internet use after the Covid-19 pandemic period. In the research using the scanning method, a total of 336 adolescent participants, 233 (69.3%) girls and 103 (30.7%) boys, were reached online and a questionnaire consisting of 11 questions was conducted. The first two questions of the questionnaire are about demographic information including gender and grade level. Seven of the nine questions are closed-ended and two are open-ended. Quantitative data were analyzed with simple statistical analysis in the SPSS package program, and qualitative data were analyzed with thematic analysis. In the quantitative findings, information is presented about adolescents' internet usage purposes and duration, and their perception of addiction by gender and grade level. As for the qualitative findings, while the theme of internet use results is defined in two categories as negative reflections of internet use and neutral evaluation of internet use, the theme of the meaning of internet usage was evaluated in three different categories as negative a attributed to internet usage, positive meanings attributed to internet usage and neutral meanings attributed to internet usage. As a result, most of the adolescents who participated in the study perceive the reflections of their internet usage behavior negatively and attribute both positive and negative meanings to the internet.

**Keywords:** Adolescent, addiction, covid-19 pandemic, Internet use, problematic Internet use

### Öz

Bu çalışma, ergenlerin Covid-19 pandemi süreci sonrasındaki problemleri internet kullanım durumlarını araştırmaktadır. Tarama yöntemi kullanılan araştırmada, 233 (%69.3) kız, 103 (%30.7) erkek toplam 336 ergen katılımcıya çevrimiçi şekilde ulaşılmış ve 11 sorudan oluşan bir anket uygulanmıştır. Anketin ilk iki sorusu cinsiyet ve sınıf düzeyi gibi demografik bilgilerle ilgilidir. Dokuz sorunun yedisi kapalı uçlu ve ikisi açık uçludur. Katılımcılardan elde edilen nicel veriler SPSS paket programında basit istatistik analiziyle, nitel veriler ise tematik analiz ile analiz edilmiştir. Nicel bulgularda, ergenlerin internet kullanım amaçları ve süreleri, cinsiyet ve sınıf düzeyine göre bağımlılık algılarına dair bilgiler sunulmaktadır. Nitel bulgularda ise internet kullanım sonuçları teması "internet kullanımının olumsuz yansımaları", "internet kullanımını nötr değerlendirme" olmak üzere iki kategoride tanımlanırken, internet kullanımının anlamı teması "internet kullanımına yüklenen olumsuz anlamlar", "internet kullanımına yüklenen olumlu anlamlar" ve "internet kullanımına yüklenen nötr anlamlar" olmak üzere üç farklı kategoride değerlendirilmiştir. Sonuç olarak araştırmaya katılan ergenlerin birçoğu, internet kullanım davranışlarının yansımalarını olumsuz algılamakla birlikte, internete hem olumlu hem de olumsuz anlamlar yüklemektedir.

**Anahtar kelimeler:** Bağımlılık, covid-19 salgını, ergen, internet kullanımı, problemleri internet kullanımı

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## Introduction

The use and impact of technology, which is preferred for different purposes by individuals in different developmental stages, is increasing day by day. One of the factors that technology brings and has an impact on human life is the internet. The Internet has significantly changed interpersonal communication practices. Thanks to this emerging digital technology, instant messaging and social media tools have become preferred because they accelerate interaction; ease of access to music and videos and user-created content facilitated the entry of a new era in media usage. As of April 2023, there are 5.18 billion internet users worldwide, indicating that 64.6 percent of the world's population is in contact with the internet. Although the internet is used extensively by both genders, it is emphasized that men use the internet more intensively than women. When examined in terms of developmental periods, it is known that internet use is higher among individuals between the ages of 15 and 24 all over the world and this age constitutes 75 percent of the world average (Statista Internet Statistics, 2023).

### Covid-19 Pandemic and Internet Usage

Internet use is a remarkable issue in the Covid-19 process, which has affected the world in the recent years (Avena et al., 2021; Islam et al., 2020; Király et al., 2020). The drastic measures taken to control the Covid-19 pandemic, such as quarantine, resulted in heightened levels of fear and uncertainty, as well as stressful situations such as social isolation and limited mobility (Brooks et al., 2020). Addictive behaviors such as different substances, gambling and video games can be used as coping strategies to reduce increased stress, anxiety and depressive mood (Király et al., 2020). In addition, it is stated that the loneliness resulting from the quarantine leads to intense internet use because people spent more than six hours a day on the internet during the pandemic, and the use increased even more during the quarantine. However, it is seen that young individuals face the risk of problematic internet use as a result of increasing their use levels by feeling more lonely (Alheneidi et al., 2021). It is stated that the prevalence of problematic internet use varies between 4% and 43.8% during the Covid-19 pandemic process (Burkauskas et al., 2022), and this supports that internet use has become problematic during the pandemic process.

### Covid-19 Process and Internet Usage Purposes

To discuss problematic internet use, the purposes for which individuals use the internet are as important as the amount of time spent online. Research shows that adolescents

primarily use the internet for work and educational purposes during the pandemic process followed by social media, information seeking, entertainment and playing online games (Siste et al., 2021). The internet environment, which contains content and activities that can positively affect the education process of adolescents, can bring different negative results when used unconsciously. Adolescents who engage in prolonged gaming activities with negative content while using the internet for a long time without time and place limits can rely on unverified information instead of doing research, and access negative content such as violence, drugs and terrorism. This situation may impair their development process as well as pose a risk to their educational processes (Aydın, 2011). It is seen that the use of internet and social media during the pandemic process has increased compared to the pre-pandemic period, and this situation has both positive and negative results. The use of the internet, which is perceived as positive for cultural activities, information resources open to free access, and entertainment activities, is perceived as a negative result in terms of individuals spending all their free time in this environment (Yıldırım & İpek, 2020). Therefore, it is essential to evaluate the consequences of internet use behavior in terms of informing adolescents about negative use.

### Covid-19 Process and Internet Applications

During the pandemic, the shift to conducting business and providing communication channels through online platforms has been one of the factors contributing to the increased internet usage. It is seen that the adolescent group, which is known to have high internet usage before the pandemic process, benefited from internet-specific social media applications both for education, socialization and to get information (Öncü, 2022). Considering that the intense and uncontrolled use of social media applications and online games raises the risk of addiction (Guessoum et al., 2020), it can be said that it is critical to know what the applications used during and after the pandemic are in terms of preventive studies. However, it can be said that adolescents' perceptions of their internet use behaviors become more significant as an element that needs to be addressed. As a matter of fact, in this period of identity acquisition, it is important to recognize misconceptions and intervene before they turn into habits. For example, perceiving the internet as a medium where social relations can be established more than a social environment and as a means of eliminating loneliness may increase the risk of addiction (Çevik & Yıldız, 2017).



### In summary

The internet became an environment in which individuals spent considerable time engaging with various applications and for diverse purposes during the pandemic. Accordingly, it can be thought that information about how internet use behaviors are shaped after the pandemic process, the purposes and duration of use will give an idea about the risk of addiction that adolescents may experience. In fact, the purposes of internet use and the amount of time spent on the internet are thought to be effective factors on the risk of addiction (Derin & Bilge, 2016). In addition, problematic internet use, which is considered in the context of behavioral addiction types, can be considered as a factor that can affect different dimensions such as quality of daily life, social relationships (Ceyhan, 2008) and interpersonal relationships (Milani et al., 2009), life satisfaction, subjective well-being (Derin & Bilge, 2016), school success (Yavuz, 2018), sleep (Kokka et al., 2021) and academic motivation level (Akbaba & Kaya, 2022). It is known that getting through this period in a healthy way, during which adolescents gain their identity and prepare for the next level of education, is important for the following periods. Therefore it becomes important how the internet usage behavior of individuals who experience an extraordinary process such as the Covid-19 pandemic during adolescence is affected. For this reason, it is seen that research has been conducted to understand the nature of problematic internet usage behaviors of adolescents during Covid-19 in different cultures (Baltacı et al., 2021; Ilesanmi et al., 2021; Paulus et al., 2022; Vejmelka & Matković, 2021). However, after the Covid-19 pandemic, there is a lack of research that evaluates problematic internet use in terms of adolescents. In a study examining research on problematic internet use, it is stated that problematic internet use may be associated with health problems of the young population, and the Covid-19 pandemic process may cause problematic internet use and thus health problems (Ruckwongpatr et al., 2022).

In the light of all these considerations, this study aimed to describe the situation of the internet use behavior that increased during the pandemic process after the process. In this regard, the applications that adolescents use on the internet, the duration and time interval of internet use, their perceptions of addiction, the consequences of internet use and the meanings they attribute to the internet are discussed. Thus, it is thought that the results of this study will shed light on preventive and curative studies to be carried out by providing a perspective on adolescents' internet use to mental health professionals working with adolescents. Furthermore, it can be said that the extent to which internet use, which may be a risk factor for adolescents, is perceived as addiction and what kind of

consequences they face as a result of internet use, will provide information to parents and teachers about the situation after the intensified use during the Covid-19 pandemic. In the light of these explanations, it is examined whether there is a change in adolescents' internet use behaviors after the Covid-19 pandemic process. In this direction, the situation of internet use, which increased due to reasons such as quarantine and distance education during the Covid-19 process, after the process, whether there is a difference in the applications and time used, internet usage results and addiction perceptions are examined. Therefore, answers to the following questions are sought:

- How did adolescents choose to use the internet during the Covid-19 pandemic period?
- What is the distribution of adolescents' perceptions of addiction towards themselves during and after the Covid-19 pandemic according to gender and grade level?
- What are the meanings that adolescents attribute to the internet after the Covid-19 pandemic?
- What are adolescents' evaluations of the results of internet usage behavior during the Covid-19 pandemic period?

## Methods

### Research Model

The research general screening model is used. A screening study was carried out on a certain group to make a general judgment about the internet usage behaviors of adolescents after the Covid-19 period. Data is collected with a questionnaire developed in accordance with this model (Büyüköztürk et al., 2010; Karasar, 2002).

### Participants

The participants of the research rely on convenience sampling, which includes the elements that are completely available, quick and easy to reach, which is one of the sampling methods in qualitative research (Patton, 2005). In addition, adolescents who were still in their adolescence period, continued formal education, volunteered for the research and informed their families about the research, participated in the research. The participants consist of a total of 336 adolescents, 233 (69.3%) girls and 103 (30.7%) boys. In addition, 99 (29.5%) of the participants attend the 9th grade, 75 (22.2%) attend the 10th grade, 101 (30.1%) attend the 11th grade, and 61 (18%) attend the 12th grade. Attempts were made to reach participants from all grade levels. The link containing the interview form was shared with the adolescents who were informed about the study before the study and those who wanted to participate voluntarily and informed their families about this issue.

### **Data Collection Tools**

A questionnaire developed to determine the internet usage behaviors and perceptions of adolescents during (during and after) the Covid-19 pandemic period was used as a data collection tool in the study. Considering related literature, questions were constructed and expert opinions were obtained from two field experts. Then, a pilot study was conducted with six adolescents and the final version was given. The first two questions of the questionnaire are about demographic information including gender and grade level. The other nine questions are aimed to examine and evaluate adolescents' internet usage behavior during the pandemic period. Seven of the nine questions are closed-ended and two are open-ended. The "Other" option was included in the answer section of closed-ended questions, allowing students to express the points they deemed necessary regarding the question. With open-ended questions, it was aimed to obtain information about the results of adolescents' internet usage behaviors and the meaning they attach to the internet.

### **Data Collection and Analysis**

Before the data collection phase of the research, "research ethics permission" was obtained from the Scientific Research Publication Ethics Board of Dumlupınar University, dated 26.01.23, with decision number 2023/01 and decision number 2023/02-66. Then, data was obtained with the questionnaire prepared online via Google Forms between February and June 2023. During this process, the participants were informed about the research in advance, and the family was informed through the link containing the interview form and consent form. Thus, informed consent was obtained from the participants and families were informed. The average response time was found to be between 10-15 minutes. The quantitative data obtained from the closed-ended questions were subjected to frequency analysis, and certain codes, categories and themes were obtained through thematic analysis from the qualitative data obtained from the two open-ended questions (Braun & Clarke, 2006). Responses to these two questions are presented as excerpts, with the participants' gender and grade level indicated in parentheses beside each excerpt.

### **Validity and Reliability of the Research**

In order to ensure the validity of the findings, which is known as the accuracy of reflecting the data accurately, the study tried to present the participants' perspectives clearly and accurately, and examples of the participants' direct expressions were given. Similarly, in the method section, the process has been tried to be explained in detail. By adding the other option to closed-ended questions, the participants were allowed to express themselves objectively. Ensuring consistency and objectivity by avoiding personal and research method biases that may have affected the findings is a factor that increases the reliability of the study.

In order to ensure reliability in the study, the researcher individually analyzed the data obtained from two open-ended questions, then a different expert in qualitative studies and research was asked to make the analysis, and then the findings were examined comparatively (Noble & Smith, 2015).

### **Results**

The findings are presented according to four subheadings. First, it is indicated how adolescents used the internet during the Covid-19 pandemic. In this regard, the focus was on internet usage times during and now during the pandemic, internet usage time frame, applications that have been used extensively since the pandemic, applications that are difficult to say no to right now, and purposes of internet use. Then, the distribution of adolescents' addiction perceptions towards themselves during the Covid-19 pandemic according to gender and grade level, the meanings attributed to the internet, and evaluations regarding the results of internet use behavior are presented, respectively.

#### **Internet Usage Preferences of Adolescents during Covid-19**

In this section, the findings of the research data are discussed and evaluated. The internet usage hours of the adolescents participating in the study are presented in Table 1.

**Table 1.***Distribution of Adolescents' Internet Usage Hours*

		1	2	3	4	5	Total
Covid 19 process internet usage		<b>1-2 hours</b>	<b>3-4 hours</b>	<b>5-6 hours</b>	<b>7-18 hours</b>	<b>Other</b>	
	<i>n</i>	38	39	60	149	50	336
	%	11.31	11.61	17.86	44.34	14.88	100
Current internet usage		<b>1-2 hours</b>	<b>3-4 hours</b>	<b>5-6 hours</b>	<b>7-18 hours</b>	<b>Other</b>	
	<i>n</i>	73	122	70	44	27	336
	%	21.73	36.31	20.83	13.10	8.04	100
Internet usage time range		<b>Before 17.00</b>	<b>17.00-20.00</b>	<b>20.00-22.00</b>	<b>22.00-00.00</b>	<b>After 00.00</b>	
	<i>n</i>	27	43	113	120	33	336
	%	8.04	12.80	33.63	35.71	9.82	100

As can be seen in Table 1, 149 (44.34%) of 336 adolescents used the internet between 7-18 hours during the Covid-19 pandemic process. It is noteworthy that the number of adolescents using the Internet for 7-18 hours decreased from 149 to 44, while the number of adolescents using the Internet for 3-4 hours decreased from 39 to 122. The cut-off

points of the internet usage hours of the adolescents were based on the answers they gave. In the internet usage time interval, it is noteworthy that the most internet usage time is between 22.00 and 00.00 and the least usage is before 17.00. Information on the internet usage behaviors of the adolescents is Table 2.

**Table 2.***Distribution of Adolescents' Internet Use Practices and Purposes*

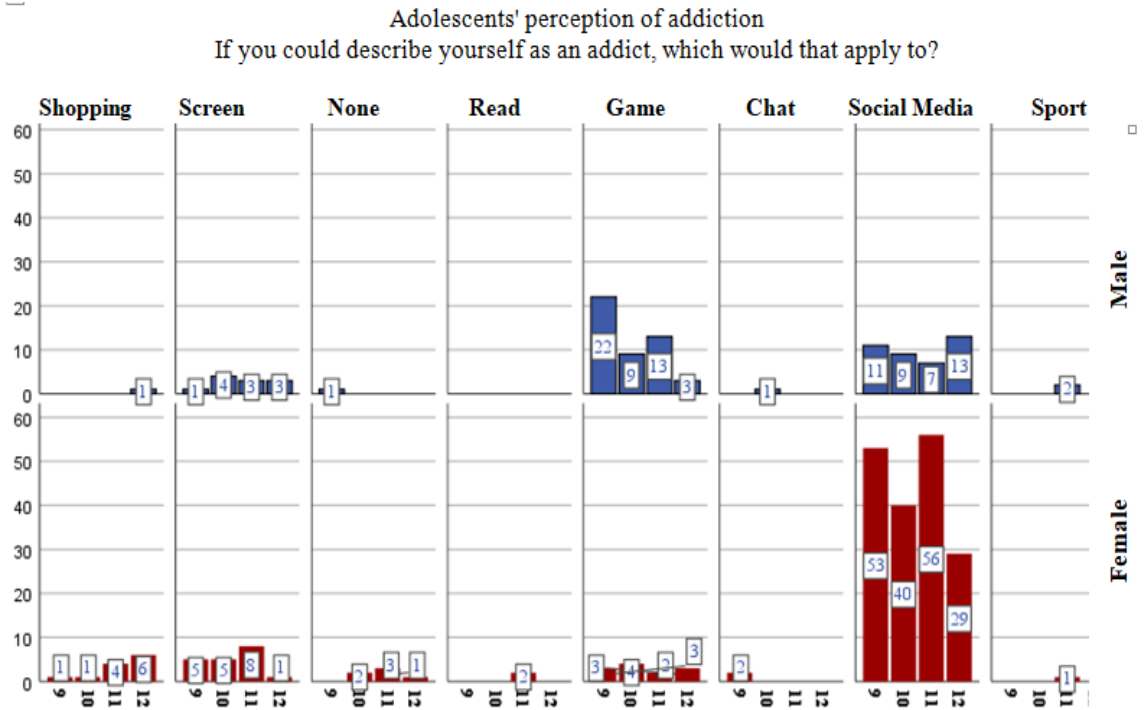
		1	2	3	4	5	6	Total
Apps used during and after the Covid 19		<b>Social Media Apps</b>	<b>Chats Apps</b>	<b>Research Apps</b>	<b>Game Apps</b>	<b>Shopping Apps</b>	<b>Others Apps</b>	
	<i>n</i>	187	66	63	12	3	5	336
	%	55.6	19.6	18.7	3.6	0.9	1.5	100
Applications that are difficult to say no		<b>Social Media Apps</b>	<b>Chats Apps</b>	<b>Shopping Apps</b>	<b>Game Apps</b>	<b>Others Apps</b>	<b>None</b>	
	<i>n</i>	161	16	1	28	34	96	336
	%	47.9	4.9	3	8.3	10.1	28.6	100
Internet usage purpose		<b>Social Media</b>	<b>Screen</b>	<b>Chat</b>	<b>Game</b>	<b>Research</b>	<b>Other</b>	
	<i>n</i>	160	66	52	32	22	4	336
	%	47.6	19.6	15.5	9.5	6.5	1.2	100

When Table 2 is examined, it is seen that the most used applications by adolescents since the Covid-19 process are; social media (n: 187) (instagram, snapchat, tiktok, pinterest, reddit, facebook, twitter), followed by messaging applications (n=66) (whatsapp, messenger, kwai), research (n: 63) (Google, EBA), games (n=12) (Cs go, epic games, discord, clash royale, league of legends, Pubg), shopping applications (n: 3) (trendyol, Hepsiburada, misli.com, sahibinden) and other applications (n=5) (Spotify, Netflix, Youtube). However, adolescents state that they have difficulty controlling the use of social media applications (n=161). In general, when we look at the purposes of

internet use, adolescents use social media the most for watching videos, chatting, playing games and doing research, respectively. Those who chose the other option made statements such as claims, coding, listening to music and all.

### **Distribution of Adolescents' Perceptions of Addiction by Class and Gender**

In Figure 1, there is information about which type of internet use is valid for adolescents' perceptions of being dependent on themselves.



**Figure 1.**  
*Adolescents' Perceptions of Addiction by Gender and Class Level*

As can be seen in Figure 1, adolescents perceive themselves as the most social media addicts in both genders and all grade levels. However, girls are more likely to perceive themselves as social media addicts. Similarly, it is noteworthy that adolescents perceive themselves as game and screen addicts in both genders and all grade levels. It is seen that boys perceive themselves as game addicts more than girls, while girls perceive themselves as more screen and shopping addicts. While the number of adolescents who do not perceive themselves as addicts is seven, it can be said that six of them are girls. When analyzed by grade level, adolescents attending the ninth grade mostly perceive themselves as social media (n:64) and game (n:25) addicts.

**Examining the Meaning that Adolescents Attribute to Their Internet Usage Behavior**

The codes, categories and themes regarding the meaning that the participants attribute to their internet usage behavior are presented in Table 3.

**Table 3.**  
*The Meaning that Adolescents Attribute to Their Internet Usage Behaviors*

Themes	Categories	Codes
The Meaning of Internet Usage	Negative Meanings	Addictive
	Attributed to Internet Use	Unnecessary
		Restrictive
		Facilitator
	Positive Meanings	Entertaining
	Attributed to Internet Use	Need
		Socializerc
		Relaxing
	Neutral Meanings	Absurdity
	Attributed to Internet Use	Instability

When Table 3 is examined, it is seen that the theme of meaning attributed to internet use is collected under 10 different codes and three different categories. It is noteworthy that the participants' internet perceptions were shaped as both positive, negative and neutral. Under the category of negative meanings attributed to internet use, there are codes that describe it as restrictive, addictive and unnecessary; under the category of positive meanings, there are facilitation, comfort, socialization, entertainment and need codes. The neutral meanings category consists of

codes called meaninglessness and ambivalence. Although participants evaluate internet use in the context of negative and neutral results, their positive perceptions towards the internet are striking. Despite this, the fact that many of the participants included statements about the addiction code in their answers is a remarkable finding in terms of problematic internet use. Codes under the positive perception category; It explains that the internet is perceived as facilitating and entertaining, is considered a necessity, and its intense use during the Covid-19 period. Examples of participants' direct statements are presented below.

I can't last a second without the Internet, I spend a large and important part of my life there. (Girl, Grade 11)

I can't survive without internet, I can't stand... (Male, Grade 10)

Once I sit on it, I can't let go. (Male, Grade 11)

Even if it is a bad habit, I will not give up. (Girl, Grade 10)

It's a waste of time, we deal with unnecessary things. (Girl, Grade 12)

Whether it is or not. (Girl, Grade 9)

It's nothing to me because I don't like to look. (Male, Grade 10)

I do not use unnecessary, social media and similar applications, they are of no use to me other than research and communication. (Girl, Grade 11)

The internet limits your range of motion and you feel handcuffed. (Girl, 9th Grade)

It's something I'm constantly stuck in the same spot where I can't make progress for myself. (Girl, Grade 11)

It is a must-have thing in life because it helps us to do everything in an easier way. (Girl, Grade 11)

When necessary, problems can be solved by the effect of the internet. (Male, Grade 11)

It gives you the opportunity to have everything at hand. (Girl, Grade 10)

Entertainment, education, shopping, etc. Access to things is easier and shorter. (Male, Grade 11)

It is an area where we can have fun in a time when technology is dominant and in the difficulties of life. (Girl, Grade 11)

When I go to the Internet, I have a lot of fun while chatting and playing videos or games. (Girl, Grade 9)

It's a tool that lets me have fun. (Girl, Grade 9)

The internet is like our hands and feet. We need it for even the smallest thing. (Male, Grade 12)

It can be necessary at any time. (Girl, Grade 12)

It's a must-have because most of the time there are things we learn from the internet. (Male, Grade 9)

For me, the internet is an important way of communication. Because it allows me to talk to people I can't talk to face to face. (Male, Grade 10)

I spend most of my time chatting. (Girl, Grade 9)

A place where I can socialize easily. (Girl, Grade 12)

I use it to relax and calm down. (Girl, Grade 11)

My mind is blown, it feels good. (Girl, Grade 12)

When I'm in a bad mood, I immediately run to the Internet. (Girl, Grade 10)

Every time I enter, I take all my stress and forget everything and become happy. (Girl, Grade 11)

I don't know. (Girl, Grade 12)

I have no idea. (Male, Grade 11)

Nothing. (Male, Grade 9)

It's a waste of time, but it seems like there are places where it is used well. (Girl, Grade 10)

Sometimes it is necessary and sometimes unnecessary. (Male, Grade 10)

### Examining the Results of Adolescents' Internet Usage Behaviors

The themes, categories and codes regarding the results of internet use are presented in Table 4.

**Table 4.**

*The Consequences of Adolescents' Internet Usage Behavior*

Themes	Categories	Codes
Consequences of Internet Use	Negative Reflections of Internet Use	Waste of Time
		Health Problems
		Academic Fail
		Dependence
	Neutral Assessment of Internet Use	Delay
		Personal Problems
		Family Problems
		Distancing from Reality
		Don't Think it Has Any Effect
		Unawareness of the Impact

As seen in Table 4, participants state that their internet usage behavior has more than one consequence. When the expressions are evaluated, they can be discussed in the categories of negative reflections of the theme of the consequences of internet use and neutral evaluation. The category of negative reflections of internet use consists of eight different codes called "loss of time, health problems, academic failure, addiction, procrastination, personal problems, family problems, distance from reality". In health problems, participants often experience eye pain, burning, eye redness, headache and neck pain, tension and contractions in the muscles and body; He talks about personal problems such as forgetfulness, inability to focus, asocialization, laziness, negative affect and psychological problems. It is noteworthy that there are 32 statements indicating that internet use leads to addiction in its reflections on life. Another category, impartial evaluation of internet use, consists of two codes: "not thinking it has an



effect and not being aware of its effect". Although the participants do not think that the internet has any effect, they think that it does not have a negative effect or they state that they have no idea about its effects.

Sometimes I realize that I'm wasting my time or that I'm wasting too much time. (Male, Grade 10)

I feel like I can't control my time. (Girl, Grade 11)

I don't waste my time and use it well. (Girl, Grade 9)

I wear glasses, my back and head hurt often. (Male, Grade 10)

It negatively affects my academic performance. (Girl, Grade 9)

It makes me very tired but I can't give up. Not without. (Girl, Grade 11)

It has negative effects such as delaying the work that needs to be done. (Girl, Grade 10)

Sometimes I dive into the internet and eat my study time, lessons are left. (Girl, Grade 10)

It creates insecurity. I am experiencing negative emotions. (Girl, Grade 10)

I can't focus, I'm lazy. I became antisocial. (Male, Grade 11)

I constantly feel depressed. (Girl, Grade 12)

My communication with my family is badly affected. Conflict is happening. (Male, Grade 10)

It makes me feel like I've spent my life there, it makes me think that you can be happier and have more fun there. Facts are not like that. (Girl, Grade 10)

I don't have it because I usually use it consciously. I don't think it has any effect. (Male, Grade 12)

I have no idea. I never thought. (Male, Grade 10)

I can't say anything about it. I don't know. (Girl, Grade 10)

## Discussion

As a result of this study, a perspective has been reached on the internet usage behaviors of adolescents from the Covid-19 pandemic process to this day. It was seen that this period of time that adolescents use the internet between 7-18 hours during the distance education period, which started during the pandemic, decreased with the transition to face-to-face education. Considering the possibility that the level of internet addiction will increase as the duration of internet use increases (Yılmazsoy & Kahraman, 2017), it can be said that the distance education period carries the risk of increasing internet addiction. On the other hand, the fact that adolescents perform their education and training processes on the internet during the distance education period, communication with their friends and different needs may have increased their usage time. As a matter of fact, adolescents state that they use youtube, whatsapp and game applications the most, followed by instagram, respectively. This is a clue that adolescents try to meet their needs such as communication and entertainment on the

Internet. However, it is noteworthy that the time interval when adolescents use the internet the most is between 22.00 and 00.00, and the least use is before 17.00. This gives an important clue when evaluated both in the distance education period and in the face-to-face education period. The time before sleep is very precious. According to the circadian rhythm, which expresses the changes in the physiological and biological processes of the organism for approximately one day, sleep at certain hours is very important and is also related to the growth hormone (Akinci & Orhan, 2016). For this reason, it can be thought that adolescents' spending these hours on the internet instead of sleeping may be an obstacle to their healthy development. Similarly, adolescents who cannot get a healthy night's sleep are at risk of not being productive in the school time frame the next day. However, considering that problematic internet use is associated with sleep (Kokka et al., 2021), adolescents' preference for internet use over sleep can be considered as a signal for problematic internet use.

Since the Covid-19 process, adolescents have been spending time intensively on social media applications such as instagram, snapchat, tiktok, pinterest, reddit, facebook, twitter; They chat with applications like whatsapp, messenger, kwai, do research with applications such as Google, EBA, they prefer Cs go, epic games, discord, clash royale, league of legends, Pubg games, trendyol, Hepsiburada, misli.com, shopping in applications like sahibinden. and they use applications such as Spotify, Netflix, Youtube. It is noteworthy that adolescents who use different applications for different purposes have difficulty in saying no and the application they cannot control is social media applications. It is important to support adolescents (Öncü, 2022) who use social media applications to meet their learning and entertainment needs in a controlled and beneficial way. In addition, considering that the intense and uncontrolled use of social media applications and online games raise the risk of addiction (Guessoum et al., 2020), it can be thought that it becomes necessary to carry out preventive studies and raise awareness for adolescents.

Adolescents state that they use the internet mostly for watching videos, playing games, chatting, doing research and shopping, after social media. During the pandemic, adolescents prefer the internet mostly for work and education, followed by the use of social media, information seeking, entertainment and online gaming (Siste et al., 2021), which supports the research findings. Despite this, adolescents state that even if they start using the internet for educational and research purposes, they suddenly find

themselves using the internet for a different purpose and have difficulty controlling it (Topçuoğlu & Kuruçay, 2022). In addition, during the Covid-19 pandemic, adolescents may perceive the internet they use for purposes such as social media, playing online games, shopping, and watching movies and TV series as an escape route from psycho-social problems that they may encounter over time, and this may pose a risk in terms of problematic internet use (Baltacı et al., 2021). Finally, it is known that role-playing games such as World of Warcraft or Second Life, in which the person plays a character operating in an online environment, and virtual relationships established through instant messaging through applications such as ICQ, MSN, Yahoo, or online dating sites lead to problematic internet use (Acier & Kern, 2011). In this respect, it can be said that the usage purposes expressed by the adolescents in this study also represent a risk in terms of problematic internet. Because it is seen that the purposes of internet use and the time spent on the internet are considered as determinants for the risk of addiction (Derin & Bilge, 2016).

How adolescents perceive themselves, especially during adolescence, is an issue that needs to be addressed. It raises the question of how adolescents who try to achieve identity gain perceive themselves to be dependent. In this study, adolescents perceive themselves as the most social media addicts in both genders and all grade levels, however, it is seen that this perception is higher in female adolescents. In addition, it is noteworthy that adolescents perceive themselves as game and screen addicts in both genders and all grade levels. It is thought that it will be useful to review the pandemic process to explain the relevant situation. During the pandemic, meeting different needs such as entertainment, communication and learning via the internet has attracted adolescents to the screen more than ever. However, in a recent study, the fact that the game addiction level of the 17-year-old group is higher than the other age groups (Gürsu & Özçelik, 2022) confirms this perception. Similarly, the increase in the time that adolescents spend on the screen during the Covid-19 pandemic process, and the fact that they will not give accurate information to their parents about this time and bring the risk of uncontrolled use to the agenda (Topçuoğlu & Kuruçay, 2022) makes the issue of screen addiction remarkable. In addition, as a result of the study, boys perceive themselves as game addicts more than girls, while girls perceive themselves as more screen and shopping addicts. In a study examining the researches on game addiction, it was seen that gender had an effect in 21 studies and it was concluded that the game addiction levels of men were higher (Şimşek & Karakuş-Yılmaz, 2020). This situation supports that male adolescents perceive themselves as game addicts. In addition to this, it

comes to the fore that gaming behavior poses a risk for male adolescents' problematic internet use. In addition, the fact that girls have a higher risk of screen addiction than boys (Çetinkaya, 2019) supports the results of the research. These results emphasize that internet usage purposes may differ according to gender and this situation has become a factor that should be taken into account in prevention studies carried out in schools.

Another result discussed in the study is the situations faced by adolescents as a result of internet use behavior. It is noteworthy that these results are perceived negatively or neutrally by adolescents. As a matter of fact, internet use, which is mostly evaluated in terms of loss of time, health problems, academic failure, addiction, procrastination, personal problems, family problems, alienation from reality, is also evaluated as not thinking that it has negative consequences and not being aware of its effects. Similarly, during the Covid-19 pandemic process, difficulties in controlling internet usage, causing problems in family relations and social interaction (Baltacı et al., 2020), problematic internet use can be associated with health problems, the Covid-19 pandemic process, problematic internet use and the knowledge that it may cause health problems (Ruckwongpatr et al., 2022) supports the research result. Finally, it is seen that adolescents' perceptions of internet use behaviors are both positive, negative and neutral. In this context, the internet, which can be perceived as restrictive, addictive and unnecessary according to the usage situation, can also be seen as facilitating, relaxing, socializing, entertaining and needy. In addition, it is noteworthy that adolescents who do not give meaning to internet use and do not think about it, perceive it neutrally. In a study that deals with perceptions of the Internet in the context of family, it was concluded that there are positive perceptions of the Internet in terms of accessing information, socializing, being a facilitator, and negative perceptions in terms of the accuracy of information, becoming an information dump and creating the risk of addiction (Akkaya, 2021).

### **Conclusion and Recommendations**

As a result, this research tries to contribute to understand the internet usage of adolescents after the Covid-19 process. Usage periods, purposes, applications they use can be considered as clues about the risk of problematic internet use. The perceptions of addiction according to grade level and gender can provide resources for possible preventive studies to be conducted. It can also provide data to field workers and researchers about the intensive use during the pandemic process and its reflections on the next process. In

addition, it can lay the groundwork for planning prevention studies at individual and societal level in line with possible risk factors and adolescents' perceptions of the Internet.

Although this study has significant implications for understanding the problematic internet use of adolescents, it can be said that there are limitations in the generalization of the results. In order to enrich the research results, at least 10 participants with different characteristics and groups are recommended (Hill, 2012). In this study, it was tried to reach the participant who would allow generalization in terms of gender and class level. However, in the study, the problematic internet usage situation was tried to be explained by using the qualitative research method, which offers different opportunities due to its nature. Another limitation is the inability to make quantitative measurements using a valid scale in order to embody the problematic internet use experiences of adolescents. In order to offer ideas for different studies on problematic internet use and to generalize the experience, participants can be diversified on topics such as place of residence, school type, socioeconomic status. Thus, results can be produced with a more general perspective on problematic internet use of adolescents.

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## Genişletilmiş Özet

### Giriş

Covid-19 salgın sürecinin öncesinde, ergenler tarafından yoğun şekilde kullanılan internet, salgın sürecinde farklı kullanım amaçları ve uygulama türleri ile daha da fazla zaman geçirilen bir ortam hâline gelmiştir. Bu nedenle salgın süreci sonrasında internet kullanım davranışlarının nasıl şekillendiği, amaçları ve kullanım süreleri ile ilgili bilgilerin, ergenlerin yaşayabileceği bağımlılık riski konusunda fikir sunacağı düşünülebilir. Nitekim internet kullanım amaçları ve internette geçirilen süre bağımlılık riski üzerinde etkili birer unsur olarak değerlendirilmektedir (Derin & Bilge, 2016). Ayrıca davranışsal bağımlılık türleri bağlamında değerlendirilen problemli internet kullanımı ergenlerin günlük yaşam, sosyal ilişkiler (Ceyhan, 2008) ve kişiler arası ilişkilerin kalitesi (Milani ve ark., 2009), yaşam doyumu ve öznel iyi oluş (Derin & Bilge, 2016), okul başarısı (Yavuz, 2018), uyku (Kokka ve ark., 2021) ve akademik güdülenme düzeyi (Akbaba & Kaya, 2022) gibi farklı boyutları etkileyebilecek bir unsur olarak değerlendirilebilir. Ergenlerin kimlik kazanımını gerçekleştirdiği ve bir üst eğitim kademesine hazırlandıkları bu dönemin sağlıklı şekilde atlatılmasının ilerleyen dönemler için önem arz ettiği bilinmektedir. Bu nedenle Covid-19 salgını gibi olağan dışı bir süreci ergenlik döneminde yaşayan bireylerin, internet kullanım davranışlarının ne şekilde etkilendiği önem kazanmaktadır. Bu nedenle farklı kültürlerde Covid-19 sürecinde ergenlerin problemli internet kullanım davranışlarının doğasını anlamaya yönelik araştırmalar yapıldığı görülmektedir (Baltacı ve ark., 2021; Ilesanmi ve ark., 2021; Paulus ve ark., 2022; Vejmelka ve Matković, 2021). Fakat Covid-19 salgını sonrasında problemli internet kullanımını ergenler boyutu ile değerlendiren araştırmaya rastlanmamıştır. Problemli internet kullanımı konusundaki araştırmaları inceleyen bir çalışmada problemli internet kullanımının genç nüfusun sağlık sorunlarıyla ilişkilendirilebileceği, Covid-19 salgın sürecinin, problemli internet kullanımı ve dolayısıyla sağlık sorunlarına yol açabileceği ifade edilmektedir (Ruckwongpatr ve ark., 2022). Bütün bu açıklamalar ışığında bu araştırmada, salgın sürecinde artan internet kullanım davranışının süreç sonrasında ne durumda olduğunu betimlemek amaçlanmaktadır. Bu bağlamda ergenlerin internette kullandığı uygulamalar, internet kullanım süreleri ve saat aralığı, bağımlılık algıları, internet kullanımının sonuçları ile internete yükledikleri anlamlar ele alınmaktadır.

### Yöntem

Araştırmada genel tarama modeli kullanılmaktadır. Nitekim Covid-19 salgın süreci sonrasında ergenlerin internet kullanım davranışlarına ilişkin genel bir yargıya varmak amacıyla belli bir grup üzerinde tarama çalışması yapılmıştır. Bu modele uygun olarak geliştirilen ve 11 sorudan oluşan çevrimiçi bir anket aracılığıyla katılımcılardan veriler toplanmıştır (Büyüköztürk ve ark., 2010; Karasar, 2002). Araştırmanın katılımcıları, henüz ergenlik döneminde olan, örgün eğitime devam eden, araştırmaya gönüllü olan ve ailelerini araştırma hakkında bilgilendiren ergenlerdir. Bu bağlamda 233'ü (%69,3) kız, 103'ü (%30,7) erkek olmak üzere toplam 336 ergenden, 99'u (%29,5) 9. sınıfa, 75'i (%22,2) 10. sınıfa, 101'i (%30,1) 11. sınıfa ve 61'i (%18) 12. sınıfa devam etmektedir. Araştırmada veri toplama aracı olarak, Covid-19 salgın sürecinde (salgın sırasında ve sonrasında) ergenlerin internet kullanım davranışlarını ve algılarını belirlemek amacıyla hazırlanan ikisi demografik bilgi, ikisi açık uçlu olmak üzere 11 sorudan oluşan anket kullanılmıştır. Anketin ilk iki sorusu cinsiyet ve sınıf düzeyi gibi demografik bilgilerle ilgilidir. Dokuz sorunun yedisi kapalı uçlu ve ikisi açık uçludur. Katılımcıların ortalama yanıt verme süresi 10-15 dakika arasında bulunmuştur. Sürecin sonunda kapalı uçlu sorulardan elde edilen veriler frekans analizine tabi tutulmuş, iki açık uçlu sorudan elde edilen verilerden ise tematik analiz yoluyla belirli kodlar, kategoriler ve temalar elde edilmiştir.

### Bulgular

Araştırma sonucunda, Covid-19 salgını sürecinde ergenlerin 7-18 saat arasında internet kullandıkları görülmüştür. İnterneti Covid-19 sürecinde 7-18 saat arası kullanan ergen sayısının süreç sonrasında 149'dan 44'e düştüğü, 3-4 saat internet kullanan ergen sayısının ise 39'dan 122'ye çıktığı dikkat çekmektedir. Bu durum Covid-19 süreci sonrasında ergenlerin internet kullanım süresinin azaldığına işaret etmektedir. Uzaktan eğitimin sona ermesi ve karantina sürecinin sonlanmasının bu sonuç üzerinde etkili olabileceği söylenebilir. Ergenlerin en fazla internet kullanımının 22.00-00.00 saatleri arasında, en az internet kullanımının ise 17.00 öncesi olduğu dikkat çekmektedir. Ayrıca Covid-19 salgın sürecinden bu yana ergenlerin en çok kullandığı uygulamaların; sosyal medya (Instagram, Snapchat, Tiktok, Pinterest, Reddit, Facebook, Twitter) ardından sırasıyla sohbet etme (Whatsapp, Messenger, Kwai), araştırma yapma (Google, EBA), oyun oynama (Cs Go, Epik Oyunlar, Discord, Clans Royale, League of Legends, Pubg), alışveriş yapma (Trendyol, Hepsiburada, misli.com, sahibinden) ve diğer etkinlikler (n:5) (Spotify, Netflix, Youtube) amacına hizmet eden uygulamalar olduğu görülmektedir. Ergenlerin hayır demekte zorlandıkları ve kontrol edemedikleri uygulamanın sosyal medya olması dikkat çekmektedir. Genel olarak ergenler sosyal medya kullanmak, video izlemek, sohbet etmek, oyun oynamak ve araştırma yapmak amacı ile interneti kullanmaktadır. Diğer seçeneği tercih edenler



ise iddia, kodlama, müzik dinleme ve hepsi gibi seçenekler üretmiştir. Bununla birlikte kızların kendilerini sosyal medya bağımlısı olarak algılama olasılıklarının daha yüksek olduğu, her iki cinsiyette ve tüm sınıf düzeylerinde ergenlerin kendilerini oyun ve ekran bağımlısı olarak algıladıkları dikkat çekmektedir. Erkeklerin kızlara göre kendilerini daha fazla oyun bağımlısı olarak algıladıkları, kızların ise kendilerini daha çok ekran ve alışveriş bağımlısı olarak algıladıkları görülmektedir. Kendini bağımlı olarak görmeyen ergenlerin sayısı yedi iken bunların altısının kız olduğu sonucuna ulaşılmıştır. Sınıf düzeyine göre bağımlılık algıları incelendiğinde ise dokuzuncu sınıfa devam eden ergenler, kendilerini çoğunlukla sosyal medya ve oyun bağımlısı olarak algılamaktadır.

### **Sonuç**

Araştırmanın nitel verileri incelendiğinde; internet kullanımının anlamı teması “internet kullanımına yüklenen olumsuz anlamlar”, “internet kullanımına yüklenen olumlu anlamlar” ve “internet kullanımına yüklenen nötr anlamlar” olmak üzere üç kategoride; internet kullanım sonuçları temasının ise “Internet kullanımının olumsuz yansımaları”, “internet kullanımını nötr değerlendirme” olmak üzere iki kategoride tanımlandığı görülmektedir. Bu bulgu ışığında; ergenlerin, internet kullanım davranışlarının sonuçlarını olumsuz algıladıkları ve internet kullanım davranışlarına hem olumlu hem de olumsuz anlamlar yükledikleri dikkat çekmektedir. Sonuç olarak bu araştırma, Covid-19 süreci sonrasında ergenlerin internet kullanım durumlarının anlamlandırılmasına katkı sağlamaya çalışmaktadır. Ergenlerin internet kullanım süreleri, amaçları, en çok kullandıkları uygulamalar problemlili internet kullanımının riskine ilişkin ipuçları olarak değerlendirilebilir. Sınıf düzeyi ve cinsiyete göre bağımlılık algıları planlanacak olası önleyici çalışmalara kaynak sağlayabilir. Ayrıca saha çalışanlarına ve araştırmacılara Covid-19 salgın sürecindeki yoğun kullanım ve bunun sonraki sürece yansımaları hakkında fikir sunabilir. Ayrıca olası risk faktörleri ve ergenlerin internet algıları doğrultusunda bireysel ve toplumsal düzeyde önleme çalışmalarının planlanmasına zemin hazırlayabilir. Bu çalışmanın ergenlerin problemlili internet kullanımını anlama açısından önemli çıkarımları olsa da sonuçların genellemesinde sınırlılıkların olduğu söylenebilir. Araştırma sonuçlarının zenginleştirilmesi amacıyla farklı özellik ve gruplara sahip en az 10 katılımcının katılımı önerilmektedir (Hill, 2012). Bu çalışmada cinsiyet ve sınıf düzeyi açısından genellemeye izin verecek katılımcıya ulaşılmaya çalışılmıştır. Araştırmanın diğer bir sınırlılığı kesitsel olmasıdır. Süreç sonrasında problemlili internet kullanımı davranışının doğasını anlayabilmek için boylamsal çalışmalar ve ergenlerin problemlili internet kullanım deneyimlerini daha derinlemesine irdelenecek karma yöntem çalışmaları planlanabilir. Problemlili internet kullanımına ilişkin farklı çalışmalara fikir sunmak ve deneyimi genelleştirmek adına katılımcılar yaşadıkları yer, okul türü, sosyoekonomik durum gibi konularda çeşitlendirilebilir. Böylece ergenlerin problemlili internet kullanımına ilişkin daha genel bir bakış açısıyla sonuçlar üretilebilir.

# Öğretim Programının Uygulayıcıları Ne Kadar Program Okuryazarı?

## How Curriculum Literate are The Implementers of the Curriculum?

### Öz

Formal eğitim bir amaç çerçevesinde şekillenir ve önceden hazırlanmış programlar aracılığıyla belli bir planlama ile yürütülür. Programların etkililiği çok büyük ölçüde uygulayıcıların bu konudaki donanımlarına ve yeterliklerine bağlıdır. Bu noktada, öğretim programlarının uygulayıcısı olan öğretmenlerin ve gelecekte uygulayıcısı olacak olan öğretmen adaylarının program okuryazarlık düzeyleri önem kazanmaktadır. Öğretim programı okuryazarlığı, öğretim programlarının uygulayıcıları olan öğretmenler ve öğretmen adaylarının bir öğretim programının amaçlarını, tasarımını, uygulanmasını ve değerlendirilmesini anlama yeteneklerini ifade eder. Bu bağlamda çalışmanın amacı; öğretim programlarının uygulayıcılarının öğretim programı okuryazarlık düzeylerinin ve "Fen Öğretim Programları" dersinin öğretmen adaylarının program okuryazarlığına etkisinin belirlenmesidir. Çalışmada betimsel tarama yöntemi kullanılmıştır. Verilerin toplanmasında "Öğretim Programı Okuryazarlık Ölçeği" nden faydalanılmıştır. Verilerin analizinde eşleştirilmiş örneklem için t testi ve tek yönlü varyans analizinden faydalanılmıştır. Çalışmanın sonucunda, 4. Sınıfa devam eden öğretmen adaylarının program okuryazarlık düzeylerinin öğretmenlerden ve 2. Sınıfa devam eden öğretmen adaylarından daha yüksek olduğu görülmüştür. Ayrıca "Fen Öğretim programları" dersini alan öğretmen adaylarının ders sonrasında öğretim programı okuryazarlık düzeylerinin anlamlı bir şekilde arttığı sonucuna ulaşılmıştır.

**Anahtar Kelimeler:** Öğretim programı, program okuryazarlığı, öğretmenler, öğretmen adayları, fen bilgisi eğitimi

### ABSTRACT

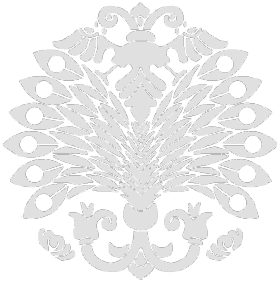
Formal education is shaped within the framework of a purpose and is carried out with a certain planning through pre-prepared curriculums. The effectiveness of the curriculum depends to a great extent on the equipment and competencies of the implementers. At this point, the curriculum literacy levels of teachers, who are the implementers of curricula, and prospective teachers, who will be the implementers in the future, gain importance. Curriculum literacy refers to the ability of teachers and pre-service teachers, who are the implementers of curricula, to understand the aims, design, implementation and evaluation of a curriculum. In this context, the aim of the study is to determine the curriculum literacy levels of curriculum implementers and the effect of the "Science Curriculum" course on the curriculum literacy of pre-service teachers. Descriptive survey method was used in the study. "Curriculum literacy scale" was used to collect the data. In the analysis of the data, t-test for paired samples and one-way analysis of variance were used. As a result of the study, it was seen that the curriculum literacy levels of pre-service teachers attending the 4th grade were higher than those of teachers and pre-service teachers attending the 2nd grade. In addition, it was concluded that the curriculum literacy levels of pre-service teachers who took the "Science Curriculum" course increased significantly after the course.

**Keywords:** Curriculum, curriculum literacy, teachers, pre-service teachers, science education

Betül  
KARADUMAN



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## Giriş

Bir ülkenin belirlenen hedefler doğrultusunda nitelikli bireyler yetiştirmesinde eğitim programlarının çok önemli bir rolü vardır. Eğitim sisteminin ne tür bir birey hedeflediği, bu hedefe ulaşmak için hangi içeriklere ihtiyaç duyduğu, nasıl bir süreç izleyeceği, destekleyici araç- gereçleri ve hedeflere ne düzeyde ulaşıp ulaşılmadığı eğitim programı yoluyla belirlenir (Çetinkaya & Tabak, 2019). En genel tanımıyla eğitim programı, öğrenene, okulda ve okul dışında planlanmış etkinlikler yoluyla sağlanan öğrenme yaşantıları düzeneğidir (Demirel, 2007). Eğitim programı ne, niçin, nasıl ve ne zaman öğreneceğinin öğrenciye açıklanmasıdır (Bolat, 2017). Eğitim programlarının farklı sınıflandırmaları mevcuttur. Örneğin Posner (2004) resmi eğitim programı, uygulamadaki/işlevsel (işevuruk) eğitim programı, destekleyici/ekstra eğitim programı, ihmal edilen/ geçersiz eğitim programı ve örtük program olarak sınıflandırmıştır. Talim ve Terbiye Kurulu tarafından hazırlanan ve okullara gönderilen öğretim programları resmi program iken, öğretmenin resmi programı sınıf iklimine, imkânlarına, yeterliklerine ve öğrenci özelliklerine göre uyarlayarak gerçekleştirebildiği etkinlikler ve ulaşabildiği kazanımlar uygulamadaki yani diğer bir deyişle yaşayan programı oluşturmaktadır. Bununla birlikte resmî olarak programda yer almayan kontrol dışındaki değişkenler dolayısıyla uygulamada ortaya çıkan davranış değişiklikleri, değerler vb. ise örtük programdır. Öğretmenin bazı nedenlerle ulaşamadığı kazanımlar ihmal edilen program, yazılı programda yer almayan ancak planlı gerçekleştirilen sosyal, kültürel, sportif etkinlikler ekstra programdır (Karacaoğlu, 2011). Eğitim programı kavramı genellikle öğretim programı kavramı ile aynı anlamda kullanılmaktadır. Ancak öğretim programı; eğitim programı temel alınarak, belli bir sınıf düzeyindeki farklı derslerle ilgili kazanımlar, içerik, eğitim durumları ve değerlendirme gibi öğeleri içeren bir rehber niteliğindedir. Yani eğitim programı ve öğretim programı arasında bir kapsayıcılık ilişkisi mevcuttur. Eğitim programlarının okullarda uygulamaya dönüşmesi öğretim programı olarak düşünülebilir. Bu yönüyle öğrenme-öğretme sürecinin etkililiği öğretim programlarının işlevsel bir biçimde işe koşulması ile mümkün görünmektedir. (Kocayığit & Aykaç, 2019). Dolayısıyla eğitim programlarının etkililiği onu uygulayan öğretmenin bu konudaki donanımı ve yeterliğine bağlıdır. Bu konuda Fidan (1985), bir programın etkililiğinin büyük ölçüde öğretmenlerin onu yorumlayışına ve uygulama becerilerine bağlı olduğunu, Saracaloğlu (1992) ise; nitelikli hazırlanan bir eğitim programının, uygulayıcıların yetersiz olması durumunda işlevselliğini kaybedebileceğini belirtmektedir. Opoh ve Awhen (2015)' e göre de; bir program çok güzel planlanmış olabilir ancak etkili uygulanmadığı takdirde hiçbir anlam ifade

etmemektedir. Öğretmenler aynı resmi programı kullanırlar ama her biri farklı şekilde uygular (Songer & Gotwals, 2005). Bu durumda kaçınılmaz olarak yaşayan programlar birbirlerinden farklı olacaktır. Bu farklılığın en önemli nedenlerinden biri ise öğretmenlerin programları anlama ve algılama şekillerinin farklı olmasıdır. Oysaki program geliştirmenin temelleri göz önünde bulundurulduğunda ortak bir hedef söz konusudur ve bu hedef doğrultusunda istenilen özelliklere sahip bireyler yetiştirilmesi beklenmektedir. Bu noktada program okuryazarlığı kavramı önem kazanmaktadır.

Karakuyu'ya (2023) göre öğretmenler tasarlanmış olan öğretim programlarını, program okuryazarlığı hakkındaki farkındalıklarına uygun olarak uygularlar. Program okuryazarı öğretmenler, resmi/planlanan programı okuyup anlayıp doğru şekilde planlar ve uygularsa resmi program ile uygulamadaki program arasındaki farkı azaltabilir (Aslan & Gürlen, 2019). Öğretmenlerin, öğretim programlarının sadece aktarıcısı olmakla kalmayıp, programların sınıf iklimine göre uyarlanabilir olduğunun ve programların bütün öğelerinin dinamik ilişkiler bütünü olarak yapılandırıldığı farkında olması gerekmektedir (Şişman, 2017). Bu farkındalık da onların öğretim programı okuryazarlık düzeylerini etkilemektedir. Öğretmenler, etkili öğretimde birincil sorumluluğa sahip oldukları için onların programa bakış açıları ile birlikte bu konuda sorumluluk alacak olan öğretmen adaylarının da öğretim programlarına ilişkin algı, beceri ve yeterliklerini anlamak da gereklidir. (Demir & Toraman, 2021). Özdemir (2012), öğretmenlerin ve öğretmen adaylarının eğitim programları ve program geliştirme süreçleriyle ilgili bilgilerinin ve bu konudaki algılarının öğretmen eğitimi açısından önemine vurgu yapmaktadır. Öğretim programı okuryazarlığı kavramı alan yazına Akınoğlu ve Doğan (2012) tarafından önerilmiş ve öğretim programının uygulayıcılar tarafından doğru anlaşılması olarak tanımlanmıştır (Yıldırım, 2019). Eğitim programı okuryazarlığı aynı zamanda program okuryazarlığı olarak da ifade edilmektedir. Bu okuryazarlık türü Keskin ve Korkmaz (2017) tarafından eğitim programları hakkında bilgi sahibi olma, onları yorumlayabilme, eleştirel bir gözle inceleyerek eğitim programlarını içinde bulunduğu şartlara uygun olarak uyarlayabilme olarak tanımlanmaktadır (Erdem & Eğmir 2018, s.124). Nsibande ve Modiba'ya (2012) göre ise; öğretmenin programı yeni durumlara uyarlayabilme kapasitesidir. Alan yazın incelendiğinde, programları tanıyan ve etkili olarak uygulayabilen öğretmenlerin mesleğe hazır olan öğretmenler olarak tanımlandığı görülmektedir (Ingvarson ve ark., 2007). Eğitim programı okuryazarlığı, öğretmenin standart planları uygulamak yerine öğretim programını yorumlayarak yeni durumlara uyarlayabilme kapasitesidir (Nsibande & Modiba, 2012). Program okuryazarlığı önemlidir, çünkü

program geliştirme bir süreçtir ve öğretim programları sıklıkla güncellenmektedir (Demir & Toraman, 2021). Dolayısıyla, yaşayan programların uygulayıcıları olan öğretmenlerin ve geleceğin öğretmenleri olan öğretmen adaylarının program okuryazarlık düzeyleri, programların uygulamaya yansımaya kalitesinde belirleyici olacaktır.

Öğrenmelerin gerçekleşme hızı, öğretmenlerin öğretim programlarına adaptasyon hızıyla paraleldir. Bu da öğretmenlerin programları anlama ve uygulama konusunda daha donanımlı olmalarını gerektirir (Keskin, 2020). Aygün (2019), öğretmenin başarısının, program geliştirmenin öğeleri açısından tanıyabilmesine bağlı olduğunu ve bu anlamda gelişmiş öğretmen adaylarının da mesleğe hazır olacağını belirtmiştir. Ayrıca öğretmen adaylarının öğretim programı okuryazarlık düzeylerinin belirlenmesinin, lisans ders içeriklerine geri bildirim sunması ve geleceğin öğretmenlerinin bu konudaki yeterliklerinin farkına varılması açısından önemli olduğu düşünülmektedir. Bu noktada büyük önem kazanan öğretmenlerin öğretim programı okuryazarlığını, mezun oldukları öğretmen eğitim programlarında eğitim programlarına ilişkin ne tür bilgilerle donatıldıklarının etkilediği düşünülmektedir. Bolat (2017), öğretmen adaylarının aldıkları eğitim içeriklerinin onların birer eğitim programı okuryazarı olmasını sağlaması gerektiğini savunmaktadır. Ünal ve Er'in (2015) çalışmasında öğretmen adaylarının program okuryazarlık düzeyleri üniversite değişkeni açısından incelenmiştir. Çalışmalarında üniversite değişkeninin anlamlı bir farklılık yarattığı görülmüştür. Bunun nedeninin ne olduğunu belirlemek adına farklı üniversitelerdeki öğretim programları incelendiğinde pozitif etkiye sahip olan programda, "öğretim programı", "program geliştirme" gibi seçmeli derslerin yer aldığı görülmüştür. Eğitim programlarına ilişkin içeriğe sahip olan derslerden biri de, Fen Bilgisi öğretmenliği programındaki "Fen Öğretim Programları (FÖP)" dersidir. FÖP dersi Fen bilgisi öğretmenliği programı 4. Yarıyılıda verilen iki ders saatlik zorunlu bir derstir. YÖK'ün (2018) Fen Bilgisi Öğretmenliği Lisans programına göre FÖP ders içeriği; "*Öğretim programlarıyla ilgili temel kavramlar; fen öğretim programlarının geçmişten günümüze gelişimi; güncel fen öğretim programlarının yaklaşımı, içeriği, geliştirmeyi amaçladığı beceriler; öğrenme ve alt öğrenme alanları; kazanımların sınıflara göre dağılımı ve sınırları, diğer derslerle ilişkisi; ilkokul ve lise fen öğretim programlarıyla ilişkisi; kullanılan yöntem, teknik, araç-gereç ve materyaller; ölçme değerlendirme yaklaşımı; öğretmen yeterlilikleri.*" şeklindedir. Dolayısıyla bu dersin Program okuryazarlığı üzerindeki etkisinin incelenmeye değer olduğu ve öğretim programı içerikli derslerin program okuryazarlığı üzerindeki etkisine bir kanıt niteliği taşıdığı düşünülmektedir. MEB

Öğretmen Yetiştirme ve Eğitimi Genel Müdürlüğü tarafından belirlenen öğretmenlik mesleği genel yeterlikleri incelendiğinde, öğretmen adaylarına "eğitim programı" kavramı ve işlevinin kazandırılmasıyla ilgili olarak "mesleki bilgi" yeterlik alanında yer alan "alan eğitimi bilgisi" başlığı altında "Alanının öğretim programı ve pedagojik alan bilgisine hâkimdir." ifadesinin yer aldığı görülmektedir. MEB tarafından hazırlanan programların benzer biçimde uygulanmasını sağlamak için öğretmenlerin program okuryazarlıklarının tespit edilmesi ve geliştirilmesi, programı algılama biçimlerinin araştırılması önemli görülmektedir (Ataş ve ark., 2021). Program okuryazarlığına sahip öğretmen adayları, hangi eğitim felsefesine dayandığını, kazanımların öğrenci gelişim özellikleri ve taksonomisi ile ilişkisini, kazanımların içerikle ilişkisini, kazanımlara ulaşmada hangi öğretim yöntem ve tekniğinin kullanılacağını, hangi ölçme ve değerlendirme aracının seçileceğini ve öğrenme ortamında kullanımı hakkında bilgi sahibi olup olmadıklarını belirleyebilirler (Güner & Aslan, 2023). Bu noktada öğretmenlerin ve öğretmen adaylarının eğitim programları hakkında sahip oldukları bilgilerin ve eğitim programı okuryazarlık düzeylerinin öğretmen yeterliği noktasında da oldukça önemli olduğu görülmektedir.

Alan yazındaki program okuryazarlığı ile ilgili çalışmalar incelendiğinde; ya öğretmenlere (Adem, 2023; Aslan & Gürlen, 2019; Ariav, 1988; Balouch ve ark., 2021; Baş, 2023; Bolat & Boncuk, 2021; Güleş, 2022; Gündoğan, 2019; Güneş-Şinego & Çakmak, 2021; Kahramanoğlu, 2019; Karakuyu, 2023; Keskin, 2020; Kuyubaşoğlu, 2019; Sarıca, 2021; Keskin & Korkmaz, 2021; Özaydın Kaya & Kaya, 2023; Sağ & Sezer, 2012; Süğümlü, 2022; Yılmaz & Kahramanoğlu, 2021) ya da öğretmen adaylarına (Aygün, 2019; Çetinkaya & Tabak, 2019; Demir ve ark., 2020; Erdem & Eğmir, 2018; Kana ve ark., 2018; Özdemir, 2012; Sural & Dedebeali, 2018; Şahin & Aşkın-Tekkol, 2023) odaklanıldığı görülmektedir. Ancak bu iki grubun program okuryazarlıklarını, öğretim programlarının paydaşları oldukları için bir bütün olarak ele alan ve onların program okuryazarlıklarını geliştirmek yönünde öneri sunmayı amaçlayan bir çalışmaya rastlanmamıştır. Bu bağlamda araştırma sonucunda elde edilecek olan bulguların;

- Yükseköğretim kurumlarına, öğretmen adaylarına sunulan eğitim programları bilgisine ilişkin geri bildirim sunacağı,
- Öğretim programlarının daha verimli bir şekilde uygulanmasına dair iyileştirici adımlar atılmasına ön ayak olacağı,
- Program uygulayıcılarının program okuryazarlık düzeylerinin belirlenmesinin, teori ile uygulama arasındaki farkı azaltma girişimlerinde faydalı olacağı

düşünülmektedir.

### Amaç

Çalışmanın amacı; programı hâlihazırda uygulamakta olan öğretmenlerin ve uygulayacak olan öğretmen adaylarının eğitim programı okuryazarlık düzeylerinin ve Fen Öğretim programları dersinin öğretmen adaylarının öğretim programı okuryazarlık düzeylerine etkisinin belirlenmesidir. Bu amaca yönelik olarak aşağıdaki sorulara yanıt aranacaktır.

- Öğretmenlerin ve öğretmen adaylarının eğitim programı okuryazarlığı düzeyleri nedir?
- Fen öğretim programları dersinin öğretmen adaylarının program okuryazarlığı düzeylerine etkisi nedir?

### Yöntem

#### Araştırmanın modeli

Çalışmada öğretim programlarının uygulayıcıları olan öğretmenlerin ve öğretmen adaylarının öğretim programı okuryazarlık düzeyleri belirlenmeye çalışılmıştır. Bu nedenle araştırmada betimsel tarama yöntemi kullanılmıştır. İki bölümden oluşan çalışmanın ilk bölümünde; Fen Bilgisi öğretmen adaylarının ve MEB' de görev yapmakta olan Fen bilgisi öğretmenlerinin program okuryazarlık düzeyleri belirlenmeye çalışılmıştır. İkinci bölümde ise; FÖP dersinin Fen Bilgisi öğretmenliği programına devam eden öğretmen adaylarının program okuryazarlık düzeylerine etkisi incelenmiştir.

#### Katılımcılar

Çalışmanın katılımcıları, bir devlet üniversitesi Eğitim fakültesindeki Fen bilgisi Öğretmenliği programının 2. sınıfına devam eden ve "Fen öğretim programları" dersini alan 48, 4. sınıfına devam eden 40 öğretmen adayı ve Milli Eğitime bağlı okullarda görev yapan 53 Fen bilgisi öğretmeninden oluşmaktadır. 2. Sınıfa devam eden öğretmen adaylarının katılımcı olarak belirlenmesinin nedeni "Fen Öğretim Programları" dersini alıyor olmaları ve bu dersin program okuryazarlığına etkisini belirlemenin çalışmanın amaçlarından biri olmasıdır. 4. Sınıfa devam eden öğretmen adaylarının seçilmesinin sebebi, öğretmenlik eğitimlerinin son döneminde yer almaları ve 4 yıl boyunca almış oldukları eğitim dersleri ile eğitim programlarına ilişkin bilgi edinmiş olduklarının varsayılmasıdır. Katılımcı öğretmenlerin seçiminde olasılıklı olmayan örnekleme yöntemlerinden olan kartopu örnekleme kullanılmıştır. 4. sınıfa devam eden öğretmen adaylarının öğretmenlik uygulamasına gittikleri okullarda görev yapan fen bilgisi öğretmenlerine ve onlar aracılığıyla da diğer öğretmenlere ulaşılmıştır. Katılımcı öğretmenlere ilişkin demografik bilgiler Tablo1'de sunulmuştur.

**Tablo 1.**

*Öğretmenlere İlişkin Demografik Bilgiler*

		Cinsiyet		Toplam
		Kadın	Erkek	
		<b>37</b>	<b>16</b>	<b>53</b>
Hizmet süresi	1-10 yıl	19	8	27
	11-20 yıl	8	4	12
	20 yıl ve üstü	10	4	14
Öğrenim durumu	Lisans	26	11	37
	Yüksek lisans	10	3	13
	Doktora	1	2	3
Mezuniyet	Eğitim Fakültesi	29	15	44
	Fen Edebiyat Fakültesi	8	1	9
Eğitim programlarına ilişkin eğitim alma durumu	Evet	2	1	3
	Hayır	35	15	50

Tablo 1 incelendiğinde, öğretmenlerin çoğunun hizmet sürelerinin 1-10 yıl arasında olduğu, eğitim fakültesi mezunu oldukları ve daha önce eğitim programlarına ilişkin bir eğitim almadıkları görülmektedir.

Katılımcı öğretmen adaylarına ilişkin demografik bilgiler ise Tablo 2' de sunulmuştur

**Tablo 2.**

*Katılımcı Öğretmen Adaylarına İlişkin Demografik Bilgiler*

	Cinsiyet		Toplam
	Kadın	Erkek	
2. sınıf	35	13	48
4. Sınıf	32	8	40

Tablo 2'den görülmektedir ki; katılımcı öğretmen adaylarının çoğu kadındır. Cinsiyet dağılımındaki bu dengesizliğin sebebi sadece katılımcılarda değil, Fen Bilgisi öğretmenliği programını tercih eden tüm öğretmen adaylarında kadınların çoğunlukta olmasıdır.

#### Veri toplama aracı:

##### Öğretim Programı okuryazarlık ölçeği

Öğretmenlerin ve öğretmen adaylarının program okuryazarlık düzeylerini belirleyebilmek için Yıldırım (2019) tarafından geliştirilen 5'li Likert tipindeki ölçek kullanılmıştır. Ölçek 27 maddeden oluşmaktadır ve 5 alt boyutu bulunmaktadır. Alt boyutlar ve alt boyutlardaki maddeler şu şekildedir;

- Felsefi Temeller okuryazarlığı (1., 2. ve 3. Maddeler),
- Sosyoekonomik temeller okuryazarlığı (4.,5.,6. ve 7. Maddeler),
- Psikolojik temeller okuryazarlığı (8.,9. ve 10. Maddeler),



- Amaçlar ve içerik bilgisi okuryazarlığı (11.,12.,13.,14.,15.,16.,17. ve 18. Maddeler) ve
- Öğretim ve ölçme-değerlendirme süreçler okuryazarlığı (19.,20.,21.,22.,23.,24.,25.,26. ve 27. Maddeler)

Ölçek olumsuz madde içermemektedir. Ölçekte puanlama aralığı 1=tamamen yetersiz ve 5=tamamen yeterli aralığında değişmekte olup her maddeden en az 1, en çok 5 puan alınabilmektedir. Toplamda ise en az 27 en çok 135 puan alınabilmektedir. Ölçeğin Cronbach's Alpha katsayısı 0,947'dir. Bu çalışma için hesaplanan Cronbach's Alpha katsayısı ise 0.834'tür.

#### Veri toplama süreci:

Öğretmenlerin ve 4. sınıfa devam eden öğretmen adaylarının program okuryazarlık düzeylerini belirleyebilmek adına ilgili ölçek araştırmacı tarafından çevrim içi form formatına dönüştürülerek veriler toplanmıştır. Aynı ölçek, 2. Sınıfa devam eden öğretmen adaylarına ise ders öncesi ön test olarak ders sonrası ise son test olarak uygulanmış ve veriler toplanmıştır.

Etik kurul onayı Çukurova Üniversitesi Sosyal ve Beşeri Bilimler Alanında Bilimsel Araştırma ve Yayın Etiği Başkanlığı'ndan (Tarih: 13.06.2022, Sayı: 417380) alınmıştır. Bu çalışmaya katılan tüm katılımcılardan yazılı ve sözlü

onam alınmıştır.

#### Verilerin analizi:

Verilerin analizinde öğretmen adaylarının FÖP dersi öncesi ve sonrasındaki program okuryazarlık düzeylerinin nasıl değiştiği ve anlamlı bir farklılık olup olmadığının belirlenmesi ve aynı örneklemin tekrarlı ölçümleri söz konusu olduğu için (Büyüköztürk, 2006) eşleştirilmiş örneklem için t testi uygulanmıştır. Öğretmenler ve iki farklı sınıf seviyesindeki öğretmen adaylarının program okuryazarlık düzeylerinin analizi için ise tek yönlü varyans analizi kullanılmıştır. Çünkü, Tek yönlü varyans analizi, ilişkisiz iki ya da daha çok örneklem ortalaması arasındaki farkın sıfırdan anlamlı bir şekilde farklı olup olmadığını test etmek üzere uygulanır (Büyüköztürk, 2006).

#### Bulgular

#### Öğretmenlerin ve öğretmen adaylarının program okuryazarlıklarına ilişkin bulgular

Öğretmenlerin ve öğretmen adaylarının program okuryazarlık düzeylerinin ne şekilde değiştiğini belirlemek üzere elde edilen beş alt faktörlü öğretim programı okuryazarlık düzeylerine dair ortalama değerleri ve standart sapma değerleri incelenmiş ve elde edilen betimsel değerler Tablo 3' te sunulmuştur.

**Tablo 3.**

*Program Uygulayıcıların Okuryazarlık Düzeylerine İlişkin Betimsel Değerler*

	Öğretmen N= 53		4. sınıf N= 40		2. sınıf N= 48	
	$\bar{X}$	SS	$\bar{X}$	SS	$\bar{X}$	SS
Felsefi temeller okuryazarlığı	3.92	.706	3.99	.606	3.50	.600
Sosyoekonomik temeller okuryazarlığı	3.88	.881	4.29	.548	4.29	.548
Psikolojik temeller okuryazarlığı	3.77	.824	4.16	.594	3.61	.678
Amaçlar ve içerik bilgisi okuryazarlığı	4.16	.680	4.38	.459	3.68	.523
Öğretim ve ölçme-değerlendirme süreçleri okuryazarlığı	4.13	.634	4.28	.542	3.47	.640
<b>Genel Öğretim programı okuryazarlığı</b>	4.04	.638	4.27	.425	3.63	.547

Tablo 3'te yer alan ortalamalar arasındaki farklılığın istatistiksel olarak anlamlı olup olmadığını belirleyebilmek

adına tek yönlü ANOVA uygulanmış ve sonuçlar Tablo 4'te sunulmuştur.

**Tablo 4.**

*Öğretmenlerin ve Öğretmen Adaylarının Öğretim Programı Okuryazarlık Düzeylerine İlişkin ANOVA Sonuçları*

		Kareler toplamı	Sd	Kareler ort.	F	p	Anlamlı farklılık
Felsefi temeller okuryazarlığı	Gruplar arası	6.53	2	3.26	7.88	.001	A*-C
	Gruplar içi	57.20	138	.41			B*-C
	TOPLAM	63.73	140				
Sosyoekonomik temeller okuryazarlığı	Gruplar arası	5.92	2	2.96	5.77	.004	B*-A
	Gruplar içi	70.85	138	.51			B*-C
	TOPLAM	76.78	140				
Psikolojik temeller okuryazarlığı	Gruplar arası	6.78	2	3.39	6.62	.002	B*-A
	Gruplar içi	70.69	138	.51			B*-C
	TOPLAM	77.47	140				
Amaçlar ve içerik bilgisi okuryazarlığı	Gruplar arası	11.60	2	5.80	17.71	.000	A*-C
	Gruplar içi	45.15	138	.33			B*-C
	TOPLAM	56.74	140				
Öğretim ve ölçme-değerlendirme süreçleri okuryazarlığı	Gruplar arası	17.19	2	8.60	22.97	.000	A*-C
	Gruplar içi	51.64	138	.37			B*-C
	TOPLAM	68.83	140				
Genel Öğretim programı okuryazarlığı	Gruplar arası	9.30	2	4.65	15.17	.000	A*-C
	Gruplar içi	42.30	138	.31			B*-C
	TOPLAM	51.60	140				

A:Öğretmenler

B: 4. Sınıf öğretmen adayları

C: 2. Sınıf öğretmen adayları

\*Anlamli farklılığın lehine olan grubu belirtir.

Öğretmenlerin ve öğretmen adaylarının program okuryazarlık düzeylerine ilişkin ANOVA sonuçları incelendiğinde, grup ortalamaları arasındaki farklılığın istatistiksel olarak anlamlı olduğu görülmektedir [ $F_{(2-138)}$ : 15.17,  $p < .01$ ]. Gruplar arasındaki farkların hangi gruplar arasında olduğunu belirlemek için yapılan Scheffe testinin sonuçlarına göre, öğretmenlerin ( $\bar{X}$ = 4.0391) ve 4. Sınıfa devam eden öğretmen adaylarının ( $\bar{X}$ = 4.2667) program okuryazarlık düzeylerinin, 2. Sınıfa devam eden öğretmen adaylarından ( $\bar{X}$ = 3.6306) daha yüksek olduğu belirlenmiştir. ANOVA sonuçları alt boyutlar açısından değerlendirildiğinde, 4. Sınıfa devam eden öğretmen adaylarının tüm alt boyutlarda diğer program uygulayıcılardan daha yüksek bir ortalamaya sahip oldukları görülmektedir.

#### **Öğretmenlerin hizmet sürelerine göre program okuryazarlıklarına ilişkin bulgular**

Öğretmenlerin hizmet sürelerine göre program okuryazarlık düzeylerinin ne şekilde değiştiğini belirlemek üzere öğretim programı okuryazarlık düzeylerine dair ortalama değerleri ve standart sapma değerleri incelenmiş ve elde edilen betimsel değerler Tablo 5'te sunulmuştur.

**Tablo 5.**

*Öğretmenlerin Hizmet Sürelerine Göre Program Okuryazarlık Düzeylerine İlişkin Betimsel Değerler*

Hizmet süresi	N	$\bar{X}$	SS
1-10 yıl	27	3.87	.743
11-20 yıl	12	4.18	.449
20 yıl ve üstü	14	<b>4.26</b>	.472
Toplam	53	4.04	.638

Tablo 5 incelendiğinde öğretmenlerin program okuryazarlık düzeyi ortalamalarının hizmet süresi arttıkça arttığı görülmektedir. Tablo 5'te yer alan ortalamalar arasındaki farklılığın istatistiksel olarak anlamlı olup olmadığını belirleyebilmek adına tek yönlü ANOVA uygulanmış ve sonuçlar Tablo 6'da sunulmuştur.

**Tablo 6.**

*Öğretmenlerin Hizmet Süresine Göre Öğretim Programı Okuryazarlık Düzeylerine İlişkin ANOVA Sonuçları*

	Kareler toplamı	Sd	Kareler ort.	F	p
Gruplar arası	1.70	2	.85	2.19	.123
Gruplar içi	19.46	50	.39		
TOPLAM	21.16	52			

Öğretmenlerin hizmet sürelerine göre program okuryazarlık düzeylerine ilişkin ANOVA sonuçları incelendiğinde, grup ortalamaları arasındaki farklılığın istatistiksel olarak anlamlı olmadığı görülmektedir [ $F_{(2-50)}=2,19, p > .01$ ].

## FÖP dersini alan Öğretmen adaylarının program okuryazarlık düzeylerine ilişkin bulgular

Öğretmen adaylarının Fen Öğretim programları dersini almadan önce ve aldıktan sonraki program okuryazarlığı düzeylerinin nasıl değiştiğini belirleyebilmek adına yapılan

eşleştirilmiş örneklem t testi sonuçları Tablo 7’de sunulmuştur.

**Tablo 7.**

FÖP Dersi Öncesi ve Sonrası Program Okuryazarlık Düzeylerine İlişkin Eşleştirilmiş Örneklem t-testi Sonuçları

	N		$\bar{X}$	S	t	sd	p
Felsefi temeller okuryazarlığı	48	Ön test	2.56	.776	-7.05	47	.000
		Son test	3.50	.60			.000
Sosyoekonomik temeller okuryazarlığı	48	Ön test	2.91	.84	-6.76	47	.000
		Son test	3.80	.63			.000
Psikolojik temeller okuryazarlığı	48	Ön test	2.90	.83	-5.08	47	.000
		Son test	3.61	.68			.000
Amaçlar ve içerik bilgisi okuryazarlığı	48	Ön test	2.85	.76	-6.72	47	.000
		Son test	3.67	.52			.000
Öğretim ve ölçme-değerlendirme süreçleri okuryazarlığı	48	Ön test	2.62	.78	-5.23	47	.000
		Son test	3.56	.99			.000
Genel Öğretim programı okuryazarlığı	48	Ön test	2.77	.72	-7.68	47	.000
		Son test	3.63	.55			.000

Tablo 7’ye göre; öğretmen adaylarının FÖP dersi sonrasında program okuryazarlık düzeylerinde anlamlı bir artış gözlenmiştir [ $t_{(47)} = -7.68, p < .01$ ]. Öğretmen adaylarının ders öncesi genel program okuryazarlığı puanlarının ortalaması  $\bar{X} = 2.77$  iken ders sonrası ortalamaları  $\bar{X} = 3.63$ ’ e yükselmiştir. Yani öğretmen adaylarının program okuryazarlık düzeyleri “orta düzeyde yeterli” den “oldukça yeterli” düzeyine yükselmiştir denilebilir. Bu bulgu, FÖP dersinin öğretmen adaylarının program okuryazarlığı düzeylerini artırmada önemli bir etkiye sahip olduğunu göstermektedir.

### Sonuç ve Tartışma

Araştırma sonuçlarına göre, programın uygulayıcılarının genel öğretim programı okuryazarlık düzeylerinin yüksek olduğu sonucuna ulaşılmıştır. Bu sonuç alan yazındaki bir çok araştırmanın sonuçları ile paralellik göstermektedir (Aslan, 2019; Aslan & Gürlen, 2019; Çetinkaya & Tabak, 2019; Demir ve ark., 2020; Erdamar, 2020; Erdem & Eğmir, 2018; Güneş-Şinego & Çakmak, 2021; Kana & ark., 2018; Keskin, 2020; Kuyubaşoğlu, 2019). 4. sınıfa devam eden öğretmen adaylarının öğretim programı okuryazarlık düzeyleri öğretmenlerden ve 2. sınıfa devam eden öğretmen adaylarından anlamlı bir şekilde farklılaşmaktadır. Benzer birçok çalışmada (Çetinkaya & Tabak, 2019; Gömleksiz & Erdem, 2018; Kana ve ark., 2018; Sural & Dedeşali, 2018) öğretmen adaylarının program

okuryazarlık düzeyleri öğrenim gördükleri sınıf düzeyine göre anlamlı bir artış göstermektedir. Şahin ve Aşkın-Tekkol (2023) ise; sınıf öğretmen adaylarının program okuryazarlık düzeylerinin sınıf düzeyine göre değişmediğini belirtmiş ve bu sonucun nedeni olarak lisans programında, öğretim programlarına ilişkin derslerin yer almamasını göstermişlerdir. Bu sonuçlara göre; eğitim fakültelerinde 4 yıl boyunca öğretim programlarına ilişkin verilen derslerin, program okuryazarlığı düzeyleri üzerinde oldukça olumlu bir etkisi olduğu söylenebilir. 2. sınıfa devam eden öğretmen adaylarının program okuryazarlık düzeylerinin diğer program uygulayıcılarının program okuryazarlık düzeylerine göre düşük olmasının nedeninin henüz eğitim programlarına ilişkin sınırlı sayıda ders almış olmaları olduğu düşünülmektedir. Zira Fen Bilgisi öğretmenliği programında eğitim/öğretim programlarına ilişkin içeriğe sahip olan dersler 4. yarıyılı başlanmaktadır ve derslerde uygulanan, mikro öğretim gibi farklı yöntem, tekniklerle ve son sınıftaki öğretmenlik uygulaması dersleri ile az da olsa programın uygulanmasını deneyimlemeye bu yarıyıldan sonra başlanmaktadır. 4. sınıfa devam eden öğretmen adaylarının, hem genel program okuryazarlığında hem de alt boyutların hepsinde öğretmenlerden ve 2. sınıfa devam eden öğretmen adaylarından daha yüksek okuryazarlık düzeyine sahip olmalarının ise lisans eğitiminde aldıkları program içerikli derslere ilişkin bilgilerinin henüz taze olmasından kaynaklandığı düşünülebilir.

Araştırmadan elde edilen bir diğer bulguya göre; “Fen Öğretim Programları” dersini alan öğretmen adaylarının ders sonrasında, öğretim programı okuryazarlık düzeylerinde anlamlı bir şekilde artış olduğu sonucuna ulaşılmıştır. Benzer şekilde; Ünal ve Er (2015) çalışmalarında, eğitim programlarında, “öğretim programı”, “program geliştirme” gibi dersler yer alan üniversitedeki öğretmen adaylarının program okuryazarlık düzeylerinin, bu derslerin yer almadığı üniversitedeki öğretmen adaylarının program okuryazarlık düzeylerinden anlamlı bir şekilde daha yüksek olduğu sonucuna ulaşmışlardır. Bu sonucu destekler şekilde Sarıgöz (2021) de tüm öğretmenlere hizmet içi eğitimlerle, öğretmen olacak adaylara ise eğitim fakültelerinde öğretim okuryazarlığı ile ilgili ciddi anlamda uygulamalı olarak dersler ve eğitimler verilmesi gerektiğini belirtmektedir. Bolat (2017) öğretmen adaylarının aldıkları eğitim içeriklerinin onların birer eğitim programı okuryazarı olmasını sağlaması gerektiğini savunmaktadır. Yeşilyurt (2013) okul öncesi öğretmen adaylarının program geliştirmeye ilişkin bilişsel farkındalık düzeylerini program geliştirme dersi almanın üst düzeyde ve olumlu yönde değiştirdiği sonucuna ulaşmıştır. Bu sonuçlar da FÖP dersinin program okuryazarlığı üzerindeki olumlu etkisini destekler niteliktedir. Öğretmenler eğitim programına mesleğe atılmadan önce aşına olur, program okuryazarı olarak mezun olurlarsa bu durum eğitim kalitesini artıracaktır (Aslan & Gürten, 2019). Buradan hareketle, tüm öğretmen eğitim programlarına, eğitim programlarına ilişkin içeriği bulunan derslerin eklenmesinin, tüm kademelerdeki eğitimin kalitesini artırmaya yardımcı olacağı düşünülmektedir.

Mevcut çalışmada öğretmenlerin görev süreleri arttıkça okuryazarlık düzeylerinde bir artış gözlenmiş ancak bu artışın istatistiksel olarak anlamlı olmadığı sonucuna ulaşılmıştır. Alan yazın incelendiğinde birçok çalışma (Aslan & Gürten, 2019; Demir & Toraman, 2021; Erdamar, 2020; Güneş-Şinigo & Çakmak, 2021; Karakuyu, 2023; Sarıca, 2021; Süğümlü, 2022) görev süresinin program okuryazarlığı üzerinde anlamlı bir etkisi olmadığını belirtmiştir. Bu çalışmalar araştırmancının sonuçlarını destekler niteliktedir. Bolat ve Baş (2023) alan yazında yer alan sonuçları değerlendirerek program okuryazarlığının zamanla gelişen bir özellik göstermediği, dolayısıyla geliştirilmesi için ek eğitim hizmetlerine ihtiyaç duyulabileceğini belirtmektedirler. Bununla birlikte, Güleş (2022), Özaydın-Kaya ve Kaya (2023) ile Barut ve Gündoğdu (2023) ise; öğretmenlerin görev süreleri arttıkça program okuryazarlığı düzeylerinin de arttığı sonucuna ulaşmışlardır. Sarıgöz (2021) de Milli Eğitim Bakanlığı'na bağlı okul ve kurumlarda görev yapan ve eğitim programları ile program okuryazarlığı konularında yetersizlik hissedilen öğretmenlere ilgili kurumlar aracılığıyla hizmet içi eğitim verilmesi

gerektiğini öne sürmüştür. Buradan hareketle sadece öğretmen eğitim programlarına program içerikli derslerin eklenmesinin değil, öğretmenler için de ihtiyaç analizleri doğrultusunda program okuryazarlığına ilişkin hizmet içi eğitimlerin verilmesinin uygun olabileceği düşünülebilir.

Eğitim programı sadece örgün eğitimin nasıl yapılacağına dair resmi bir belge değil, etkili öğrenme ve öğretme ortamlarını sağlayan bir rehberdir. Bu nedenle öğretmen adayları başta olmak üzere her öğretmen, program okuryazarlığı konusunda aktif olmalıdır (Bolat, 2017). Oliva (2004), öğretmen eğitim kurumlarının, mezunlarının "program okuryazarlığı" olarak adlandırılacak, program hakkında bilgi ve program geliştirme konusunda temel beceriler kazanmalarını sağlamaları gerektiğini belirtmektedir. Öğretmen adaylarının lisans eğitimleri sırasında program okuryazarlığı becerileri gelişirse, öğretmenlik için daha hazırlıklı olacaklardır (Güner & Aslan, 2023). Bu çalışma, öğretmen adaylarının program okuryazarlık düzeylerinin, program içerikli derslerle geliştirilebileceği sonucunu ortaya koymaktadır. Bu sonuçtan yola çıkarak, eğitim fakültelerinin lisans programlarına program içerikli derslerin eklenmesinin ve öğretmenlere program içerikli hizmet içi eğitimlerin verilmesinin eğitim programlarının etkili bir şekilde uygulanmasında faydalı olacağı düşünülmektedir.

### Öneriler

- Bu çalışma branş bazında ele alınmış ve sadece Fen bilgisi öğretmenleri ve öğretmen adayları ile sınırlandırılmıştır. Gelecekte gerçekleştirilecek çalışmalarda tüm branşlardan öğretmenler ve öğretmen adayları çalışmaya dâhil edilerek daha geniş bir hedef kitleye ulaşılabilir.
- Hem öğretmen ve öğretmen adaylarının hem de yöneticilerin program okuryazarlık düzeylerini belirleyebilen bir ölçme aracına ulaşamadığı için bu çalışmanın katılımcıları öğretmen ve öğretmen adaylarından oluşmaktadır. Yöneticileri de içine alarak tüm paydaşların okuryazarlık düzeylerini belirlemeye yönelik çalışmalar gerçekleştirilebilir.
- Bu çalışmada öğretmenlerin öğretim programı okuryazarlık düzeyleri belirlenmiş ve aynı zamanda öğretmen adaylarının öğretim programı okuryazarlıklarına Fen Öğretim Programları dersinin etkisini incelemiştir. Yapılacak çalışmalarda Öğretim programlarını etkilemesi muhtemelen olan başka değişkenlerin etkisi incelenebilir.

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## Extended Abstract

### Purpose

The purpose of the study is to determine the curriculum literacy levels of the teachers who are currently implementing the curriculum and the pre-service teachers who will implement the curriculum and the effect of the Science Curriculum (SC) course on the curriculum literacy levels of pre-service teachers. In line with this purpose, answers to the following questions will be sought.

1. What are the curriculum literacy levels of teachers and pre-service teachers?
2. What is the effect of science curriculum course on pre-service teachers' curriculum literacy levels?

### Method

Since the study aimed to determine the curriculum literacy levels of teachers and pre-service teachers who are the implementers of curricula, the research was conducted with descriptive survey method. The study consisted of two parts. In the first part, it was tried to determine the curriculum literacy levels of pre-service teachers who are continuing their science teaching program and science teachers working in MoNE. In the second part, it was tried to determine how the curriculum literacy levels of pre-service science teachers were affected by the SC course. The participants of the study consisted of 48 pre-service teachers in the 2nd year and 40 in the 4th year of the Science Teaching Program at the Faculty of Education of a state university, and 53 science teachers working in schools affiliated to the National Education. 5-point Likert-type "Curriculum literacy scale" which was developed by Yıldırım (2019) is used to collect data. Cronbach's Alpha coefficient of the scale is .947. The Cronbach's Alpha coefficient calculated for this study is .834. The scale was applied to pre-service teachers attending the 2nd grade as a pre-test before the course and as a post-test after the course and data were collected. t-test for paired samples was applied to determine how pre-service teachers' curriculum literacy levels changed before and after the SC course and whether there was a significant difference. One-way analysis of variance was used to analyse the curriculum literacy levels of teachers and pre-service teachers at two different grade levels.

### Conclusion and Discussion

According to the results, it was concluded that the general curriculum literacy levels of the curriculum implementers were high. This result is in line with the results of many studies in the literature (Aslan, 2019; Aslan & Gürlen, 2019; Çetinkaya & Tabak, 2019; Demir et al., 2020; Erdamar, 2020; Erdem & Eđmir, 2018; Güneş Şinego & Çakmak, 2021; Kana et al., 2018; Keskin, 2020; Kuyubaşođlu, 2019) 4th grade pre-service teachers' curriculum literacy levels differ significantly from teachers and 2nd grade pre-service teachers. In many similar studies (Çetinkaya & Tabak, 2019; Gömleksiz & Erdem, 2018; Kana et al. 2018; Sural & Dedebali, 2018), the curriculum literacy levels of pre-service teachers show a significant increase according to the grade level they study. According to these results, it can be said that the courses on curriculum given in education faculties for 4 years have a very positive effect on curriculum literacy levels. The reason why 2nd grade pre-service teachers' curriculum literacy levels are lower than the curriculum literacy levels of other curriculum practitioners is thought to be that they have taken a limited number of courses related to curriculum. This is because the courses with content related to education/training programs in the science teaching program start in the 4th semester and it is after this semester that they start to experience the implementation of the curriculum, albeit to a lesser extent, with different methods and techniques such as micro-teaching and teaching practice courses in the last year.

According to another finding obtained from the study, it was concluded that there was a significant increase in the curriculum literacy levels of pre-service teachers who took the "Science Curriculum" course after the course. Similarly, Ünal and Er (2015) concluded in their study that the curriculum literacy levels of pre-service teachers in universities that include courses such as "curriculum" and "curriculum development" in their education programs are significantly higher than the curriculum literacy levels of pre-service teachers in universities where these courses are not included. In support of this result, Sarıgöz (2021) also states that all teachers should be given in-service training and prospective teachers should be given serious practical courses and training on instructional literacy in faculties of education. These results support the positive effect of the curriculum development course on curriculum literacy. From this point of view, it is thought that integrating courses with curriculum content to all teacher education programs will help improve the quality of education at all levels.

An increase was observed in the literacy levels of teachers as their tenure increased, but it was concluded that this increase was not statistically significant. When the literature is examined, many studies (Aslan & Gürlen, 2019; Demir & Toraman,

2021; Erdamar, 2020; Güneş-Şinego & Çakmak, 2021; Karakuyu, 2023; Sarıca, 2021; Süğümlü, 2022) stated that tenure has no significant effect on curriculum literacy. These studies support the results of the study. Bolat and Baş (2023) evaluate the results in the literature and state that curriculum literacy does not show a feature that develops over time, so additional training services may be needed to improve it. On the other hand, Güleş (2022), Özaydın-Kaya and Kaya (2023) and Barut and Gündoğdu (2023) concluded that as the tenure of teachers increases, their curriculum literacy levels also increase. From this point of view, it can be thought that it may be appropriate not only to add curriculum courses to teacher education programs, but also to provide in-service training on curriculum literacy for teachers in line with needs analyses.

This study reveals that pre-service teachers' curriculum literacy levels can be improved through curriculum content courses. Based on this result, it is thought that adding curriculum-content courses to the undergraduate programs of faculties of education and providing in-service trainings with curriculum content to teachers will be useful in the effective implementation of education programs.

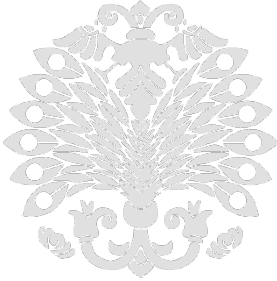
# Internet Addiction and Social Appearance Anxiety: A Meta-Analysis

## İnternet Bağımlılığı ve Sosyal Görünüş Kaygısı: Bir Meta-Analiz Çalışması

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### ABSTRACT

The purpose of the present study is to analyze average effect size of the relationship between internet addiction and social appearance anxiety utilising the meta-analysis method. The study included 23 studies published between 2016 and 2022, and the study sample was composed of Turkish participants. The number of participants was 8957. Analysis results showed that the heterogeneity was significant and high. The general effect size was found to be significant in the relationship between internet addiction and social appearance anxiety, it had a medium effect size. However, moderating roles of the year of publication and education level were not found to be significant. Funnel plot analysis was performed to determine publication bias. Egger's regression test was also performed, which was not significant at a 95% confidence interval. No significant difference was found between observed in Duval and Tweedie's trim and fill test and corrected effect size. All these analyses indicate that there is no publication bias. The findings of the present study are discussed on basis of the relevant literature.

**Keywords:** Internet addiction, social appearance anxiety, meta-analysis, Turkish sample

### ÖZ

Bu araştırmanın amacı internet bağımlılığı ile bireyin sosyal görünüş kaygısıyla ilişkisinin ortalama etki büyüklüğünü meta-analiz yöntemiyle incelenmesidir. Bu çalışma 2016 ile 2022 yılları arasında yayınlanan 23 çalışmayı içermektedir. Çalışma Türkiye örnekleminde seçilmiştir. Katılımcıların sayısı 8957'dir. Yapılan analiz sonucunda heterojenlik anlamlı ve yüksek düzeyde olduğu bulunmuştur. Ayrıca internet bağımlılığı ile sosyal görünüş kaygısı arasındaki ilişkide genel etki büyüklüğü anlamlı ve orta etki büyüklüğüne sahip olduğu bulunmuştur. Bunun yanında yayın yılı ve eğitim kademesinin moderatör rollerinin anlamlı olmadığı bulunmuştur. Yayın yanlılığı belirlemek için huni grafiği analizi yapılmıştır. Huni grafiği analizi yanı sıra Egger's regression testinin %95 güven aralığında anlamlı olmadığı bulunmuştur. Duval ve Tweedie'nin kırpma ve doldurma testinde gözlenen ve düzeltilmiş etki büyüklüğü arasında anlamlı bir farklılık olmadığı bulunmuştur. Tüm bu analizler çerçevesinde yayım yanlılığı olmadığı söylenebilir. Elde edilen bulgular alanyazın kapsamında tartışılmıştır.

**Anahtar Kelimeler:** İnternet bağımlılığı, sosyal görünüş kaygısı, meta-analiz, Türkiye örnekleme

## Introduction

The utilization of the internet has been increasing worldwide day by day. Today, more than 5 billion people in the world utilise the internet (Internet World Stats, 2021). As for Turkey, 82.6% of the population uses the internet actively (Turkish Statistical Institute, 2021). The intensive utilization of the internet at the national and international levels provides many opportunities. However, despite these opportunities, it creates many problem areas, one of which is internet addiction (Kuss & Griffiths, 2020). Some of the symptoms of this addiction include preoccupation (excessive use of the internet), withdrawal (physical and psychological withdrawal), tolerance (a stepwise rise in the utilisation of the Internet), changes in psychology (sudden mood changes), recurrence (recurrent internet addiction), and conflicts (increase in inner and interpersonal conflicts) (Wölfling et al., 2010). When these symptoms of internet addiction are taken into consideration, it is considered to be associated with several problem areas. Hence, the related literature reports negative relationships between overuse of the internet and academic performance (Akhter, 2013), self-respect (Bahrainian et al., 2014), self-control (Agbaria, 2021), well-being (Zajac et al., 2017), and social acceptance (Askarizadeh, Amiri & Karamoozian, 2015). Besides, it was reported to be positively and significantly correlated with loneliness (Ümmeet & Ekşi, 2016), depression (Guo et al., 2012), impulsion (Şimşek et al., 2019), and social anxiety (Weinstein et al., 2016). In addition to these problem areas, the literature reports that internet addiction is linked with social appearance anxiety, which is another variable of study (Ceylan, 2012; Traş et al., 2019). Social appearance anxiety is described as an individual's anxiety about the adverse evaluation of his/her physical appearance by others (Hart et al., 2008). This type of worry includes many physical features such as the individual's facial shape, weight, way of smiling, height etc., social appearance anxiety highlights the importance that individuals attach to the evaluation of themselves in the eyes of other people. Hence, Leary's Self-presentation Theory indicates an individual's anxiety to be caused by other people's negative perceptions about themselves. According to this theory, individuals frequently check their impressions of others and attach serious importance to this impression. Their anxiety level increases when they think that this impression is inadequate, which could also be associated with several problem areas. The literature reports a negative association between social appearance anxiety and self-confidence (Antonietti et al., 2013; Boursier et al., 2020), well-being (Seki & Dilmaç, 2015), quality of life (Duru & Örsal, 2021), coping with stress (Bakalim, 2016), and life satisfaction (Erçevik, 2021). On the other hand, it is positively associated with eating disorders

(Levinson et al., 2013), fear of being evaluated negatively (Doğan, 2018), body shyness (Boursier & Gioia, 2020), and internet addiction (Ozturk, 2021; Şensoy & Dijle, 2021; Yıldırım & Taştan, 2020).

The internet enables individuals to share their images on social media constantly (Kuss & Griffiths, 2020). However, during this self-presentation, individuals' anxiety increases due to many reasons, such as wanting to make the images that are shared unrealistic and close to perfect (McComb & Mills, 2021) and comparing Themselves with famous people and models (Verduyn et al., 2020), etc. In this regard, in their model developed to explain internet addiction, Tam and Walter (2013) highlight the importance of the relationship between an individual's strong desire for self-reflection and internet addiction. Besides, in the Cognitive Behaviorist Model, Davis (2001) explains internet addiction and highly emphasizes link between internet addiction and anxiety. In addition, social comparison theory explains the relation between internet addiction and social appearance anxiety. According to this theory, individuals determine their body perceptions by comparing with other people (Festinger, 1954). In the last few decades, the abuse of the internet has led to social comparison in social media. Accordingly, over-sharing on the internet about the necessity of imperfect body perception triggers social appearance anxiety (Yang et al., 2018). Therefore, there may be a positive association between internet addiction and social appearance anxiety.

## The Present Study

Though there are studies indicating the positive link between internet addiction and social appearance anxiety in Turkey (Ak, 2020; Ayar et al., 2018; Koca, 2020), no studies were found to have investigated and synthesized these studies as a whole. The current study will fill this knowledge gap in existing literature. Accordingly, the objective of the present study is to synthesise the studies on link between overuse of the internet and social appearance anxiety in the sample. This meta-analysis is thus believed to contribute to literature. This study could also initiate the formation of intervention programs as it presents the results obtained by calculating the average effect size of the association between two variables. The results of the the present study which integrates studies conducted in Turkey, could contribute to the increase in individuals' awareness levels by determining the link internet addiction and social appearance anxiety, an inverse factor caused by excessive internet use. In light of the significance of the issue, the objective of this study is to determine average effect size of the link between internet addiction and social appearance anxiety through the meta-analysis method.



## Methods

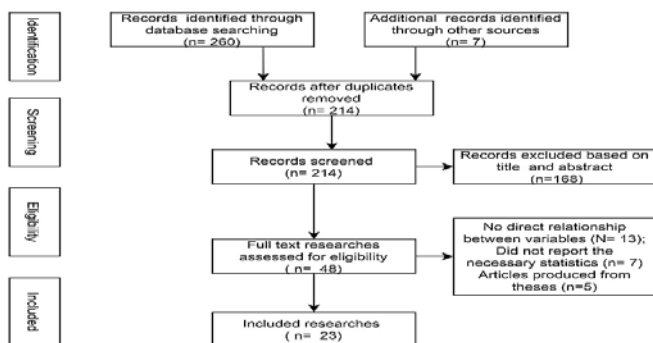
This study utilized the meta-analysis method. Meta-analyses are utilized to compute the effect size of the studies (Card, 2012).

### Literature Review

Google Academic, Web of Science, ERIC, EBSCO, ULAKBİM, ProQuest, PubMed, and the National Thesis Center were reviewed to access studies conducted in Turkey on this issue. Reviews were conducted between January and April 2022. The study was completed in May 2022. When the reviews were performed in these databases, the phrases “internet use disorder”, “excessive internet use”, “internet addiction”, “problematic internet use”, “social appearance anxiety”, and “social physical anxiety” were reviewed in Turkish and English separately and in a way to investigate their relationship with each other.

### Study Selection Criteria

The studies to be involved in the analysis were selected using the following factors as criteria: (1) utilizing a cross-sectional study that investigates link between internet addiction (IA) and social appearance anxiety (SAA), (2) presenting the sample in the article, (3) selecting the study group from Turkey, (4) being published as an article or thesis, and (5) including high school or university-level students in the sample. These criteria were also determined for inclusion and exclusion. The studies were analyzed within the framework of these criteria, which indicated 23 studies to be included in the study (Table 1.) This study utilized PRISMA (Moher et al., 2009) criteria, which provides principles for the process of performing and reporting the meta-analysis. Figure 1 demonstrates the flowchart of the review and identification of studies to be involved in the study.



**Figure 1.** Flowchart of the Study Selection Process in the Meta-Analysis of IA and SAA

## Statistical Analyses

This study utilized the Pearson correlation coefficient ( $r$ ) to determine the effect size. However, since the  $r$ -value was problematic in terms of normal distribution between  $\pm .25$  and  $\pm 1$ ,  $r$  value was transformed to Fisher's  $z$  value as recommended by Cooper (2010). The effect value was calculated in this way. It was converted to the  $r$ -value again in the reporting phase. Average effect size is accepted as low if  $r = .1$ , moderate if  $r = .3$ , and strong if  $r = .5$  (Cohen, 1988). A fixed or random-effects model is utilized to combine the effect size of the studies in meta-analysis, and the general effect size is calculated in this way. If the studies are heterogeneous, the random-effects model is chosen (Borenstein et al., 2013). Heterogeneity was determined utilizing  $Q$  and  $I^2$  statistics.  $Q$  value is expected to be significant ( $p < .05$ ). On the other hand, the  $I^2$  value is accepted as a sign of low heterogeneity if it is up to 25%, medium if it is up to  $< 50\%$ , and high if it is 75% and over (Card, 2012). Following the determination of heterogeneity, a meta-regression analysis was performed to determine what had a moderating effect on the association between IA and SAA. Hence, education level and publication year models were included in the analysis. Besides, funnel plots, Egger's regression, Duval and Tweedie's trim and fill tests were performed to evaluate publication bias of the studies. In the absence of the publication bias, the funnel plot should distribute symmetrically around the general effect size of the studies. Besides, Egger's regression test should not be significant (Borenstein et al., 2013), and the difference between the observed and corrected effect sizes in the Duval and Tweedie's trim and fill test should not be significant (Duval & Tweedie, 2000). In this study, ethical permission was not obtained since no procedure was performed on the participants. CMA 3.0 was utilized for the analysis.

## Results

### Homogeneity Tests and Pooled Analyses

As it is demonstrated in Table 2, heterogeneity was significant ( $Q = 523.41$ ,  $p < .01$ ) and high ( $I^2 = 95.80$ ). On the other hand, according to random-effects model, general effect size was significant and had a medium effect size in the link between internet addiction and social appearance anxiety ( $r = .42$ ; 95% CI:  $.34, .50$ ). Meta-regression was performed for the variables that are considered to play a moderating role in this effect size. As Table 2 and Table 3 demonstrate, the education level ( $p > .05$ ) and the publication year ( $p > .05$ ) did not have significant moderating roles on the internet addiction and social appearance anxiety general effect size.

**Table 2.***Random Model of the Correlation Between IA and SAA*

N	Effect size (r)	95% CI for r	Homogeneity test			Test of null (two tailed)	
			Q (r)	p	I <sup>2</sup>	Z-value	p
23	.42	[.34, .50]	523.41	.00	95.80	8.69*	.00

\*p &lt; .01

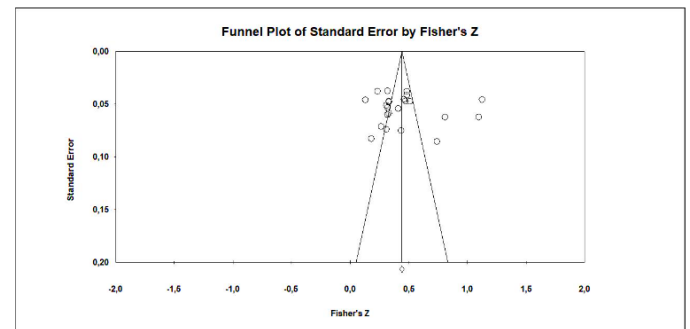
**Table 3.***Meta-regression According Models*

Covariate	Coefficient	Standard Error	95% CI	Z-value	p-value (two tailed)	Q	df	p
Model (EL)								
Intercept	.33	.26	[-.18, .84]	1.28	.20	1.29	3	.73
High School	.09	.27	[-.45, .63]	.33	.74			
Mixed	.23	.28	[-.32, .79]	.82	.41			
University	.10	.27	[-.44, .64]	.37	.71			
Model (Publication Year)								
Intercept	.33	.26	[-.18, .84]	1.26	.21	0.65	3	.88
2016-2018	.07	.29	[-.49, .62]	.23	.82			
2019-2020	.15	.28	[-.40, .69]	.52	.60			
2021-2022	.15	.28	[-.40, .71]	.55	.58			

EL; Education level.

**Publication Bias**

The funnel plot in Figure 2 was analyzed to determine publication bias, and it was found to distribute symmetrically relatively around the general effect size. On the other hand, Table 4 Egger's regression test was not significant at a 95% confidence interval ( $p > .05$ ). As demonstrated in Table 4, no significant difference was found between the .42 [.34, .50] observed in Duval and Tweedie's trim and fill test and the corrected .42 [.34, .50] effect size. All these analyses indicate the absence of the publication bias.

**Figure 2.***Funnel Plot the Analysis with All Samples***Table 4.***Egger's Regression Intercept Test, Duval and Tweedie's Trim and Fill Test*

Intercept	Standard Error	95% CI	t	df	p-value (two tailed)
2.39	4.59	[-7.16, 11.95]	.52	21	.61
Random Effect Model	Trimmed Studies	Effect size (r)	95% CI	Q	
Observed Effect	0	.42	[.34, .50]	523.35	
Corrected Effect		.42	[.34, .50]	523.35	

**Discussion**

The results of the present study demonstrate that the association between internet addiction and social appearance anxiety was significant, it had a medium effect

size. Individuals have the opportunity to post their photos instantly on the internet. Transformation of this opportunity into an appearance comparison could be an anxiety factor for individuals (Yurtseven, 2019). Hence, according to the Social Comparison Theory, when individuals do their self-

assessment, they take others as a reference, and believing that this assessment is negative could cause the individual to experience anxiety (Kraye et al., 2008). In this regard, a study grounded in Social Comparison Theory found that things shared on the internet were negatively associated with body image (Lawallen & Behm-Morawitz, 2016). When they share things on the internet, individuals ponder their brains intensively about how their appearance is seen by others. They experience social appearance anxiety if they think their appearance can be assessed negatively by others (Aslan & Tolan, 2022). According to the Self-presentation Theory, individuals give importance to how they are evaluated by others when they reflect their characteristics. Beliefs in the negative evaluations of others could be a severe anxiety factor for individuals (Leary, 2001). In this regard, a study based on the Self-presentation Theory reported positive link between internet use disorder and body dissatisfaction (Melioli et al., 2005). Besides these theories, Davis's (2001) Cognitive Behaviorist Model, one of the internet addiction models, focuses on the association between internet addiction and individuals' anxiety. Social appearance anxiety is one of them. Hence, the literature includes studies on the link between internet addiction and social appearance anxiety. Studies in the literature indicate a positive link between internet addiction and social appearance anxiety (Boursier et al., 2020; Rodgers et al., 2013). Although there are no similar meta-analyses, some meta-analysis supports the findings of this study. Accordingly, Saiphoo and Vahedi (2019) found that social media use increased body image disturbance in meta-analysis, consistent with the results of this study. Similarly, Holland and Tiggemann (2016) carried out a systematic review and reported that overuse of the internet negatively affects body perception. In addition, the meta-analytic review emphasised that social networking sites adversely influence ideal body perception (Mingoia et al., 2017). Consequently, it can be concluded that individuals' excessive engagement on the internet at an addiction level is associated with the excessive importance given to how they are seen by others, which could be related to their social appearance anxiety.

The present study also found the moderating roles of the publication year and education level were not significant in the relationship between internet addiction and social appearance anxiety. The link between internet addiction and social appearance anxiety has been investigated in recent years in the literature. Accordingly, the study carried out by Rodgers et al. (2013) can be considered an early publication. As for Turkey, these kinds of studies seem to have been conducted after the year 2016 (Doğan, 2016;

Gilik, 2016), with studies conducted more intensively in 2019 (Erdoğan, 2019; Traş, 2019), 2020 (Ak, 2020; Yıldırım, 2020) and 2021 (Ceylan, 2021; Fidan, 2021). As a result, the nonsignificant moderating role of the publication year could be associated with the short periods of the publication years. The moderating role of education level was not significant, either. Studies that examined the link between internet addiction and social appearance anxiety in Turkey were found to select high school students (Fidan, 2021; Kocaman, 2021), university students (Ceylan, 2021; Kireççi, 2019) or both of these groups as samples (Erdoğan, 2019; Işık, 2019). The years in these education levels also encompass transition years between adolescence and emerging adulthood periods (Arnett, 1994). Hence, years encompassing this education level include a period when individuals experience an increase in internet addiction (Kuss & Griffiths, 2020) and intensive social appearance anxiety (Boursier et al., 2020). As a result, high school and university years are transition periods from adolescence to emerging adulthood, and individuals in this period do not differ significantly in terms of internet addiction and social appearance anxiety, indicating why the moderating role of education level was not significant in this study. This study found a positive and significant effect with a medium effect size in the link between internet addiction and social appearance anxiety. On the other hand, the moderating roles of publication year and education level were not significant.

### **Suggestions for Future Research and Limitations**

Considering the results of this study, intervention programs can be formed for internet addiction, and individuals who develop internet addiction can be provided with psychological support services to decrease their social appearance anxiety, which is associated with this addiction. In addition, this study includes samples from high schools and universities, but psycho-social preventive support programs can be designed in a way to include internet addiction and social appearance anxiety as well as the relationship between these two variables in lower education levels as well.

This study included a Turkish sample, so future meta-analysis studies could include other cultures and countries using the same topic. Besides, a meta-analysis can be conducted to determine the link between these two variables in different age groups. The current study examined internet addiction and social appearance anxiety only in the sample of Turkey. In future studies, a similar meta-analysis involving the overall literature can be

conducted. This study included internet addiction, which is a type of behavioural addiction. In future studies, relationships between other behavioural addictions such as online shopping addiction and social appearance anxiety can be explored. Future studies may contribute to the understanding of the association mechanism between internet addiction and social appearance anxiety. Accordingly, the mediating and moderating roles of irrational beliefs, peer support, family cohesion, social comparison, perfectionism in the association between internet addiction and social appearance anxiety can be investigated. Apart from social appearance anxiety, other meta-analysis studies could investigate the relationship between internet addiction and body image, ideal body stereotype, body shyness, body dissatisfaction, body avoidance, etc. In addition to these, this study explained the common effect of the studies that investigated the link between internet addiction and social appearance anxiety. However, it is not possible to interpret which one is the cause and which one is the effect. Experimental studies can

be conducted considering this factor. Additionally, the issue of the link between internet addiction and social appearance anxiety continues to remain topical. Accordingly, similar meta-analyses can be conducted in future studies as the number of studies addressing these two variables increases.

This study has some limitations. Firstly, it included only cross-sectional studies and analyzed the relationship between internet addiction and social appearance anxiety. Since it analyzed the relationship itself, it was not possible to comment on a cause-and-effect relationship, which is another limitation of the study. Including only the Turkish sample and only high school and university levels rather than other education levels are also considered limitations. Besides, this study investigated only the moderating role of education level and publication year in the effect size of association between internet addiction and social appearance anxiety. The lack of any other moderating roles can be considered a limitation.

**Table 1.**

*Characteristics of the Studies Included in the Meta-analysis*

Study Name	r	N	Female	Male	Education Level	Journal	Publication Year
Ceylan, 2021	.45	581	212	369	University	Dissertation	2021-2022
Erdogan, 2019	.8	260	149	111	Mixed	Dissertation	2019-2020
Kocaman et al., 2021	.31	712	306	406	High School	Article	2021-2022
Kireççi, 2019	.3	383	230	153	University	Dissertation	2019-2020
Fidan, 2021	.81	481	220	221	High School	Dissertation	2021-2022
Dogan et al., 2016	.13	475	306	169	High School	Article	2016-2018
Çakmak, 2018	.63	140	76	64	University	Dissertation	2016-2018
Karakas-Kaya, 2021	.32	294	189	109	Mixed	Dissertation	2021-2022
Tras et al., 2019	.43	484	332	152	University	Article	2019-2020
Öztürk, 2021	.31	356	215	141	High School	Article	2021-2022
Ayar et al., 2018	.47	450	223	227	University	Article	2016-2018
Isık, 2019	.67	260	140	120	Mixed	Dissertation	2019-2020
Yildirim et al., 2020	.44	453	229	224	University	Article	2019-2020
Gilik, 2016	.31	280	140	140	High School	Dissertation	2016-2018
Korkmaz, 2017	.26	200	105	95	Mixed	Dissertation	2016-2018
Ak, 2020	.18	149	111	38	University	Dissertation	2019-2020
Sensoy et al., 2021	.45	700	302	398	High School	Article	2021-2022
Aslan et al., 2022	.32	440	279	161	University	Article	2021-2022
Koca, 2020	.23	700	302	398	High School	Dissertation	2019-2020
Yurtseven, 2019	.39	343	108	235	University	Dissertation	2019-2020
Dikmen, 2019	.3	186	145	41	Mixed	Dissertation	2019-2020
Atas, 2018	.41	180	107	73	High School	Dissertation	2016-2018
Sakar, 2021	.32	450	186	264	Mixed	Dissertation	2016-2018

**Etik Komite Onayı:** Meta-analiz çalışması olduğu için etik kurul izni alınmamıştır.

**Hakem Değerlendirmesi:** Dış bağımsız.

**Yazar Katkıları:** Fikir-BK; Tasarım-BK; Denetleme-BK; Kaynaklar-BK; Veri Toplanması ve/veya İşlemesi-BK; Analiz ve/veya Yorum-BK; Literatür Taraması-BK; Yazıyı Yazan-BK; Eleştirel İnceleme-BK.

**Çıkar Çatışması:** Yazarlar, çıkar çatışması olmadığını beyan etmiştir.

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**Ethics Committee Approval:** Ethics committee permission was not obtained as it was a meta-analysis.

**Informed Consent:** Informed consent was not obtained as this was a meta-analysis.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept -BK; Design-BK; Supervision-BK; Resources-BK; Data Collection and/or Processing-BK; Analysis and/or Interpretation-BK; Literature Search-BK; Writing Manuscript-BK; Critical Review-BK; Other-BK.

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## Geniştirilmiş Özet

### Amaç

Bu araştırmanın amacı, Türkiye örnekleminde internet bağımlılığı ile sosyal görünüş kaygısı arasındaki ilişkinin ortalama etki büyüklüğünü meta-analiz yöntemiyle incelenmesidir.

### Yöntem

Bu çalışmada meta-analiz yöntemi kullanılmıştır. Meta-analiz, çalışmaların etki büyüklüğünü hesaplamak için kullanılır (Card, 2012). Bu çalışmada etki büyüklüğünü belirlemek için Pearson korelasyon katsayısı (r) kullanılmıştır. Ancak r değeri  $\pm .25$  ile  $\pm 1$  arasında normal dağılım açısından sorunlu olduğu için Cooper (2010) tarafından önerildiği gibi r değeri Fisher'in z değerine dönüştürülmüştür. Meta-analizde çalışmaların etki büyüklüklerini birleştirmek için sabit ya da rastgele etkiler modeli kullanılır ve genel etki büyüklüğü bu şekilde hesaplanır. Çalışmalar heterojen ise rastgele etkiler modeli seçilir (Borenstein ve ark., 2013). Heterojenlik Q ve  $I^2$  istatistikleri kullanılarak belirlenmiştir. Q değerinin anlamlı olması beklenir ( $p < .05$ ).  $I^2$  değeri ise %25'e kadar ise düşük, <%50 ise orta, %75 ve üzerinde ise yüksek heterojenlik işareti olarak kabul edilmektedir (Card, 2012). Ayrıca, çalışmaların yayın yanlılığını değerlendirmek için huni grafikleri, Egger regresyonu, Duval ve Tweedie'nin kırpma ve doldurma testleri yapılmıştır. Yayın yanlılığının olmaması için huni grafiğinin çalışmaların genel etki büyüklüğü etrafında simetrik olarak dağılması gerekmektedir. Ayrıca, Egger'in regresyon testinin anlamlı olmaması (Borenstein ve ark., 2013) ve Duval ve Tweedie'nin kırpma ve doldurma testinde gözlenen ve düzeltilmiş etki büyüklükleri arasındaki farkın anlamlı olmaması gerekmektedir (Duval ve Tweedie, 2000).

### Bulgular

Bu çalışmada heterojenlik anlamlı ( $Q = 523.41, p < .01$ ) ve yüksektir ( $I^2 = 95.80$ ). Öte yandan, rastgele etkiler modeline göre, internet bağımlılığı ve sosyal görünüm kaygısı arasındaki bağlantıda genel etki büyüklüğü anlamlı ve orta düzeyde bir etki büyüklüğüne sahiptir ( $r = .42$ ; %95 GA: .34, .50). Huni grafiği yayın yanlılığını belirlemek için analiz edilmiş ve genel etki büyüklüğü etrafında nispeten simetrik olarak dağıldığı görülmüştür. Öte yandan, Egger regresyon testi %95 güven aralığında anlamlı bulunmamıştır ( $p > .05$ ). Duval ve Tweedie'nin kırpma ve doldurma testinde gözlemlenen .42 [.34, .50] ile düzeltilmiş .42 [.34, .50] etki büyüklüğü arasında anlamlı bir fark bulunmamıştır. Tüm bu analizler yayın yanlılığının olmadığını göstermektedir.

### Sonuç ve Öneriler

Bu çalışmanın sonuçları, internet bağımlılığı ile sosyal görünüş kaygısı arasındaki ilişkinin anlamlı olduğunu ve orta düzeyde bir etki büyüklüğüne sahip olduğunu göstermektedir. Bireyler fotoğraflarını anlık olarak internette yayınlama imkânına sahiptir. Bu fırsatın bir görünüm karşılaştırmasına dönüşmesi bireyler için bir kaygı faktörü olabilir (Yurtseven, 2019). Nitekim Sosyal Karşılaştırma Teorisi'ne göre bireyler kendilerini değerlendirirken başkalarını referans alırlar ve bu değerlendirmenin olumsuz olduğuna inanmak bireyin kaygı yaşamasına neden olabilir (Kramer ve ark., 2008). Bu bağlamda, Sosyal Karşılaştırma Teorisi'ne dayandırılan bir çalışmada, internette paylaşılan şeylerin beden imajı ile negatif ilişkili olduğu bulunmuştur (Lawallen & Behm-Morawitz, 2016). Bireyler internette bir şeyler paylaştıklarında, dış görünüşlerinin başkaları tarafından nasıl görüldüğü konusunda yoğun bir şekilde kafa yorurlar. Görünüşlerinin başkaları tarafından olumsuz değerlendirilebileceğini düşünürlerse sosyal görünüş kaygısı yaşarlar (Aslan & Tolan, 2022). Benlik Sunumu Teorisi'ne göre bireyler, özelliklerini yansıtırken başkaları tarafından nasıl değerlendirildiklerine önem verirler. Başkalarının olumsuz değerlendirmelerine yönelik inançlar bireyler için ciddi bir kaygı faktörü olabilmektedir (Leary, 2001). Bu bağlamda, Benlik Sunumu Teorisi'ne dayanan bir çalışma, internet kullanım bozukluğu ile beden memnuniyetsizliği arasında pozitif bir bağlantı olduğunu bildirmiştir (Melioli ve ark., 2005). Bu kuramların yanı sıra, internet bağımlılığı modellerinden biri olan Davis'in (2001) Bilişsel Davranışçı Modeli, internet bağımlılığı ile bireylerin kaygıları arasındaki ilişkiye odaklanmaktadır. Sosyal görünüş kaygısı da bunlardan biridir. Bu nedenle literatürde internet bağımlılığı ve sosyal görünüş kaygısı arasındaki ilişkiyi inceleyen çalışmalar bulunmaktadır. Literatürdeki çalışmalar, internet bağımlılığı ile sosyal görünüş kaygısı arasında pozitif bir bağlantı olduğunu göstermektedir (Boursier ve ark., 2020; Rodgers ve ark., 2013;). Benzer meta-analizler bulunmamakla birlikte, bazı meta-analizler bu çalışmanın bulgularını desteklemektedir. Buna göre, Saiphoo ve Vahedi (2019) meta-analizde sosyal medya kullanımının beden imajı rahatsızlığını artırdığını bulmuşlardır ve bu çalışmanın sonuçlarıyla tutarlıdır. Benzer şekilde, Holland ve Tiggemann (2016) sistematik bir inceleme gerçekleştirmiş ve internetin aşırı kullanımının beden algısını olumsuz etkilediğini bildirmiştir.

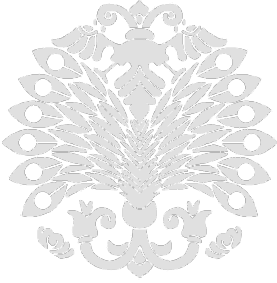
# Understanding and Managing Change in Educational Organizations

## Eğitim Örgütlerinde Değişimi Anlamak ve Yönetmek

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### ABSTRACT

The deterministic perspective, which views contemporary educational organizations as classical cause-and-effect systems that can be easily controlled and digitized, no longer provides the necessary support and solutions to these organizations and their problems. Instead, the validity of complexity and chaos theory has emerged, which considers educational organizations as dynamic and complex systems and acknowledges that although many things are unpredictable, there is a certain order and even seemingly insignificant factors can have significant consequences. Therefore, evaluating the management of change in educational organizations from the perspective of these theories will provide an advantage in exploring the nature of change and managing it successfully. In this paper, after discussing change and management as an inevitable phenomenon, the paradigm shift mentioned above was explained. Subsequently, chaos theory was examined, and the applications of the theory in the context of managing change in educational organizations were discussed.

**Keywords:** Change, change management, chaos and complexity theory, self-organization, organizational change

### Öz

Günümüz eğitim örgütlerini kolaylıkla kontrol edilebilen ve sayısallaştırılabilen klasik neden-sonuç sistemleri olarak gören deterministik bakış açısı, artık bu örgütlere ve sorunlarına gereken desteği ve çözümleri sunamamaktadır. Bunun yerine, eğitim örgütlerini dinamik ve karmaşık sistemler olarak kabul eden ve çoğu şeyin tahmin edilemez olmasına rağmen belirli bir düzene sahip olduğu ve önemsiz görünen şeylerin bile çok önemli sonuçlar doğurabileceği anlayışını veren karmaşıklık ve kaos kuramı geçerlilik kazanmıştır. Dolayısıyla, değişimin yönetimine ilişkin eğitim örgütlerinin bu kuramların perspektifinden değerlendirilmesi hem değişimin doğasının keşfedilmesinde hem de başarılı bir şekilde yönetilmesinde avantaj kazandıracaktır. Bu çalışmada, öncelikle kaçınılmaz bir olgu olarak değişim ve yönetimi tartışıldıktan sonra yukarıda sözü edilen paradigma değişimi açıklanmıştır. Sonrasında ise kaos kuramı irdelenerek eğitim örgütlerindeki değişimin yönetimi bağlamında kuramın uygulamaları tartışılmıştır.

**Anahtar Kelimeler:** Değişim, değişim yönetimi, kaos ve karmaşıklık kuramı, kendi kendini örgütlenme, örgütsel değişim

## Introduction

We are encountering many new situations today, whether achieved or unexpected, by humanity. As Hargreaves (2002) stated, " We live in a world of endless and relentless change... and it challenges us to come to terms with and master new knowledge, skills and experiences"(p.189). Change is considered "one of the oldest known realities of humanity" (Şen & Batı, 2020, p. 76). The quote by the Greek philosopher Heraclitus, "The only constant in life is change," has been widely embraced to the extent that questioning change is no longer common. Moreover, factors such as technological advancements, increasing diversity in human needs, and heightened awareness levels among individuals have accelerated and necessitated change.

Although change is sometimes perceived as a threat and sometimes as an opportunity for organizations, unfortunately, most modern organizations often fail to achieve sustainable and effective change (Lewis, 2019; Stouten vd., 2018; Vakola, 2014; Van Tonder, 2004). Relevant research indicates that managers believe only one of the planned three organizational change interventions is genuinely successful (Meaney & Pung, 2008, cited in Armenakis & Harris, 2009). In the United Kingdom, only 38% of managers think that the change in their organizations is successful (Holbeche, 2006, cited in Stouten et al., 2018). Similar perceptions about changes in educational organizations are observed in studies conducted in our country (Kondakçı et. al. 2019; Toprak, 2018). On the other hand, despite the conceptual and theoretical accumulation, the question of how to achieve successful change in educational organizations is the most significant concern for scholars and practitioners because most interventions either have not reached their goals or have not been implemented at all (Acton, 2021; Cheng & Walker, 2008; Kondakçı et. al., 2019; Toprak, 2018). Research on change in educational organizations has yielded the following results:

- It is consistently top-down (Hoşgörür, 2016; Toprak, 2018);
- It creates conflicts with stakeholders when implemented rapidly (Toprak, 2018).
- It is unprepared and not consulted with practitioners (Demiral, 2014).
- Focus is placed on macro-level aspects without being aware of the complexity of change and without examining the micro-level dynamics (Kondakçı et al., 2019).
- School administrators have limited authority in the change process (Hoşgörür, 2016).

- In the minds and memories of teachers, the failure of change has gradually become a phenomenon (Hargreaves, 2002).
- Sustainability has not been achieved (Hargreaves, 2002).
- There is a lack of a collaborative learning culture, and the lessons to be learned have not been fully embraced. A change system focused on top-down, bottom-up, and horizontal improvements and innovations has not been established (Fullan, 2016).
- The role defined for teachers, who are the key factor in education, is passive, and there is insufficient space, time, and environment to influence government policies regarding the benefits teachers provide to students (Shirley & MacDonald, 2016, cited in Kondakçı et al., 2019).
- In planned change, the stable vision for the future, and in particular, the development of plans by those responsible for change in public institutions based on limited information and material resources, has led to poorly designed and unclear or unrealistic goals (Hargreaves, 2002).
- The change process has not been understood (Acton, 2021).

When examining these results, it can be said that the most important factor that makes the change efforts unsuccessful is the insufficient understanding of the nature of the change and the conditions requiring change. Factors that will give educational organizations an advantage in dealing with ongoing changes include knowing the nature and source of the continuous change phenomenon (Çobanoğlu, 2008) and better defining organizational change to increase the likelihood of success and reduce the negative consequences of unsuccessful changes on organizational members and stakeholders. However, it is also important to reconsider the paradigms we rely on when assessing situations. The ineffective management of uncertainties and crises, along with the inability to accurately identify the source, may be attributed to many situations being approached with linear (Newtonian) methods rather than the complexity paradigm.

In today's world, complexity science and chaos theory have begun to be utilized to explain the nature and origins of the phenomenon of change. Understanding chaos theory and complexity sciences is crucial for the systematic transformation of education systems to better meet the rapidly changing needs of society and children. Furthermore, it can help in understanding when existing education systems might be ready for transformation, what system dynamics might influence changes once transformation begins, and how the changes made might



impact the system. Moreover, chaos theory and complexity sciences can assist in understanding and enhancing the transformation process itself, which is a complex system utilized by education systems to transform themselves (Reigeluth, 2004).

It is believed that this study will shed light on reviewing the paradigms used as references for evaluating changing situations and understanding the current changes. Additionally, it is considered important for education organizations to develop a different perspective and effectively manage the phenomenon of continuous change with the assistance of complexity science and chaos theory. Therefore, the aim of this study is to present a conceptual framework for the explanation of the dynamics of change through complexity science and chaos theory, drawing from both international literature and previous research (e.g., Akmansoy & Kartal, 2014; Altun, 2001; Çobanoğlu, 2008; Ertürk, 2012; Gürel, 2018). Subsequently, the development of a framework for applications in educational organizations is aimed. The comprehensive research question guiding the study can be presented as follows: Can complexity science and chaos theory provide insights that facilitate the exploration and management of the nature and source of change in educational organizations, and can they serve as a guide in managing change? This article will address two auxiliary research questions: i) What is the change in the paradigm based on the examination and analysis of the literature? ii) What is chaos theory, and how does it explain change?

### Methods

The information presented in this review provides a general overview of complexity science and chaos theory, offering a different perspective on the nature and management of change for educational organizations. Therefore, it is designed as a "traditional review," where previous studies on a specific topic are gathered and interpreted, and their conclusions and evaluations are synthesized (Torgerson et al., 2017, p.357). Peer-reviewed articles and books on "Organizational change" and "Complexity science and chaos theory" were accessed through the electronic resources of the author's university library. Studies containing keywords such as "change," "organizational change," "organizational change in educational organizations," "complexity science," "chaos theory," "chaos in educational organizations," and "chaos in educational management" were searched for. Inclusion criteria for the study scope included being "written in English or Turkish," "accessible in full text or abstract," and "being an academic study regardless of its type and

publication year." The author determined the suitability of the study by reading the title, abstract, and full text if available. Searches containing combinations of the identified keywords and related concepts were continued until the author believed saturation was achieved.

### Organizational Change

According to Lewis (2019), change is "something we sometimes seek, sometimes resist, and often have thrust upon us" (p. 1). While change is defined in its simplest terms as "moving from one level to another," it also encompasses situations where "the places of individuals and objects are altered, and personal knowledge, skills, and abilities are placed in a different position than the current situation" (Kerman & Öztop, 2014; Tunçer, 2013). This shift to a different level or position, whether planned or unplanned, can occur in the desired direction or an undesirable one.

The phenomenon of change, which progressed at a slow pace worldwide until the Industrial Revolution, gained momentum after the revolution. Especially with the developments in information technologies in the 1990s, it accelerated, affecting not only societal and individual lives but also organizational life. Just as individuals are compelled to adapt their social and private lives to uncertain situations, all open-system organizations must be sensitive to the uncertainties and changes occurring in their environments and respond dynamically (Kerman and Öztop, 2014). Indeed, extraordinary circumstances such as the recent pandemic have necessitated many changes, particularly in the structure and functioning of work (Almaz, 2022, p. 339; Öge & Çetin, 2020, p. 7; Serinikli, 2021, p. 278; Şen & Batı, 2020, p. 76). Therefore, for today's organizations, the emphasis appears to be more on how to manage change rather than its necessity.

The mentioned organizational change involves the transformation of an organization from one point to another. Kanter (1992) explained change as an event, describing the movement of an organization from "state 1 at time 1" to "state 2 at time 2." (p. 9). Moran & Brightman (2000, cited in Eroğlu & Alga, 2019) argue that organizational change is (1) non-linear, and therefore, the beginning and end cannot be clearly defined; (2) effective change involves the integration of multiple improvement efforts; (3) occurs both top-down and bottom-up; and (4) measurement of goals is a key element for success and sustainability.

Organizational change, although a prominent and enduring topic in management (Alkaya & Hepaktan, 2003; Suddaby &

Foster, 2017), is criticized for its weakness when it comes to how the change is managed, due to factors such as the undefined nature of change and its epistemological status being left "unexamined" (Suddaby & Foster, 2017), and the lack of a common understanding in the scientific literature on basic change processes (Stouten et. al., 2018; Van Tonder, 2004). As a result, the following fundamental questions about change often remain unanswered (Suddaby & Foster, 2017, p.1): "How can we know when change has been successfully implemented?", "How do we distinguish change from stability?", "Where do we look for change in complex organizations?" and perhaps most importantly, "What do we mean when we say the organization has changed?"

Change is sometimes seen as an "inevitable phenomenon that constantly creates organizational problems and makes finding solutions mandatory" (Çobanoğlu, 2008). However, considering it as a problem is not entirely incorrect. Numerous studies (Bamberger et al., 2012; Dahl, 2011; Ferrie et al., 1998; Loretto et. al., 2010) show that exposure to organizational change increases the risk of various health problems. Understanding the process of change can also be challenging and frustrating for leaders because it requires them to consider factors they may not want to deal with (Fullan et al., 2005, p. 55). However, it is essential not always to perceive change as a problem but also as an opportunity. According to Lewis (2019), change can be a way to overcome many significant problems related to politics, governance, the rule of law, philosophy, and the distribution of rights and resources that closely concern societies, organizations, and individuals. It is also related to productivity, effectiveness, quality, competitiveness, creating common values, understanding, and collaboration. Change should be considered as a response to some important threats or opportunities that occur outside the organization (Alkaya & Hepaktan, 2003). Organizational change refers to intentional and planned change initiatives aimed at improving organizational performance or development in a changing context (Wang et al., 2023, p. 1040).

### **The Shifting Paradigm and Complexity**

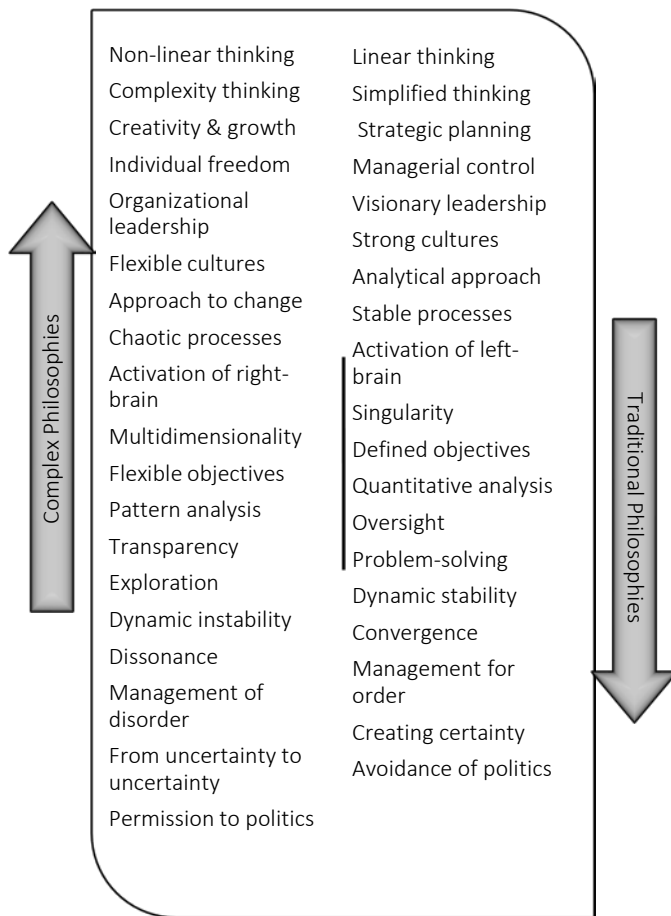
Newton's three fundamental laws of classical physics, based on the hypothesis that "certain effects will occur in response to certain causes" and "everything that happens can be precisely measured" and "given certain effects to

the system, certain reactions will occur," have become a dominant paradigm, especially known as the law of action and reaction, and it has become widespread in many fields, including governance (Ertürk, 2012). Karacay (2004), explaining that the essence of Newton's laws is based on determinism, describes determinism as "the present state of a physical system is the result of its previous state":

...it is possible to determine every event and motion in advance. According to Newton's laws of motion, just as the current event and motion arise from the previous event and motion, the future event or motion will also be the result of the current event or motion. From the perspective of a classical physicist, being able to predict with absolute certainty that Halley's comet will revisit Earth in the year 2061, or to accurately calculate when the next solar eclipse will occur and from where on Earth it will be best visible, is an undeniable triumph of determinism. This view, which has been the foundation of modern science for 400 years, has created the science, technology, and civilization we find ourselves in today.

However, the "quantum physics theory" proposed in the early 1900s, which has had significant impacts on the development of management science (Bayramoğlu, 2016), began to gain more acceptance by providing answers to many unanswered questions left by the Newtonian paradigm (Ertürk, 2012). Emphasizing that the future of systems is unpredictable and uncertain, the complexity paradigm has replaced the old paradigm and is considered the fundamental paradigm for contemporary organizational theories.

Today's new paradigm indicates another aspect where non-linearity, chaos, complexity, and uncertainty are considered normal (Erçetin, 2001). It is almost impossible to assess organizational activities definitively, and assuming linearity and predictability does not seem very reasonable (Çakar & Alakavuklar, 2013). Therefore, the complexity of political, regulatory, and technological changes faced by most organizations puts pressure on them to adapt to these changes, even to make radical changes (Greenwood & Hinings, 1996), and to have competitive, flexible, and more adaptable structures (Arévalo & Espinosa, 2015). The strong criticisms of the traditional paradigm based on organizational theory and the ineffectiveness of associated hierarchical control have led to the examination of social organizations as complex systems (Arévalo & Espinosa, 2015). The paradigm shifts mentioned in Figure 1 are illustrated.



**Figure 1.**  
*Paradigm Shifts in Management Philosophies and Practices*  
(Singh & Singh, 2002)

The subject of complexity, although gaining importance in recent years, has deep historical roots. Early works such as Adam Smith's "Invisible Hand," Von Neumann's "Self-Reproducing Automata," and Darwin's "Theory of Evolution" have inspired some of the earliest theories about complex systems and self-organization. While the idea of complex systems has been used to describe a wide range of chemical, physical, biological, technological, and social phenomena, there is still no consensus on what constitutes a complex system or its characteristics (Arévalo & Espinosa, 2015). Some researchers do not consider complexity science as a discipline but rather define it as an "interdisciplinary field" shared by researchers with the same view (Vigni, 2020).

### Chaos Science and Chaos Theory

Although chaos is originally a philosophical concept dating back to ancient times, it has been neglected by scientists attempting to view situations without linear relationships through a positivist perspective over the past two centuries; propositions or systems that are chaotic have been avoided (Altun, 2001). However, in Chaos Theory and parallel to it, in

complexity theory, the presence of nonlinear relationships in complex systems (organizations) that can create unexpected and unpredictable outcomes is emphasized (Töremen, 2000). The reasons for the inability to make predictions for most of these "nonlinear" dynamic systems (Karaçay, 2004) are the lack of analytical solutions for these systems; the inability to precisely determine any initial condition (The Principle of Uncertainty in Measurement) and the sensitivity to initial conditions, where even very small changes in the initial conditions of the system can lead to very large differences (Sensitive dependence on initial conditions- the Butterfly Effect).

Chaos, derived from the physical and mathematical sciences, is defined as "irregular, unpredictable behavior occurring in an extremely sensitive system to changes in initial conditions" (Singh & Singh, 2002). Dynamic systems with unpredictable behaviors or the behaviors of these systems are referred to as chaos (Karaçay, 2004). The "irregularity" in these definitions of chaos is not simply a disorder or chaos in a straightforward sense. Describing disorder in this way will make chaos and the opposite of chaos, order, more incomprehensible. Order and disorder can have many different interpretations (Öge, 2005). If considered as two extremes, Erçetin et al. (2013) indicate that there are infinite possibilities for the chaotic and ordered states of any system. They also suggest that the definitions of chaos and order can vary depending on the system and the observer:

If we take a particle as an example, it may not perceive its movements as chaotic from its own perspective, but an observer who observes the source of the particle's movement and other particles influencing it for a sufficient period of time may perceive the behavior of the particle as chaotic. Since the boundary between order and chaos is not clear, it is difficult to clearly determine the level of chaos of a system. Such a level should be defined for each system. Definitions like "more chaotic" or "less chaotic" valid for one system may not be valid when compared with another system. Comparing the chaos in the storage of information in the human brain with the chaos observed in changes in heart rhythm is probably impossible. It may be problematic to focus on the duration of observations in these comparisons because there may be unknowns outside the observed period.

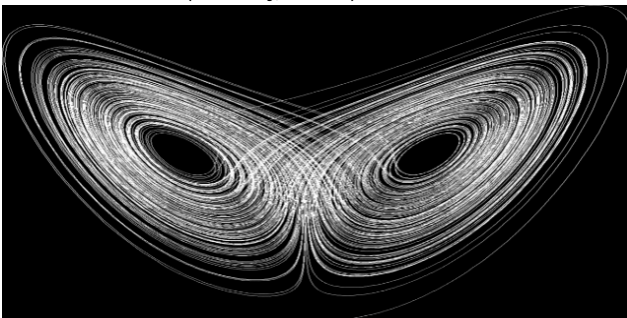
Although chaos is generally considered a disorder, chaos theorists explain it with three different situations: (1) "stable equilibrium" where the balance is temporarily disturbed, and stability and balance can be restored in a short time, (2) "limited instability" or "chaos" where order and disorder coexist, and it is possible to predict how the system will behave despite unpredictable events and changes, and (3) "explosive instability" where there is no order and general

trends. Theorists believe that organizations are closer to "limited instability" or chaos rather than "stable equilibrium." If this is accepted, management approaches adopted during stable periods should be seriously changed. Organizations need to become places with more chaos and improve their management skills (Töremen, 2000).

Chaos means the existence of disorder and turbulence (Açıkalın & Bölücek, 2014). According to chaos researchers, when complex systems begin to lose their balance, they are pulled in different directions by powerful attractors<sup>1</sup>, one of which dominates the others, making them insignificant (Töremen, 2000). Moreover, some of these attractors can pull the system into a balanced or near-balanced state, while others can force the system into an entirely new shape (Morgan 1998, p. 293). The most popular example related to the latter is the "Lorenz attractor".

Lorenz used his computer to enter data and graphically display the temperature values he found to prepare a simple weather forecast. By randomly elevating the temperature values he had chosen, even in small proportions that the most sensitive thermometer could not detect, Lorenz expected that there would be no difference in the graphs when he ran the function again. However, he observed that entirely different functions emerged instead. He noticed that the ups and downs in the graph created a pattern like a butterfly in the long run (Öge, 2005).

As a result of the research conducted by meteorologist Edward Lorenz, who made a significant contribution to chaos theory, the shape known as the "Lorenz Attractor," resembling butterfly wings or owl eyes, emerged from the inadvertent elevation of temperature values (Figure 1). Attractive forces created this pattern or fractals<sup>2</sup> in the chaos theory literature. When examining the figure, it is understood that "every event that appears so complex has its own cause" (Turunç, 2008).



**Figure 1.**  
*Lorenz Attractor (Wilkinson, 1997)*

<sup>1</sup> Attractor: Although events occurring in chaotic systems are often described as random, it is observed that there are some areas of concentration, called "attractors," in their mathematical representation. Attractor is defined as "a focal point within the system that attracts other structures of the system towards itself" (Kuşcu et al., 2020).

This figure illustrates the "presence of a regular structure within irregular flow" and the idea that "the system never repeats itself, and the orbits do not intersect" (Demirkan, 2017). Based on this finding, Lorenz suggested that accurate, reliable, and long-term predictions about the weather were impossible due to chaotic behavior, as systems exhibiting non-periodic behavior make forecasting beyond a certain period unfeasible (Öge, 2005). Thus, Lorenz highlighted two interesting characteristics of chaotic systems, even though they may appear disorderly from the outside, there is an inherent order within them (Biçici, 2016; Öge, 2005; Turunç, 2008):

### Sensitive Dependence on Initial Conditions

In chaos theory, it is explained through the metaphor of the "butterfly effect" that small changes in initial conditions can lead to significant and unpredictable differences in outcomes. According to Karaçay (2004), physicists have an interesting saying to describe this situation: "If a butterfly flaps its wings in China, it can cause a hurricane in Texas." Although the occurrence of this event may not seem very likely, what is intended to be conveyed here is that "like the flap of a butterfly's wings, a very small effect can trigger many small changes in a chain reaction, thus affecting the system, moving it away from the attractive element" (Çobanoğlu, 2008).

Henri Poincaré, the scientist who initially formulated chaos theory, asserted that even tiny differences in initial conditions would lead to significant differences in outcomes, making predictions impossible (Biçici, 2016). The event that made this possible was the resolution of the three-body problem in astronomy (where Newton's laws perfectly fit the motion of two celestial bodies, but analytical solutions cannot be obtained when there are more than two celestial bodies), which gained considerable attention in astronomy in the early 20th century, resolved by Henri Poincaré (Karaçay, 2004).

In 1900, King Oscar II of Norway announced that he would reward anyone who could prove whether the solar system was stable. Henri Poincaré demonstrated in the same year that the solution to the system of equations determining the motion of the solar system was sensitive to initial conditions. He showed that, although the initial conditions could never be accurately determined, making it impossible to determine whether the solar system was stable. Poincaré was the first to use the term "chaos" for this unpredictable situation. Thus, Poincaré became the

<sup>2</sup> Fractal: In a chaotic system, it is the "smallest subunits resembling each other and the whole" (Orhan, 2013). These structures are "geometric structures, numerous and resembling each other and the whole system, representing the entire system" (Kuşcu et al., 2020).



recipient of the reward without solving the intended problem (p. 5).

#### Non-Randomness:

According to chaos theory, non-randomness implies that most events occurring in the world have a chaotic structure, and all chaotic structures have an inherent order within them. In other words, there is an "order within disorder." Examples of situations where chaos emerges include the swirling of cigarette smoke in helical patterns, the fluttering of a flag in the wind, the behavior of cars moving one after the other on a highway, or the dripping of water from a tap, initially falling at regular intervals but eventually losing its regularity (Öge, 2005). These chaotic structures, not conforming to the Newtonian scientific paradigm, also exhibit the characteristics of a dynamic process.

#### Self-organization (Otopoiesis)

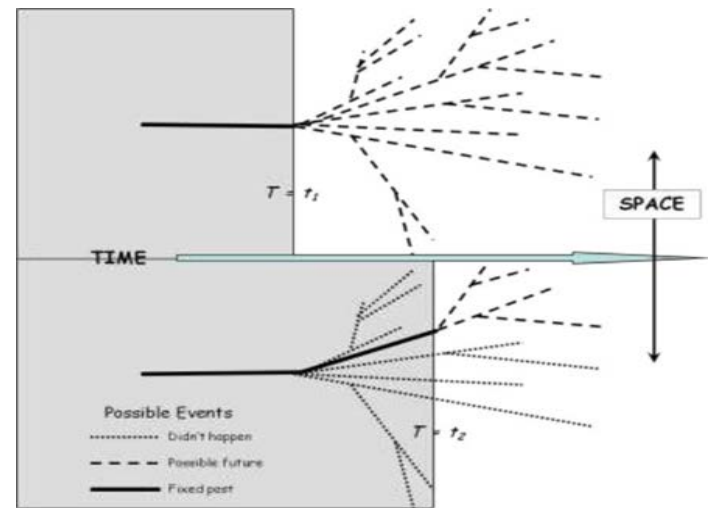
Chaos theory teaches us that there is no system that can be considered correct, and unpredictability is inherent. Therefore, for organizations to sustain their existence as systems, they must be able to perceive changes occurring in their environment, undergo the necessary transformations, and manage chaos (Bayramoğlu, 2016; Çobanoğlu, 2008; Kurşunoğlu & Tanrıöğen, 2006). The chaotic environment in which systems find themselves already forces them to find new and creative ways to improve themselves.

As evident from the previous sections, chaos theory has its own vocabulary and metaphors. One of these metaphors is the concept of the "edge of chaos," fervently advocated by Kauffman. Through his research, Kauffman:

...began to see that living systems operated at their most robust and efficient level in the narrow space between stability and disorder—poised at "the edge of chaos" It was here, it appeared, that the agents within a system conducted the fullest range of productive interactions and exchanged the greatest amount of useful information. People recognize this in everyday life: A slightly messy office is a productive one; rollicking families are happy; economies flourish under scant regulation. The edge of chaos, but not quite chaos itself. (cited in Lissack, 1999, p.114).

Chaos theorists have focused on events that lead systems to transform themselves, moving from a state of equilibrium to the edge of chaos. According to this theory, when systems (components) are taken out of balance and brought to the edge of chaos at an unpredictable time, they encounter various outcomes resembling bifurcations<sup>3</sup>, branching into

very different futures (see Figure 3). The system works to "self-organize effectively to escape from this chaos" through unpredictable defense mechanisms, thanks to both the energy it possesses and readiness for such situations. The initial influential "attractor" can eliminate potential changes and lead the system to a different variation of its initial state if it disperses the existing energy and instability. However, if the new "attractor" becomes more dominant, the energy it possesses can pull the system for reshaping (Morgan, 1998, p. 295; Yüksel & Esmer, 2019).



**Figure 2.**

*Motion of a Particle Through Space and Time Where The Motion is Randomly Perturbed (Hall, 2013)*

Figure 2 depicts the possible trajectories of a physical system at two points in time ( $t_1$  and  $t_2$ ) in the state-space where time progresses from left to right. The gray areas represent the block universe of past time, while the white area represents the yet undetermined future. The line separating the past and the future is the "now." Historical events located in the fixed past are represented by straight-thick lines. When now =  $t_1$ , the possible futures reachable in the next moment are adjacent possible states represented by dashed lines. In our perceived universe, at any given moment, only one of the adjacent possible states available for that moment has actualized. At a later moment, when  $t_2$  is reached, it is observed that the possibilities that were once possible are no longer possible (Hall, 2013, p. 114).

<sup>3</sup> Bifurcation is the disruption of order. In a disaster, patterns of order are lost, individuals become confused, disoriented, and disillusioned. Thus, forking results in radical change, and thereafter, previous assumptions, methods, models, and

relationships no longer function (Liska et al., 2012). Irreversible decisions are made at fork points (Erdoğan, 2012).



In turbulent<sup>4</sup> environments described above, the ability of systems to respond to environmental conditions by reproducing/changing their internal structures and/or functions solely relying on themselves is explained by the concept of self-organization (autopoiesis) (Çobanoğlu, 2008; Mbengue et al., 2018). Self-organization is defined as a form of organization where "the system as a whole produces, changes, and differentiates itself from its components" and was developed by two Chilean biologists, Humberto Maturana and Francisco Varela (1974). These two biologists argued that autopoiesis is the "definition of life" and developed their theories to understand the nature and characteristics of living systems (Costa & Tribolet, 2015).

The goal of self-organizing systems is to "produce themselves" and, as a result, present the organization itself and its identity as a product (Morgan, 1998, p. 281). Self-organizing systems are adaptable and agile; they develop themselves. The most prominent features of self-organizing systems are as follows (Reigeluth, 2004):

- **Openness:** To be open to its environment, the system must actively seek information around it and make this information widely available within the system. However, the system must go beyond searching for and circulating information in its environment; it must also become a part of its environment. When it becomes part of its environment, the system gradually gains autonomy from its environment and develops new capacities that make it more skillful.
- **Self-reference:** The system changes in a way that remains consistent with itself by referring to the fundamental ideas, values, or beliefs that give it an identity. In this way, when the environment changes and the system realizes that it needs to change, change occurs in a way that is always consistent with itself. Change is never random; the system does not move towards strange new directions.
- **Autonomy:** People are free to make their decisions about changes. The more freedom there is in self-organization, the more order there is. When sufficient freedom is given by making self-reference, the system allows changes to occur before reaching a crisis point, creating more stability and order. Paradoxically, by self-organizing, the system will be "less controlling but more orderly."

To understand the changes and transformations that occur in the system, self-organization requires a focus on both internal and external factors. Additionally, "self-adapting systems are considered as systems that force themselves to production and living, co-evolving systems" (Erdemir and Koç, 2010). According to Coleman (1999), in turbulent environments, the system's adaptive capacity to the environment is increased through the logic of emerging new organizational forms (such as cellular forms), and the organization becomes stronger than each cell working alone with autonomous small teams (cells) seeking entrepreneurial opportunities and sharing knowledge among themselves.

When environmental demands change, new cells can be formed and old ones disbanded as necessary; like an amoeba changing with its surroundings, the operating logic of the form is based on flexibility with accepted protocols of knowledge sharing substituting for hierarchical controls. Thus, cellular organizations are designed to be reconfigurable according to shifts in the market and/or the emergence of new knowledge (p.37).

When autopoiesis is examined from the perspective of organization management, it is observed that social structures exhibit open system characteristics in response to external influences. The organization transforms the information it receives from its environment and decides on the change it will implement in response to the impact within its internal structure. Of course, not every piece of information from the environment will cause a change within the organization, and sometimes the organization will choose the alternative of not reacting. The basis for the decisions the organization makes is whether the change is accepted within its internal structure. Since the information from the environment is evaluated by the organization in terms of its value and validity, any information can trigger one organization into action while being ineffective in another at any given time (Töremen, 2000).

### **Chaos Theory in the Management of Educational Organizations**

Toffler (1980, cited in Reigeluth, 2004) defined three main waves of societal evolution. Significant changes in education systems accompanied each of these main waves. Thus, examples of co-evolution between education systems and their environments began to emerge. In the Agricultural Age, the dominant paradigm of education was a single-room school building, private lessons, and apprenticeship. In the

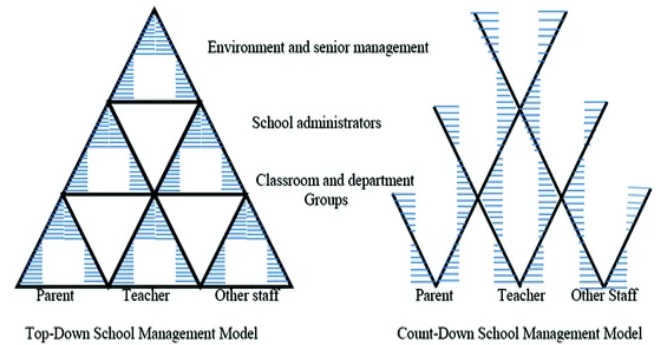
<sup>4</sup> Turbulence is the complexity of irregularities, with disorder, chaos, energy dissipation, and drift predominating its structure. It involves random movements (Altun, 2001).

Industrial Age, schools being modeled after factories, standardization, and teacher-centered learning became the dominant paradigm. Now, as the information age deepens, society is undergoing a dramatic change, like the days of the Industrial Revolution, putting significant pressure on education systems to evolve together. As the pace of societal changes increases, the need for co-evolution in education has become more urgent than ever (Reigeluth, 2004). In addition, sudden events like the global COVID-19 pandemic, which have affected all societies, have triggered changes in education at an unprecedented pace (Williamson et al., 2021) or increased expectations for change (Korkmaz & Toraman, 2020). Therefore, applying chaos theory to complex systems such as schools in the present day creates a significantly important opportunity for change and transformation because learning and thinking are not linear processes (Akmansoy and Kartal, 2014). Indeed, Toffler also accepts chaos theory as the new paradigm of the information age (cited in Mercan et al., 2013).

The three fundamental conditions listed as characteristics of a chaotic system, "non-linear operation," "iterativity (the output of one cycle being the input of the next)," and "small changes in initial conditions leading to significant differences in outcomes," are observed features in educational organizations (Erçetin et al., 2015, p.149). In an era where contemporary paradigms are unstable and constantly changing, education is intertwined with chaos and complexity, making itself largely unpredictable. This chaos affects education at every level and in all systems without exception, influencing all stakeholders as well (Erçetin and Bisaso, 2018). Therefore, defining education as a chaotic phenomenon, considering the multitude of factors influencing the success of these organizations (Ertürk, 2012), and managing the upcoming changes from this perspective will enhance success. In relation to the characteristics of chaos theory mentioned in previous pages, the following points can be made regarding change management in educational organizations:

- Chaos theory guides educational organizations to navigate through challenging processes. However, metaphors such as "fractals," "strange attractors," and the "butterfly effect" seem distant from organizational behavior for managers and practitioners. Managers must accept the reality that successful educational organizations are complex networks with non-linear feedback loops (Gunter, 1995).
- Educational organizations are open systems that are constantly in interaction with their environment.

However, in the information age, where society undergoes rapid changes, and the future is uncertain and unpredictable, these organizations are obligated to shape the future of societies. Therefore, as Erçetin and colleagues (2015) pointed out, educational organizations need to be designed in ways that encourage proactiveness and support changes to be effective in education and teaching (for an example design, see Figure 3).



**Figure 3.**  
*Comparative View of Two Different School Management Models (Erçetin & Bisaso, 2015)*

- Another important factor in effectively managing change in educational organizations is the leadership process. According to Erçetin et al. (2013), leading an organization in chaotic situations involves creating different leadership compositions for each situation and deciding which type of leadership to use. This, in turn, is only possible if the leader accurately analyzes the current situation. Therefore, leadership in chaotic environments is about discovering the nature of the system, its effects, and the periodicity of these effects. As Altun (2001) pointed out, studies on chaos theory show that managers who are familiar with chaos theory are more effective in solving chaotic situations. Although Shufutinsky and colleagues (2021) define leaders who can adapt to highly chaotic and changing situations and take proactive steps as "shock leaders," it does not seem logical to find and recommend a single leadership style for all situations in chaotic systems. Instead, in a chaotic environment, the expected behaviors from leaders or leadership can be as follows (Erçetin et al., 2013, p. 100):
  - Especially having knowledge about the system,
  - Discovering the basic elements affecting the system,
  - Discovering the periodic relationship between these effective elements,

- Considering this relationship network when making managerial decisions,
- And most importantly, having an extremely strong leadership profile that goes beyond necessity, including skillfully using all relevant leadership styles and models.
- Complex systems, due to their sensitivity to internal conditions, can lead to turbulence or chaos even with small changes in their environment (Bayramoğlu, 2016). Educational organizations can also be influenced by attractive elements such as the characteristics of society, the quantity and quality of human resources needed by the economy, and technological developments (Çobanoğlu, 2008), and this influence can force the system to a new organizational structure (fractals). Therefore, instead of a mechanical response expected from the system, new structures that solve these unpredictable problems in the direction of organizational restructuring should be realized. In such cases, "members of the organization must adopt forms of continuous reorganization with teamwork and project teams, and the continuous renewal of teams can mean the full use of individuals' creativity and potential" (Çobanoğlu, 2008). Such social interactions are based more on collaboration than on implicit agreement: what matters is open communication, active listening, recognizing learning opportunities, and the individual's capacity for self-motivation and self-regulation (Gunter, 1995). In addition, when educational organizations approach the threshold of chaos, they should have personnel who can self-organize and take instant action at a high level; plans and projects should be prepared together with implementers rather than at the top of the organization, and the organization should have a dynamic structure with a shared vision, mission, and values, seeking continuous innovation and change in education and learning (Bayramoğlu, 2016).
- "Bifurcation points" have provided organizational management with a different perspective on events (Erdoğan, 2012). Experiments, innovations, and attractors such as taking individual initiatives (Thiéart & Forgues, 1995) are sources of instability for educational organizations and can push the system out of its programmed route and stable balance. Similarly, dialogues among teachers, students, and all other stakeholders about stories, problems, unresolved situations, and incomplete initiatives can create the conditions necessary for the system to organize itself. All of these contribute to breaking the existing status quo, arousing curiosity, revitalizing interaction, and change. This interaction and change always form the basis for the transformation of the system at different levels and in different places (Erçetin et al., 2015).
- When educational organizations reach the edge of chaos, choosing one of the options presented (bifurcation point) means making irreversible decisions. For example, due to the COVID-19 pandemic and the subsequent need for social distancing, online learning has gained unprecedented momentum for educational institutions to quickly adapt to the situation and continue education. However, there are also criticisms that this technology-driven change, often seen as neutral, is being imposed on education to address growing societal issues. The question of whether the decisions made by education leaders truly pave the way for the desired future of education is being debated (Teräs et al., 2020). Therefore, occasionally making reversals in the education system and re-adopting elements that have lost their functionality will both lead to losses and negatively affect the change initiative and the perceptions of the system members towards change.
- Chaos Theory allows educational managers to see that they have a third option in addition to stability or dissolution, and that is to work within "limited instability." Therefore, a successful educational organization will deviate from the balance between stability and dissolution, and management behavior will operate in a continuous order and chaotic environment. The future is unseen because it is unpredictable and subject to change. Feedback can generate complex behaviors where a direct connection between cause and effect is not readily apparent. The future is created by sensitive responses to fluctuations in the environment or by the "Butterfly Effect" - "the flapping of a butterfly's wings in one part of the world can cause a storm in another" (Gunter, 1995). Just like the COVID-19 pandemic creating a butterfly effect worldwide, deeply affecting many areas such as education, health, economy, or involving all stakeholders of the education system including students, teachers, administrators, and parents (Ceylan, 2022). Baker (1995, cited in Altun, 2001) also stated that schools exhibit a nonlinear situation, and the Butterfly Effect is observed in these systems, and even simple decisions made by management can have very large effects; events can create a ripple effect and spread beyond the school. Therefore, in managing change in educational organizations, considering all

variables together, considering that even small changes can create a "Butterfly Effect," is essential. Additionally, the "butterfly effect" underscores the understanding that one person can have an impact, so educational organizations should mobilize and motivate all their human resources to unleash their full potential.

### Conclusion

The recent COVID-19 pandemic, essentially a health issue, has led to numerous crises because of the complexity of the real world and the interdependence between human life and social, scientific, economic, political, educational, cultural, and religious phenomena. It has increased awareness of the inevitability of chaos. Like all sectors, it has necessitated mandatory changes to ensure effectiveness in educational organizations. Considering that education and educational organizations are inherently chaotic structures directly affected by changes in all areas, effective management of change in these organizations has become even more critical. In such times, traditional detailed plans, controls, and routines are replaced by a holistic view of events, structures that can adapt to rapid changes and human resources. Chaos theory, which offers a different perspective on organizational change, provides ways to facilitate its management by exploring the nature and source of change. This theory suggests to educational organizations that survival in a rapidly changing environment depends on their adaptation to their environment or context; they can be driven to the brink of chaos by inevitable crises or situations (attractors) and seize new opportunities; and that in the face of encountered problems, a holistic perspective encompassing all factors and developing different solutions is more functional than traditional solutions.

Based on the advantages provided by complexity science and chaos theory, educational organization managers can be recommended the following: (i) Establish a flexible, dynamic, and adaptable structure within educational organizations and adopt a collaborative and innovation-friendly culture to tackle complex situations effectively. (ii) Create a working environment where the potential of human resources is well analyzed, teamwork is encouraged, and creativity is supported, (iii) Recognize that such a shift in understanding can only be achieved with a workforce equipped with the necessary skills and knowledge to lead in any situation. Therefore, it is essential to provide conditions that enable all educational managers to acquire the required leadership skills and knowledge.

### Limitations

This study, aiming to examine organizational change and change management in educational organizations from the perspective of complexity science and chaos theory, is designed in the form of a traditional review. Therefore, one limitation of this study is that the literature on the subject has not been systematically reviewed, and only publications in Turkish and English have been included. In this context, the author acknowledges the possibility that selection bias may have influenced the studies included in this review due to the use of a traditional method instead of a systematic approach.

**Etik Komite Onayı:** Bu çalışma, araştırma yöntemi olarak geleneksel derlemeyi kullandığı için etik kurul onayına ihtiyaç duymamaktadır.

**Hakem Değerlendirmesi:** Dış bağımsız.

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**Ethics Committee Approval:** This study, using a traditional literature review as its research method, does not require ethical approval.

**Peer-review:** Externally peer-reviewed.

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## Genişletilmiş Özet

### Giriş

Günümüzde insanoğlunun başardığı ya da beklemediği pek çok yeni durumla karşılaşyoruz. Hargreaves'in (2002) dediği gibi "sonsuz ve acımasız değişim dünyasında yaşıyoruz... ve değişim, yeni bilgi, beceri ve deneyimleri kabul etmemiz ve bunlarda uzmanlaşmamız için bizi zorluyor"(s. 189). Değişim, "insanlığın bilinen en eski gerçekliklerinden biri" olarak kabul edilir ( Şen & Batı, 2020, s. 76). Yunanlı filozof Herakleitos'un "değişmeyen tek şey, değişimdir" sözü o kadar çok benimsenmiş durumda ki günümüzde değişim artık sorgulanmıyor. Dahası, teknolojik gelişmeler, insanların gereksinimlerindeki artışlar ve çeşitlilik ile bireylerin farkındalık düzeylerinin artması gibi faktörler de değişimi hızlandırmış ve örgütler için değişimi bir zorunluluk haline getirmiş durumda.

Değişim, bazen örgütlerin varlığı için bir tehdit bazen de bir fırsat olarak ele alında da maalesef günümüz örgütleri, sürdürülebilir ve etkili bir değişimi gerçekleştirmede çoğu zaman başarısız olmaktadır (Lewis, 2019; Stouten vd., 2018; Vakola, 2014; Van Tonder, 2004). İlgili araştırmalar da yöneticilerin planlanan üç örgütsel değişim müdahalesinden sadece birinin gerçekten başarılı olduğuna inandığını (Meaney & Pung, 2008, akt., Armenakis & Harris, 2009) ve Birleşik Krallık'taki yöneticilerin de sadece %38'inin örgütlerindeki değişimin başarılı olduğunu düşündüklerini (Holbeche, 2006, akt., Stouten vd., 2018) ortaya koymaktadır. Eğitim örgütlerindeki değişimlere ilişkin benzer değerlendirmeler, ülkemizde yürütülen çalışmalarda da (Kondakçı, ve ark., 2019; Toprak, 2018) görülmektedir. Diğer taraftan kavramsal ve kuramsal anlamda yeterli birikim olmasına rağmen, eğitim örgütlerinde başarılı bir değişimin nasıl gerçekleştirileceği sorusu, bilim insanları ve uygulayıcılar için en büyük endişe kaynağıdır, çünkü çoğu müdahale ya hedeflerine ulaşamamıştır ya da hiç uygulanmamıştır (Acton, 2021; Cheng & Walker, 2008; Toprak, 2018; Kondakçı ve ark., 2019). Sonuçlar incelendiğinde; girilen değişim çabalarını başarısız kılan en önemli faktörün değişimin ve değişimi gerektiren koşulların yeterince anlaşılmasında olduğu söylenebilir. Yaşanan değişimlerle baş etmede eğitim örgütlerine avantaj kazandıracak faktörler, süreklilik gösteren değişim olgusunun doğasını ve kaynağını bilmek (Çobanoğlu, 2008) ve değişimin başarı olasılığını artırmak ve başarısız değişimlerin örgüt üyeleri ve paydaşları üzerindeki olumsuz sonuçlarını azaltmak için örgütsel değişimi daha iyi tanımlamak olacaktır. Ancak, bunun yanında, durumları değerlendirmede referans aldığımız paradigmalarda da gözden geçirilmesi önemli görülmektedir. Yaşanılan belirsizliklerin ve kriz durumlarının etkili şekilde yönetilememesi, kaynağın doğru bir şekilde belirlenememesinin yanı sıra yaşanan pek çok durumun karmaşıklık paradigması yerine doğrusal (Newton) yaklaşımlarla ele alınmasına da bağlı olabilir.

Bu çalışmanın, değişen durumları değerlendirmede referans olarak kullanılan paradigmalarda gözden geçirilmesine ve yaşanan değişimlerin daha iyi anlamlandırılmasına ışık tutacağı düşünülmektedir. Ayrıca, eğitim örgütlerinin karmaşıklık bilimi ve kaos teorisi yardımıyla süreklilik gösteren değişim olgusu karşısında farklı bir bakış açısı geliştirmesine ve etkili bir şekilde yönetilebilmelerine de katkı sağlayabileceği için önemli olduğu düşünülmektedir. Bu çalışmanın amacı hem uluslararası literatürden hem de önceki araştırmalardan (Örn; Akmansoy & Kartal, 2014; Altun, 2001; Çobanoğlu, 2008; Ertürk, 2012; Gürel, 2018) yola çıkarak, karmaşıklık bilimi ve kaos kuramının değişimi açıklamasına yönelik kavramsal bir yapı sunmaktır. Daha sonraki aşamada ise eğitim örgütlerindeki uygulamalara yönelik bir çerçevenin geliştirilmesi amaçlanmaktadır. Araştırmaya yön veren kapsamlı araştırma sorusu şu şekilde sunulabilir: Karmaşıklık bilimi ve kaos kuramı, eğitim örgütlerindeki değişimin doğasının ve kaynağının keşfedilerek yönetilmesini kolaylaştırabilecek anlayışlar sunabilir mi ve değişimi yönetmede rehber olarak hizmet edebilir mi? Bu makalede ele alınacak iki yardımcı araştırma sorusu şunları içermektedir: i) Literatürün incelemesine ve analizine dayalı olarak değişimi değerlendirmede referans alınan paradigmadaki değişim nedir? ii) Kaos kuramı nedir ve değişimi nasıl açıklamaktadır?

### Yöntem

Bu derlemede sunulan bilgiler, eğitim örgütleri için değişimin doğasına ve yönetimine farklı bir bakış açısını sunan karmaşıklık bilimi ve kaos kuramı konusunda genel bir bakış sunmaktadır. Bu nedenle, belirli bir konuda daha önceden yapılmış çalışmaların bir araya getirildiği, yorumlandığı ve sonuç ve değerlendirmelerinin sentezlendiği "geleneksel derleme" olarak tasarlanmıştır (Torgerson ve ark., 2017, s.357). "Örgütsel değişim", "Karmaşıklık bilimi ve kaos kuramı" konularıyla ilgili hakemli makalelere ve kitaplara yazarın görev yaptığı üniversitenin kütüphanesinin elektronik kaynakları aracılığıyla erişilmiştir. Anahtar kelimeler olarak "değişim", "örgütsel değişim", "eğitim örgütlerinde örgütsel değişim", "karmaşıklık bilimi", "kaos kuramı", "eğitim örgütlerinde kaos" ve "eğitim yönetiminde kaos" ifadelerini içeren çalışmalar aranmıştır. Çalışma kapsamına dahil etme kriterleri olarak "İngilizce veya Türkçe dillerinde yazılmış olma", "tam metnine ya da özetine ulaşılabilmek", "türü ve yayın yılı

fark etmeksizin akademik bir çalışma olma” kabul edilmiştir. Yazar çalışmanın uygunluğunu, makalenin başlığını, özetini ve ulaşılabilirliği tam metnini okuyarak belirlemiştir. Belirlenen anahtar kelimelerin ve ilgili kavramların kombinasyonlarını içeren aramalar, yazar doygunluk olduğuna inanıncaya kadar devam ettirilmiştir.

### **Sonuç**

Temelde bir sağlık sorunu olan son dönemdeki COVID-19 salgını, gerçek dünyanın karmaşıklığı ve insan yaşamı ile sosyal, fen, ekonomik, politik, eğitimsel, kültürel ve dini olgular arasındaki karşılıklı bağımlılığın bir sonucu olarak birçok krize yol açmış; kaçınılmaz olan kaosa ilişkin farkındalığı arttırmıştır. Tüm sektörlerde olduğu gibi eğitim örgütlerinde de etkililiğini sağlayabilmesi için zorunlu değişimleri gerektirmiştir. Eğitim ve eğitim örgütlerinin her alanda yaşanan değişimlerden doğrudan etkilenen kaotik bir yapıya sahip olduğu göz önünde alındığında da bu örgütlerdeki değişimin etkili yönetimi daha da kritik hale gelmiştir. Böyle zamanlarda alışılan detaylı planlar, denetimler ve rutinler, yerine olaylara bütüncül bir bakış, hızlı değişimlere ayak uydurabilecek yapılar ve insan kaynakları önem kazanmış durumdadır. Örgütsel değişime farklı bir gözle bakmayı sağlayan kaos kuramı, değişimin doğasını ve kaynağını keşfederek yönetimini kolaylaştırabilecek yollar sunmaktadır. Bu kuram, eğitim örgütlerine, hızla değişen bir çevrede var olabilmelerinin, çevresi ya da bağlamıyla olan uyumuna bağlı olduğunu; kaçınılmaz farklı krizlerin ya da durumların (çekicilerin) etkisiyle kaosun eşiğine sürüklenerek yeni fırsatlar yakalayabileceğini; karşılaşılan sorunlar karşısında alışılmış çözümler yerine tüm faktörleri kapsayan bütüncül bir bakış açısı ve farklı çözümler geliştirmesinin daha işlevsel olduğunu ortaya koymaktadır.

Dolayısıyla, karmaşıklık biliminin ve kaos kuramının sağladığı bu avantajlara dayalı olarak eğitim örgütleri esnek, dinamik ve uyarlanabilir bir yapıya ve karşılaşılabileceği karmaşık durumlara karşı işbirlikçi ve yeniliğe açık bir kültüre sahip olması gerekmektedir. Ayrıca, sahip oldukları insan kaynağının potansiyelini iyi analiz ederek takım çalışmasının ve yaratıcılığın desteklendiği bir çalışma ortamını da yaratılması da önemli görülmektedir. Böyle bir anlayış değişikliğinin de bunu gerçekleştirebilecek donanıma sahip insan kaynağı ile mümkün olacağından hareketle, Tüm eğitim yöneticilerinin her türlü durumda liderlik edebilecek bilgi ve liderlik becerilerine sahip olması gereklidir.

### **Sınırlılıklar**

Örgütsel değişime ve eğitim örgütlerinde değişimin yönetimine karmaşıklık bilimi ve kaos kuramı perspektifinden bakmayı amaçlayan bu çalışma, geleneksel derleme biçiminde tasarlanmıştır. Dolayısıyla konuyla ilgili literatürün sistematik bir biçimde ele alınmamış olması ve sadece Türkçe ve İngilizce dillerindeki yayınların kapsama alınması bu çalışmanın sınırlılıklarıdır. Bu bağlamda, yazar, sistematik yöntem yerine bu derlemede geleneksel yöntemin kullanılması nedeniyle, seçim yanlılığının kapsama alınan çalışmaları etkilemiş olabileceği olasılığını kabul etmektedir.

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