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Editorial Note

Dear Readers,

Welcome to the latest issue of the International Journal of Educational Spectrum (IJES). In this issue, we present a diverse collection of scholarly contributions that examine key issues in education, including technology integration, early childhood education, language learning, mathematical pedagogy, and psychological factors affecting students' learning experiences.

This issue highlights research on the Educational Informatics Network (EBA) in Türkiye, early childhood education indicators in a global context, and the role of cognitive and social-emotional factors in learning. Additionally, we feature studies on teachers' attitudes toward chess and intelligence games, the significance of career exploration experiences, and the impact of phonological awareness in preschool children.

We extend our gratitude to all authors, reviewers, and contributors who made this issue possible. We hope that these articles will provide valuable insights to educators, policymakers, and researchers alike.

Sincerely,

Dr. Öğr. Üyesi Hakan Ulum
Editor-in-Chief, International Journal of Educational Spectrum (IJES)

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Using Educational Informatics Network (EBA) as an Educational Learning Platform in EFL Courses in Türkiye[1]

Ahmet Kurnaz[2]*, Ebru Şire Kaya[3]

Abstract

The FATIH Project, initiated by the Turkish Ministry of National Education in 2011, is a prominent global educational technology endeavor. Its initiatives include the widespread implementation of interactive whiteboards and the enhancement of school internet infrastructure. Among its components, the Educational Informatics Network (EIN/EBA) serves as a social learning platform, offering e-contents and course materials to bolster classroom instruction for teachers and students. This study employs an explanatory sequential research design to probe EFL teachers' perceptions of EBA, ascertain their usage levels, and explore their suggestions for improving the platform. Quantitative data from 547 EFL teachers in Hatay, Türkiye, gathered via convenience sampling, alongside semi-structured interviews with ten teachers using purposive sampling, constitute the two-stage data collection approach. Quantitative analysis, conducted using SPSS and AMOS software, reveals significant differences in EFL teachers' opinions and usage levels of EBA based on education level, registration status, and awareness of the FATIH Project. Additionally, qualitative findings highlight challenges such as infrastructure inadequacies and deficiencies in course materials and interactivity. These insights underscore the importance of incorporating teachers' suggestions to bolster EBA utilization and cultivate positive perceptions among educators.

Keywords: EBA, FATIH Project, EFL teachers in Türkiye, Educational Informatics Network, Educational Learning Platform

Türkiye'de Yabancı Dil Olarak İngilizce Derslerinde Eğitici Öğrenme Platformu olarak Eğitim Bilişim Ağı'nın (EBA) Kullanımı

Özet (Türkçe)

2011 yılında Türkiye Cumhuriyeti Millî Eğitim Bakanlığı tarafından başlatılan FATİH Projesi, önde gelen bir küresel eğitim teknolojisi girişimidir. Proje kapsamında, etkileşimli tahtaların yaygınlaştırılması ve okullardaki internet altyapısının geliştirilmesi hedeflenmiştir. Bu projenin ana bileşenlerinden biri olan Eğitim Bilişim Ağı (EBA), sınıf içi öğretimi desteklemek amacıyla e-içerikler ve ders materyalleri sunan bir sosyal öğrenme platformu olarak öğretmen ve öğrenciler tarafından kullanılmaktadır. Bu çalışmada, İngilizce öğretmenlerinin EBA'ya yönelik algılarını incelemek, kullanım düzeylerini belirlemek ve platformu geliştirmeye yönelik önerilerini araştırmak amacıyla açımlayıcı sıralı bir araştırma deseni kullanılmıştır. Araştırma, Hatay'da görev yapan 547 İngilizce öğretmeninden kolayda örnekleme yöntemiyle toplanan nicel veriler ve amaçlı örnekleme yöntemiyle seçilen 10 öğretmenle yapılan yarı yapılandırılmış görüşmelerle iki aşamalı bir veri toplama yaklaşımını içermektedir. SPSS ve AMOS yazılımları kullanılarak gerçekleştirilen nicel analizler, EFL öğretmenlerinin EBA'ya ilişkin görüşleri ve kullanım düzeylerinde eğitim seviyesi, kayıt durumu ve FATİH Projesi'ne ilişkin farkındalık düzeylerine göre anlamlı farklılıklar olduğunu ortaya koymaktadır. Ayrıca, nitel bulgular altyapı yetersizlikleri ile ders materyalleri ve etkileşimdeki eksiklikler gibi zorlukları vurgulamaktadır. Araştırma bulguları, EBA kullanımını artırmak ve öğretmenler arasında olumlu bir algı oluşturmak için öğretmenlerin önerilerinin mutlaka dikkate alınmasının önemini vurgulamaktadır.

Anahtar Kelimeler: EBA, FATİH Projesi, Türkiye'deki İngilizce öğretmenleri, Eğitim Bilişim Ağı, Eğitici Öğrenme Platformu

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* Corresponding author

[1] This study is based on a master's thesis.

[2] Lecturer., Adana Alparslan Türkeş Science and Technology University, Adana/Türkiye, akurnaz@atu.edu.tr
[3] Asst. Prof. Dr., Çukurova University, Adana/Türkiye, ebrusire@cu.edu.tr

Introduction

Due to recent technological advancements, technology integration has evolved into a crucial component of school instructional activities. As a result, many governments worldwide have begun to invest in technology and education (OECD, 2010). Besides, conventional teaching methods have become obsolete and inadequate for the current generations. Consequently, it has become imperative to adjust educational curricula and settings (Ellis, 2001). The primary objective of technological transformation is to educate individuals through technology-integrated teaching, fostering their freedom, creativity, scientific thinking, and self-reliance rather than relying on rote learning. Based on this fact, the cornerstone of the technological integration in Turkish education has been built by the "Project e-Transformation Turkey" and "Vision 2023 Certificate of Strategy" (Akıncı, Kurtoğlu, & Seferoğlu, 2012). As a part of these efforts, Türkiye designed the FATIH Project, a macro-level technology integration project in education (Kızılet & Özmen, 2017). The project was introduced in 2011 and is currently managed by the Ministry of National Education (MoNE) in cooperation with the Ministry of Transport, Maritime Affairs, and Communications.

The need for online education and the creation of course-specific digital materials has emerged as a result of the FATIH Project. Incorporating and using electronic educational materials encourages student engagement and makes new information more accessible. Students should have equal access to educational opportunities, and the FATIH project helps make that a reality. As part of the FATIH Project, the Turkish Ministry of National Education (MoNE) is working to ensure that all Turkish schools can access modern technology. The project aims to provide students and teachers with tablets, printers, e-mail addresses, cloud-based storage accounts, and high-speed internet connections for interactive whiteboards (FATIH Project, 2019). The project's overarching objective is to aid educators by providing instructional course e-contents and hardware upgrades in various formats and with diverse purposes. Therefore, the General Directorate of Innovation and Educational Technologies created EBA (*EIN - Educational Informatics Network*) as a social educational platform to use e-content with technologies integrated into learning-teaching environments (EBA, 2019).

EBA hosts many resources, including documents, exam papers, photographs, lecture videos, articles, visualizations, journals, contests, and course e-contents. On the platform, course e-contents are created and distributed by either the Ministry of National Education or volunteering teachers. Teachers who prefer to build their e-contents submit them for approval by EBA moderation. The 2016 Activity Report of the Ministry of National Education (MoNE) states that e-content materials for English courses at all levels are now being produced and developed. The objective is to finish this process and make the contents available on EBA in the coming years (MoNE, 2016).

The EBA platform plays a crucial role in the FATIH project by facilitating the creation, development, distribution, and management of learning content in schools that have already been equipped with the necessary physical resources. EBA commenced its activities in 2011 with the slogan "Gateway to the Future of Education" and consistently strives to create dependable, appropriate, and precise information that aligns with the curriculum requirements across all disciplines. The objectives related to the EBA platform in Türkiye's instruction Vision 2023 document are included among the goals of foreign language instruction. One of the objectives states that by utilizing new resources, students can immerse themselves in the English-speaking world (MoNE, 2018). The objective of the MoNE is to acquire cutting-edge digital resources from national and international publishers to enhance the variety and volume of the course content available on EBA. This suggests that EBA is expected to play a prominent role in the future of education nationwide.

In addition, the National Education Statistics report released in the 2018-2019 academic year reveals that there are 54.036 public schools in Türkiye. According to another figure by the

Ministry of National Education (MoNE), in 2018, 14.154 schools had internet network infrastructure in their classrooms. Out of them, only 6.904 were fully completed in 2016. Despite its initiation in 2011, this data indicates a significant scarcity of schools and classrooms with Internet connectivity. Furthermore, the Ministry of National Education (MoNE) strongly encourages and recommends using EBA in classrooms to enhance student autonomy and promote technology integration into educational courses. Nevertheless, the statistics indicate that around 26% of state schools nationwide are equipped with classroom internet connections under the FATIH Project (MoNE, 2018). This presents a prominent issue that must be tackled, as it adds more difficulties to the teaching process.

While the FATIH Project has been extensively studied for its technological infrastructure and general education applications (Demir, Özdinç & Ünal, 2018; Maden & Önal, 2018; Aktay & Keskin, 2016), there is limited research on its implications for English as a Foreign Language (EFL) education (Karanfil & Özet, 2021; Kılıç, 2020; Kuloğlu & Bay, 2019). However, recent studies often overlook how EBA supports or hinders the specific pedagogical practices required for effective language learning. In this respect, this research significantly addresses this critical gap by investigating EFL teachers' perceptions of EBA and provides in-depth perspectives into its utility and potential for improving language acquisition within Türkiye's current education system.

Besides, EBA serves as a critical instrument in Türkiye's effort to align with global educational trends emphasizing digital equity and technology integration. By providing students and teachers with access to digital resources, the platform aims to equalize opportunities and foster digital literacy (EBA, 2019). However, as previously discussed (Karabacak & Aktaş, 2024; Shaikh & Özdaş, 2022; Tuna, 2022; Cantürk & Cantürk, 2021, Kuloğlu, 2018; Kalemkuş, 2016), significant challenges might persist, including inadequate infrastructure in rural areas, limited internet access, and insufficient alignment of digital materials with curriculum goals in terms of teaching EFL in Türkiye. In line with these shortcomings, this study situates EBA within these broader challenges and focuses on its specific impact on EFL education, which is a field that uniquely relies on interactive and multimodal content to develop linguistic proficiency.

Moreover, teaching EFL necessitates specialized pedagogical strategies that often rely on multimodal and interactive content. Effective language instruction requires resources that engage students through audio-visual aids, real-world scenarios, and practice-based activities (Koehler & Mishra, 2009). Unlike subjects like mathematics or science, EFL teaching relies on fostering practical communication skills, which necessitate resources beyond standard course materials, such as videos, audio recordings, and gamified language exercises (Reber et al., 2020).

While EBA hosts a wide range of digital resources, its alignment with the unique needs of EFL teachers and learners remains underexplored. This study investigates how EBA addresses or falls short of these pedagogical demands and presents a comprehensive analysis of its potential to enhance language learning outcomes from the EFL teachers' point of views. Additionally, by uncovering EFL teachers' perceptions of EBA, this study aims to provide actionable insights for improving the platform's effectiveness in foreign language instruction. The findings are expected to inform policymakers on how to address critical challenges, such as infrastructure deficiencies and the alignment of digital resources with EFL curricula.

This study draws on the experiences of 547 EFL teachers from Hatay, a province with diverse educational contexts that reflect many of the challenges faced by educators in Türkiye, and it is limited to the academic year of 2019-2020. While this sample size is substantial and provides meaningful insights, regional factors such as disparities in infrastructure, teacher training, and socioeconomic conditions may influence the findings. As such, the results may not be fully generalizable to all EFL teachers across Türkiye.

Based on this background, this study examines how EFL teachers handle the scenario where EBA is encouraged for usage despite the possibility of lacking internet connectivity in specific classroom settings. To this end, this research aims to provide answers to the following research questions:

1. What are the EFL teachers' opinions about EBA?
2. What are the EFL teachers' usage levels of EBA?
3. What are the EFL teachers' suggestions for the improvement of EBA?

Method

Research Design

This three-faceted study aims to examine the opinions, usage levels, and suggestions of EFL teachers about using the EBA. The research analyzes the variables of gender, age, educational status, teaching experience, type of school, internet connection at home, interactive whiteboards in the classroom, internet connection in the interactive whiteboards, being a registered user on EBA, and having information about the FATIH Project. For this purpose, the research is designed with the explanatory sequential design of the mixed-method research design strategies. According to Creswell and Plano Clark (2011), the researcher collects qualitative and quantitative data using this research methodology. The primary goal of an explanatory sequential research design is to systematically investigate a phenomenon by initially gathering qualitative data to gain a complete understanding and subsequently analyzing quantitative data to elucidate and clarify the links identified in the qualitative data.

Within this framework, the study uses a questionnaire to collect quantitative data and a semi-structured interview to collect qualitative research data. The quantitative aspect of the study involves investigating EFL teachers' opinions, usage levels, and suggestions through questionnaire items tailored to their demographic characteristics. After collecting and analyzing quantitative data, the study proceeds to conduct the qualitative portion with EFL teachers who frequently utilize EBA in their courses. This method aims to comprehensively identify and examine the problems they encounter and gather their suggestions for enhancing the use of the platform.

Moreover, while this study does not specifically adopt the Technology Acceptance Model (TAM) as a framework, its constructs could provide a useful lens for interpreting the relationships among the variables studied. TAM posits that users' acceptance of technology is influenced by three antecedents: perceived usefulness, perceived ease of use, and behavioral intention (Chen & Zhao, 2022). Perceived usefulness pertains to individuals' conviction that utilizing technology can enhance their performance, whereas perceived ease of use refers to their idea that employing the technology requires minimal effort. The foundation of the Technology Acceptance Model (TAM) posits that users' perceived ease of use and perceived utility directly affect their behavioral intention, which then dictates actual usage behavior; additionally, perceived ease of use might influence perceived usefulness (Davis, 1989). In particular, the findings on technical barriers and resource limitations align with perceived ease of use, while teachers' feedback on EBA's pedagogical contributions may correspond to perceived usefulness. These constructs help contextualize the observed patterns in teachers' opinions, usage levels, and suggestions, and in this respect, while TAM is not the primary framework for data collection, it could provide a conceptual lens for understanding the interconnections among EFL teachers' opinions, usage levels, and practical suggestions for improvement.

Participants

This explanatory sequential mixed-methods study involves the participation of 547 English teachers working in the Hatay Province of Türkiye through a convenience sampling approach for the quantitative study stage in the 2019-2020 academic year. The researchers used the "Questionnaire on Teachers' Opinions about EBA Usage," developed by Alabay (2015), and adapted and redesigned for this study as a quantitative data collection instrument. This questionnaire consists of 10 close-ended items for demographic information and 34 items with a 5-point Likert scale for collecting data about the EFL teachers' general opinions about EBA, their opinions about EBA usage levels, and suggestions for the improvement of EBA. In the following qualitative stage of the study, semi-structured interviews were conducted to gather comprehensive data from 10 EFL teachers. The interview participants were chosen using purposive sampling, specifically targeting EFL teachers to acquire data that aligns with the study's objectives. The interview consists of 5 questions related to the participants' demographics and seven open-ended topics that specifically address their suggestions for EBA. These recommendations are categorized under difficulties, content development, motivation, and future implications.

Table 1 shows the general layout of the research questions, sampling, participants, and data collection tools:

Table 1. General Layout of Research Design

Research Questions	Sampling Technique	Participants	Data Collection Tools
1. What are the EFL teachers' opinions about EBA?	Convenience Sampling	547 EFL Teachers	Questionnaire on Teachers' Opinions about EBA Usage
2. What are the EFL teachers' usage levels of EBA?	Convenience Sampling	547 EFL Teachers	Questionnaire on Teachers' Opinions about EBA Usage
3. What are the EFL teachers' suggestions for the improvement of EBA?	Convenience Sampling	547 EFL Teachers	Questionnaire on Teachers' Opinions about EBA Usage
	Purposive Sampling	10 EFL Teachers	Semi-structured Interview

Table 2 displays the frequency (f) and percentage (%) distribution of demographic features among the participant EFL teachers who took part in the questionnaire section of the study.

Table 2. Frequency (f) and Percentage (%) Distribution of Teachers' Demographic Features in the Questionnaire (n=547)

Variable	Group	Frequency f	Percentage %
Gender	Male	128	23.4
	Female	419	76.6
Age	21-25	25	4.6
	26-30	139	25.4
	31-35	194	35.5
	36-40	118	21.6
	41 and more	71	13.0
Educational Status	Bachelor's degree	495	90.5
	Postgraduate degree	52	9.5
Teaching Experience	1-5 year(s)	128	23.4
	6-10 years	196	35.8
	11-15 years	124	22.7
	16-20 years	55	10.1
	21 years and more	44	8.0
Type of School	Primary School	64	11.7
	Secondary School	350	64.0
	High School	133	24.3
Internet Connection at Home	Yes	521	95.2
	No	26	4.8
Interactive Whiteboards in the Classroom	Yes	469	85.7
	No	78	14.3
Internet Connection in the Interactive Whiteboards	Yes	432	79.0
	No	115	21.0
Being a Registered User on EBA	Yes	522	95.4
	No	25	4.6
Having Information about the FATIH Project	Yes	440	80.4
	No	107	19.6

Table 3 presents the frequency (f) and percentage (%) distribution of demographic features among the EFL teachers who participated in the semi-structured interview section of the study.

Table 3. Frequency (f) and Percentage (%) Distribution of Teachers' Demographic Features in the Semi-structured Interview

Variable	Group	Frequency f	Percentage %
Gender	Male	3	30.0
	Female	7	70.0
Age	21-25	1	10.0
	26-30	3	30.0
	31-35	3	30.0
	36-40	2	20.0
	41 and more	1	10.0
Educational Status	Bachelor's degree	8	80.0
	Postgraduate	2	20.0
Teaching Experience	1-5 year(s)	4	40.0
	6-10 years	3	30.0
	11-15 years	1	10.0
	16-20 years	1	10.0
	21 years and more	1	10.0
Type of School	Secondary School	8	80.0
	High School	2	20.0

Data Collection

Questionnaire on Teachers' Opinions about EBA Usage

The "Questionnaire on Teachers' Opinions regarding EBA Usage," originally devised by Alabay (2015) and modified and revised for the present study, was employed by the researchers as a quantitative data collection tool. The questionnaire comprises 44 items, including 34 closed-ended items for demographic information and ten closed-ended items with a 5-point Likert scale, which gathers data on the EFL teachers' general opinions about EBA, their opinions about EBA usage levels, and suggestions for the improvement of EBA.

The questionnaire, which was adapted from Alabay (2015) for this study, was subjected to the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to assess the construct validity. Before performing EFA, it is necessary to calculate the Kaiser Meyer Olkin (KMO) sampling adequacy value and the significant value of Bartlett's test of sphericity to assess the appropriateness of the data for factor analysis. When the KMO value exceeds .50, each variable within the scale could predict other variables (Field, 2009). The analysis undertaken in this study yielded a KMO sample adequacy score of .965, indicating a high level of adequacy. Additionally, Bartlett's test of sphericity yielded a significant result ($\chi 2$=15877.799, *sd*=406; p<.01). Consequently, the data acquired from the scale was appropriate for factor analysis. Based on the results of the EFA, during the initial stage, it was seen that the factor loads of one item from the sub-dimension "general opinions about EBA" and four items from the sub-dimension "usage levels of EBA" were below the threshold of 0.32. Consequently, these items were eliminated from the dataset, and the analysis was repeated.
The eigenvalues and variances of the factors obtained from the exploratory factor analysis (EFA) are presented in Table 2.

Table 4. Factor Structure of Questionnaire on Teachers' Opinions on EBA Usage

Factor Order	Factors	Factor Eigenvalue	Percentage of Variance (%)	Percentage of Total Variance (%)
1	Factor 1	7.534	25.981	25.981
2	Factor 2	6.987	24.093	50.074
3	Factor 3	6.126	21.124	71.198

Table 4 shows that the three-dimensional scale accounts for 71.20% of the variance. Separately, the first factor is responsible for 25.98% of the total variance, the second for 24.09%, and the third for 21.12%. According to Kline (2011), it is sufficient if the total variation explained in multidimensional scales exceeds 41%.
Table 5 displays the distribution of scale items based on factor loads and sizes.

Table 5. Item Factor Loads After Rotation and Scale Items of the Dimensions

Dimension	Item Number	1st Dimension	2nd Dimension	3rd Dimension
Opinions about EBA	b11	.845		
	d11	.840		
	e11	.822		
	c11	.822		
	f11	.820		
	g11	.778		
	a11	.752		
	h11	.715		
	j11	.662		
	k11	.651		
Usage levels of EBA	j12		.811	
	m12		.809	
	i12		.790	
	h12		.772	
	f12		.765	
	e12		.740	
	l12		.715	
	k12		.700	
	d12		.580	
	b12		.477	
Suggestions for EBA	c13			.815
	d13			.804
	b13			.801
	f13			.782
	e13			.775
	g13			.771
	a13			.770
	i13			.754
	h13			.740

Table 5 shows that the factor loads of items in the first dimension range from .65 to .84. In contrast, those in the second dimension range from .47 to .81. Items in the third dimension range from .74 to .81. The scale's reliability was tested by calculating the alpha internal consistency coefficients for each dimension. As a result, the alpha internal consistency coefficients for the first, second, and third dimensions are .96, .92, and .96, respectively. These results imply that the questionnaire scale is perfectly reliable.

Furthermore, CFA was applied to validate the factor structure obtained from EFA and control the interactions between the factors obtained during the research. The CFA model's compatibility was evaluated using chi-square divided by degree of freedom (χ2/sd), general fit index (GFI), adjusted goodness fit index (AGFI), root mean square error of approximation (RMSEA), incremental fit index (IFI), and comparative fit index (CFI) values (Çelik & Yılmaz, 2013; Kline, 2011). In the CFA analysis, theoretically supported changes (error bindings) were made to the variables to enhance the fit index values for the applicable model.

Figure 1 shows the standardized value coefficients for the parameters in the established model.

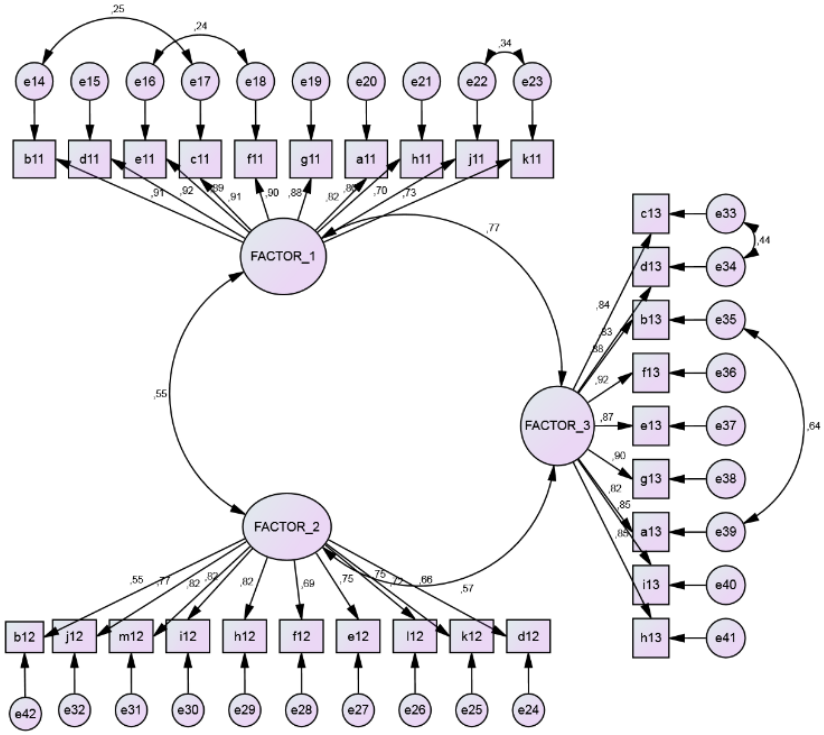

Figure 1. Standardized values for the model

The three-dimensional structure acquired using EFA was tested on the scale using CFA. The CFA results were similar to the EFA results, and the fit indices were at the recommended values (χ2=1272.699, df=369, p<0.01, χ2/df=3.449, RMSEA=0.06, AGFI=0.85, GFI=.85, IFI=.94, CFI=.94).

Table 6 shows the values of the fit indices used to assess the theoretical model's adequacy concerning the data received from the CFA analysis and the CFA model's fit values.

Table 6. Fit Values of the Fit Indices Used* and Fit Values of the Model

Fit Indices	Perfect Values	Acceptable Values	Model Fit Indices	Result
$\chi 2$/sd	$0 \leq \chi 2/sd \leq 2$	$2 \leq \chi 2/sd \leq 5$	3,449	Acceptable Fit
RMSEA	$.00 \leq RMSEA \leq .05$	$.05 \leq RMSEA \leq .08$	.06	Acceptable Fit
CFI	$.95 \leq CFI \leq 1.00$	$.90 \leq CFI \leq .95$	.94	Acceptable Fit
GFI	$.95 \leq GFI \leq 1.00$	$.90 \leq GFI \leq .95$	.85	Acceptable Fit
AGFI	$.95 \leq AGFI \leq 1.00$	$.85 \leq AGFI \leq .90$	.85	Acceptable Fit
IFI	$.95 \leq IFI \leq 1.00$	$.90 \leq IFI \leq .95$	.94	Acceptable Fit

**(Çelik & Yılmaz, 2013; Çokluk, Şekercioğlu, & Büyüköztürk, 2014)*

Table 6 indicates that the tested theoretical model has a structure that matches the data set, and the model fit indices are satisfactory. According to Kline (2011), a $\chi 2$ value between 2 and 5 indicates an appropriate level of model-data compatibility. Another compatibility criterion is an RMSEA value of less than .08, indicating an appropriate level of model compatibility with the data set. The fact that the other fit criteria were likewise acceptable indicated that the tested model fit well with the data.

Semi-structured Interview

The researchers designed the semi-structured interview, and it aims to gather comprehensive data from 10 EFL teachers. The interview participants were chosen using purposive sampling, specifically targeting EFL teachers to acquire data that aligns with the study's objectives. The interview consists of 5 questions related to the participants' demographics and seven open-ended topics that specifically address the EFL teachers' suggestions for EBA. These recommendations cover many aspects, including issues, content creation, motivation, and future implications. The researchers designed the interview questions with guidance from academic professionals and specialists. The form includes seven more questions that consist of sub-items. These sub-items were designed to be asked of participants depending on their replies to obtain clarification or more specific information since the interviews were designed as semi-structured.

Data Analysis

After the CFA and EFA were completed, trial versions of SPSS and AMOS software were utilized to evaluate the research data downloaded via Google Forms. The following values were employed in descriptive analysis: frequency (*f*), arithmetic mean ($\bar{X}$), percentage (%), and standard deviation (*sd*). The skewness and kurtosis data were used to determine if the scale scores met the assumption of normalcy. The scale scores were found to have a normal distribution. Answers to the scale's items were scored as (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; and (5) Strongly agree in the items related to the level of agreement, and as (1) Never; (2) Rarely; (3) Sometimes; (4) Often; and (5) Always in the items related to the frequency level.

Additionally, independent samples t-tests were used to determine whether there is a statistically significant difference in the sub-dimensions of the scale, including the scores of the variables of gender, educational status, internet connection at home, interactive whiteboards in the classroom, internet connection in the interactive whiteboards, being a registered user on EBA, and knowing about the FATIH Project. In addition, one-way analysis of variance (ANOVA) was used to see whether the mean scores obtained from the scale differed statistically significantly by age, teaching experience, and type of school.

The content analysis method was utilized to organize and understand the semi-structured interview material. Yıldırım and Şimşek (2013) describe this form of analysis as interpreting

and summarizing acquired data based on codes, categories, and themes. The findings are clearly expressed, carefully explained, and interpreted by reviewing and explaining the information supplied by the participants. In this context, face-to-face interviews with 10 EFL teachers were scheduled, with a maximum duration of 20 minutes. The interviewees were informed about the ethical considerations and agreed to participate and be recorded in the interviews. The audio recording was used during the interviews to ensure no research data went unnoticed. After all the interview meetings were completed, the interview material was first transcribed word for word from the recordings. The transcriptions were then shared with an academician from the Department of Education to confirm reliability and get feedback. The researchers familiarized themselves with the transcribed texts by reading them extensively. The coding technique was then done by finding the participants' most frequently repeated expressions. The coded data were examined to identify themes and categories based on the similarities and contrasts between the participants' choice of words, sentences, expressions, and phrases. As a result, the findings were presented in tables and explored in depth.

Findings

Analysis and Findings of the Questionnaire

The findings questionnaire was evaluated using several variables, and the findings of these evaluations are discussed in the subsequent sections. Hence, the independent t-tests were employed to examine the variables of gender, age, educational status, teaching experience, type of school, internet connection at home, interactive whiteboards in the classroom, internet connection in the interactive whiteboards, being a registered user on EBA, and having information about the FATIH Project. Conversely, a one-way analysis of variance was employed to examine the variables of age, teaching experience, and type of school. In the analysis of the results, Factor 1 indicates ELF teachers' opinions, Factor 2 reflects their EBA usage levels, and lastly, Factor 3 shows their suggestions for the improvement of EBA.

Table 7. T-Test Results by Gender

	Gender	**N**	$\bar{X}$	**S**	**sd**	**t**	**p**
Factor 1	Male	128	3.0648	1.13336	545	.814	.416
	Female	419	2.9779	1.03415			
Factor 2	Male	128	2.3305	.92469	545	2.470	.014
	Female	419	2.1059	.89252			
Factor 3	Male	128	3.1372	1.18433	545	.293	.769
	Female	419	3.1050	1.05333			

Table 7 highlights that the mean scores for Factor 1 exhibit no significant difference based on gender. The scores of male and female teachers are comparable, suggesting that gender does not significantly affect teachers' overall opinions about EBA. However, there is a significant difference in Factor 2, as male teachers exhibit higher scores ($\bar{X}$*=2.33*) than female teachers ($\bar{X}$*=2.10*), indicating more utilization of EBA among male teachers. In contrast, the mean scores for Factor 3 show no significant difference based on gender, suggesting that gender does not affect teachers' suggestions significantly.

Table 8. T-Test Results by Educational Status

	Educational Status	N	$\bar{X}$	S	sd	t	p
Factor 1	Bachelor's	495	2.9649	1.05234	545	-2.281	.023
	Postgraduate	52	3.3154	1.06704			
Factor 2	Bachelor's	495	2.1127	.87910	545	-.3.695	.000
	Postgraduate	52	2.5942	1.02735			
Factor 3	Bachelor's	495	3.0837	1.07187	545	-1.922	.065
	Postgraduate	52	3.3868	1.17269			

Table 8 demonstrates significant differences in mean scores for Factor 1 depending on the level of education. Teachers with postgraduate degrees achieved higher scores ($\bar{X}$*=3.31*) compared to those with bachelor's degrees ($\bar{X}$*=2.96*), demonstrating an influence of educational status on their opinions of EBA. Similarly, Factor 2 shows significant differences in mean scores, indicating that individuals with postgraduate degrees ($\bar{X}$*=2.59*) outperform those with bachelor's degrees ($\bar{X}$*=2.11*) regarding EBA usage levels. This suggests that EFL teachers with postgraduate qualifications exhibit higher EBA utilization. However, in the case of Factor 3, the mean scores do not show substantial differences based on educational status. This indicates that teachers, regardless of their level of education, have comparable suggestions.

Table 9. T-Test Results by Internet Connection at Home

	Internet Connection at Home	N	$\bar{X}$	S	sd	t	p
Factor 1	Yes	521	2.9841	1.06139	545	-1.397	.163
	No	26	3.2808	.95750			
Factor 2	Yes	521	2.1668	.91029	545	.960	.338
	No	26	1.9923	.77145			
Factor 3	Yes	521	3.1009	1.08549	545	-1.126	.261
	No	26	3.3462	1.05471			

As illustrated in Table 9, mean scores for Factor 1 reveal no significant difference based on the presence of an internet connection at home, with scores being similar regardless of internet access. This suggests that Internet availability at home does not notably influence teachers' general opinions regarding EBA. Similarly, for Factor 2, mean scores do not differ significantly depending on internet connectivity, indicating that the Internet at home does not significantly impact teachers' EBA usage levels. Additionally, the mean scores for Factor 3 also show no significant difference based on the Internet connection variable, suggesting that whether teachers have Internet access at home does not significantly affect their suggestions for EBA.

Table 10. T-Test Results by Interactive Whiteboard in the Classroom

	Interactive Whiteboard in the Classroom	N	$\bar{X}$	S	sd	t	p
Factor 1	Yes	469	3.0086	1.02185	545	.562	.574
	No	78	2.9359	1.25811			
Factor 2	Yes	469	2.1539	.88384	545	-.289	.773
	No	78	2.1859	1.02472			
Factor 3	Yes	469	3.1227	1.06688	545	.538	.591
	No	78	3.0513	1.18967			

Table 10 demonstrates that mean scores for Factor 1 show no significant difference based on the presence of an interactive whiteboard in the classroom, with similar scores observed regardless of interactive whiteboard availability, and this reflects that its presence does not significantly influence teachers' general opinions about EBA. Likewise, for Factor 2, mean scores do not significantly differ depending on the interactive whiteboard's presence, suggesting that its availability in the classroom does not notably impact teachers' EBA usage levels. Similarly, mean scores for Factor 3 do not significantly vary based on interactive whiteboard presence, which means that its availability in the classroom does not notably affect teachers' suggestions regarding EBA.

Table 11. T-Test Results by Internet Connection in the Interactive Whiteboard in the Classroom

	Internet Connection in the Classroom	**N**	$\bar{X}$	**S**	**sd**	**t**	**p**
Factor 1	Yes	432	3.0269	1.03632	545	1.230	.219
	No	115	2.8904	1.13300			
Factor 2	Yes	432	2.1740	.89931	545	.780	.436
	No	115	2.1000	.92452			
Factor 3	Yes	432	3.1335	1.07611	545	.876	.382
	No	115	3.0338	1.11609			

According to Table 11, mean scores for Factor 1 show no significant difference based on whether there is an internet connection in the interactive whiteboards in classrooms, with similar scores observed regardless of internet connectivity. This shows that the presence or absence of an internet connection in interactive whiteboards does not significantly affect teachers' opinions on EBA. Similarly, for Factor 2, mean scores do not significantly differ based on internet connectivity in interactive whiteboards, suggesting that its presence or absence does not notably impact teachers' EBA usage levels. Likewise, mean scores for Factor 3 do not significantly vary depending on internet connectivity in interactive whiteboards, indicating that its presence or absence does not significantly affect teachers' suggestions for the improvement of EBA.

Table 12. T-Test Results by Being a Registered User on EBA

	Registered User on EBA	**N**	$\bar{X}$	**S**	**sd**	**t**	**p**
Factor 1	Yes	522	3.0311	1.05050	545	3.352	.001
	No	25	2.3120	.99219			
Factor 2	Yes	522	2.1854	.90575	545	3.210	.001
	No	25	1.5960	.67112			
Factor 3	Yes	522	3.1482	1.06907	545	3.547	.000
	No	25	2.3689	1.15591			

Table 12 highlights significant differences in mean scores for Factor 1 based on EFL teachers' registration status on EBA, with registered users scoring higher ($\bar{X}$*=3.03*) compared to non-registered users ($\bar{X}$*=2.31*), indicating that registered users hold more favorable general opinions about EBA. Similarly, for Factor 2, significant differences in mean scores are evident, with registered users scoring higher ($\bar{X}$*=2.18*) than non-registered users ($\bar{X}$*=1.59*), suggesting higher EBA usage levels among registered users. Moreover, the mean scores for Factor 3 also vary significantly based on registration status, with registered users scoring higher ($\bar{X}$=3.14) than non-registered users ($\bar{X}$*=2.36*), indicating that registered users provide more sound suggestions related to EBA.

Table 13. T-Test Results by Having Information about the FATIH Project

	Having Information about the FATIH Project	N	$\bar{X}$	S	sd	t	p
Factor 1	Yes	440	3.0405	1.05613	545	1.901	.068
	No	107	2.8243	1.05158			
Factor 2	Yes	440	2.2186	.89414	545	3.179	.002
	No	107	1.9112	.90807			
Factor 3	Yes	440	3.1434	1.08292	545	1.353	.177
	No	107	2.9855	1.08610			

Table 13 reveals that mean scores for Factor 1 do not exhibit any significant difference based on teachers' knowledge about the FATIH Project, with similar scores observed regardless of their awareness of the project. Hence, this deduces that having information about FATIH does not significantly influence teachers' general opinions on EBA. However, for Factor 2, significant differences in mean scores are evident, with teachers informed about the FATIH Project scoring higher ($\bar{X}=2.21$) compared to those uninformed ($\bar{X}=1.91$), suggesting higher EBA usage levels among informed participants. Conversely, mean scores for Factor 3 do not significantly vary based on knowledge of the FATIH Project, indicating that teachers' suggestions for EBA remain unaffected by their awareness of the project.

One-Way Analysis of Variance Results by Age

Table 14. One-Way Analysis of Variance Results by Age

	Age	N	M	S	Source of Variation	Sum of squares	sd	Mean of squares	F	p
Factor 1	1	25	3.18	1.00	Between-group	.965	4	.241		
	2	139	2.99	1.04	Within-group	609.943	542	1.125		
	3	194	2.98	1.01	Total	610.908	546		.214	.931
	4	118	2.97	1.10						
	5	71	3.01	1.13						
	Age	**N**	**M**	**S**	**Source of Variation**	**Sum of squares**	**sd**	**Mean of squares**	**F**	**p**
Factor 2	1	25	2.57	.79	Between-group	6.489	4	1.622		
	2	139	2.17	.92	Within-group	440.025	542	.812		
	3	194	2.08	.82	Total	446.514	546		1.998	.093
	4	118	2.11	.99						
	5	71	2.25	.91						
	Age	**N**	**M**	**S**	**Source of Variation**	**Sum of squares**	**sd**	**Mean of squares**	**F**	**p**
Factor 3	1	25	3.64	1.03	Between-group	7.672	4	1.918		
	2	139	3.08	1.04	Within-group	634.340	542	1.170		
	3	194	3.10	1.08	Total	642.011	546		1.639	.163
	4	118	3.08	1.13						
	5	71	3.05	1.07						

1: 21-25 years old, 2: 26-30 years old, 3: 31-35 years old, 4: 36-40 years old, 5: 41 years and older

Table 14 indicates that there is no statistically significant difference observed in the first dimension of the scale concerning age group ($F_{(4, 542)}$=.214, p>.05), implying that the age groups of participating EFL teachers do not significantly differ in their total scores regarding general opinions about EBA. Similarly, no significant difference is found in the mean scores of the second dimension concerning age group ($F_{(4, 542)}$=1.998, p>.05), suggesting that age groups do not significantly vary in total scores related to EBA usage levels. Moreover, Table 14 demonstrates that there is no significant difference in the mean scores of the third dimension based on age group ($F_{(4, 542)}$=1.639, p>.05), indicating that age groups do not significantly differ in their total scores concerning teachers' suggestions for EBA.

One-Way Analysis of Variance Results by Teaching Experience

Table 15. One-Way Analysis of Variance Results by Teaching Experience

	Teaching Experience	N	M	S	Source of Variation	Sum of squares	sd	Mean of squares	F	p
Factor 1	1	323	2.99	1.02	Between-group	1.330	3	.443		
	2	124	2.98	1.15	Within-group	609.578	543	1.123	.395	.757
	3	55	2.90	.97	Total	610.908	546			
	4	45	3.13	1.14						
	Teaching Experience	**N**	**M**	**S**	**Source of Variation**	**Sum of squares**	**sd**	**Mean of squares**	**F**	**p**
Factor 2	1	323	2.17	.88	Between-group	4.750	3	1.583		
	2	124	2.07	.97	Within-group	441.765	543	.814	1.946	.121
	3	55	2.03	.76	Total	446.514	546			
	4	45	2.41	.96						
	Teaching Experience	**N**	**M**	**S**	**Source of Variation**	**Sum of squares**	**sd**	**Mean of squares**	**F**	**p**
Factor 3	1	323	3.11	1.06	Between-group	1.315	3	.438		
	2	124	3.13	1.16	Within-group	640.697	543	1.180	.371	.774
	3	55	2.98	1.10	Total	642.011	546			
	4	45	3.20	.98						

1: 1-5 year(s), 2: 11-15 years, 3: 16-20 years, 4: 21 years and more

Table 15 indicates that there is no statistically significant difference observed in the first dimension of the scale concerning teaching experience ($F_{(3, 543)}$=.395, p>.05), suggesting that the teaching experiences of participating EFL teachers do not significantly differ in their total scores regarding general opinions about EBA. Similarly, no significant difference is found in the mean scores of the second dimension concerning teaching experience ($F_{(4, 542)}$=1.946, p>.05), implying that teaching experiences do not significantly vary in total scores related to EBA usage levels. Moreover, Table 13 demonstrates that there is no significant difference in the mean scores of the third dimension based on teaching experience ($F_{(4, 542)}$=.371, p>.05), indicating that teaching experiences do not significantly differ in their total scores concerning teachers' suggestions for EBA.

One-Way Analysis of Variance Results by the Type of School

Table 16. One-Way Analysis of Variance Results by the Type of School

	Type of School	N	M	S	Source of Variation	Sum of squares	sd	Mean of squares	F	p
Factor 1	1	64	2.97	1.10	Between-group	.141	2	.071	.063	.939
	2	350	3.01	1.05	Within-group	610.767	544	1.123		
	3	133	2.98	1.05	Total	610.908	546			
	Type of School	**N**	**M**	**S**	**Source of Variation**	**Sum of squares**	**sd**	**Mean of squares**	**F**	**p**
Factor 2	1	64	2.28	.99	Between-group	1.237	2	.618	.756	.470
	2	350	2.13	.89	Within-group	445.277	544	.819		
	3	133	2.15	.87	Total	446.514	546			
	Type of School	**N**	**M**	**S**	**Source of Variation**	**Sum of squares**	**sd**	**Mean of squares**	**F**	**p**
Factor 3	1	64	3.12	1.12	Between-group	.389	2	.195	.165	.848
	2	350	3.09	1.07	Within-group	641.622	544	1.179		
	3	133	3.15	1.096	Total	642.011	546			

1: Primary School, 2: Secondary School, 3: High School

Table 16 concludes that there is no statistically significant difference observed in the first dimension of the scale concerning the type of school ($F_{(2, 544)}$=.063, p>.05), indicating that the type of school attended by participating EFL teachers does not significantly affect their total scores regarding general opinions about EBA. Similarly, no significant difference is found in the mean scores of the second dimension concerning the type of school ($F_{(2, 544)}$=.756, p>.05), suggesting that the type of school attended by participants does not significantly influence their total scores related to EBA usage levels. Furthermore, Table 14 also indicates that there is no significant difference in the mean scores of the third dimension based on the type of school ($F_{(2, 544)}$=.165, p>.05), implying that the type of school attended by participants does not significantly affect their total scores concerning teachers' suggestions for EBA.

Analysis and Findings of the Semi-structured Interview

The semi-structured interviews involved 10 EFL teachers to delve deeply into the third research question of the study, focusing on "*What are the EFL teachers' suggestions for the improvement of EBA?*" The interviews unveiled four key themes: "problems, content development, motivation, and future implications." These themes and their interrelated codes are elaborated in the subsequent tables, and the teachers' responses are substantiated by excerpts provided during the interviews. The frequencies documented in the tables indicate how frequently the participants articulated these codes.

EFL Teachers' Problems When Using EBA

Table 17. EFL Teachers' Problems When Using EBA

Codes	Frequency
Lack of adequate infrastructure on EBA	10
Taking a long time when accessing EBA	8
Incompatibility of curriculum objectives with materials on EBA	8
A limited number of course e-contents based on grades	7
Lack of course materials according to student level	6
Uninteresting and insufficient course materials	5
Problematic methods of logging into EBA	5
A long time of publishing of the self-designed materials	3
Irrelevant search results	3
Loss of time during the course	3

The findings from Table 17 indicate a unanimous agreement among the interviewed EFL teachers regarding the need for enhanced infrastructure within EBA to manage concurrent user demands. Additionally, they highlighted prolonged access times due to overloaded servers and inadequate website infrastructure.

> *"There are deficiencies in its technical infrastructure, and course materials are limited. The website was not very user-friendly, but it has become better with updates. Technical infrastructure and servers should be improved…" (Interviewee 1).*
>
> *"There may be times when we experience access problems during overload… EBA is a useless platform if schools are without a smartboard, students without a computer and the internet access …" (Interviewee 5)*

Most EFL teachers participating in the study found that the course materials and e-contents on EBA were insufficient for various grades and student levels, lacked alignment with curriculum objectives, and failed to engage students.

> *"Course contents must be kept updated. When the curriculum changes, the content should be updated instantly; the old content should not stay there for months. Overall, when compared to other courses, English course materials are slightly weaker in terms of content richness …" (Interviewee 8)*
>
> *"The website can be designed in a fun way, with more visual games for children and interactive activities. Primary, secondary, and high school levels require very different course contents…" (Interviewee 2)*
>
> *"Almost every year, our textbooks are changed. Last year, we had a different textbook for 6th graders, but this year it is a new one. Despite this, course activities on EBA are fixed …" (Interviewee 4)*

Less frequently mentioned issues include difficulties in sharing teachers' self-designed materials on the platform, perception of e-contents on EBA as time-consuming during lessons, and the platform providing irrelevant search results.

"I wanted to share the activities I prepared for my lessons several times in EBA. However, after five months, EBA moderation still has not been approved, and no feedback has been provided about approval or rejection …" (Interviewee 7)

"I don't find the search bar and results very useful because it makes it difficult for me to access the materials I am looking for…" (Interviewee 9)

"I tried to integrate EBA into my lessons at some points in the past. We have an internet connection in the interactive whiteboards. That's a nice thing… but logging into EBA and reaching the relevant course materials cause a waste of time for me …" (Interviewee 3)

In summary, the issues highlighted by teachers using EBA indicate the necessity for infrastructure enhancements, updates to course materials, and improvements in the moderation process for teachers' self-designed materials. Additionally, there is a need for the development of a more practical search algorithm to ensure access to relevant course materials.

EFL Teachers' Content Development Reflections When Using EBA

Table 18. EFL Teachers' Content Development Reflections When Using EBA

Codes	Frequency
Supporting courses with videos and animations	9
Integration of the interactive Web 2.0 applications	7
Agreement with private publishers for a variety of content	7
Practice-based activities aimed at listening and speaking	6
Sharing popular teachers' videos on EBA	5
Needing the gamification elements	5
The necessity of flashcard applications for vocabulary teaching	4

Table 18 presents an overview of the participant EFL teachers' opinions regarding content development on EBA. The predominant concern relates to the lack of interactivity in the course e-contents. Teachers noted a deficiency in interactive activities such as videos, animations, cartoons, songs, short films, and Web 2.0 applications.

"Students learn as they are exposed to language. So, I am sending links to different websites on EBA. Videos, online exercises, animations, and short films are very popular. I think it would be easier to send these activities to students if those materials were uploaded or available on EBA." (Interviewee 6)

"*Game-based digital activities can be designed in cooperation with computer engineers and teachers. Certainly, video and animations should be added. Interactive applications are necessary." (Interviewee 10)*

The participant teachers emphasize the significance of forming agreements with private publishers and facilitating teachers' ability to share course videos on video platforms. This would enable them to disseminate their ready-made materials as interactive content on EBA.

"I think EBA can cooperate with private publishers to use their course materials on the platform. So, we can access a great variety of course contents for our lessons, and thus, students' achievement can increase." (Interviewee 9)

"There are many popular teachers who record and share their videos on video-sharing platforms. If the Ministry can team up with them to transfer their course videos to EBA, that will make a big step." (Interviewee 1)

Additionally, the participant EFL teachers emphasized the importance of designing and sharing activities on EBA that focus on developing the four skills while teaching English to young learners.

"EBA should provide children with the opportunity to listen and read level books that are suitable for their grades. This should involve gamification elements, too. In this way, students' attention can be attracted to EBA." (Interviewee 2)

"Since the portal does not have a feature of audio recording, I do not know how much it improves students in speaking skills." (Interviewee 10)

An overview of the participant EFL teachers' reflections on English course content on EBA highlights the lack of interactive materials and the platform's limited usefulness for language practice. Consequently, there is a call to update the website to focus on teaching the four language skills and serving as an alternative learning and practice platform for EFL students.

EFL Teachers' Motivation When Using EBA

Table 19. EFL Teachers' Motivation When Using EBA

Codes	Frequency
Low participation in assignments given on EBA	9
The necessity of interesting contents to increase motivation	8
Insufficient number of course materials	7
Negative effects of students' demotivation on teachers' motivation	5

The content analysis of the discourse from participant EFL teachers in semi-structured interviews indicated a lack of motivation to use EBA. While teachers express motivation to assign homework on the platform and actively seek interesting course materials to engage students, they face challenges due to low student participation in assignments. This factor contributes to a decrease in teachers' overall motivation. Furthermore, participants emphasize the importance of engaging content to enhance student motivation. They also note that the quantity of content on EBA is inadequate and needs updating.

"I do not think it motivates me. I think it motivates the students very little because there are not so many activities to do when using EBA." (Interviewee 1)

"As I said before, the course e-content must be more attractive and interesting to motivate the student… Although I tell students that I assigned homework on EBA during the lessons, there is not much interest. So, it is not a very motivating platform for now." (Interviewee 6)

In addition to opinions about assignments and content, participant EFL teachers also addressed the issue of student demotivation. Despite their efforts to engage them, they expressed concerns about being negatively affected by students' lack of motivation for EBA.

"I allocate ten days when I send homework to a class of 30 in the semester. After ten days, I check the reports just to see that 3 or 4 students completed the homework in a 30-student classroom. So, I gave up assigning on EBA, and it is a loss of time." (Interviewee 3)

"No way... It does not motivate me very much because there is no content that interests me, so there are no materials I think will attract my students. That's why my first job in the morning is not to visit EBA. I hope one day it will be like this." (Interviewee 7)

EFL Teachers' Future Implications for EBA

Table 20. EFL Teachers' Future Implications for EBA

Codes	Frequency
Resolving the infrastructure problems	10
The necessity of Internet access in the classroom	10
The enrichment of the number of course contents	9
Game-based extracurricular activities	7
Dissemination of the features of the platform	6
Designing auxiliary activities for the textbook	6
Development of activities based on the four skills	4
Teachers' appreciation of student e-portfolios	2

The data on future implications for enhancing EBA in educational settings were obtained from EFL teachers. Table 20 presents the frequencies of their implication for the future. Analysis revealed that the immediate focus should be on resolving infrastructure and access issues, as emphasized by all EFL teachers, who indicated that the future of EBA hinges on the prompt implementation of solutions to these problems.

> *"The platform becomes permanent when parents and teachers believe in the necessity of EBA provided that it strengthens its infrastructure. In order for the platform to be sustainable, access problems of all socioeconomic students must be resolved." (Interviewee 5)*
>
> *"The internet connection of interactive whiteboards and infrastructure deficiencies must be addressed at all costs. Without these, EBA can't enter the classrooms and homes of students and teachers." (Interviewee 2)*
>
> *"... 3 GB of free access to EBA is, unfortunately, not enough. When students watch two or three videos, they spend almost half of it. So, there must be radical solutions to provide justice and opportunity for every student." (Interviewee 6)*

Furthermore, the EFL teachers in this research strongly advocate for developing high-quality content for English courses, which they perceive as currently insufficient. They stress the importance of aligning materials on EBA with textbooks.

> *"I also find it inadequate for students with different learning types and speeds because the contents on EBA are almost unavailable. So, we have to consult other materials that appeal to students." (Interviewee 7)*
>
> *"Homework assigned on the portal can be sent as a class. Individual differences between students are not considered. ... For example, I can't send fun games on EBA, but I need them badly because my students love playing. I hope there will be more games." (Interviewee 2)*

Discussion

This research aimed to investigate the potential influence of various variables, including gender, age, educational status, teaching experience, type of school, internet connectivity, presence of interactive whiteboards, EBA registration, and awareness of the FATIH Project, on EFL teachers' opinions, usage levels, and suggestions for the improvement of EBA. The discussion is structured into two sections. Firstly, the quantitative data from the questionnaire, collected from 547 participant EFL teachers, are analyzed. Throughout this section, the research variables are examined considering two previous studies in the literature: one by Kalemkuş (2016) and another by Alabay (2015), who conducted similar research with a relative research topic. Despite differences in research context, similarities and differences in findings are critically discussed. Secondly, the qualitative data from semi-structured interviews with 10 EFL teachers knowledgeable about EBA are discussed. These findings are critically analyzed in relation to

past research in the literature, including studies by Çakmak and Taşkıran (2017), Karalar and Doğan (2017), Karasu (2018), Kuloğlu and Bay (2019), Saklan and Ünal (2019), Şahin and Erman (2019), Türker and Güven (2016), Yıldız and Gündüz (2019), Cantürk and Cantürk (2021), Shaikh and Özdaş (2022), and Karabacak & Aktaş (2024).

In contrast to prior research, this study's findings diverge from those of Kalemkuş (2016) and Alabay (2015) regarding the impact of gender on usage levels, opinions, and suggestions for EBA among high school teachers. While Kalemkuş (2016) observed significant differences in usage levels and opinions but not in suggestions, Alabay (2015) found no significant differences based on gender. However, this study, focusing solely on EFL teachers across various school types, presents similarities and contradictions with prior research, potentially attributed to its narrower scope than previous studies encompassing teachers from diverse disciplines at the high school level.

In the study by Kalemkuş (2016), high school teachers holding a postgraduate degree exhibited higher scores across dimensions of opinions, usage levels, and suggestions for EBA. Conversely, Alabay (2015) found no significant difference between teachers with bachelor's and postgraduate degrees. In contrast to Alabay's findings, this study's results align more closely with Kalemkuş's study, particularly regarding opinions about EBA. In Kalemkuş's (2016) study, a significant difference was observed favoring high school teachers with an internet connection at home concerning opinions about EBA, although no significant difference was noted in usage levels and suggestions for EBA. However, Alabay (2015) did not investigate this variable in their study. Consequently, the findings of this study do not parallel those of Kalemkuş's (2016) study.

In the study, many participants, totaling 467 teachers (85.7%), reported having Interactive Whiteboards (IWBs) in their classrooms. Consequently, it was anticipated that teachers with and without IWBs would exhibit distinct opinions about EBA. However, the results did not indicate any notable differences. Unlike previous studies by Alabay (2015) and Kalemkuş (2016), this variable was introduced for the first time in this study. Moreover, no prior research in the literature review focused on this aspect of the FATIH Project. Among the participants, 432 EFL teachers (79%) reported having an Internet connection in the interactive whiteboards (IWBs) in their classrooms, while a significant number of 115 teachers (21%) lacked Internet access on their IWBs. Given that EBA, as discussed in the introduction chapter, relies on internet access for classroom use, this finding is surprising and requires further investigation.

While Kalemkuş (2016) did not explore this variable in his research, Alabay (2015) noted that 56 (26.9%) out of 208 high school teachers were not registered on EBA during his study. Alabay (2015) concluded that registered teachers showed higher agreement with opinions about EBA in the questionnaire. Additionally, their usage levels and suggestions for EBA significantly favored those registered on the platform. In alignment with these findings, the results of this study are consistent with those of Alabay (2015). The results also indicate that teachers who were informed about the FATIH Project exhibit higher EBA usage levels than those who are not. This suggests that awareness of the FATIH Project correlates with increased integration of EBA into teaching practices. However, no significant difference was observed in teachers' opinions and suggestions regarding EBA based on their level of information about the project. In contrast to Kalemkuş (2016), Alabay (2015) included the FATIH Project in their questionnaire, revealing a significant difference in high school teachers' EBA usage levels. This finding aligns with the outcomes of the present study, suggesting consistency with Alabay's findings.

While Alabay (2015) incorporated the age variable into their study, Kalemkuş (2016) did not. Alabay (2015) concluded that age did not significantly impact high school teachers' opinions and usage levels of EBA. This study's results align with those findings from the literature. In contrast to Kalemkuş (2016), who found a significant effect of teaching experience on high

school teachers' opinions and usage levels of EBA, this study did not find such a correlation among EFL teachers. The discrepancy in findings could be attributed to the different participant settings, with Kalemkuş (2016) focusing on high school teachers while this study targets EFL teachers. Additionally, Alabay (2015) reported no significant difference in EBA usage levels based on teaching experience, which is consistent with the results of this study.

In contrast to previous studies by Kalemkuş (2016) and Alabay (2015), which did not include the variable of school type, this study highlights significant differences in the quality and quantity of course materials on EBA across different school levels. As the first research to explore the impact of school type on EFL teachers' perceptions and usage of EBA, this study provides valuable insights for future investigations in this field. Previous studies corroborate this study's findings regarding teachers' challenges in using EBA. Yıldız and Gündüz (2019) highlighted the dependence of EBA usage on internet access, while Cantürk and Cantürk (2021) and Çakmak and Taşkıran (2017) and noted inadequacies in school infrastructure for EBA implementation. Similarly, Şahin and Erman (2019) emphasized the necessity of improving technological infrastructure for effective EBA utilization. Karasu (2018) and Saklan and Ünal (2019) also underscored the detrimental impact of insufficient infrastructure and internet connectivity on the usefulness of EBA.

The findings regarding the mismatch between EBA course materials and curriculum objectives echo similar conclusions from previous studies. Karalar and Doğan (2017) and Yıldız and Gündüz (2019) both highlighted the lack of suitable content tailored to students' needs and grade levels. Kuloğlu and Bay (2019) found that most teachers do not contribute course materials to EBA, exacerbating the issue. Moreover, Karasu (2018) observed that teachers perceive the listing of course materials on EBA as confusing, further compounding the challenges associated with content accessibility and usability.

The findings from the semi-structured interviews align with previous studies, indicating the necessity of preparing e-content and resources for use on interactive whiteboards through EBA (Anatürk, 2014). Additionally, concerns were raised about the lack of alignment between EBA videos and course objectives, as well as the non-interactive nature of e-content materials (Karabacak & Aktaş, 2024; Shaikh & Özdaş, 2022; Kızılet & Özmen, 2017; Ateş et al., 2015;). Similarly, Kuloğlu (2018) found that while there are enough e-contents on EBA, their quality is deemed inadequate by EFL teachers, who expect higher-quality materials in the future. However, the specific finding regarding the agreement with private publishers for synchronous sharing of course materials on EBA is unique to this study and warrants further consideration in content enrichment efforts for the platform.

In line with findings from other studies, some teachers in this research also expressed concerns about EBA's potential to decrease student motivation (Türker & Güven, 2016). However, the literature lacks previous research investigating teachers' motivation when using EBA. This highlights a significant gap in the literature regarding the relationship between EBA usage and teacher motivation, suggesting the need for further exploration in future studies. Given the limited research on EBA, addressing this gap could provide valuable insights into the dynamics of motivation within EBA usage contexts.

The concerns the participant EFL teachers voiced regarding the infrastructure and course materials on EBA echo findings from previous studies. These studies emphasize the need to strengthen the platform's infrastructure and enrich its course contents (Karabacak & Aktaş, 2024; Shaikh & Özdaş, 2022; Cantürk & Cantürk, 2021; Çakmak & Taşkıran, 2017; Kızılet & Özmen, 2017). They also highlight the importance of including only effective materials and addressing deficiencies in course materials such as realism, regularity, visuality, functionality, and usefulness (Cantürk & Cantürk, 2021; Karasu, 2018; Kuloğlu & Bay, 2019).

Besides, as a result of the research conducted with 10 EFL teachers during the COVID-19 period to reveal their opinions about the English live course conducted during the relevant

period, Karabacak and Aktaş (2024) reported that different methods and techniques should be integrated into distance education delivered through EBA to increase students' participation in English lessons. They also suggested that the use of interesting materials in distance education should be increased, and teachers should be supported in producing materials and content to increase students' motivation. They further underscored that necessary hardware and internet support should be provided and infrastructure problems should be eliminated to ensure equal opportunity in distance education.

Additionally, Shaikh and Özdaş (2022) evaluated the views of 80 EFL teachers in the distance education process. It was also deduced that the infrastructure of the EBA application should be strengthened, the content section should be updated with activities that will attract students' interest, and the class categorization option should be added to make it easier to understand whether students are doing the activities sent. They further emphasized that the planning and preparation of digital content on EBA by considering the pedagogical needs of students will enable the distance education process to be more qualified and efficient.

Despite the presence of some games on EBA currently, their quality and practicality are deemed insufficient. Embedding gamification elements within these games could enhance student engagement and provide more opportunities for language practice. This finding aligns with a study by Timur, Yılmaz, and İşseven (2017), underscoring the importance of incorporating interactive games and quizzes into EBA.

The findings of the current study align with previous research, indicating that the introduction activities of the EBA social education platform are perceived as insufficient by teachers. It was suggested that more memorable and active methods should be employed in promoting the platform, and teachers should be involved in more promotional meetings and in-service training to increase awareness of EBA. These recommendations correspond with the suggestions made in studies by Karabacak and Aktaş (2024), Shaikh and Özdaş (2022), Saklan and Ünal (2019), Kuloğlu and Bay (2019), and Ayan (2018), highlighting the importance of enhancing efforts for the publicity of the portal.

Consequently, the participating EFL teachers expressed concerns regarding the temporary solutions to EBA's problems, emphasizing the need for swift and comprehensive resolutions. They remain optimistic about EBA's future potential, contingent upon addressing infrastructure issues and diversifying course materials to enhance interactivity and alignment with curricular objectives. Their foremost demand is the permanent resolution of infrastructure challenges, including internet access and the availability of interactive whiteboards in schools. They believe that improving the quality of e-content will boost teacher and student motivation. Ultimately, their perceptions of EBA are shaped by individual experiences, underscoring the importance of maintaining updated content and professional platform management.

Conclusion

The study revealed significant gender differences, with male teachers demonstrating higher EBA usage levels than their female counterparts. EFL teachers with postgraduate degrees held more favorable opinions about EBA compared to those with bachelor's degrees. Registration on the platform and familiarity with the FATIH Project also emerged as critical factors influencing EBA usage and perceptions. EFL teachers who were registered on EBA or had more information about the FATIH Project displayed higher levels of engagement and more positive attitudes toward the platform.

Interestingly, age, teaching experience, and school type did not significantly impact EBA usage or perceptions. Similarly, variables such as having internet access at home, IWBs in classrooms, or internet connectivity in IWBs showed no significant effect. These findings suggest that infrastructure issues may not have been as influential in the context of this study, potentially due to the specific sampling methods used.

Qualitative insights from semi-structured interviews highlighted persistent challenges, including infrastructure deficiencies and limited internet access in classrooms. These issues were echoed in EFL teachers' feedback, which emphasized the adverse effects of such problems on EBA's efficacy. Additional challenges included misalignment between curricular goals and EBA materials, insufficient and unengaging course content, and a lack of differentiation based on student levels and learning speeds.

Implications

The study acknowledges several limitations that shape its findings and offer directions for future research. It was conducted solely with EFL teachers in Hatay, Türkiye, restricting its generalizability to other regions, educational contexts, or disciplines. Additionally, the data collection occurred during the 2019–2020 academic year, limiting its relevance to subsequent developments. The study's focus on teacher perspectives without significant exploration of students' views or learning outcomes further narrows its scope. The overlap with the early stages of the COVID-19 pandemic, when EBA became a crucial tool for distance education, also suggests the need for more targeted research on its role in remote learning environments. In this aspect, to enhance EBA's functionality and adoption, the study suggests the following:

Infrastructure Improvements: Addressing internet and technological infrastructure issues in classrooms is paramount. EFL teachers identified these as foundational barriers to effective platform use.

Content Development: EBA should expand its course offerings to include more interactive, engaging, and diverse materials. Suggestions included incorporating gamification, videos, animations, and interactive Web 2.0 tools. EFL teachers also recommended categorizing materials by grade level and catering to varying student needs.

Motivation and Support: EFL teachers' motivation to use EBA is heavily influenced by student engagement and the quality of available materials. Initiatives to increase teacher motivation might include competitions for content creation, collaboration on e-content design, and roles for EFL teachers in EBA's development.

Feedback and Training: EFL teachers emphasized the importance of regular updates, better search functionality on EBA, and timely feedback on shared materials. Practical, hands-on training programs about EBA and the FATIH Project were also recommended.

Consequently, future research should address these limitations by including diverse participant groups from various cities, subjects, and educational levels. Studies could explore the perspectives of students, as well as the impacts of EBA on their individual learning processes. Further investigations might also focus on teachers' content development competencies and the motivation factors for both teachers and students in using EBA. Expanding methodologies to include classroom observations would provide richer insights into how EBA is utilized across disciplines. Finally, examining the platform's effectiveness in distance education contexts could yield valuable findings to enhance its functionality and adaptability for future crises or evolving educational needs.

References

Akıncı, A., Kurtoğlu, M., & Seferoğlu, S. S. (2012). How can FATIH project achieve its goals? A situation analysis study. *Uşak Üniversitesi Akademik Bilişim, 1*(10).

Aktay, S., & Keskin, T. (2016). Analysis of educational information network (EBA). *Journal of Education Theory and Practical Research, 2*(3), 27-44.

Alabay, A. (2015). A research into secondary education teachers' and students' views on EBA (Educational Informatics Network) usage [Unpublished master's thesis]. İstanbul Aydın University.

Anatürk, C. (2014). *High school science teachers' beliefs and attitudes towards the use of interactive whiteboards in education* [Unpublished master's thesis]. Bilkent University.

Ayan, E. (2018). *An investigation on the use and e-content development status of teachers in the educational information network* [Unpublished master's thesis]. Hacettepe University.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2014). *Scientific research methods* (17th ed.). Pegem Academy.

Cantürk, G., & Cantürk, A. (2021). Determining the opinions of English teachers about the distance online education experience in Covid-19 pandemic by using metaphors. *International Journal of Current Approaches in Language, Education and Social Sciences (CALESS), 3*(1), 1-37.

Chen, Y., & Zhao, S. (2022). Understanding Chinese EFL learners' acceptance of gamified vocabulary learning apps: An integration of self-determination theory and technology acceptance model. *Sustainability, 14*(18), 11288. https://doi.org/10.3390/su141811288

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research*. Sage Publications.

Çakmak, Z., & Taşkıran, C. (2017). Views of social studies teachers on education information network (EBA) platform. *International Journal of Turkish Education Sciences, 5*(9), 284-295.

Çelik, H. E., & Yılmaz, V. (2013). *Structural equality modeling: Basic concepts, applications, programming*. Anı Publishing.

Çokluk, Ö., Şekercioğlu, G., & Büyüköztürk, Ş. (2014). *Multivariate statistics: SPSS and LISREL applications* (3rd ed.). Pegem Academy.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340. https://doi.org/10.2307/249008

Demir, D., Özdinç, F., & Ünal, E. (2018). An examination of participation in the education information network (EBA) portal. *Erzincan University Journal of Education Faculty, 20*(2), 407-422.

Ellis, V. (2001). Analogue clock/digital display: Continuity and change in debates about literacy, technology and English. In A. Loveless & V. Ellis (Eds.), *ICT pedagogy and the curriculum - Subject to change* (pp. 18-32). Routledge.

EBA. (2019). Yeni EBA yayında. Retrieved December 10, 2019, from https://www.eba.gov.tr/haber/1568113361

FATIH Project. (2019). About FATIH project. Retrieved December 10, 2019, from http://fatihprojesi.meb.gov.tr/en/index.html

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Sage Publications.

Karabacak, Ş., & Çam Aktaş, B. (2024). The quality of English teaching through the educational information network (EIN) during the pandemic process: Teachers', students', and parents' opinions (Erzurum province example). *Anadolu Üniversitesi Eğitim Fakültesi Dergisi (AUJEF), 8*(1), 28-64.

Karasu, T. (2018). Imam Hatip vocational and religious culture and moral knowledge course teachers' views on educational media network (EBA). *Journal of Bitlis Eren University Institute of Social Sciences, 7*(2), 925-943.

Karalar, H., & Doğan, U. (2017). Teacher perception on educational informatics network: A qualitative study of a Turkish Anatolian high school. *International Education Studies, 10*(4), 101-112. https://doi.org/10.5539/ies.v10n4p101

Karanfil, F., & Özet, M. N. (2021). How EBA (Educational Informatics Network) platform and Memrise may help EFL learners: A review for state school EFL learners in Turkey. *Journal of Foreign Language Education and Technology, 6*(1), 76-91.

Kılıç, A. (2020). *A study on improving EFL learners' listening skills through education informatics network (EBA) and identifying learners' perceptions towards the platform* [Unpublished master's thesis]. Bursa Uludağ University.

Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education, 9*(1), 60-70.

Maden, S., & Önal, A. (2018). A research on the use of secondary school Turkish course contents in electronic information network. *Journal of Language Education and Research, 4*(2), 101-121.

MoNE. (2016). *2016 activity report*. Retrieved December 10, 2019, from http://sgb.meb.gov.tr/www/dokumanlar/icerik/30

MoNE. (2018). *Turkey's education vision 2023*. Retrieved December 10, 2019, from https://2023vizyonu.meb.gov.tr

Reber, R., Canning, E. A., & Harackiewicz, J. M. (2018). Personalized education to increase interest. *Current Directions in Psychological Science, 27*(6), 449–454. https://doi.org/10.1177/0963721418793141

Saklan, H., & Ünal, C. (2019). Opinions of science teachers on the status of EBA among digital education platforms. *Ondokuz Mayıs University Journal of Education Faculty, 38*(1), 19-34.

Shaikh, G., & Özdaş, F. (2022). Uzaktan eğitim sürecinde İngilizce öğretmenlerinin görüşlerinin değerlendirilmesi: Nitel bir analiz. *Academia Eğitim Araştırmaları Dergisi, 7*(1), 59-91.

Şahin, M., & Erman, E. (2019). Investigation of history course teachers' opinions on educational informatics network (EBA). *Mehmet Akif Ersoy University Journal of Education Faculty, 49,* 256-275.

Timur, B., Yılmaz, Ş., & İşseven, A. (2017). Secondary school students' opinion for using the system of educational informatics network (EBA). *Asian Journal of Instruction, 5*(1), 44-54.

OECD. (2010). *Inspired by technology, driven by pedagogy: A systemic approach to technology-based school innovations*. Educational Research and Innovation, OECD Publishing.

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All authors have contributed equally to this article or are single authors.

Conflict of Interest

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Analysis of Teachers' Attitudes to Chess and Intelligence Games According to Some Variables

Gözdegül Arık Karamık[1], **Ali Özkaya**[2]*

Abstract

In recent years, there has been a notable increase in the emphasis placed on teaching chess and other intellectual games to students in schools. It is equally important to consider teachers' attitudes toward these games, as such attitudes may influence their instructional approaches. The aim of this study is to examine teachers' attitudes toward chess and intellectual games in relation to several variables. A relational survey model was employed throughout the research. A total of 245 teachers from various academic disciplines participated in the study. Data were collected using a personal information form, the Intelligence Games Attitude Scale, and the Chess Attitude Scale. The findings indicate that there is no statistically significant difference in attitudes toward chess based on gender. Furthermore, teachers employed in public schools exhibited higher attitude scores than their counterparts in private schools. While no significant differences were identified in attitude scores based on school level or professional experience, a significant difference was observed concerning the level of chess proficiency. It can be proposed that teachers who incorporate intellectual games, particularly chess, will cultivate greater interest and more positive attitudes toward these games among their students.

Keywords: chess, intelligence games, teacher, attitude

Öğretmenlerin Satranç ve Zekâ Oyunları Tutumlarının Bazı Değişkenlere Göre İncelenmesi

Özet

Son yıllarda öğrencilere okullarda satranç ve zeka öğretimi önem kazanmıştır. Öğretmenlerin satranç ve zeka oyunlarına yönelik tutumları da bu tür oyunları öğrencilerine öğretmede önemlidir. Araştırmanın amacı, öğretmenlerin satranç ve zeka oyunlarına yönelik tutumlarını bazı değişkenlere göre incelemektir. Araştırmada ilişkisel tarama modeli kullanılmıştır. Araştırmaya farklı branşlardan 245 öğretmen katılmıştır. Veriler kişisel bilgi formu, Zeka Oyunları Tutum Ölçeği ve Satranç Tutum Ölçeği ile toplanmıştır. Araştırma sonuçlarına göre öğretmenlerin satranca yönelik tutum puanlarının cinsiyete göre anlamlı bir farklılık göstermediği, devlet okullarında görev yapan öğretmenlerin tutum puanlarının özel okullarda görev yapan öğretmenlere göre daha yüksek olduğu tespit edilmiştir. Okul düzeyi ve mesleki deneyime göre tutum puanlarında anlamlı bir fark bulunmazken, satranç oynamayı bilme düzeyine göre anlamlı bir fark bulunmuştur. Öğretmenlerin başta satranç olmak üzere zeka oyunlarını aktif kullanmalarının, öğrencilerinin bu tür oyunlara olan ilgi ve tutumlarını artıracağı söylenebilir.

Anahtar Kelimeler: satranç, zekâ oyunları, öğretmen, tutum

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* Corresponding author

[1] Assist. Prof. Dr., Akdeniz University Faculty of Education, Mathematics and Science Education, Antalya, TURKEY, gkaramik@akdeniz.edu.tr
[2] Assoc. Prof. Dr. Akdeniz University Faculty of Education, Mathematics and Science Education, Antalya, TURKEY, ozkaya42@gmail.com

Introduction

Various methods and techniques are used to provide students with many skills, which are also considered 21st century skills. These are problem solving, critical thinking, creative thinking and innovation application skills, communication and collaboration skills, information and media literacy, entrepreneurship, leadership, and responsibility. One of these methods is games, especially chess (Ulus, 2022). In literature, game genres are grouped under various titles, but they are commonly classified into five types. These are physical games, object games, dramatic games, language games and games with rules (Aksoy & Çiftçi, 2019; Aral & Durualp, 2014).

Intelligence games are included in the rule game group among these game types. Intelligence games are divided into various subgroups in the MEB intelligence games curriculum and in the resources related to the program (MEB, 2013; 2019). According to literature review, memory games, strategy games, verbal games, reasoning and processing games and geometric mechanical games, and intelligence questions are types of intelligence games. In reasoning and operation games the players reach conclusions with logical inferences by making use of clues. The necessary information to solve the problem is provided to the players at the beginning of the game. In verbal games children get use of vocabulary or general culture together with logical inferences. In geometric-mechanical games players need visual perception skills. In memory games players need short term and long-term memory skills, and they can also play the games using their visual and verbal skills. In strategy games players can either win or lose; and one player decides on his move looking at the other player's move. For intelligence questions, on the other hand, players need to have a different reasoning skill, they need to reach the conclusion by evaluating the clues provided to solve a problem (MEB, 2013; 2019). There are three levels of difficulty in these games: beginner, intermediate and advanced; different games need different numbers of players (MEB, 2013) and most of these games can also be played on digital platforms. With these rich genres and contents, intelligence games have very important gains in terms of education and development of children. Children learning, liking and playing these types of games at school is directly related to teachers' attitudes towards these games. In order for teachers to play these games as part of the lesson in the classroom, they must first believe in the benefits of these games. It is important to determine teachers' attitudes towards intelligence games because these attitudes have the power to actively shape and influence teachers' current behaviors towards an event, object, or situation as a reflection of their past life and experiences, and show their cognitive and emotional tendencies (Allport, 1935; Kağıtçıbaşı, 1999; Taylor et al., 2015). These attitudes, which include the behaviors, thoughts, and feelings of teachers towards intelligence games, are also one of the most important psychological characteristics as an individual (Karasar, 2009). In this respect, it is important for teachers to like and care about intelligence games, buy them, have fun while dealing with them, and follow competitions about intelligence games. Therefore, teachers' positive attitudes towards intelligence games will contribute to the development of children's physical, cognitive, social, and emotional aspects, such as problem solving, attention, working memory, and school success. These attitudes of teachers can also be an indicator of the frequency of including mind games in the education curriculum, which is beneficial for children and provides them with a rich educational environment.

Determining these attitudes of teachers can also contribute to the further development of intelligence games education programs and to eliminate their deficiencies by revealing the adoption of mind games by teachers. The World Chess Federation (FIDE) determined chess as "a game played between two opponents who move their pieces alternately on a square board called a 'chessboard". The aim of both sides is to checkmate the opponent's king and win the game (International Chess Federation [FIDE], 2022). Scientific studies reveal the positive aspects of chess. According to Frank (1974), chess causes the grasping speed to increase greatly. It can be said that chess is useful in establishing a cause-effect relationship between

events. Chess develops creative thinking in individuals thanks to the different and effective problems it produces in the game. Chess is not only seen as a sport but also as a tool that contributes to the education of students because chess, as a strategy game, has multifaceted academic effects such as problem solving, analytical thinking and applying mathematical concepts (Aydın, 2015).

It is widely accepted that the game of chess, which is contemplated as a projection and a simulation of life, has positive and lasting effects on education. It can be said that it raises individuals with strong concentration and careful attention. Playing chess requires many skills because in-depth analysis of the emerging positions in the game of chess is required (Pritchard, 1998; Sadık et al., 2018). As a result of the static and dynamic evaluation of various situational elements, the most appropriate move emerges (Suetin, 1994). Chess training can be used as a tool to teach children to focus on what really matters in each situation. Chess is an activity-based game that encourages critical thinking and involves self-learning within itself (Barrett & Fish, 2011).

In today's world, where the importance of using time and space is increasing, one of the concepts that children should learn is time management. While technology and pace of life are increasing rapidly, time management cannot be considered separately (Sadık, 2006). Although chess is not a speed game played against time, it is a thoughtful sport that must be played within a certain time frame. The aim is to be able to play fast and make the right decision at the same time. With this aspect, chess is among the games that best emphasize the importance of time and increase the skill of using time. It is known that children learning chess play very quickly under time pressure and can make the right decisions.

Chess also teaches that a plan should be made by using the available possibilities in the most rational and economical way to reach the goal (Kulaç, 2005). Undoubtedly, it is of great importance that the game, which contains such benefits, is loved by students, and ensured that they play it. Studies on chess found that students who received it in early childhood were more accomplished in math and cognitive skills than those who did not obtain this education (Sağlam Tekneci, 2009). Sadık (2006) terminated that children who can play chess have better problem-solving skills than those who do not. In another study, Büyükaşık (2017) found that secondary school students exhibited positive attitudes towards problem solving as their chess knowledge level increased.

Some games that do not contain educational elements offered by technological devices to children make individuals socially distant and addicted. For this reason, it is important for the individual to turn to games that will enable him to learn, socialize and have fun to lead a quality life, and develop the necessary skills and abilities (Çağır & Oruç, 2020). In this context, teachers have a great responsibility in making students love games such as chess and enabling them to play. Undoubtedly, the lessons students take during their education significantly affect the behaviors and achievements they will form in their future education and professional life. It is thought that it is more important to decide the tendency of teachers towards a game with such a significant impact. Teachers have an important place in transferring knowledge, the cultural values, and skills of society to the younger generations (Hosgörur, Kılıç & Dündar, 2002). Professional qualifications of the teacher; general culture, also subject area knowledge, and teaching profession knowledge and skills constitute, while personal qualities include a person's propensity for the profession, being an example and a model required by teaching (Çınar, 2008). Attitude is a mental, emotional, and behavioral reaction predisposition that an individual organizes based on his experience, motivation and knowledge against any object, social issue or event around him (İnceoğlu, 2004). Attitude is a tendency attributed to an individual that regularly forms her feelings, thoughts, and behaviors about a psychological object. (Smith 1968; Kağıtçıbaşı, 2005). Attitudes are divided into three as mental, emotional, and behavioral. It is thought that there is mostly organization and therefore internal consistency among these

elements. According to this assumption, the person's knowledge about a subject (cognitive element) determines how he should approach it (emotional) and how he will behave towards it (behavioral element). The mental, emotional, and behavioral stance of the person about an object, situation or person reflects his or her attitude (Göksel et al. 2017). Therefore, for the attitude to emerge, there must be an organizational and harmonious relationship and coordination between the three elements in question. Unless there is an internal harmony and organization, that is, coordination between mental, emotional, and behavioral elements, it is not possible to form an attitude (İnceoğlu, 2004). The role model status of my teachers is undoubtedly directly related to their attitudes.

There are many studies with Students (Aciego, Garcia, & Betancourt , 2012; Barrett & Fish, 2011; Çağır & Oruç, 2020; Gökkaya, 2022; Hong & Bart, 2007; Joseph, Veena Easvaradoss, & Solomon, 2016; Kazemi, Yektayar, & Abad, 2012; Sağlam Tekneci, 2009; Sertel, 2017; Scholz et al., 2008; Trinchero, 2013; Wu, 2022) and teacher candidates (Sadık & Tezcan Kardaş, 2018) investigating their contributions to cognitive and affective characteristics, especially academic achievement. For example, Aciego, Garcia, and Betancourt (2012) investigated the benefits of playing chess on the intellectual and social-emotional development of school children. Barrett and Fish (2011) examined the effectiveness of chess training on mathematics achievement for students receiving special education services. Çağrı and Oruç (2020) examined the effects of using intelligence and intelligence games in Social Studies class on academic success and students' attitudes towards Social Studies class. However, studies with teachers who will teach these games to students are few (Şahin and Yıldırım, 2022). In this context, it will be important to know the level of teachers' attitudes towards intelligence games and chess.

Moving from these contexts, the aim of this study is to analyze how teachers' attitudes towards chess and intelligence games change according to some variables (gender, school level, branch, etc.). For this purpose, sub-problems.

1. Is there a significant relationship between teachers' attitude scores towards chess and intelligence games? (Do teachers' attitudes towards chess significantly predict their attitudes towards mind games?)
2. Do teachers' attitude scores towards the game of chess change according to gender, school level, official or private institution, teaching experience and level of chess knowledge?

Method

Correlational survey model was used in the research. The correlational survey model aims to determine the presence or degree of co-variance between two or more variables. In the correlational survey model, it is tried to find out whether the variables change together and if there is a change, how this happens (Büyüköztürk, 2016; Karasar, 2005). The correlational research process consists of identifying the problem, selecting a sample, collecting data, and interpreting the results. As a problem in the research, the relationship between teachers' chess and intelligence games attitudes and the change of attitudes according to some variables were discussed.

Participants

The study group consists of 229 teachers working in the Mediterranean region. The teachers who voluntarily participated in the study were reached online. For the homogeneity of the groups, the normality of the data (kurtosis skewness coefficients) and the homogeneity of the variances (Levene test) were tested in the groups. After it was seen that the conditions were

met, the data were analyzed. The teachers who participated in the study demographic information is shown in Table 1.

Table 1. Demographic information of study group

	Group	N	%
Gender	Male	145	63.3
	Female	84	36.7
School level	Primary school	45	19.7
	Middle school	100	43.7
	High school	84	36.7
Employed institution	Private	60	26.2
	Public	169	73.8
Professional Experience	1-5 years	61	26.6
	6-10 years	42	18.3
	11-15 years	38	16.6
	16-20 years	48	21.0
	24-25 years	26	11.4
	26 years and above	14	6.1
The state of knowing how to play chess	None	33	14.4
	Little	69	30.1
	Intermediate	98	42.8
	Well	29	42.8

Data Collection

Personal Information Form as a data collection tool, the Scale for Attitude towards Chess (SAC) and the Scale for Attitude towards Intelligence Games (SAIG) were used.

Ethics Committee Permission

This study was carried out with the decision of Akdeniz University Social Sciences and Humanities Research and Publication Ethics Board dated 10.06.2022 and numbered 10/211.

Personal Information Form

The form, which was prepared by the researchers and received expert opinions from 3 faculty members and 2 teachers from the faculty of education who are experts in their fields, consists of questions including teachers' gender, school level, branch, official or private institution, graduated faculty, teaching experience and level of chess knowledge.

Scale for Attitude towards Chess (SAC)

Factor loads of the one-dimensional and 16-item Likert-type scale developed by Sadık, Öntürk and Dinç (2018) vary between .76 and .94, the total explained variance of the scale was calculated as 86%, the Cronbach's Alpha reliability coefficient was calculated as .98, and the Cronbach α internal consistency was calculated by the researchers. Reliability coefficient was calculated as 0.939. It was decided that the scale is an appropriate, valid, reliable, and useful scale.

Scale for Attitude towards Intelligence Games (SAIG)

Kurupınar and Aydoğan (2020), the first sub-factor with 11 items accounted for 31.98% of the total variance, while the second sub-factor comprised 31.98% of the total variance with 6 items

and 13.41%, in a 22-item scale designed in a five-point Likert type, including positive attitude, negative attitude and behavioral component. and the third sub-factor explained 7.96% with 5 items. The three-factor structure explains 53.35% of the total variance. The validity of the structure reached by EFA was confirmed by CFA and the Cronbach Alpha reliability coefficient of the whole scale was found to be .89. It was observed that the Cronbach Alpha reliability coefficients of the sub-factors ranged from .81 to .89 by the researchers. The Cronbach α internal consistency reliability coefficients of this scale were found to be 0.807 for the attitude towards intelligence games, 0.658 for the positive attitude, 0.770 for the negative attitude, and 0.801 for the behavioral item. As a result of the findings, it was decided that the scale is valid and reliable in measuring attitudes towards intelligence games.

Data Analysis

One-way outlier scanning was performed on the data, the cut-off point was determined as ±3 (Raykov & Marcoulides, 2008), and the 16 values outside this cut-off point were excluded from the analysis. The normality of the data was checked with the skewness-kurtosis coefficients. The interval of ∓ 1 was accepted as the cut -off point for the skewness coefficients. The equality of variances between the groups was tested with the Levene test, which showed that the assumption of equal variance was met. When the kurtosis-skewness coefficients of the variables for the regression analysis were examined, it was accepted that the data did not deviate much from normality and showed a distribution close to normal, since the values obtained were close to the ±1 range. Multicollinearity was checked with VIF values, and it was determined that all these values were below 10. Durbin Watson values were examined for autocorrelation, and it was determined that all values were between 1 and 3. Analyses were performed after determining that all assumptions were met.

Findings

The relationship between attitude towards chess and attitude towards mind games

Multiple regression analysis was applied to determine whether teachers' attitudes towards chess significantly predicted their attitudes towards mind games. The findings obtained as a result of the analysis are given in Table 2.

Table 2. Regression Results Regarding the Prediction of Teachers' Attitudes Towards Chess

Variable	B	Std. Error$_t$	β	T	P*	Double r	Partial R
Constant	6.093	15.344	-	0.397	0.692	-	-
Negative Attitude	-0.515	0.207	-0.173	-2.491	0.013	-0.418	-0.164
Positive Attitude	2.059	0.453	0.303	4.548	0.000	0.465	0.290
Behavioral Element	0.579	0.188	0.197	3.089	0.002	0.386	0.202
R=0.538	R^2=0.290						
$F_{(3.225)}$=30.561	p=0.000						

*p<0.05

The bilateral and partial correlations between the predictor variables and the predicted variable were examined, it was seen that there was a negative moderate relationship between teachers' attitudes towards chess and negative attitudes (r=-0.418), and when other variables were controlled, the correlation was -0.164. A positive moderate correlation was found between

teachers' positive attitudes and their attitudes towards chess (r=0.465). When other variables were controlled, the correlation value was found to be 0.290. A positive moderate correlation was determined between the participants' attitudes towards chess and their behavioral component scores (r=0.386). When positive and negative attitude variables were controlled, the relationship was found to be 0.202.

Positive attitude, negative attitude and behavioral component variables and attitude towards chess variable show a moderately significant relationship (R=0.538, R^2=0.290, p=0.000); positive attitude, negative attitude and behavioral component explain approximately 29% of the total variance in teachers' attitudes towards chess. According to the standardized regression coefficients (β), the order of importance of the predictor variables on teachers' attitudes towards chess is positive attitude behavioral component and negative attitude. The significant levels of the regression coefficients were examined according to the t-test results, and it was seen that positive attitude, negative attitude, and behavioral element were significant predictors of teachers' attitudes towards chess. According to the multiple regression analysis, the regression equation for the prediction of performance is given below.

Attitude towards chess = 6.093-0.515* (Negative attitude) + 2.059* (Positive attitude) + 0.579* (Behavioral element)

Findings on the Relationship between Teachers' Attitude Scores Towards Chess Game and Gender

Whether the teachers' attitudes towards chess differed significantly according to their gender was checked with the t-test for independent groups, and the results obtained from the analysis are shown in Table 3.

Table 3. T-Test Results of Teachers' Attitudes Towards Chess by Gender

	Grup	**N**	**$\overline{X}$**	**S**	**sd**	**t**	**p***
Attitude towards chess	Female	145	63.22	12.91	227	-1.349	0.179
	Male	84	65.55	12.06			

**p<0.05*

According to the results obtained, it was determined that the scores of the teachers included in the study towards chess did not show a significant difference according to gender ($t_{(227)}$=-1.349, p= 0.179).

Findings on the Relationship of Teachers' Attitude Scores Towards the Chess Game with the Public or Private Institution

Whether the teachers' attitudes towards chess differed significantly according to the institutions they work at was checked with the t-test for independent groups, and the results obtained from the analysis are shown in Table 4.

Table 4. T-Test Results of Teachers' Attitudes Towards Chess According to the Institutions They Work

	Group	**N**	**$\overline{X}$**	**S**	**sd**	**t**	**p***
Attitude towards chess	Private	60	60.27	13.34	227	-2.764	0.006
	Public	169	65.44	12.11			

**p<0.05*

According to the results obtained, it was determined that the attitude scores of the teachers included in the study showed a significant difference according to the institution they worked in ($t_{(227)}$=-2.764, p=0.006). It was observed that the $\bar{X}$ attitude scores of teachers working in public schools ($\bar{X}$= 64.44) were higher than those of teachers working in private institutions ($\bar{X}$ = 60.27).

Findings on the relationship between teachers' attitude scores towards the game of chess and the school level where they work.

Whether the teachers' attitude scores towards chess show a significant difference according to the school level they work in was analyzed with a single factor ANOVA, and the results of the analysis are shown in Table 5.

Table 5. One-Factor ANOVA Results of Teachers' Attitude Scores Towards Chess by School Level

	Source of Variance	Sum of Squares	sd	Mean Squares	F	p*
Attitude towards chess	Between groups	395.227	2	197.613	1.242	0.291
	Within groups	35964.197	226	159.134		
	Total	36359.424	228			

**p<0.05*

According to the results of one-factor ANOVA, it was determined that the attitudes of the individuals included in the study towards chess did not differ significantly according to the school level they worked at ($F_{(2,226)}$=1.242, p=0.291).

Findings on the Relationship between Teachers' Attitude Scores Towards Chess and Their Professional Experience

Whether the teachers' attitude scores towards chess show a significant difference according to their professional experience was analyzed with a single-factor ANOVA, and the results of the analysis are shown in Table 6.

Table 6. One-Factor ANOVA Results of Teachers' Attitude Scores Towards Chess According to Professional Experience

	Source of Variance	Sum of Squares	sd	Mean Squares	F	p*
Attitude towards chess	between groups	1525.347	5	305.069	1.953	0.087
	within groups	34834.077	223	156.207		
	Total	36359.424	228			

** p<0.05*

According to the results of one-factor ANOVA, it was determined that the attitudes of the teachers included in the study did not show a significant difference according to their professional experience ($F_{(5,223)}$=1.953, p=0.087).

Findings on the Relationship between Teachers' Attitude Scores Towards Chess and Chess Playing Knowledge Levels

Whether the teachers' attitude scores towards chess show a significant difference according to their level of knowing how to play chess was analyzed with a single-factor ANOVA, and the analysis results are shown in Table 7.

Table 7
One-Factor ANOVA Results of Teachers' Attitude Scores Towards Chess According to Their Level of Knowing How to Play Chess

	Source of Variance	Sum of Squares	sd	Mean Squares	F	p*
Attitude towards chess	between groups	4612.443	3	1537.481	10.897	0.000
	within groups	31746.981	225	141.098		
	Total	36359.424	228			

**p<0.05*

According to the results of one-factor ANOVA, it was determined that the attitudes of the individuals included in the study showed a significant difference according to their level of knowing how to play chess ($F_{(3,225)}$=10.897, p=0.000). Tukey test, one of the post-hoc tests, was used to determine the source of the difference, and according to the test results, those who said, "I don't know" ($\bar{X}$=54.45) "I know little" ($\bar{X}$=63.94), "I know moderately" ($\bar{X}$=65.37) and "I know well" ($\bar{X}$=71.00). It was determined that there was a difference between those who said. When the averages were examined, it was determined that the scores of the teachers in the "I don't know" category were lower than the scores of the teachers in all other groups. In addition, it was determined that the scores of the teachers who answered, "I know little" and those who answered "I know well" differed significantly. It has been determined that the scores of those who say, "I know little" are lower than those who say, "I know well".

Conclusion and Discussion

This study, which examines whether the attitude scores of teachers towards chess games change according to gender, school level, public or private institution, teaching experience and level of chess knowledge, and whether it predicts their attitude scores towards intelligence games, was conducted online with 245 teachers working at different levels. Teachers' attitudes towards chess were determined using a 16-item Likert-type scale, and their attitudes towards intelligence games were determined using a 22-item Likert-type scale with three factors (positive attitude, negative attitude, and behavioral element). As a result of the analyzes made, with the attitudes of teachers towards chess; it was determined that there was a negative moderate relationship between negative attitudes, a positive moderate relationship between positive attitudes, and a moderate positive relationship between behavioral item scores. In addition, it was determined that positive attitude, negative attitude, and behavioral component explained approximately 29% of the total variance in teachers' attitudes towards chess, and it was found that the order of importance of the predictive variables on teachers' attitudes towards chess was positive attitude, behavioral component, and negative attitude. When the significance levels of the regression coefficients were examined, it was seen that positive attitude, negative attitude, and behavioral element were significant predictors of teachers' attitudes towards chess. Whether the teachers' attitude scores towards chess differed significantly according to their genders, it was checked with the t-test for independent groups and it was determined that the attitude scores towards chess did not show a significant difference according to gender. This situation coincides with the results of Sadık and Tezcan Kardaş (2018), who found that attitudes towards chess do not differ according to gender, and Altun and Görmez (2021), who found that teachers' attitudes towards digital games do not differ according to gender. From these results, it can be said that both male and female teachers show a similar interest or lack of interest in chess and digital games.

It was checked with t-test for independent groups whether the teachers' attitude scores towards chess differed significantly according to the institutions they work in, and it was seen that the attitude scores of teachers working in public schools were higher than those of teachers working in private institutions. Although there is no study on this subject in the literature, one of the factors may be that private school teachers have limited time devoted to chess due to working full time. This situation can be interpreted as teachers working in public schools are more interested in chess and spend more time on chess.

It was analyzed with a single factor ANOVA whether the teachers' attitude scores towards chess showed a significant difference according to the school level they studied, and it was determined that the attitudes towards chess did not show a significant difference according to the school level they studied. This situation can be interpreted as chess appealing to all ages.

Whether the teachers' attitude scores towards chess show a significant difference according to their professional experience was analyzed with a single-factor ANOVA and it was determined that teachers' attitudes towards chess did not show a significant difference according to their professional experience. In the study of Şen and Sarıkaya (2015), it was observed that as the professional seniority of the teachers increased, the use of drama, theater and art activities decreased, and the efforts to complete the missing achievements in chess increased.

Whether the teachers' attitude scores towards chess show a significant difference according to their level of knowing how to play chess was analyzed with a single-factor ANOVA and it was determined that their attitudes towards chess showed a significant difference according to their level of knowing how to play chess. It was determined that the scores of the teachers in the "I don't know" category were lower than the scores of the teachers in all other groups. In addition, it was determined that the scores of the teachers who answered, "I know little" and those who answered "I know well" differed significantly. It has been determined that the scores of those who say, "I know little" are lower than those who say, "I know well". It is possible to expect a direct relationship between teachers' chess playing levels and their attitudes towards chess. However, the direction and strength of this relationship may vary depending on many variables. In general, teachers who play chess more often and better are expected to have more positive attitudes towards chess. Because a game played regularly can provide many benefits such as giving pleasure to the person and developing problem-solving skills, thus causing them to have more positive feelings towards the game. In some cases, it is also possible to think that teachers who are not very successful at chess may develop negative attitudes towards the game. Constant losing or having difficulty with the complexity of the game can lead to a negative perception of the game. The reasons for this situation include childhood experiences, social environment, education process, and school environment. This situation coincides with the findings of Devecioğlu and Karadağ (2014), who stated that situations such as teacher incompetence and teacher indifference cause disruptions in the teaching of chess and intelligence games.

There are many studies showing the positive contribution of chess and intelligence games to both affective and cognitive development of the person (Aciego, Garcia, & Betancort, 2012; Büyükaşık, 2017; Eldaou, & El- Shamieh, 2015; Gliga & Flesner, 2014; Sala & Gobet, 2016; Tamer, 2020; Tekneci, 2009). On the other hand, there is a limited number of studies on the attitudes of teachers who will teach chess in schools towards chess and intelligence games. Therefore, it is important to determine the affective characteristics of both teachers and prospective teachers such as attitudes towards chess and intelligence games, and self-efficacy. In this sense, it is important to inform teachers in all branches about the benefits of mind games and chess. Courses can be opened for teachers who do not know chess. Chess teaching and

refereeing courses can be expanded among teachers. Chess tournaments can be organized within schools. In this study, data were collected from 245 teachers who teach in different branches and levels. After excluding 16 with missing information, the study was conducted with data from 229 teachers. More detailed findings can be obtained with studies conducted with a larger number of teachers.

References

Aciego, R., García, L., & Betancort, M. (2012). The benefits of chess for intellectual and social-emotional enrichment in school children. *The Spanish Journal of Psychology, 15*(2), 551-559. https://doi.org/10.5209/rev_SJOP.2012.v15.n2.38866

Altun, A., & Gormez, E. (2022). An investigation of teachers' attitudes towards the utility of digital games in the social studies courses. *Pakistan Journal of Distance and Online Learning, 7*(2), 19-36. http://journal.aiou.edu.pk/journal1/index.php/PJDOL/article/view/1260/171

Barrett, D. C., & Fish, W. W. (2011). Our move: Using chess to improve math achievement for students who receive special education services. *International Journal of Special Education, 26*(3), 181-193. https://eric.ed.gov/?id=EJ959011

Büyükaşık, E. (2017). *Ortaokul öğrencilerinin problem çözmeye yönelik tutumları ile satranç bilgisi seviyeleri arasındaki ilişki* [Unpublished master's thesis]. Mersin Üniversitesi.

Büyüköztürk, Ş. (2016). *Bilimsel araştırma yöntemleri* (22. baskı). Pegem Akademi.

Çağır, S., & Oruç, Ş. (2020). Intelligence and mind games in concept teaching in social studies. *Participatory Educational Research, 7*(3), 139-160. https://doi.org/10.17275/per.20.39.7.3

Eldaou, B. M. N., & El-Shamieh, S. I. (2015). The effect of playing chess on the concentration of ADHD students in the 2nd cycle. *Procedia - Social and Behavioral Sciences, 192*, 638-643. https://doi.org/10.1016/j.sbspro.2015.06.111

Fédération Internationale des Échecs [FIDE]. (2017). *Laws of chess*. https://www.fide.com/fide/handbook.html

Fédération Internationale des Échecs [FIDE]. (2018). *Laws of chess*. https://rcc.fide.com/wp-content/uploads/2022/12/Laws_of_Chess-2018_ENG.pdf

Gliga, F., & Flesner, P. I. (2014). Cognitive benefits of chess training in novice children. *Procedia - Social and Behavioral Sciences, 116*, 962-967. https://doi.org/10.1016/j.sbspro.2014.01.328

Gökkaya, M. B. (2022). Üniversite öğrencilerinin satranç oynama oranı, satranca başlama yaşı ile cinsiyet, eğitim görülen bölüm ve bölge ilişkisinin değerlendirilmesi. *Aksaray University Journal of Sport and Health Researches, 3*(1), 79-91. http://asujshr.aksaray.edu.tr/tr/pub/issue/70321/113086

Hong, S. (2005). *Cognitive effects of chess instruction on students at risk for academic failure* [Unpublished doctoral dissertation]. University of Minnesota.

Joseph, E., Easvaradoss, V. V., & Solomon, N. J. (2016). Impact of chess training on academic performance of rural Indian school children. *Open Journal of Social Sciences, 4*(2), 20-24. http://dx.doi.org/10.4236/jss.2016.42004

Karasar, N. (2009). *Bilimsel araştırma teknikleri* (20. baskı). Nobel Yayın Dağıtım.

Kazemi, F., Yektayar, M., & Abad, A. M. B. (2012). Investigation of the impact of chess play on developing meta-cognitive ability and math problem-solving power of students at different levels of education. *Procedia - Social and Behavioral Sciences, 32,* 372-379.

Pritchard, D. B. (1998). *Satranca başlangıç* (Y. K. Peker, Çev.). Akdeniz Yayıncılık.

Raykov, T., & Marcoulides, G. A. (2008). *An introduction to applied multivariate analysis* (1st ed.). Taylor & Francis Group.

Sadık, R. (2006). *İlköğretim 4. ve 5. sınıf satranç bilen öğrenciler ile satranç bilmeyen öğrencilerin doğal sayılara ilişkin dört işlem ve problem çözme başarılarının karşılaştırılması* [Unpublished master's thesis]. Abant İzzet Baysal Üniversitesi.

Sadık, R., & Tezcan Kardaş, N. (2018). An analysis of the attitudes of the teacher candidates towards the game of chess. *Universal Journal of Educational Research, 6*(11), 2438-2443.

Sadık, R., Öntürk, Y., Dinç, F., & Özen, A. (2018). Satranç oyununa yönelik tutum ölçeği geliştirilmesi. *Türkiye Spor Bilimleri Dergisi, 2*(2), 53-60. https://doi.org/10.32706/tusbid.486539

Sağlam Tekneci, S. (2009). *Okul öncesi eğitimde alınan satranç eğitiminin ilköğretim birinci sınıf öğrencilerin matematik becerileri üzerindeki etkisinin incelenmesi* [Unpublished master's thesis]. Abant İzzet Baysal Üniversitesi.

Sala, G., & Gobet, F. (2016). Do the benefits of chess instruction transfer to academic and cognitive skills? A meta-analysis. *Educational Research Review, 18,* 46-57. https://doi.org/10.1016/j.edurev.2016.02.002

Scholz, M., Niesch, H., Steffen, O., Ernst, B., Loeffler, M., Witruk, E., & Schwarz, H. (2008). Impact of chess training on mathematics performance and concentration ability of children with learning disabilities. *International Journal of Special Education, 23*(3), 138-148. https://eric.ed.gov/?id=EJ833690

Şahin, H., & Yıldırım, A. (2022). 2019 Okulöncesi satranç öğretim programının satranç antrenörlerinin, okulöncesi öğretmenlerinin, alan uzmanlarının görüşleri doğrultusunda incelenmesi. *Anadolu Journal of Educational Sciences International, 12*(2), 537-573. https://doi.org/10.18039/ajesi.1027688

Trinchero, R. (2013). Can chess training improve Pisa scores in mathematics? An experiment in Italian primary schools. http://hdl.handle.net/2318/142194

Wu, I. H. (2022). *The learning assessment of game-based instruction on mathematical literacy-oriented subject to elementary school fifth grade students* [Unpublished master's thesis]. National Sun-sen University.

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Middle School Mathematics Teachers' Views on The Concept of Mathematical Game[1]

Cansu Nur Güngör[2], **Emel Topbaş Tat**[3]*

Abstract

In this study, the views of middle school mathematics teachers on the concept of mathematical games were investigated. The participants of the study consisted of 13 middle school mathematics teachers. Phenomenology, one of the qualitative research methods, was used in the study. Interviews were used for the collection of data. The data were analyzed through content analysis. As a result of the research, the teachers mostly used the expressions instructive and fun in their definitions of mathematical games. It was found that the participants explained the relationship between mathematics and games with the presence of mathematics in games and mathematics making sense of games. It was observed that teachers used mathematical games for cognitive/academic and affective purposes. In terms of the benefits of mathematical games, the focus was on the benefits for the subject, the student and the teacher. Similarly, it was emphasized that mathematical games have various effects on students' learning, attitudes toward the lesson, personal development and social development. However, it was determined that teachers experienced various difficulties during the game design/planning and teaching process.

Keywords: mathematics, game, educational game, mathematical game.

Ortaokul Matematik Öğretmenlerinin Matematiksel Oyun Kavramına İlişkin Görüşleri

Özet

Bu araştırmada ortaokul matematik öğretmenlerinin matematiksel oyun kavramına ilişkin görüşleri araştırılmıştır. Çalışmanın katılımcıları 13 ortaokul matematik öğretmeninden oluşmaktadır. Araştırmada nitel araştırma yöntemlerinden fenomenoloji kullanılmıştır. Veri toplamada mülakatlar kullanılmıştır. Veriler içerik analizi ile analiz edilmiştir. Araştırma sonucunda öğretmenlerin matematiksel oyun tanımlamalarında en çok öğretici ve eğlenceli ifadelerini kullandıkları görülmüştür. Katılımcıların matematik ve oyun arasındaki ilişkiyi oyunlarda matematiğin varlığı ve matematiğin oyunları anlamlandırması ile açıkladıkları görülmüştür. Öğretmenlerin matematiksel oyunları, bilişsel/akademik ve duyuşsal amaçlar doğrultusunda kullandıkları görülmüştür. Matematiksel oyunların faydaları konusunda ise konuya, öğrenciye ve öğretmene yönelik faydalara odaklanılmıştır. Benzer şekilde matematiksel oyunların öğrencilerin öğrenme durumlarına, derse yönelik tutumlarına, kişisel gelişimlerine ve sosyal gelişimlerine çeşitli etkilerinin olduğu vurgulanmıştır. Bununla birlikte, öğretmenlerin oyun tasarlama/planlama ve ders sürecinde çeşitli zorluklar yaşadıkları tespit edilmiştir.

Anahtar Kelimeler: matematik, oyun, eğitsel oyun, matematiksel oyun.

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* Corresponding author

[1] This study is produced from the first author's master's thesis conducted under the supervision of the second author.

[2] Teacher, Ministry of National Education, Türkiye, cansuunur@gmail.com
[3] Assist. Prof. Dr., Necmettin Erbakan University, Türkiye, etopbastat@erbakan.edu.tr

Introduction

Mathematics has been a feared and unsuccessful subject for many students. While anxiety is one of the common problems today, tests and exams in education also cause mathematics anxiety (Luttenberger et al., 2018). Tuncer and Yılmaz (2016) stated that achievement anxiety causes students to have a negative attitude toward mathematics. There are also many studies investigating the relationship between mathematics anxiety and mathematics achievement (Ramirez et al., 2018; Weissgerber et al., 2022; Zhang et al., 2019). Zivkovic et al. (2023) found that there was a negative relationship between students' enjoyment of mathematics and mathematics anxiety. Students see mathematics as numbers and calculation and think that they need to be smart to be successful in mathematics (Uçar, 2011). The idea that one can be successful in mathematics with innate talent is seen as one of the causes of mathematics anxiety (Delice et al., 2009). While students' study time and study methods have a positive effect on their achievement, there is a significant relationship between achievement and attitude toward mathematics (Uçar et al., 2010). It can be said that involving students in the lesson will increase their self-confidence and thus reduce anxiety (Baas, 2020). In addition to focusing on meaningful learning and a student-centered approach in the mathematics learning and teaching process, revealing the fun aspect of mathematics through the use of activities, concrete materials and games should be considered in developing positive attitudes toward mathematics (Topbaş Tat, 2021).

Games have been around in various forms since humans have existed. Games, which are an important part of childhood, are effective in developing problem solving skills in a creative way (Broadhead, 2006; Wood, 2009). There are 5 main reasons why people play games. These reasons are relationship, desire to participate, emotional conflict arising from competition, success and leadership (Yee, 2002, as cited in Uğurel & Moralı, 2008). According to Uğurel and Moralı (2008), the relationship between mathematics and games can be explained by associating the desire to solve mathematical problems with these reasons. Beyond the relationship between mathematics and games, games have become an alternative method in mathematics teaching today. In addition to reducing mathematics anxiety, games, especially computer games, have a very important place in learning abstract mathematical concepts (Demirbilek & Tamer, 2010). In addition, the use of games is important for increasing achievement in mathematics and for having a positive effect on the perception of and attitudes toward mathematics in society (Fajri, 2020; Uğurel & Moralı, 2008). Çakıroğlu and Baki (2016) emphasized that the use of learning objects in mathematics teaching has a positive effect on the attitude toward mathematics, but emphasized the importance of combining the objects used especially with game and competition style activities. Teaching with games can also be seen as a way of learning mathematics through experiences (Weng, 2022). With mathematical games, students become more active in the classroom and have the opportunity to succeed (Rawansyah et al., 2021; Tural Sönmez, 2012). Teaching with games increases participation while supporting creative learning and problem solving (Smith, 2020). In summary, it can be stated that mathematical games provide both cognitive and affective benefits (Alanazi, 2020; Arroyo et al, 2017; Bullock et al., 2021; Fouze & Amit 2018; Kiili et al., 2014; Maryani, 2019; Moyer et al., 2019).

When the studies on mathematical games are examined, it is generally seen that experimental studies were conducted to determine the effect of the game on various variables such as achievement, motivation and attitude (Başün & Doğan, 2020; Canbay, 2012; Cohrssen & Niklas, 2019; Denli, 2021; Fiorella et al., 2019; Ihendinihu, 2020; Ku et al., 2014; Muntean et al., 2018). In addition, systematic review studies on mathematical games were also found in the literature (Pan et al, 2022; Uluçay and Çakır, 2014). There are also descriptive studies in which we can see the opinions about mathematical games. For example, Ayvaz Can (2020)

found that mathematical game perceptions of prospective primary school teachers were positive. In the studies on teachers' perceptions and use of mathematical games, it can be seen that most of the studies have been conducted with primary school teachers (Ateş & Bozkurt, 2021; Çil & Sefer, 2021; Doğan & Sönmez, 2019; Hoşgör, 2010). However, there are also studies conducted with mathematics teachers and prospective teachers (Özata, 2019; Yıldız Durak, 2020). When analyzing the participants in the studies on mathematical games, it is found that these studies were mostly conducted with students and prospective teachers. In various studies conducted with teachers and prospective teachers, participants' game design and implementation processes were analyzed (Karadeniz, 2017; Topçu et al., 2014; Ünveren Bilgiç, 2021). In these studies, teachers were asked to design a game and this process was analyzed. In the studies on the applicability of mathematical games, the opinions of teachers and prospective teachers were taken through the games determined (Doğan Sönmez, 2019; Hoşgör, 2010; Özata, 2019). Studies on teachers and prospective teachers, who are the group that both implement and design games, are important in terms of reflecting their perspectives on the concept of mathematical games. In addition, teachers' opinions are important in terms of reflecting experiences on many issues such as the effectiveness of mathematical games, students' reactions to mathematical games, and the difficulties encountered in using mathematical games. However, it has been observed that there are few studies in the literature where we can see the views of middle school mathematics teachers on this issue. Accordingly, the aim of this study is to determine the views of middle school mathematics teachers working in schools affiliated to the Republic of Türkiye Ministry of National Education on the concept of mathematical games. The problem statement of the study was determined as "What are the views of middle school mathematics teachers on the concept of mathematical game?". The sub-problems of the study are as follows:

1) How do middle school mathematics teachers define mathematical game?
2) What are the views of middle school mathematics teachers on the relationship between the concepts of mathematics and game?
3) What is the status of middle school mathematics teachers' use of mathematical games?
4) What are the views of middle school mathematics teachers on the purposes of using mathematical games?
5) What are the views of middle school mathematics teachers on the features that should be included in mathematical games?
6) What are the views of middle school mathematics teachers on the benefits of using mathematical games in mathematics teaching?
7) What are the views of middle school mathematics teachers on the difficulties in the use of mathematical games?
8) What are the views of middle school mathematics teachers on students' reactions to mathematical games?
9) What are the views of middle school mathematics teachers on the effects of using mathematical games on students?
10) What are the suggestions of middle school mathematics teachers about mathematical games and the use of mathematical games?

Method

Qualitative research method was used in this study. The aim of qualitative research is in-depth description and interpretation. Qualitative researchers report different perspectives and many factors related to the problem and ultimately reveal the big picture in general (Creswell, 2013). Phenomenology, one of the qualitative research designs, was used in the study. Phenomenology is an in-depth research that allows us to fully grasp the phenomena. As a

result of the research, a better understanding of the phenomenon is achieved. In phenomenology, research is conducted with individuals who experience the phenomenon (Yıldırım & Şimşek, 2021). Phenomenology deals with lived experiences. The personal experiences of the participants are emphasized. The essence of the experiences is discussed. A common definition made by the participants is discussed (Creswell, 2013). In this study, phenomenology was used since it was aimed to learn the views of middle school mathematics teachers on the concept of mathematical game.

Participants

Participants of the study consists of middle school mathematics teachers working in public schools affiliated to the Republic of Türkiye Ministry of National Education. The study was carried out with 13 mathematics teachers working in Karapınar district of Konya province. The teachers participating in the study were determined on a voluntary basis. For ethical reasons, the names of the participants and the schools where they work were kept confidential. Accordingly, the participants were referred to as T1, T2, T3, ..., T13. Information on gender, age and teaching experience of the participants is given in Table 1.

Table 1. Information on gender, age and teaching experience of the participants

Code	Gender	Age	Teaching experience
T1	Female	25	4
T2	Female	31	10
T3	Female	32	4
T4	Male	36	14
T5	Female	27	5
T6	Female	27	4
T7	Female	29	3
T8	Female	30	9
T9	Female	26	4
T10	Male	29	5
T11	Female	28	5
T12	Female	37	15
T13	Female	27	4

Data collection

Interview method was used to collect data in the study. Interview is the most frequently used data collection method in qualitative research. Since the interview is based on speaking, it is a method that eliminates limitations in data collection (Yıldırım & Şimşek, 2021). The semi-structured interview form developed by the researcher was used as a data collection tool in the study. In semi-structured interviews, the participant is asked open-ended questions that are not predetermined, in addition to predetermined questions. Semi-structured interviews are more suitable for qualitative research as open-ended questions eliminate limitations (Çelebi, 2021). The interview form developed in this context consists of two parts. The first part consists of 10 questions about the personal information of the participants, and the second part consists of 11 questions about the concept of mathematical games. Teachers were asked questions about the definition of mathematical games, the relationship between mathematics and games, their use of mathematical games, the games they use, the features that mathematical games should have, the benefits of mathematical games, the difficulties in using games, students' reactions to games, and the effects of games on students.

Interviews were conducted with the identified participants by determining the time when the participants were available. The interviews were conducted in the schools where the participants were working. The interviews lasted between 10-30 minutes. During the interviews, voice recordings were taken with the consent of the participants.

Data analysis

The data collected in the study were analyzed by content analysis. In content analysis, data are analyzed in more depth. It is analyzed with themes that are not predetermined. The list of codes and themes can be changed and developed (Yıldırım & Şimşek, 2021). Content analysis mostly deals with how and why question patterns (Çelebi, 2021). During the data analysis process, firstly the interviews were transcribed. Then, codings were made and themes were developed. The themes and codes were presented in the findings section with frequency values and tables for each sub-problem.

Validity and reliability

In qualitative research, validity and reliability are ensured by reporting the data obtained in detail, including direct details, obtaining expert opinion, and explaining the data collection and data analysis in detail (Yıldırım & Şimşek, 2021). Ethics committee permission was obtained before the study. The interview form used in the research was prepared by taking expert opinion. Before the actual interviews, a pilot interview was conducted with a middle school mathematics teacher other than the participants of the study. The data collected in the study were firstly written down. The codings were reported in detail. In addition, direct quotations from the interviews were also included in the findings section. Data collection and data analysis were explained in detail.

Findings

In the study, answers to 10 sub-problems were sought to investigate the views of middle school mathematics teachers on the concept of mathematical game. The findings were presented according to the sub-problems. The findings are presented in tables with frequency values.

Middle School Mathematics Teachers' Definitions of Mathematical Games

The findings related to the first sub-problem of the study, “How do middle school mathematics teachers define mathematical games?” are given in Table 2. Teachers' definitions of mathematical games were grouped under three themes: cognitive/academic dimension, affective dimension and content dimension.

Table 2. Middle school mathematics teachers' definitions of mathematical games

Theme	Code	*f*	Participant
Cognitive/Academic Dimension	Instructive	7	T1, T3, T5, T7, T8, T10, T11
	Concretizing	2	T5, T11
	Active participant	1	T9
Affective Dimension	Entertaining	6	T1, T3, T7, T8, T9, T10
	Intriguing	1	T5
	Endearing mathematics	2	T4, T6
Content Dimension	Connected to everyday life	2	T10, T12
	Involving mathematical operation/mathematics	1	T13
	Involving the history of mathematics	1	T2

Involving drama	1	T2

According to Table 2, teachers defined mathematical games as instructive, concretizing and enabling active participation in the cognitive/academic dimension. In the affective dimension, they defined it as entertaining, intriguing and endearing mathematics. In the content dimension, they defined mathematical games as being connected to everydaily life, involving mathematical operations/mathematics, involving the history of mathematics, and involving drama. In the definitions, the instructive aspect of the mathematical game was emphasized with expressions such as understanding, comprehension and learning. For example, T1 defined mathematical games as; "Games that we use in the lesson, that we make students play so that they can better understand and comprehend the subject and that we use to make the lesson more fun". While defining the mathematical game, T6 said; "I think mathematical game is an application that we do to make students love mathematics and I think that everything we do in this field can be included in the concept of mathematical game".

Middle School Mathematics Teachers' Views on the Relationship between Mathematics and Game

The second sub-problem of this study is "What are the views of middle school mathematics teachers on the relationship between the concepts of mathematics and game?". The findings of middle school mathematics teachers' views on the relationship between mathematics and game are presented in Table 3.

Table 3. The relationship between mathematics and game

Code	***f***	**Participant**
There is mathematics in games	13	T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13
Math makes sense of the game	2	T5, T7

According to Table 3, the teachers expressed the relationship between the concepts of mathematics and games as follows: *There is mathematics in games and mathematics makes sense of games*. T8, who stated that there is mathematics in games, explained this situation as follows:

> *Of course there is maths in games. We already start with the simplest hopscotch at the very beginning, don't we? We can say that the child encounters the most numbers. Apart from that, I think it is present in all games. For example, the child counts, basic counting skills, for example, she will play hide and seek, maybe counting starts at the age of five... I think it is also present in the games that children play in their social life.*

Teachers associated the mathematics in the games with the game rules. T9 stated that mathematics was used while creating game rules; "Games are related to mathematics. We definitely benefit from mathematics when creating games or rules". T13 stated that there is mathematics in the rules of games as follows: "We can say that there is mathematical thinking in the formation and rules of games".

Middle School Mathematics Teachers' Use of Mathematical Games

The findings related to the third sub-problem of the study, "What is the status of middle school mathematics teachers' use of mathematical games?" are presented in Table 4. All teachers participating in the study stated that they used games. Accordingly, the status of middle school mathematics teachers' use of mathematical games was categorized under the themes of the games used, frequency of game use, the phase of the lesson used, and the grade level used.

Table 4. The status of middle school mathematics teachers' use of mathematical games

Theme	Code	*f*	Participant
Games Used	Paper and pencil games	9	T1, T3, T5, T6, T7, T8, T9, T11, T12
	Digital games	9	T4, T5, T6, T7, T8, T9, T10, T12, T13
	Physical games	2	T2, T11
Frequency of game use	Not very often	12	T1, T2, T3, T4, T5, T6, T7, T9, T10, T11, T12, T13
	Every week	1	T8
The phase of the lesson used	All stages	3	T4, T10, T12
	End of lesson/subject	8	T2, T3, T5, T6, T7, T9, T11, T13
	Reinforcing the topic	3	T1, T8, T13
	Evaluation	1	T13
Grade level used	Grade 5	13	T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13
	Grade 6	10	T1, T3, T4, T5, T7, T10, T11, T12, T13
	Grade 7	6	T1, T5, T6, T11, T12, T13
	Grade 8	5	T1, T5, T6, T11, T12

According to Table 4, the games used by the teachers were coded as *paper and pencil games*, *digital games* and *physical games*. T7, who stated that she used paper and pencil games and digital games, said: "I used puzzles. Also, when I turn them into competitions, children are more interested in them. There are also smart boards, interactive games, especially in integers, we also used them". T1 stated that there were also coloring activities in the games she used. Coloring activities were coded as paper and pencil games. Among the teachers who use digital games, T6 explained the games she used as follows: "We actually play games on the smart board more. We use various applications or use games on EBA (Educational Informatics Network)". T11, one of the teachers who used physical games, explained the game as follows:

> *On a ground drawn on the ground in the coordinate system; we made games in which we determined the positions of the children and determined their positions relative to each other. In eigth grades, we played games about the position of the point relative to the point, their location on the coordinate system.*

According to Table 4, teachers' frequency of game use was coded as *not very often* and *every week.* When the frequency of teachers' game use was analyzed, 12 teachers stated that they did not use games very often. One teacher stated that she used games every week. T3 stated that she did not use games very often and expressed her thoughts as follows: "I cannot use them very often. Naturally, since our class hours are limited, in order to catch up with the subjects". T3 associated this situation with the difficulty she had in allocating time. Similarly, T9, while associating the fact that she did not use games very often with time and curriculum, expressed her thoughts as follows: "Unfortunately, I cannot use it very much because the course duration and curriculum are intense".

According to Table 4, the stages of the lesson in which mathematical games were used were coded as *all stages, end of lesson/topic, reinforcing the topic and evaluation.* T1, explaining

the use of games at the end of the subject with the reason that there should be no confusion, expressed her views as follows: “I prefer to use the game after giving the basic rules of the topic first, so that they can understand it better. I do not prefer it at first in order not to be confusing”.

According to Table 4, the status of middle school mathematics teachers' use of mathematical games by grade level was coded as 5th grade, 6th grade, 7th grade and 8th grade. According to Table 4, games were used in all grade levels. It is also seen that teachers mostly preferred to use games at the 5th grade level. Explaining this situation with the fact that 5th grade students are at the age of play, T9 expressed her views as follows: “I use it more in fifth grade. Since fifth graders are at the age of play and the subjects are more suitable for games, I prefer this age group more”.

Middle School Mathematics Teachers' Purposes of Using Mathematical Games

The findings related to the fourth sub-problem of the study, “What are the views of middle school mathematics teachers on the purposes of using mathematical games?” are given in Table 5. Teachers' purposes of using mathematical games were divided into two as *cognitive/academic purposes* and *affective purposes*.

Table 5. Middle school mathematics teachers' purposes of using mathematical games

Theme	Code	*f*	Participant
Cognitive/Academic purposes	Teaching the subject	2	T1, T8,
	Reinforcing the topic	6	T3, T5, T6, T7, T8, T11
	Ensuring understanding/comprehension	5	T5, T7, T10, T11, T13
	Ensuring active participation	10	T1, T3, T4, T5, T6, T7, T8, T9, T10, T13
	Conducting measurement/evaluation	2	T2, T3
	Concretizing	5	T7, T8, T11, T12, T13
	Making the lesson effective	3	T3, T4, T9
	Associating with daily life	3	T2, T12, T13
Affective Purposes	Endearing mathematics	3	T2, T4, T9
	Changing the perception that math is difficult	2	T3, T8
	Providing motivation	1	T1
	Making the lesson fun	8	T1, T2, T3, T5, T7, T8, T9, T13
	Attracting interest	6	T1, T5, T6, T7, T9, T13
	Ensuring adaptation to school/lesson	2	T3, T8

According to Table 5, teachers' cognitive/academic purposes for using mathematical games were coded as *teaching the subject, reinforcing the topic, ensuring understanding/comprehension, ensuring active participation, conducting measurement/evaluation, concretizing, making the lesson effective and associating with daily life*. In the affective dimension, it was coded as *endearing mathematics, changing the perception that mathematics is difficult, providing motivation, making the lesson fun, attracting interest, and ensuring adaptation to school/lesson.* However, teachers stated that they used mathematical games for more than one reason. For example, T3 stated that the purposes of using mathematical games were to ensure active participation, to make the lesson

effective, to make the lesson fun, to change the perception that mathematics is difficult, and to adapt to the school/lesson:

> *What are the purposes of use? As I said, to make the lesson more effective, to make the students who do not participate in the lesson participate in the lesson... I want to break the perception that mathematics is difficult, in fact, mostly for this... I try to make the lesson more fun so that they can adapt to middle school better or not to create a perception that mathematics is difficult.*

Characteristics of Mathematical Games According to Middle School Mathematics Teachers

The findings related to the fifth sub-problem of the study, "What are the views of middle school mathematics teachers on the features that should be included in mathematical games?" are given in Table 6. As a result of the analysis of the data, the features that should be present in mathematical games consist of the themes of *the contributions of games to the learning and teaching process, game content, game duration and participant status of the games.*

Table 6. Characteristics of mathematical games

Theme	**Code**	***f***	**Participant**
Contributions to the teaching and learning process	Motivating	2	T1, T5
	Intriguing	7	T1, T2, T4, T7, T9, T12, T13
	Communication enhancing	3	T2, T6, T8
	Collaborative	1	T3
	Educational	1	T5
	Instructive	3	T3, T5, T11
	Entertaining	4	T3, T4, T7, T9
Game content	Containing drama	1	T2
	Containing the history of mathematics	1	T2
	Appropriate to the Curriculum	6	T2, T4, T9, T11, T12, T13
	Suitable for student level	4	T2, T4, T5, T10
	Up-to-date	1	T12
	Understandable	4	T1, T6, T8, T10
	Easy to apply	3	T7, T10, T13
	Safe	1	T4
	Economic	2	T4, T13
Game duration	Two class hours	3	T2, T4, T11
	One class hours	6	T3, T6, T7, T8, T9, T13
	Less than one class hour	2	T5, T10
	Variable depending on the student	2	T1, T12
Participant Status	Group games	6	T1, T2, T5, T6, T8, T11
	Individual games	2	T12, T13
	Individual-Group games	5	T3, T4, T7, T9, T10

According to Table 6, the features that mathematical games should have were coded in terms of their contribution to the learning and teaching process as *motivating, intriguing, communication enhancing, collaborative, educational, instructive and entertaining*.

Emphasizing that the games should be intriguing and entertaining, T7 expressed her thoughts as follows: “It should first attract the attention of the class. Children should focus on it, we can say that it should be intriguing. Then it can be entertaining. It can be entertaining for children to be more active in an activity...”. In addition, T7 stated that entertaining games would increase participation.

According to Table 5, the content of the games were coded as *including drama, including the history of mathematics, appropriate to the curriculum, appropriate to the student level, up-to-date, understandable, easy to apply, safe and economic*. For example, T5 emphasized that mathematical games should be suitable for the level of students, motivating and instructive and stated the features that should be in mathematical games as follows: “It is important that it is suitable for students' readiness and developmental levels. It is also important that it is instructive and educational... I think it should also increase motivation”.

According to Table 6, the duration of mathematical games was coded as *two class hours, one class hour, less than one class hour and variable depending on the student*. According to Table 5, teachers mostly stated that the duration of mathematical games should be one class hour. Associating the time allocated for the mathematical game with the attention of the students, T6 expressed her thoughts as follows:

> *Unfortunately, it cannot be short because it is not possible to keep the concentration of the class. So it takes a little longer. I don't think less than one lesson is appropriate. I think at least 40 minutes will go because there is an explanation period and it takes a long time for the children to adapt.*

T5, on the other hand, stated that the duration should be less than one class hour in order not to distract the attention of the students: “It cannot be too long anyway, and I think it should be about 20-30 minutes in a way that will not bore the students and will not disturb their attention”.

According to Table 5, the participant status of mathematical games was coded *as group games, individual games and individual-group games*. T2 discussed the increase in communication in group games and said: “It would be better with a group, I think it would be more efficient. Group game is better both for the communication of the students and for it to be more fun”. T4 expressed his views “I think both group and individual games should be used according to the time and place, I use them”. Referring to the advantage of observing students individually in individual games, T13 expressed her views as follows: “The games on the smart board that I implement are usually individual. I like it. The students see themselves individually, I see them. This is an advantageous situation, of course”.

Benefits of Using Mathematical Games According to Middle School Mathematics Teachers

The findings related to the sixth sub-problem of the study, “What are the views of middle school mathematics teachers on the benefits of using mathematical games in mathematics teaching?” are given in Table 7. The benefits of using mathematical games according to middle school mathematics teachers are presented under the themes of *benefits for the subject, benefits for the student and benefits for the teacher.*

Table 7. Benefits of using mathematical games

Theme	Code	*f*	Participant
Benefits for the subject	Associates with daily life	2	T11, T12
	Concretizes	2	T4, T12
	Provides easy learning	5	T1, T7, T8, T11, T12
	Provides permanent learning	5	T4, T5, T7, T8, T11

Benefits for the student	Enables understanding/comprehension	6	T2, T3, T9, T10, T11, T13
	Provides practicality	1	T12
	Provides active participation	10	T2, T3, T 4, T5, T6, T7, T9, T10, T11, T12
	Enables peer learning	5	T2, T6, T7, T8, T9
	Supports the development of intelligence	1	T2
	Provides self-assessment	2	T9, T13
	Provides effective lesson	3	T2, T5, T9
	Increases communication	4	T3, T6, T8, T13
	Provides adaptation to school	1	T6
	Develops a positive attitude	5	T5, T8, T11, T12, T13
	Increases interest	2	T1, T5
	Provides motivation	4	T1, T5, T10, T12
	Reduces fear	3	T1, T2, T3
	Makes the lesson fun	10	T1, T3, T4, T5, T7, T8, T9, T11, T12, T13
	Provides a sense of achievement	2	T4, T8
Benefits for the Teacher	Facilitates observation	5	T1, T3, T8, T12, T13
	Facilitates evaluation	1	T1
	Improves time management	3	T1, T2, T4
	Provides positive feedback	1	T13
	Enables student-teacher communication	2	T2, T3
	Provides motivation	1	T9
	Makes the lesson fun	1	T12

According to Table 7, the benefits of mathematical games for the subject were coded as *associates with daily life and concretizes*. T11 expressed her thoughts as follows: "Our games can benefit the use of what they have learned in daily life". She stated that mathematical games are useful for associating learnings with daily life.

According to Table 7, the benefits of mathematical games for students were coded *as provides easy learning, provides permanent learning, enables understanding/comprehension, provides practicality, provides active participation, enables peer learning, supports the development of intelligence, provides self-assessment, provides effective lesson, increases communication, provides adaptation to school, develops positive attitudes, increases interest, provides motivation, reduces fear, makes the lesson fun and provides a sense of achievement*. T7 explained the benefits of mathematical games for students as follows:

> *First of all, it increases permanent learning. I think what we tell will become more permanent. These types of games take place in their memories. So I think we can say that it increases permanent learning... We can also say that it facilitates learning... I can say that it is both permanent and facilitates learning.*

T1, who thinks that mathematical games reduce the fear of mathematics and develop a positive attitude toward mathematics with the ease of learning and the benefits they provide to the subject, explained her thoughts as follows:

> *I think it makes learning easier for the student. The student's interest in mathematics may increase and the fear may decrease. For example, if the student realizes that the game make the subject easier or, for example, in mathematics, we usually cannot use what we learn in daily life, we think, what use is it to us, but if the students see a place*

to apply it in the game, maybe it can make them more motivated. Of course, this can vary from subject to subject.

According to Table 7, the benefits of mathematical games for teachers were coded as *facilitates observation, facilitates evaluation, improves time management, provides positive feedback, enables student-teacher communication, provides motivation, and makes the lesson fun*. T1 who stated that mathematical games provide convenience for the teacher and that the increased communication in the classroom environment provides ease of observation for the teacher also explained views as: "Especially in individual activities, you have the opportunity to follow students individually. In terms of developmental follow-up, I think it is good".

Difficulties in the Use of Mathematical Games According to Middle School Mathematics Teachers

The findings related to the seventh sub-problem of the study, "What are the views of middle school mathematics teachers on the difficulties in the use of mathematical games?" are given in Table 8. The difficulties encountered in the use of mathematical games were categorized under two themes: *difficulties encountered in the game design/planning process and difficulties experienced during the lesson.*

Table 8. Difficulties in the use of mathematical games

Theme	Code	*f*	Participant
Difficulties encountered in the game design/planning process	Designing appropriate games	2	T3, T6
	Concretizing	1	T12
	Designing intriguing games	1	T1
	Not being able to predict student reactions	1	T2
	Adjusting the game duration	1	T1
	Finding appropriate games	5	T5, T7, T8, T9, T13
	Accessing resources	1	T7
	Requiring labor	4	T2, T5, T9, T13
	Requiring cost	2	T4, T6
	Allocating time	11	T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13
Difficulties experienced during the lesson	Explaining/teaching the rules of the game	5	T1, T5, T6, T8, T10
	Ensuring concentration	1	T6
	Game management	10	T3, T5, T6, T7, T8, T9, T10, T11, T12, T13
	Making the lesson flow difficult	1	T1

According to Table 8, the difficulties experienced by teachers in the process of designing/planning games were coded as *designing appropriate games, concretizing, designing intriguing games, not being able to predict student reactions, adjusting the game duration, finding appropriate games, accessing resources, requiring labor, requiring cost, and allocating time*. The difficulties experienced during the lesson process were coded as *explaining/teaching the rules of the game, ensuring concentration, game management and making the lesson flow difficult*. While T10 emphasized the process required to prepare the game, he expressed his thoughts as follows: "In the games we use, preparing the material requires a process. We cannot say I will play a game with zero preparation. We cannot teach a lesson with zero preparation anyway. It has difficulties in this way, but as I said, after a while...". T9, who had difficulty in finding appropriate games in the game design/planning

process, associated this situation with the curriculum and grade levels and said: "It is also very difficult to find appropriate games. At every grade level, it can be impossible to complete the curriculum on time and make the lesson fun with games suitable for the curriculum. Sometimes, I think it is actually a challenging process in general, it requires labor and a lot of time".

According to Table 8, teachers stated that they had more difficulty in game management (f=10) during the lesson. Associating the difficulty in game management with the class size, T3 expressed her thoughts as follows: "I think this is the most difficult part if the class is crowded, controlling the class. It is much more difficult than teaching a normal lesson, the noise can be too much". Similar thoughts were expressed by T12; "We can lose control of the class, there can be a lot of noise. When there is a lot of noise, we may have difficulty in following the development of the students".

According to Table 8, another difficulty experienced during the lesson process was stated as explaining/teaching the game rules. T1 stated that explaining/teaching the game may cause confusion in the students and explained this situation as follows:

> *The most difficult situations for me are explaining and teaching the rules of the games to the students, because most of the time the students have difficulty in understanding. Because at the beginning, students come to us with a prejudice, they have difficulty in mathematics. We explain the subject, and when we give the rules of the game to the students, if these rules are a bit complicated, the students may break away, that is, they may have difficulty.*

Middle School Mathematics Teachers' Views on Students' Reactions to Mathematical Games

The findings related to the eighth sub-problem of the study, "What are the views of middle school mathematics teachers on students' reactions to mathematical games?" are given in Table 9.

Table 9. Students' reactions to mathematical games

Theme	***f***	**Participant**
Positive reactions	13	T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13
Negative reactions	6	T1, T3, T5, T6, T9, T10

According to Table 9, students' reactions were grouped under two themes: *positive reactions and negative reactions.* According to Table 9, all 13 teachers who participated in the study stated that students reacted positively to the use of mathematical games. Reactions such as happiness, excitement, joy, interest, and willingness were coded under the theme of positive reactions. T10 stated that students reacted positively to the use of mathematical games because they liked games and explained this situation as follows:

> *Children generally react positively to the games. But there is also such a situation, sometimes if they like a game, when we try to play another game, they may say, "Teacher, let's play the other game, you know, we played it last lesson, it was very good". So we may have a problem in choosing a game. But in general, when I say that we will play games in this lesson, I see that the children react positively. We don't get too many negative reactions, which is because they like to play games.*

According to Table 9, six teachers stated that students could react negatively as well as positively to the use of games. Here, reactions such as sadness, making noise, shyness and boredom were coded under the theme of negative reactions. Associating the negative reactions with the success of the students in the mathematics course, T1 expressed her views

as follows: “I think the students actually like it mostly. They are happy about it, but the student who does not understand, you know, the student with a low level of achievement, can be timid in the game because they already have difficulty in understanding the subject. We may encounter such a situation from time to time”.

Middle School Mathematics Teachers' Views on the Effects of Mathematical Games on Students

The findings related to the ninth sub-problem of the study, “What are the views of middle school mathematics teachers on the effects of using mathematical games on students?” are given in Table 10.

Table 10. Effects of mathematical games on students

Theme		Code	*f*	Participant
Effects on learning situations		Enables mental computation	1	T12
		Enables learning	12	T1, T2, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13
		Enables active participation	2	T5, T11
		Generates confusion	2	T1, T12
Effects on attitudes toward the lesson	Positive attitude development	Provides motivation	4	T1, T5, T8, T10, T12
		Increases interest in the lesson	4	T1, T3, T5, T7
		Makes students love mathematics	6	T2, T3, T4, T5, T7, T9
		Breaks prejudice against mathematics	3	T2, T11, T13
	Negative attitude development	Distracts from the lesson	5	T3, T6, T7, T10, T11
Effects on personal development		Provides empathy	1	T1
		Improves communication skills	9	T1, T3, T4, T5, T6, T7, T8, T9, T10
		Provides leadership qualities	3	T2, T4, T7
		Improves self-confidence	6	T5, T7, T8, T9, T11, T13
		Enables self-expression	3	T2, T6, T9
		Provides self-knowledge	3	T2, T3, T12
		Develops a sense of winning and losing	1	T3
		Develops a sense of solidarity	2	T3, T4
Effects on social development		Improves social skills	2	T1, T2, T8
		Allows to get to know each other	1	T2
		Enables collaboration	3	T2, T3, T4

The views of middle school mathematics teachers on the effects of mathematical games on students are presented in Table 10 under the themes *of effects on learning situations, effects on attitudes toward the lesson, effects on personal development and effects on social development.* According to Table 10, the effects of the use of mathematical games on students' learning situations were coded as: *Enables mental computation, enables learning, enables active participation, generates confusion.* According to Table 10, with the exception of one teacher, all other teachers stated that the use of mathematical games enabled learning. T11, who stated that mathematical games provided learning, expressed her thoughts as follows: "Learning becomes more permanent as the learning outcomes are put into practice". While T4 stated that mathematical games provide permanent learning, he also mentioned the positive effect of mathematical games on achievement. Here, permanent learning and success were coded as enabling learning. T4's views are given below:

> *It becomes easier to remember, easier to learn. I think that when the lesson they learned that day, when they make the acquisition playful, it is more permanent in the memories. Otherwise, we explained something and the child went home, it was a standard lesson, the possibility of forgetting it is much higher. But when there is a game, an experience, it increases permanence. I myself have witnessed that students compete with the other class over time, even if they were very low at the beginning, after three months, after five months, at the end of the year, and sometimes even get ahead.*

According to Table 10, the effects of mathematical games on students' attitudes toward the course were divided into two categories as *positive attitude development and negative attitude development*. Positive attitude development was coded as *provides motivation, increases interest in the lesson, makes students love mathematics, and breaks prejudice against mathematics*. On the other hand, negative attitude development was coded as *distracts from the lesson.* T3, who associated mathematical games to make students love mathematics and increase their interest in the lesson with the fun of the lesson, explained this situation as follows:

> *I think there must be students who don't like mathematics but they start to like it thanks to mathematical games. It is necessary to make the lesson more beautiful with this kind of fun activities instead of many ordinary, routine lessons, just telling the subject. Maybe this kinds of activities increased their interest in the lesson. They might have thought before, like "she is talking about it", but when we made them do this activity, they might think, "this lesson can be good, you can have fun in this lesson".*

According to Table 10, five teachers stated that mathematical games can develop negative attitudes and cause distraction from the lesson. T6, who thinks that the use of mathematical games has an effect on students such as developing negative attitudes, stated that students may be distracted from the lesson as follows: "*They believe that the lesson is distrupted, unfortunately they do not make any effort to learn the subject".*

According to Table 10, the effects of mathematical games on students' personal development were coded as *provides empathy, improves communication skills, provides leadership qualities, improves self-confidence, enables self-expression, provides self-knowledge, develops a sense of winning and losing, and develops a sense of solidarity*. For example, T6, who stated that mathematical games improve students' communication skills, explained this situation as follows:

> *I can bring together students who are less communicative, and if there are students who don't talk at all, at least they have an idea with group work. The student who is*

silent, who is completely isolated from the class, becomes a little more involved in the class thanks to the game.

According to Table 10, teachers stated that mathematical games affect social skills. The effects of mathematical games on social development were coded as *improves social skills, allows to get to know each other, and enables collaboration.* T1, who stated that mathematical games improve students' social skills, expressed her thoughts while associating social skills with group games as follows: "Games played with a group improve social skills more than games played individually".

Middle School Mathematics Teachers' Suggestions on Mathematical Games and the Use of Mathematical Games

In the last part of the interviews, teachers were asked for their suggestions on mathematical games and the use of mathematical games. The findings related to teachers' suggestions are presented in Table 11.

Table 11. Middle school mathematics teachers' suggestions on mathematical games and the use of mathematical games

Code	*f*	Participant
Material and resource support should be provided	5	T4, T5, T7, T12, T13
Curriculum and lesson hours should be regulated	4	T3, T7, T9, T13
Well-designed games should be used	2	T1, T8
Games should be used at lower grade levels	1	T8
Interactive games should be used	1	T10

According to Table 11, teachers' suggestions for mathematical games and the use of mathematical games were coded as: *material and resource support should be provided, curriculum and lesson hours should be regulated, well-designed games should be used, games should be used at lower grade levels, and interactive games should be used.* Suggesting the organization of the curriculum and lesson hours, T9 expressed her thoughts as follows: "If the curriculum and lesson hours is organized in a way that can include games, I think we can use games more effectively". Suggesting that well-designed games should be used, T8 expressed her thoughts as follows: "In my opinion, it is a well-planned game with well-defined rules, well-drawn framework, well-planned game; let's play, what are we going to play, what are the rules, what will happen if this happens, what will happen if that happens, we need to determine these well".

Discussion

In the study, the views of middle school mathematics teachers on the concept of mathematical games were investigated. In the definitions made, entertaining, intriguing and endearing mathematics were emphasized in the affective dimension. In the content dimension, they defined mathematical games as being related to daily life, involving mathematical operations/mathematics, involving the history of mathematics, and involving drama. In line with the findings, it was seen that teachers focused on the positive features of mathematical games in their definitions of mathematical games. From the definitions made by the teachers, it can be said that they have positive thoughts toward mathematical games, and the study conducted by Özata (2019) also supports this finding.

In the study, teachers' views on the relationship between the concepts of mathematics and games were also examined. As a result of the current study, the idea that mathematics and

games are seen as a part of our daily lives draws attention. It is seen that mathematics is present in simple or complex ways in the games played by human beings at all ages (Uğurel & Moralı, 2008).

In the study, the use of mathematical games by middle school mathematics teachers was examined. It was observed that all of the teachers used mathematical games in their lessons. It is seen that the games used by the teachers are mostly paper and pencil games and digital games. In the study conducted by Baran Kaya and Gökçek (2021), it was stated that teachers mostly preferred card games. Within the scope of digital games, the use of smart boards and EBA (Education Information Network) draws attention. It is important that the games preferred by teachers are easily accessible and easily applicable (Çil & Sefer, 2021; Doğan & Sönmez, 2019). In the study, teachers reported that they did not use mathematical games very often. Teachers explained the reason for this situation as difficulties in completing the curriculum on time and in allocating time. One of the main difficulties in using games in the classroom is the allocation of time due to the curriculum (Çil & Sefer, 2021). It was found that teachers used mathematical games mostly at the end of the lesson/subject. Teachers explain this situation with the idea that games can be used after the subject is learned.

When the grade levels at which teachers used mathematical games were examined, it was seen that games were used at all grade levels. However, it was observed that teachers mostly preferred to use games at the fifth and sixth grade levels. In the studies on mathematical games, it can be seen that the primary school group is predominant and the groups that have more interaction with games in their daily lives are the primary and middle school groups (Gözel & Toptaş, 2023; Uluçay & Çakır, 2014).

When the views of the teachers on the purposes of using mathematical games were examined, it was seen that teachers mostly used mathematical games to ensure active participation and to make the lesson fun. In the literature, there are studies indicating that mathematical games make the lesson fun, students participate more actively, and the lesson is more interesting (Çil & Sefer, 2021; Hoşgör, 2010; Kiili et al., 2014; Özata, 2019; Uluçay & Çakır, 2014). Fouze and Amit (2018) associated the use of games in mathematics teaching with the fact that children like games, that is, the things they like attract their attention.

In the current research, it was found that teachers preferred mathematical games to be intriguing and entertaining. This result can be associated with the fact that one of the purposes of using mathematical games is to attract attention. Research shows that mathematical games enable students to learn by having fun (Ayvaz Can, 2020; Fouze & Amit, 2018).

As a result of the research, it was seen that teachers thought that mathematical games were beneficial for learning. In the study conducted by Ateş and Bozkurt (2021), it was stated that mathematical games facilitate learning and provide permanent learning. Studies also show that mathematical games support mathematical development and improve learning (Alanazi, 2020; Cohrssen & Niklas, 2019; Maryani, 2019; Moyer et al., 2019).

Regarding the difficulties in using mathematical games, it was found that teachers had more difficulties in allocating time and game management. It is known that teachers have responsibilities such as controlling the game, observing the students and the environment for the use of educational games in mathematics teaching (Wood, 2009). All these responsibilities can be associated with teachers' classroom management. In this context, while teachers take an active role in the use of games in lessons, it is known that teachers generally have difficulty in classroom management for game use (Çil & Sefer, 2021). In addition, it was found that teachers also stated that they had difficulties in the game design/planning process. Fiorella et al. (2019) also emphasized the importance of designing appropriate games for

mathematical game use. Similarly, Bullock et al. (2021) stated that the design should be of high quality, especially in digital games.

As a result of the research, all of the teachers stated that students reacted positively to mathematical games. However, some of the teachers stated that students may also react negatively to mathematical games. Adıgüzel (2018) stated that students may be tense depending on winning and losing situations in educational games. It can be thought that this situation may cause negative reactions. As a result of the current research, in the opinions of the teachers regarding the benefits of mathematical games, it was stated that mathematical games provide learning. Similarly, many studies indicate that mathematical games increase permanent learning and success (Başün & Doğan, 2020; Canbay, 2012; Denli, 2021; Fajri, 2020; Ku et al., 2014). Similarly, teachers mostly stated that mathematical games develop positive attitudes and provide motivation. Rawansyah et al. (2021) also reported that mathematical games increase motivation and interest in the lesson. It was found that the majority of the teachers felt that mathematical games increase students' communication skills and provide self-confidence. In the study conducted by Ku et al. (2014), it was concluded that games positively affect self-confidence. In addition, it was also found that there were opinions that mathematical games improve social skills. Efe Kendüzler (2023) stated that mathematical games increase student-teacher interaction. In the study conducted by Darragh (2021), it was stated that mathematical games increased cooperation among students.

In the current research, middle school mathematics teachers' views on the concept of mathematical games in various dimensions were examined and it was seen that teachers had a general knowledge about the concept of mathematical games. It was determined that teachers used mathematical games at least once and reflected a positive views on mathematical games. It was seen that the teachers supported the idea that mathematical games are useful and have positive effects. It was concluded from the teachers' opinions that students like mathematical games and this situation is effective in developing positive attitudes toward mathematics. In this direction, it can be suggested to use mathematical games in the mathematics learning and teaching process. However, it was found that teachers experienced various difficulties in using mathematical games. In this direction, it can be suggested to provide support to teachers in overcoming these difficulties. Similarly, it can be suggested to create resources for teachers and students to access mathematical games easily.

References

Adıgüzel, Ö. (2018). *Eğitimde yaratıcı drama* [Creative drama in education]. Yapı Kredi Yayınları.

Alanazi, H. M. N. (2020). The effects of active recreational math games on math anxiety and performance in primary school children: An experimental study. *Multidisciplinary Journal for Education, Social and Technological Sciences, 7*(1), 89–112.

Altun, M. (2006). Matematik öğretiminde gelişmeler [Developments in mathematics teaching]. *Uludağ Üniversitesi Eğitim Fakültesi Dergisi, XIX (2),* 223–238.

Arroyo, I., Micciollo, M., Casano, J., Ottmar, E., Hulse, T. & Rodrigo, M. M. (2017). Wearable learning: Multiplayer embodied games for math. *In Proceedings of the Annual Symposium on Computer-Human Interaction in Play* (pp. 205–216).

Ateş, B. K. & Bozkurt, E. (2021). Oyunlarla matematik öğretimine ilişkin sınıf öğretmenlerinin görüşleri [Classroom teachers' views on teaching mathematics through games]. *Muallim Rıfat Eğitim Fakültesi Dergisi, 3*(2), 1–17.

Ayvaz Can, A. (2020). Sınıf öğretmeni adaylarının matematik oyunu kavramına ilişkin metaforik algıları [Primary school teacher candidates' metaphoric perceptions about mathematics games]. *Marmara Üniversitesi Atatürk Eğitim Fakültesi Eğitim Bilimleri Dergisi, 52*, 482–504.

Baas, B. (2020). *The perceptions and experiences of math anxiety* [Master thesis]. Dominican University of California. https://doi.org/10.33015/dominican.edu/2020.EDU.06

Baran Kaya, T. & Gökçek, T. (2021). Ortaokul matematik öğretmeni adaylarının matematik öğretimi için tasarladıkları oyunların farklı açılardan ele alınması [Analysis of games designed by the secondary school pre-service mathematics teachers]. *Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi Dergisi, 52,* 600–621.

Başün, A. R. & Doğan M. (2020). Matematik eğitiminde uygulanan oyunla öğretimin akademik başarıya ve kalıcılığa etkisi [The effect on academic success and permanence of teaching with game applied in mathematics education]. *Disiplinlerarası Eğitim Araştırmaları Dergisi, 4*(7), 155–167.

Broadhead, P. (2006). Developing an understanding of young children's learning through play: The place of observation, interaction and reflection. *British Educational Research Journal, 32*(2), 191–207.

Bullock, E. P., Roxburgh, A. L., Moyer-Packenham, P. S., Bektas, E., Webster, J. S., & Bullock, K. A. (2021). Connecting the dots: Understanding the interrelated impacts of type, quality and children's awareness of design features and the mathematics content learning goals in digital math games and related learning outcomes. *Journal of Computer Assisted Learning, 37*(2), *557–586.*

Canbay, İ. (2012). *Matematikte eğitsel oyunların 7. Sınıf öğrencilerinin öz-düzenleyici öğrenme stratejileri, motivasyonel inançları ve akademik başarılarına etkisinin incelenmesi* [Analysing the effects of educational games in mathematics on 7th grade students' self-regulatory strategies, motivational beliefs and academic achievements][Master thesis]. Marmara University.

Cohrssen, C. & Niklas, F. (2019). Using mathematics games in preschool settings to support the development of children's numeracy skills. *International Journal of Early Years Education, 27*(3), 322–339.

Creswell, J. W. (2013). Nitel araştırma yöntemleri: Beş yaklaşıma göre nitel araştırma ve araştırma deseni (Çeviri Editörleri: M. Bütün ve S. B. Demir). Siyasal Yayın Dağıtım.

Çakıroğlu, Ü., & Baki, A. (2016). Ortaöğretim matematik dersinde öğrenme nesneleri kullanımının öğrencilerin matematik dersine yönelik tutumlarına etkisi: Deneysel bir çalışma [Effect of using learning objects in secondary school mathematics course to the attitudes towards mathematics: An experimental study]. *Eğitim Teknolojisi Kuram ve Uygulama, 6*(2), 134–153.

Çelebi, M. (Ed.). (2021). *Nitel araştırma yöntemleri* [Qualitative research methods]. Pegem Akademi Yayıncılık.

Çil, O. & Sefer, F. (2021). Sınıf öğretmenlerinin oyun temelli matematik etkinliklerine yönelik görüşlerinin incelenmesi [The investigation of elementary school teachers'

opinions on game based mathematics activities]. *Trakya Eğitim Dergisi, 11(3),* 1366–1385.

Darragh, L. (2021). Playing maths games for positive learner identities. *Set: Research Information for Teachers, 1*, 36–42.

Delice, A., Ertekin, E., Aydin, E., & Dilmaç, B. (2009). An investigation of the relationship between epistemological beliefs and mathematics anxiety levels of student teachers. *Journal of Human Sciences, 6*(1), 361–375.

Demirbilek, M. & Tamer, S. L. (2010). Math teachers' perspectives on using educational computer games in math education. *Procedia Social and Behavioral Science, 9,* 709–716.

Denli, M. (2021). *Oyunlarla matematik öğretiminin tam sayılar konusunda ortaokul 7. sınıf öğrencilerinin matematik başarısına etkisi* [The effect of mathematics teaching with games on integers on mathematics achivement of 7 th grade student] [Master thesis]. Gazi University.

Doğan, Z. & Sönmez, D. (2019). İlkokul öğretmenlerinin matematiksel oyunların matematik derslerinde kullanılması süreçlerine ilişkin görüşleri [Opinions of primary school teachers about the process of using mathematical games in mathematics lessons]. *Marmara Üniversitesi Atatürk Eğitim Fakültesi Eğitim Bilimleri Dergisi, 50,* 96–108.

Efe Kendüzler, S. (2023). *Eğitsel oyun, matematik merkezinde oyun ve dijital oyunun çocukların matematik ve öz-düzenlemeli öğrenme becerilerine etkisi* [The effects of educational play, play in math center and digital play on the mathematics and self-regulated learning skills of children] [Doctoral dissertation]. Pamukkale University.

Fajri, N. (2020). Using fractional card media and math games to increase students' activities and learning outcomes. *Journal of Physics: Conference Series, 1539*(1).

Fiorella, L., Kuhlmann, S. & Vogel-Walcutt, J. J. (2019). Effects of playing an educational math game that incorporates learning by teaching. *Journal of Educational Computing Research, 57*(6), *1495–1512*.

Fouze, A. Q., & Amit, M. (2018). Development of mathematical thinking through integration of ethnomathematic folklore game in math instruction. *Eurasia Journal of Mathematics, Science and Technology Education, 14*(2), *617–630.*

Gözel, E. & Toptaş, V. (2023). Türkiye'de 2004-2022 yılları arasında ilkokul matematik öğretiminde eğitsel oyun kullanımı üzerine yapılmış çalışmaların incelenmesi. [Analysis of the studies carried out regarding the use of educational games in teaching primary school mathematics between 2004 and 2022 in Turkey]. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi, 24*(1), 570–614.

Hoşgör, A. (2010). *İlköğretim 1. sınıf öğretmenlerinin matematik derslerinde oyun etkinliklerinin kullanımına ilişkin görüşleri* [First grade primary school teachers' opinion about using game activities in mathematic courses] [Master thesis]. Çukurova University.

Ihendinihu, U. E. (2020). Effect of mathematics games on secondary school students'attitude to mathematics. *Journal of The Nigerian Academy of Education, 14*(1), 225–238.

Karadeniz, M. H. (2017). Geleneksel çocuk oyunlarının matematiğe uyarlanması ve uygulanması sürecindeki kazanım ve problemlere genel bir bakış [A general review of acquisitions and problems in the process of adapting and applying traditional children's games into maths]. *Kastamonu Eğitim Dergisi, 25*(6), 2245–2262.

Kiili, K., Ketamo, H., Koivisto, A. & Finn, E. (2014). Studying the user experience of a tablet based math game. *International Journal of Game-Based Learning, 4*(1), 60–77.

Ku, O., Chen, S. Y., Wu, D. H., Lao, A. C. & Chan, T. W. (2014). The effects of game-based learning on mathematical confidence and performance: High ability vs. low ability. *Journal of Educational Technology & Society, 17*(3), *65–78.*

Luttenberger, S., Wimmer, S. & Paechter, M. (2018). Spotlight on math anxiety. *Psychology Research and Behavior Management, 11*, 311–322.

Maryani, S. (2019). Math game for early childhood. *Jurnal Empowerment, 8*(1), 39–48.

Moyer Packenham, P. S., et al. (2019). How design features in digital math games support learning and mathematics connections. *Computers in Human Behaviar, 91,* 316–332.

Muntean, C. H., Mawas, N. E., Bradford, M. & Pathak, P. (2018). Investigating the impact of an immersive computer-based math game on the learning process of undergraduate students. *2018 IEEE Frontiers in Education Conference (FIE*).

Özata, M. (2019). *Ortaokul matematik eğitiminde eğitsel matematik oyunlarının kullanılabilirliği üzerine öğretmen ve öğretmen adaylarının görüşleri* [Teaching and teacher candidates' opinions on the usability of educational mathematics in secondary education] [Master thesis]. Mersin University.

Pan, Y., Ke, F., & Xu, X. (2022). A systematic review of the role of learning games in fostering mathematics education in K-12 settings. *Educational Research Review, 36,* 100448.

Ramirez, G., Hooper, S. Y., Kersting, N. B., Ferguson, R., & Yeager, D. (2018). Teacher math anxiety relates to adolescent students' math achievement. *AERA open,* 4(1).

Rawansyah, R., Pramudhita, A. N., & Pramitarini, Y. (2021). Enhancing student interest in learning through the development of serious mathematics games. *In IOP Conference Series: Materials Science and Engineering, 1073*(1).

Smith, H. (2020). Learning through games: How math games can enhance education [Master thesis]. Worcester Polytechnic Institute.

Topbaş Tat, E. (2021). Matematiğe yönelik tutum [Attitude toward mathematics]. E. Ertekin & B. Dilmaç (Ed.), *Matematiğin Duyuşsal Özellikleri*. Pegem Akademi.

Topçu, H., Küçük, S. & Göktaş, Y. (2014). Sınıf öğretmeni adaylarının ilköğretim matematik öğretiminde eğitsel bilgisayar oyunlarının kullanımına yönelik görüşleri. [Views of elementary school pre-service teachers about the use of educational mathematics

games in mathematics teaching]. *Turkish Journal of Computer and Mathematics Education 5*(2), 119–136.

Tuncer, M. & Yılmaz, Ö. (2016). Ortaokul öğrencilerinin matematik dersine yönelik tutum ve kaygılarına ilişkin görüşlerinin değerlendirilmesi [An evaluation of the secondary school students' opinions on attitudes and anxieties towards mathematics class]. *KSÜ Sosyal Bilimler Dergisi*, *13*(2), 47–64.

Tural Sönmez, M. (2012). *6. sınıf matematik derslerinde web üzerinden sunulan eğitsel matematik oyunlarının öğrenci başarısına etkisi* [The effects of instruction with web based games on sixth grade students' academic achievement in "fractions and decimals " subject in mathematics lesson] [Master thesis]. Çukurova University.

Uçar, Z. T. (2011). Öğretmen adaylarının pedagojik içerik bilgisi: Öğretimsel açıklamalar. [Preservice teachers' pedagogical content knowledge: Instructional explanations]. *Turkish Journal of Computer and Mathematics Education (TURCOMAT), 2*(2), 88–102.

Uçar, Z. T., Pişkin, M., Akkaş, E. N. & Taşçı, D. (2010). İlköğretim öğrencilerinin matematik, matematik öğretmenleri ve matematikçiler hakkındaki inançları. [Elementary students' beliefs about mathematics, mathematics' teachers and mathematicians]. *Eğitim ve Bilim*, *35*(155), 131–144.

Uğurel, I. & Moralı, S. (2008). Matematik ve oyun etkileşimi [The interaction of mathematics & game]. *GÜ, Gazi Eğitim Fakültesi Dergisi*, *28*(3), 75–98.

Uluçay, İ. S., & Çakır, H. (2014). İnteraktif oyunların matematik öğretiminde kullanılması üzerine araştırmaların incelenmesi [Review of research on interactive games as a teaching environment for mathematics]. *Eğitim Teknolojisi Kuram ve Uygulama*, *4*(1), 13–34.

Ünveren Bilgiç, E. N., (2021). İlköğretim matematik öğretmen adaylarının eğitsel matematik oyun tasarlama ve uygulama deneyimleri [The experiences of primary school mathematics teacher candidates in designing and implementing educational mathematics games]. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi, 22(3),* 2090–2127.

Yıldırım, A. & Şimşek, H. (2021). *Sosyal bilimlerde nitel araştırma yöntemleri* [Qualitative research methods in social sciences]. Seçkin Yayıncılık.

Yıldız Durak, H. (2019). Matematik öğretmenliği öğretmen adaylarının oyun algıları ve oyunların matematik eğitimine entegrasyonu ile ilgili görüşlerinin incelenmesi. [Investigation of mathematics teacher candidates' perceptions of games and their views on the integration of games into mathematics education]. *In Book of Proceedings ERPA International Congress on Education 2019* (p. 122).

Weissgerber, S. C., Grünberg, C., Neufeld, L., Steppat, T., & Reinhard, M. A. (2022). The interplay of math anxiety and math competence for later performance. *Social Psychology of Education, 25*(4), 977–1002.

Weng, T. (2022). Life-oriented Math Game Design. *In Proceedings of the 2022 5th International Conference on Education Technology Management* (pp. 70-76).

Wood, E., (2009). Developing a pedagogy of play. *Early Childhood Education: Society and Culture,* 27–38.

Zhang, J., Zhao, N., & Kong, Q. P. (2019). The relationship between math anxiety and math performance: A meta-analytic investigation. *Frontiers in psychology, 10*, 1613.

Zivkovic, M., Pellizzoni, S., Doz, E., Cuder, A., Mammarella, I., & Passolunghi, M. C. (2023). Math self-efficacy or anxiety? The role of emotional and motivational contribution in math performance. *Social Psychology of Education,* 1–*23.*

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The Turkish Form of the Career Exploration and Decision-Making Learning Experiences Scale: Validity and Reliability Studies

Ersoy Çarkıt[1]*, Sami Kırteke[2]

Abstract

The role of past career exploration and decision-making learning experiences in the career exploration and decision-making process as facilitators or hinderers is theoretically known. However, empirical support for the role of past career exploration and decision-making learning experiences in the career exploration and decision-making process is limited due to the lack of a valid and reliable measurement tool. Therefore, this study aims to examine the validity and reliability of the Career Exploration and Decision-Making Learning Experiences Scale Turkish form. In this context, two separate studies were conducted. Study 1 included 310 undergraduate students (248 female and 62 male). In Study 1, confirmatory factor analysis was conducted to validate the factor structure of the Turkish version of the Career Exploration and Decision-Making Learning Experiences Scale. Study 2 included 340 undergraduate students (235 female and 105 male). In Study 2, multiple linear regression analyses were performed to examine the predictive role of career exploration and decision-making learning experiences on self-efficacy and outcome expectations related to the same behavioural domain. The findings of Study 1 confirmed the five-factor structure (mastery experiences, verbal persuasion, vicarious learning, positive emotion, and negative emotion) of the Turkish version of the Career Exploration and Decision-Making Learning Experiences Scale. The Cronbach's alpha values for the Turkish version of the scale were adequate in Study 1 and 2. The results of Study 2 indicated that mastery experiences, vicarious learning, and positive emotion positively predicted both self-efficacy and outcome expectations. Additionally, negative emotion was found to predict outcome expectations positively. The results are discussed in the light of the relevant literature, and limitations and recommendations are presented.

Keywords: learning experiences, career exploration and decision-making, self-efficacy, outcome expectations

Kariyer Araştırma ve Karar Verme Öğrenme Deneyimleri Ölçeği Türkçe Formu: Geçerlik ve Güvenirlik Çalışmaları

Özet (Türkçe)

Kariyer araştırma ve karar verme sürecinde, bu sürece ilişkin geçmiş öğrenme deneyimlerinin kolaylaştırıcı veya engelleyici rolü kuramsal olarak bilinmektedir. Ancak, kariyer araştırma ve karar verme sürecinde, bu sürece ilişkin geçmiş öğrenme deneyimlerinin rolüne ilişkin ampirik destek, geçerli ve güvenilir bir ölçme aracı eksikliğinden sınırlıdır. Bu nedenle, bu çalışmanın amacı Kariyer Araştırma ve Karar Verme Öğrenme Deneyimleri Ölçeği Türkçe formunun geçerlik ve güvenirliğini incelemektir. Ayrıca kariyer araştırma ve karar verme öğrenme deneyimlerinin aynı davranışsal alana ilişkin öz yetkinlik ve sonuç beklentilerini yordayıcı rolünü incelemek de amaçlanmıştır. Bu bağlamda, iki ayrı çalışma yürütülmüştür. Çalışma 1'de 310 lisans öğrencisi (248 kadın ve 62 erkek) bulunmaktadır. Çalışma 1'de Kariyer Araştırma ve Karar Verme Öğrenme Deneyimleri Ölçeği Türkçe formunun faktör yapısının doğrulanması için doğrulayıcı faktör analizi yapılmıştır. Çalışma 2'de 340 lisans öğrencisi (240 kadın ve 105 erkek) bulunmaktadır. Çalışma 2'de ise kariyer araştırma ve karar verme öğrenme deneyimlerinin aynı davranışsal alana ilişkin öz yetkinlik ve sonuç beklentilerini yordayıcı rolünü incelemek için çoklu doğrusal regresyon analizleri yapılmıştır. Çalışma 1'in sonuçları Türkçe Kariyer Araştırma ve Karar Verme Öğrenme Deneyimleri Ölçeği'nin ilişkili beş faktörlü (başarılı performanslar, sözel ikna, dolaylı öğrenme, pozitif duygu ve negatif duygu) yapısını doğrulamıştır. Kariyer Araştırma ve Karar Verme Öğrenme Deneyimleri Ölçeği Türkçe formunun Cronbach alfa değerleri Çalışma 1 ve Çalışma 2'de yeterli bulunmuştur. Çalışma 2 sonuçları başarılı performanslar, dolaylı öğrenme ve pozitif duygu öz yetkinliği ve sonuç beklentilerini pozitif yönde yordadığını göstermiştir. Ayrıca negatif duygu sonuç beklentilerini pozitif olarak yorduyordu. Sonuçlar ilgili literatür çerçevesinde tartışılmış, sınırlılıklar ve öneriler sunulmuştur.

Anahtar Kelimeler: öğrenme deneyimleri, kariyer araştırma ve karar verme, öz yetkinlik, sonuç beklentileri

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* Corresponding author

[1] Dr., Nevşehir Hacı Bektaş Veli University, Türkiye, ersoy.12@hotmail.com
[2] Dr., 100th Year Vocational Education Center, Konya, Türkiye, samikirteke44@gmail.com

Introduction

Career exploration and decision-making represent a pivotal developmental task for university students (Super et al., 1996). This process, however, is frequently accompanied by challenges (Levin et al., 2024). These challenges manifest in various forms, including career barriers (Ulaş & Kızıldağ, 2018), indecision (Demirtaş-Zorbaz et al., 2023), anxiety (Brown et al., 2012; Hacker et al., 2013), and engagement in career exploration and decision-making behaviours (Lent et al., 2019). Addressing these challenges necessitates the cultivation of individuals' career exploration and decision-making self-efficacy (Betz et al., 1996; Lent & Brown, 2013). Career exploration and decision-making self-efficacy refers to an individual's belief in their abilities to perform career exploration and decision-making tasks (Lent et al., 2016). Career exploration and decision-making self-efficacy can benefit individuals by enabling them to take an active role in the career process (Bike, 2013). Research has indicated that individuals with high self-efficacy in career exploration and decision-making tend to exhibit greater career decidedness (Çarkıt, 2024a; Lent et al., 2016; Li et al., 2019; Penn & Lent, 2019). Furthermore, individuals who possess this confidence are more inclined to establish career exploration intentions (Çarkıt, 2024a; Lent et al., 2017) and engage in career exploration behaviours (Lent et al., 2019). Conversely, low levels of career exploration and decision-making self-efficacy have been associated with decision-making anxiety (Morris & Lent, 2023; Penn & Lent, 2019) and career indecision (Büyükgöze-Kavas, 2011; Choi et al., 2012; Öztemel, 2012). These studies generally demonstrate that self-efficacy facilitates career exploration and decision-making, underscoring the importance of promoting it for university students.

Learning experiences are important in developing self-efficacy in career exploration decision-making (Lent & Brown, 2013). Bandura (1986) conceptualizes learning experiences as sources of self-efficacy and defines them in four categories: mastery experiences, verbal persuasion, vicarious learning, and emotional arousal. Mastery experiences refer to past experiences performing tasks in a specific behavioural domain (Bandura, 1986). Verbal persuasion refers to the encouragement and prompting of individuals by significant others to perform tasks in a particular behavioural domain (Bandura, 1997). Vicarious learning refers to the experiences that individuals gain from observing role models performing the target behaviours (Bandura, 1986). Finally, emotional arousal refers to the positive and negative emotions an individual feels while performing tasks related to a specific behavioural domain (Bandura, 1977). As a result, people feel competent by remembering their past successful experiences in certain behavioural domains, being appreciated and encouraged by significant others while performing these behaviours, observing role models who exhibit the same behaviours, and feeling more positive emotions and less negative emotions while performing these behaviours (Bandura, 1986). Bandura argued that the most powerful learning experience that informs self-efficacy is mastery experiences.

Learning experiences constitute an important variable group of the Social Cognitive Career Theory (SCCT; Lent & Brown, 2013; Lent et al., 1994), which is rooted in Bandura's (1986) Social Cognitive Theory. Lent et al. (1994) expand Bandura's (1986) hypothesis by proposing that learning experiences inform not only self-efficacy but also outcome expectations. Therefore, self-efficacy and outcome expectations shape and cultivate thanks to positive learning experiences. Consequently, learning experiences are recognized as a pivotal source of self-efficacy and outcome expectations (Lent et al., 1994). Following other variables of the SCCT, learning experiences are defined and measured to specific behavioural domains. Career exploration and decision-making learning experiences refer to individuals' mastery

experiences related to their past career exploration and decision-making experiences, verbal encouragement received from their environment in this process, indirect learning experiences, and positive and negative emotions felt in this process (Lent et al., 2017). The SCCT assumes that career exploration and decision-making learning experiences affect the career exploration and decision-making process by strengthening or weakening self-efficacy and outcome expectations (Lent & Brown, 2013).

Since there is a limited number of measurement tools in the literature on career exploration and decision-making learning experiences, the role of this variable group in the SCCT models and the career decision-making process has not been sufficiently studied (Lent et al., 2017). Bike (2013) developed the Career Decision Learning Experiences Scale. However, this scale does not fully capture the behavioural domain of career decision-making in terms of content. To facilitate the SCCT studies on the career exploration and decision-making process, Lent et al. (2017) developed the Career Exploration and Decision-Making Learning Experiences Scale for university students. The CEDLES is grounded in Bandura's (1986) Social Cognitive Theory and Lent et al.'s (1994) classification of learning experiences (mastery experiences, verbal persuasion, vicarious learning, and emotional arousal) in the SCCT. The CEDLES include a five-factor structure, encompassing mastery experiences, verbal persuasion, vicarious learning, positive emotion, and negative emotion (Ireland & Lent, 2018; Lent et al., 2017). The scale was developed for a sample of university students in the United States. In addition, the scale was found to be both valid and reliable when administered to a sample of Chinese university students (Zhou & Xu, 2022). In accordance with the results of the scale development study conducted by Lent et al. (2017), Zhou and Xu (2022) reported in their scale adaptation study that mastery experiences, verbal persuasion, vicarious learning, and positive emotion were positively associated with self-efficacy, outcome expectations, and social support. In contrast, negative emotion was negatively associated with these variables.

The CEDLES (Lent et al., 2017) has frequently been employed to test the SCCT Career Self-Management Model (Lent & Brown, 2013). In accordance with the assumptions of the SCCT, previous studies have demonstrated that career exploration and decision-making learning experiences facilitate the career decision-making process (Lent et al., 2017). For instance, these learning experiences are related to self-efficacy and outcome expectations regarding career exploration and decision-making (Ireland & Lent, 2018; Lent et al., 2017). Furthermore, mastery experiences in career exploration and decision-making are a positive predictor of self-efficacy (Ireland & Lent, 2018; Lent et al., 2017). In addition, positive emotion has been found to predict self-efficacy positively, while negative emotion has been found to predict it negatively. Similarly, vicarious learning and positive emotion have been shown to positively influence positive outcome expectancies, while negative emotion has been demonstrated to negatively predict them (Ireland & Lent, 2018; Lent et al., 2017). Similarly, Lent et al. (2019) reported that mastery experiences and positive emotions positively predicted career exploration and decision-making self-efficacy. According to the SCCT, learning experiences are influenced by individual inputs, such as gender roles, and contextual factors, such as social support and barriers (Lent et al., 1994). This proposition is supported by findings that learning experiences mediate the relationship between the perception of social support with self-efficacy and outcome expectations (Ireland & Lent, 2018). Furthermore, learning experiences have been found to mediate the relationship among personality traits, including neuroticism, conscientiousness, extraversion, self-efficacy, and outcome expectations (Ireland & Lent, 2018). Additionally, mastery experiences and positive emotions have been demonstrated to predict career decidedness, both directly and indirectly, through self-efficacy (Lent et al., 2017, 2019). The extant studies summarized above

underscore the importance of career exploration and decision-making learning experiences for the career development process, and they also indicate that the CEDLES facilitates research on career exploration and decision-making.

The Present Study

The present study focuses on learning experiences related to the behavioural domain of career exploration and decision-making. In Türkiye, the Mathematics Self-Efficacy Expectancy Informational Sources Scale (Özyürek, 2002, 2010) was developed for a sample of high school students. Additionally, the Engineering Learning Experiences Scale, a tool developed by Garriott et al. (2021), was adapted into Turkish by Gerçek et al. (2023) for a sample of engineering undergraduate students. Özyürek's (2002, 2010) scale assesses the sources of confidence in high school students' mathematics ability (Özyürek, 2005). The Engineering Learning Experiences Scale (Garriott et al., 2021) assesses undergraduate engineering students' perceptions of their learning experiences in engineering majors. The behavioural domains that these scales focus on (i.e., the behavioural domains of learning mathematics and engineering, respectively) differ from the behavioural domains focused on in the current study (i.e., career exploration and decision-making). To date, no scale has been found in Türkiye that specifically assesses undergraduate students' career exploration and decision-making learning experiences. Consequently, the extant literature on career exploration and decision-making learning experiences in Türkiye remains limited. Furthermore, as previously mentioned, extant studies have yielded mixed results concerning the association between career exploration and decision-making learning experiences and self-efficacy, as well as outcome expectations.

This study aims to conduct validity and reliability studies of the CEDLES developed by Lent et al. (2017) with a sample of Turkish university students. The aim was also to examine whether career exploration and decision-making learning experiences predict self-efficacy and outcome expectations in the same behavioural domain. To this end, two distinct studies were conducted. Study 1 examined the validation of the five-factor correlational structure of the CEDLES with data collected from Turkish undergraduate students. Study 2 examined the predictive role of career exploration and decision-making learning experiences on self-efficacy and outcome expectations in the same behavioural domain. In other words, Study 2 examines whether career exploration and decision-making learning experiences predict self-efficacy (Research Question 1) and outcome expectations (Research Question 2) in a sample of Turkish undergraduate students. Based on the literature summarized above and SCCT (Lent & Brown, 2013), mastery experiences, verbal persuasion, vicarious learning, and positive emotion were expected to predict self-efficacy positively, while negative emotion was expected to predict it negatively. Similarly, mastery experiences, verbal persuasion, vicarious learning, and positive emotion were expected to positively predict outcome expectations, whereas negative emotion was expected to predict them negatively. The present study's findings are expected to contribute to the advancement of knowledge regarding career exploration and decision-making and offer implications for practice, given the malleable nature of learning experiences. Specifically, CEDLES can be used to identify learning experiences that influence the career exploration and decision-making process of Turkish university students. Furthermore, the CEDLES can be utilized by researchers and psychological counsellors operating within university counselling or career development centres.

Study 1
Method

Participants

The participants in this study comprised 310 undergraduate students from a state university, with 248 identifying as female and 62 as male. The participants were selected through a convenience sampling method. The age of the participants ranged from 18 to 34 years old (mean = 21.16, standard deviation = 2.22). The decision to employ convenience sampling was predicated on its advantageous characteristics concerning temporal, financial, and logistical constraints. The participants were categorized as follows: 62 were first-year students (20%), 60 were second-year students (19.4%), 98 were third-year students (31.6%), and 90 were fourth-year students (29%). Furthermore, the participants' socioeconomic status was assessed, revealing that 15 individuals reported having a lower socioeconomic status (4.8%), 30 individuals reported having a below-middle socioeconomic status (9.7%), 219 individuals reported having a middle socioeconomic status (70.6%), 42 individuals reported having an above-middle socioeconomic status (13.5%), and four individuals reported having a very high socioeconomic status (1.3%).

Measure

The Career Exploration and Decision-Making Learning Experiences Scale (CEDLES). The CEDLES was developed by Lent et al. (2017) to assess learning experiences related to the behavioural domain of career exploration and decision-making based on Bandura's (1997) concept of learning experiences. The scale comprises five subscales, each comprising four items: mastery experiences, verbal persuasion, vicarious learning, positive and negative emotion. Participants are instructed to respond to each item on a 5-point Likert scale, ranging from *strongly disagree* (1) to *strongly agree* (5). Participants respond to the positive and negative emotion items on a Likert scale ranging from *very little or not at all* (1) to *very much* (5). The five-factor correlational model demonstrated a good fit for the data, as evidenced by the following statistical indices: $\chi 2 = 240.55$, df = 160, CFI = .97, RMSEA = .04, and SRMR = .06. The subscales of the CEDLES demonstrated a positive correlation with self-efficacy. The Cronbach's alpha values of the subscales ranged between .80 and .89 (Ireland & Lent, 2018; Lent et al., 2017).

Translation Procedure

Translating the CEDLES into Turkish, the translation process suggested by Ægisdóttir et al. (2008) was followed. The items of the CEDLES were translated into Turkish independently by the two experts. Two experts came together and compared the two translations. As a result of the comparison, it was seen that the translations were mostly similar. A comparative analysis of the resulting translations led to a consensus on the most suitable translation. A subsequent comparison of the original form and its Turkish translation revealed that the latter was suitable for utilization. Subsequently, a group of university students (n = 8) from the study group was consulted to assess the comprehensibility and cultural appropriateness of the items. The analysis revealed no significant issues, necessitating no modifications to the items.

Data Collection

The data were collected using Google Forms. Following the thorough review of a page elucidating the aim of the study, all participants provided their consent. The participants were

informed that they were free to withdraw from the study at any participation stage and that their responses were voluntary. The scale was completed in an average time of approximately five to six minutes. The study was conducted to assess the validity and reliability of the CEDLES, and permission was obtained from the scale's developer prior to its implementation.

Data Analysis

The data were analyzed using the statistical software AMOS and SPSS. Confirmatory factor analysis (CFA) was conducted to evaluate the fit of the five-factor structure of the scale with the data. It is emphasized that five to 10 times the number of estimated parameters is adequate for CFA (Worthington & Whittaker, 2006). In this model, the number of estimated parameters was 50. Therefore, since the number of participants was more than six times the estimated parameters, it was deemed adequate. The goodness of fit of the model was determined by the cut-off values established by Tabachnick & Fidell (2013) for CFI and TLI (i.e., ≥ .90) and RMSEA and SRMR (i.e., ≤ .08). The skewness kurtosis values of all items were within ±1.5. These values indicated a normal distribution (Tabachnick & Fidell, 2013). Therefore, CFA was executed with maximum likelihood. Additionally, Cronbach's alpha coefficient was calculated to determine the internal consistency of the scale.

Results

First, a single-factor structure was tested. For this, CFA was conducted by loading all items on a single latent variable. The one-factor model did fit the data poorly: $\chi 2 = 1078.738$, df = 170, CFI = .67, TLI = .63, RMSEA = .132, and SRMR = .114. The five-factor relational model fit perfectly with the data: $\chi 2 = 245.710$, df = 160, CFI = .97, TLI = .96, RMSEA = .042, and SRMR = .050. In the five-factor correlational model, all items loaded significantly on the relevant factors at $p < .001$, and item factor loadings ranged from .34 to .87. CFA results for the five-factor correlational model are presented in Figure 1.

The internal consistency coefficients of the subscales of the Turkish CEDLES were $\alpha = .78$ for mastery experiences, $\alpha = .89$ for verbal persuasion, $\alpha = .85$ for vicarious learning, $\alpha = .73$ for positive affect, and $\alpha = .81$ for negative affect.

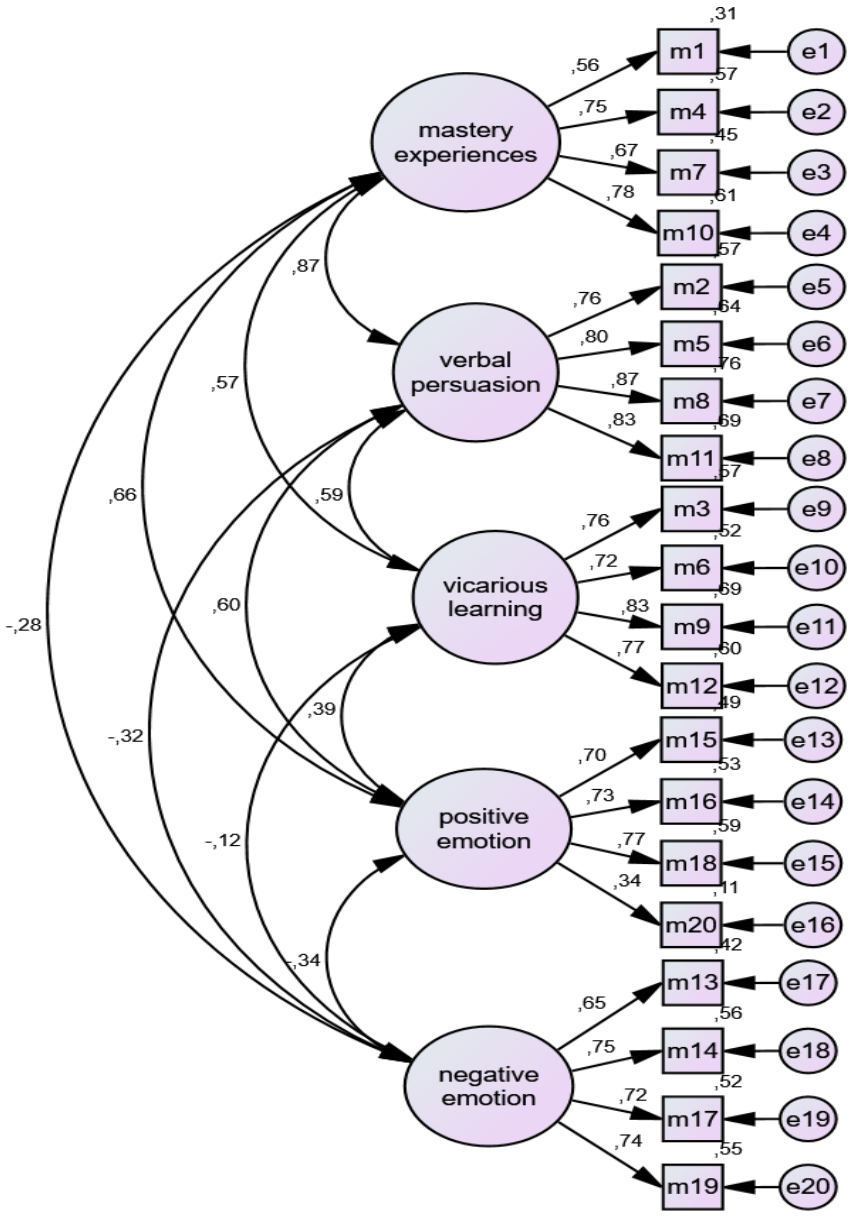

Figure 1. Five-factor correlational model

Study 2
Method

Participants

Participants were 340 (235 female and 105 male) undergraduate students from a state university selected by convenience sampling. The age of the participants ranged between 18 and 35 (Mean = 21.17, Standard Deviation = 2.80). The convenience sampling method was preferred due to its benefits in terms of time, cost, and effort. Of the participants, 91 were first-year students (26.8%), 116 were second-year students (34.1%), 64 were third-year students (18.8%) and 64 were fourth-year students (18.8%). Five (1.5%) students stated they were in the foreign language preparatory class.

Measure

In Study 2, the following scales were used with the Turkish form of the CEDLES created in Study 1.

The Career Exploration and Decision Self-Efficacy Scale. Self-efficacy was measured using the Turkish version (Çarkıt, 2024a) of the Career Exploration and Decision Self-Efficacy Scale (Lent et al., 2016). The scale consists of two subscales (brief decision-making and coping) and 12 items. In this study, the eight-item brief decisional self-efficacy subscale of the scale was used. Participants answered the items on a 5-point Likert scale ranging from 0 = *not at all confident* to 4 = *completely confident*. The scale was found to be a good fit for a sample of Turkish undergraduate students: $\chi 2 = 127.58$, df = 53, CFI = .94, TLI = .93, RMSEA = .07, and SRMR = .05. The Turkish Career Exploration and Decision Self-Efficacy Scale was positively related to outcome expectations and career decidedness and had high internal consistency ($\alpha = .92$) (Çarkıt, 2024a). With the present data, the α value of the scale was found to be .92.

The Career Decision-Making Outcome Expectations Scale. Outcome expectations were measured using the Turkish version (Çarkıt, 2024b) of the Career Decision-Making Outcome Expectations Scale (Betz & Voyten, 1997; Lent et al., 2017). The scale has eight items and is unidimensional. Participants answer the items on a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5). The scale was found to be a good fit for a sample of Turkish undergraduate students: $\chi 2 = 56.48$, df = 20, CFI = .97, TLI = .96, RMSEA = .07, and SRMR = .02. The Turkish Career Decision-Making Outcome Expectations Scale was positively related to self-efficacy and exploration intentions and was found to have high internal consistency ($\alpha = .92$) (Çarkıt, 2024b). With the present data, the α value of the scale was .93.

Data Collection

The data collection process of Study 2 was the same as the data collection process of Study 1. Data were collected through Google Forms. All participants approved the informed consent form after reading a page about the purpose of the study. All participants answered the set of scales voluntarily and were aware that they were free to withdraw at any participation stage. Participants took approximately 10 minutes to answer the scale.

Data Analysis

The collected data were analyzed using SPSS. Multiple linear regression analysis was conducted to examine the level of prediction of career exploration and decision-making learning experiences on self-efficacy and outcome expectations related to the same behavioural domain. The required sample size calculation for multiple linear regression analysis was made with the G Power program. The results showed that 138 participants were needed for five predictor variables, a medium effect size (.15), and a significance level of .05. Therefore, the current sample size was adequate for multiple linear regression analysis. The assumption of normality was assessed by calculating the skewness and kurtosis values of the variables (see Table 1). As the skewness and kurtosis values were found to be between ±1.5, it was determined that the assumption of a normal distribution was not violated (Tabachnick & Fidell, 2013). The multicollinearity assumption was assessed by examining the Variance Inflation Factors (VIF) values. The VIF values ranged from 1.09 to 2.17. As the VIF value

was less than 10, it can be concluded that there is no multicollinearity problem. Finally, the risk of autocorrelation was examined by calculating the Durbin-Watson coefficient. The Durbin-Watson coefficient was found to be 1.82 and 2.07. As the Durbin-Watson coefficient is close to 2, the probability of autocorrelation among error terms is negligible (Tabachnick & Fidell, 2013).

Results

Table 1 presents the results of the correlation analysis and the descriptive statistics. Four subscale scores (mastery experiences, verbal persuasion, vicarious learning, and positive emotion) exhibited a positive relationship with self-efficacy, while the negative emotion subscale demonstrated a negative association. Furthermore, the four previously mentioned subscale scores (mastery experiences, verbal persuasion, vicarious learning, and positive emotion) were positively related to outcome expectancies.

Table 1. The relationships among study variables and descriptive statistics

Variables	1	2	3	4	5	6	*7*
1. Mastery experiences	(.77)						
2. Verbal persuasion	.64**	(.83)					
3. Vicarious learning	.49**	.49**	(.84)				
4. Positive emotion	.56**	.40**	.39**	(.69)			
5. Negative emotion	-.25**	-.17**	-.09	-.24**	(.79)		
6. Self-efficacy	.69**	.51**	.52**	.52**	-.20**	(.92)	
7. Outcome expectations	.37**	.23**	.31**	.30**	.05	.38**	(.93)
M	3.73	3.57	3.53	3.46	3.11	2.89	4.08
SD	.76	.83	.96	.79	.95	.75	.80
Skewness	-.69	-.59	-.54	-.30	-.12	-1.02	-.102
Kurtosis	.99	.50	-.18	.30	-.66	1.79	1.11

**$p < .01$. The Cronbach's alpha values are presented in parentheses on the diagonal.

Multiple linear regression analysis was conducted to test whether career exploration and decision-making learning experiences could predict self-efficacy for career exploration and decision-making. Multiple linear regression analysis was conducted, with all variables entered into the analysis simultaneously. Table 2 presents the findings of this regression analysis.

Table 2. Prediction of self-efficacy

Model	*B*	*SE*	β	*t*	*p*
Constant	.01	.21		.04	.972
Mastery experiences	.47	.05	.48	8.79	.000
Verbal persuasion	.04	.05	.04	.82	.416
Vicarious learning	.16	.04	.21	4.61	.000
Positive emotion	.14	.04	.15	3.185	.002
Negative emotion	-.02	.03	-.02	-.59	.553

$F = 78.456$; $R^2 = .540$; $\Delta R^2 = .533$; $p = .000$

The findings indicated that the regression model demonstrated statistical significance ($F = 78.456$, $p < .001$). The regression model accounted for 53% of the variance in self-efficacy within the same behavioural domain. The regression model revealed that mastery experiences

(β = .48, $p < .001$), vicarious learning (β = .21, $p < .001$), and positive emotion (β = .15, $p < .01$) significantly predicted self-efficacy, while verbal persuasion (β = .04, $p > .05$) and negative emotion (β = -.02, $p > .05$) did not.

In order to determine whether career exploration and decision-making learning experiences can predict outcome expectations regarding career exploration and decision-making, a multiple linear regression analysis was conducted, all variables were entered into the analysis simultaneously. Table 3 presents the findings of the regression analysis.

Table 3. Prediction of outcome expectations

Model	*B*	*SE*	β	*t*	*p*
Constant	1.80	.29		6.15	.000
Mastery experiences	.31	.08	.30	4.12	.000
Verbal persuasion	-.06	.06	-.06	-.92	.360
Vicarious learning	.14	.05	.16	2.73	.007
Positive emotion	.13	.06	.13	2.07	.039
Negative emotion	.13	.04	.15	2.98	.003

$F = 15.790$; $R^2 = .191$; $\Delta R^2 = .179$; $p = .000$

The findings indicated that the regression model demonstrated statistical significance ($F = 15.790$, $p < .001$). The regression model explained approximately 18% of the outcome expectations related to the same behavioural domain. The regression model revealed that mastery experiences (β = .30, $p < .001$), vicarious learning (β = .16, $p < .01$), positive emotions (β = .13, $p < .05$), and negative emotions (β =.15, $p < .01$) significantly predicted outcome expectancies, while verbal persuasion did not (β = -.06, $p > .05$).

Conclusion and Discussion

The present study examined the factor structure and reliability of the Turkish version of the CEDLES. The results indicate that the Turkish version of the CEDLES is a suitable instrument for assessing Turkish university student's career exploration and decision-making learning experiences, thereby substantiating the factor structure and theoretical underpinnings of the original study (Lent et al., 2017). Additionally, the findings indicated that career exploration and decision-making learning experiences accounted for a substantial proportion of the variance in self-efficacy and outcome expectancies within the same behavioural domain.

Confirmatory factor analysis results showed that the Turkish version of CEDLES had five correlated factors consistent with the original scale (Ireland & Lent, 2018; Lent et al., 2017). The findings indicated that the five-factor structure of the CEDLES Turkish version exhibited an optimal fit with the data and was more suitable than the one-factor model. These outcomes are consistent with the theoretical underpinnings of the CEDLES framework (Bandura, 1997; Lent et al., 2017). The findings also align with the factor structure of the original CEDLES (Ireland & Lent, 2018; Lent et al., 2017) and its Chinese version (Zhou & Xu, 2022). On the other hand, the reliability of the Turkish CEDLES was substantiated by Cronbach's alpha values of the five-factor model. The Cronbach's alpha values of the subscales ranged from .69 to .89, which were similar to the Cronbach's alpha values of the original scale (Lent et al., 2017), the Chinese version (Zhou & Xu, 2022), and in previous studies (Chang et al., 2023; Garrison et al., 2023; Ireland & Lent, 2018). The correlation between mastery experiences and

verbal persuasion items was high, reflecting the results in the original version of the scale. Lent et al. (2017) and Ireland and Lent (2018) posit that this phenomenon may be attributable to individuals with limited experience in making important decisions relying on feedback from significant others (e.g., family members, friends, and educators) to inform their self-perception in this domain. Significant others may intentionally or unintentionally convey their perceptions regarding career exploration and decision-making abilities to individuals, and it may be challenging to differentiate between mastery experiences and verbal persuasion, as these statements may be particularly influential, especially for individuals with limited experience in making significant decisions (Lent et al., 2017). Prior studies have indicated that support and feedback from significant others play a particularly significant role in career exploration and decision-making in Turkey (Çarkıt, 2024a; Koçakoğlu & Yalçın, 2020; Öztemel, 2013). Consequently, the observed high correlation between mastery experiences and verbal persuasion factors may suggest that Turkish university students value encouragement, guidance, and support from their significant others regarding self-efficacy and outcome expectations, particularly given their limited experience in making significant decisions.

Career exploration and decision-making learning experiences were significant predictors of self-efficacy and outcome expectations related to career exploration and decision-making. Specifically, mastery experiences, vicarious learning, and positive emotions have been shown to predict self-efficacy and outcome expectancies positively. These findings align with the theoretical framework proposed by Lent and Brown (2013), which posits that learning experiences shape self-efficacy and outcome expectancies. The present study's findings are consistent with previous studies (Ireland & Lent, 2018; Lent et al., 2017; Zhou & Xu, 2022). The findings imply that university students with past mastery experiences and role models in career exploration and decision-making and who experience positive emotions in this process are more likely to have confidence in their abilities in career exploration and decision-making. The findings also imply that these students may possess a stronger conviction that their engagement in career exploration and decision-making endeavors might culminate in favorable outcomes.

A notable finding was that negative emotions predicted outcome expectations positively. This finding inconsistent with the results reported by Zhou and Xu (2022), who found that negative emotion was negatively related to outcome expectancies. Moreover, the SCCT (Lent & Brown, 2013) posits that students who encounter negative emotions during the career exploration and decision-making process weaken the conviction that engaging in career exploration and decision-making behaviours yields positive outcomes. However, the present finding suggests that students who experience negative emotions in the career exploration and decision-making process may believe that performing tasks in this behavioural domain may lead to positive outcomes. Contrary to the prevailing hypothesis, the present study found that negative emotions positively predicted outcome expectancies. Parallelly, Lent et al. (2017) found that negative emotions, contrary to expectations, positively predicted outcome expectations. The present result suggests that university students who encounter negative emotions in the career exploration and decision-making process are more likely to nurture expectations that their career exploration and decision-making behaviours might yield positive outcomes. This outcome may be attributable to statistical suppression, or it may signify that students who encounter negative emotions in the career exploration and decision-making process may contemplate the positive outcomes of their behaviours, contemplating the possibility of focusing on coping with these emotions (Lent et al., 2017).

Limitations and Future Direction

The present study demonstrates the validity and reliability of the Turkish CEDLES in measuring university students' learning experiences related to career exploration and decision-making. However, it is imperative to consider the study's limitations. Firstly, participants in the present study were selected employing a convenience sampling method. Consequently, it would be advantageous for subsequent studies to assess the validity and reliability of the CEDLES in samples of students from diverse regions and universities. Given the significance of career exploration and decision-making in the developmental process of university students (Super et al., 1996), the decision to focus on this particular sample was made. However, given the significance of career exploration and decision-making as a fundamental behavioural domain across the life-span, it would be advantageous to extend the study to include participants from diverse developmental stages in subsequent research. For instance, it may be beneficial to assess whether the CEDLES effectively capture the career exploration and decision-making learning experiences of adolescents and adults. A notable limitation of the present study is the omission of examining the stability coefficient of the CEDLES. In future studies, the stability coefficient of the CEDLES should be examined using the test-retest technique. The present study examined the relationships of Turkish CEDLES with self-efficacy and outcome expectancies, and the results supported its concurrent validity. Subsequent studies must ascertain the concurrent validity of the Turkish CEDLES by investigating its associations with other SCCT variables (e.g., decisional support, exploratory goals, career decidedness, and decisional anxiety). The CEDLES can be used to test the formal hypotheses of the SCCT (Lent & Brown, 2013). However, conflicting findings emerge in the extant literature concerning the relationship between negative emotions experienced during career exploration and decision-making and outcome expectancies. Consequently, further research should be conducted on the relationship between career exploration and decision-making learning experiences and self-efficacy and outcome expectancies. Finally, the CEDLES can by counsellors working in university counseling or career development centres to facilitate students' career exploration and decision-making processes. Turkish CEDLES can be used to evaluate the effectiveness of programs by developing intervention programs that aim to improve university student's career exploration and decision-making learning experiences.

References

Ægisdóttir, S., Gerstein, L. H., & Çinarbaş, D. C. (2008). Methodological issues in cross-cultural counseling research: Equivalence, bias, and translations. *The Counseling Psychologist, 36*(2), 188–219. https://doi.org/10.1177/0011000007305384

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191–215. https://doi.org/10.1037/0033-295X.84.2.191

Bandura, A.(1986). *Social foundations of thought and action: A social cognitive theory.* Prentice-Hall, Inc.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* Freeman.

Betz, N. E., Klein, K. L., & Taylor, K. M. (1996). Evaluation of a short form of the Career Decision-Making Self-Efficacy Scale. *Journal of Career Assessment, 4*(1), 47–57. https://doi.org/10.1177/106907279600400103

Betz, N. E., & Voyten, K. K. (1997). Efficacy and outcome expectations influence career exploration and decidedness. *The Career Development Quarterly, 46*(2), 179–189. https://doi.org/10.1002/j.2161-0045.1997.tb01004.x

Bike, D. H. (2013). *Career decision learning experiences: Development and validation of a scale* [Doctoral Dissertation]. University of Missouri–Columbia.

Brown, S. D., Hacker, J., Abrams, M., Carr, A., Rector, C., Lamp, K., Telander, K., & Siena, A. (2012). Validation of a four-factor model of career indecision. *Journal of Career Assessment, 20*(1), 3–21. https://doi.org/10.1177/1069072711417154

Büyükgöze-Kavas, A. (2011). *Testing a model of career ındecision among university students based on social cognitive career theory* [Yayımlanmamış doktora tezi]. Middle East Tecnical University.

Chang, B., Zekai, L., Wang, L., Zhong, L., & Shen, Y. (2023). A latent profile analysis linking career learning experience profile to career decision-making difficulties. *The Career Development Quarterly, 71*, 111–123. https://doi.org/10.1002/cdq.12322

Choi, B. Y., Park, H., Yang, E., Lee, S. K., Lee, Y., & Lee, S. M. (2012). Understanding career decision self-efficacy: A meta-analytic approach. *Journal of Career Development, 39*(5), 443–460. https://doi.org/10.1177/0894845311398042

Çarkıt, E. (2024a). Adaptation to turkish of the career exploration and decision self-efficacy scale. *The Career Development Quarterly, 72*(3), 215–230. https://doi.org/10.1002/cdq.12353

Çarkıt, E. (2024b). Validating the Turkish versions of the Career Decision-Making Outcome Expectancies and the Career Decision-Making Exploratory Intentions Scales in undergraduate students. *Nevşehir Hacı Bektaş Veli Üniversitesi SBE Dergisi, 14*(2), 884–895. https://doi.org/10.30783/nevsosbilen.1470007

Demirtaş-Zorbaz, S., Korkut-Owen, F., Arıcı-Şahin, F., & Mutlu, T. (2023). Career sailboat: A model for enhancing career decision-making self-efficacy among job-seekers. *British Journal of Guidance & Counselling, 51*(2), 284-297. https://doi.org/10.1080/03069885.2023.2177615

Garrison, Y. L., Kim, T., Son, Y., Aldrich, C., Ali, S. R., & Jiao, T. (2023). Fluent or discriminated? English language and experiential sources of career self-efficacy among Asian international students in the United States. *International Journal for Educational and Vocational Guidance*, 1-21. https://doi.org/10.1007/s10775-023-09620-z

Garriott, P. O., Hunt, H. K., Navarro, R. L., Flores, L. Y., Lee, B. H., Suh, H. N., Brionez, J., Slivensky, D., Lee, H. S. (2021). Development and initial validation of the engineering learning experiences scale. *Journal of Vocational Behavior, 124*, 103516. https://doi.org/10.1016/j.jvb.2020.103516

Gerçek, M., Elmas-Atay, S., & Yılmaz, D. (2023). Engineering Learning Experiences: A Scale Adaptation and Validation into Turkish. *Journal of Career Development, 50*(3) 612–632. https://doi.org/10.1177/08948453221120685

Hacker, J., Carr, A., Abrams, M., & Brown, S. D. (2013). Development of the Career Indecision Profile: Factor structure, reliability, and validity. *Journal of Career Assessment, 21*(1), 32–41. https://doi.org/10.1177/1069072712453832

Ireland, G. W., & Lent, R. W. (2018). Career exploration and decision-making learning experiences: A test of the career self-management model. *Journal of Vocational Behavior, 106,* 37–47. https://doi.org/101016/j.jvb.2017.11.004

Koçakoğlu, M. G., & Yalçın, B. (2020). Kariyer gelişim sürecinde aile. *International Social Mentality and Researcher Thinkers Journal, 6*(37), 1921-1929.

Lent, R. W., & Brown, S. D. (2013). Social cognitive model of career self-management: Toward a unifying view of adaptive career behavior across the life span. *Journal of Counseling Psychology, 60,* 557–568. https://psycnet.apa.org/doi/10.1037/a0033446

Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior, 45*(1), 79–122. http://dx.doi.org/10.1006/jvbe.1994.1027

Lent, R. W., Ezeofor, I., Morrison, M. A., Penn, L. T., & Ireland, G. W. (2016). Applying the social cognitive model of career self-management to career exploration and decision-making. *Journal of Vocational Behavior, 93,* 47–57. https://doi.org/101016/j.jvb.2015.12.007

Lent, R. W., Ireland, G. W., Penn, L. T., Morris, T. R., & Sappington, R. (2017). Sources of self-efficacy and outcome expectations for career exploration and decision-making: A test of the social cognitive model of career self-management. *Journal of Vocational Behavior, 99,* 107–117. https://doi.org/101016/j.jvb.2017.01.002

Lent, R. W., Morris, T. R., Penn, L. T., & Ireland, G. W. (2019). Social–cognitive predictors of career exploration and decision-making: Longitudinal test of the career self-management model. *Journal of Counseling Psychology, 66*(2), 184–194. https://doi.org/10.1037/cou0000307

Lent, R. W., Wang, R. J., Morris, T. R., Ireland, G. W., & Penn, L. T. (2019). Viewing the Career Indecision Profile within a theoretical context: Application of the social cognitive career self-management model. *Journal of Counseling Psychology, 66*(6), 690–700. https://doi.org/10.1037/cou0000367

Levin, N., Lipshits-Braziler, Y., & Gati, I. (2024). Patterns of career decision-making difficulties in 16 countries: A person-centered investigation. *Journal of Counseling Psychology, 71*(1), 34–47. https://doi.org/10.1037/cou0000704

Li, H., Ngo H.-Y., & Cheung F. (2019). Linking protean career orientation and career decidedness: The mediating role of career decision self-efficacy. *Journal of Vocational Behavior, 115,* 103322. https://doi.org/10.1016/j.jvb.2019.103322

Morris, T. R., & Lent, R. W. (2023). Revisiting the bottleneck hypothesis: The role of sexual identity development in the career exploration and decision-making of sexual minority college students. *Journal of Vocational Behavior, 141*, 103838. https://doi.org/10.1016/j.jvb.2022.103838

Öztemel, K. (2012). Relationships between career indecision career decision making self-efficacy and locus of control. *Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi, 32*(2), 459–477.

Öztemel, K. (2013). Testing the validity of the emotional and personality-related career decision-making difficulties questionnaire in Turkish culture. *Journal of Career Development, 40*(5), 390–407. https://doi.org/10.1177/0894845312468060

Özyürek, R. (2002). Liseli öğrenciler için matematik yetkinlik beklentisi bilgilendirici kaynaklar ölçeğinin geliştirilmesi: Ön çalışma. *Kuram ve Uygulamada Eğitim Yönetimi, 32*, 502–531.

Özyürek, R. (2005). Informative sources of math-related self-efficacy expectations and their relationship with math-related self-efficacy, interest, and preference. *International Journal of Psychology, 40*(3), 145–156. https://doi.org/10.1080/00207590444000249

Özyürek, R. (2010). Matematik Yetkinlik Beklentisi Bilgilendirici Kaynaklar Ölçeği'nin geçerlik ve güvenirlik çalışmaları. *Kuram ve Uygulamada Eğitim Bilimleri Dergisi, 10*(1), 419–447.

Penn, L. T., & Lent, R. W. (2019). The joint roles of career decision self-efficacy and personality traits in the prediction of career decidedness and decisional difficulty. *Journal of Career Assessment, 27*(3), 457–470. https://doi.org/10.1177/1069072718758296

Super, D. E., Savickas. M. L., & Super, C. M. (1996). The life-span, life-space approach to careers. In D. Brown, L. Brooks, & Associate (Eds.), *Career choice and development: Applying contemporary theories to practice* (3rd ed., pp. 121–178). Jossey-Bass.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Pearson.

Ulaş, Ö., & Kızıldağ, S. (2018). Kariyer engelleri ölçeği'nin (KEÖ) geliştirilmesi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 34*(1), 182-196.

Worthington, R. L., & Whittaker, T. A. (2006). Scale development research. *The Counseling Psychologist, 34*(6), 806–838. https://doi.org/101177/0011000006288127

Zhou, Y., & Xu, G. (2022). Career Exploration and Decision-Making Learning Experiences (CEDLE) Scales: Validation among Chinese vocational college students. *Journal of Career Development, 49*(4), 846–861. https://doi.org/10.1177/0894845321998004

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Some Indicators Regarding Early Childhood Education and Care in Türkiye and Their International Comparison

Mehmet Fatih Alaca[1]* , **Sait Akbaşlı**[2]

Abstract

This study aims to compare Türkiye's early childhood education and care (ECEC) indicators, such as enrollment rates, duration of education, age of access, mandatory school start age, student-to-teacher ratios, and allocated budgets, with those of the top six European countries ranked in the United Nations Human Development Index 2024. The comparison is based on reports from UNICEF (United Nations Children's Fund), OECD (Organisation for Economic Co-operation and Development), EU (European Union), UNESCO (United Nations Educational, Scientific and Cultural Organization), UNDP (United Nations Development Programme) and the World Bank. The study group of the research consists of Switzerland, Norway, Iceland, Denmark, Sweden, which are among the top six countries determined according to the Human Development Index (HDI) specified in the United Nations Human Development Report (2024) in 2024, and Türkiye, which is ranked 45th. This study group was selected using the criterion sampling technique, one of the purposeful sampling methods. This descriptive study uses a qualitative approach. The findings indicate that Türkiye lags behind the compared countries in terms of ECEC enrollment and budget allocation. It is recommended that ECEC should be mandatory and free for at least one year.

Keywords: OECD, early childhood education and care, comparative education

Türkiye'de Erken Çocukluk Eğitimi ve Bakımına İlişkin Göstergelerin Uluslararası Karşılaştırması

Özet (Türkçe)

Bu araştırmanın amacı EÇEB' de okullaşma oranı, eğitim süreleri, yararlanma yaşları, zorunlu eğitime başlama yaşı, öğretmen başına düşen öğrenci sayıları ve ayrılan bütçe göstergeleri bağlamında Türkiye ile Birleşmiş Milletlerin 2024 yılında yayınlanan İnsani Gelişim Endeksinde ilk altı sıraya giren Avrupa ülkelerini karşılaştırmak ve Türkiye'nin uluslararası durumunu ortaya koymaktır. Bu amaçla UNICEF'in (Birleşmiş Milletler Çocuklara Yardım Fonu) çocukluk eğitimi ve bakımına ilişkin raporları, OECD'nin (Ekonomik Kalkınma ve İşbirliği Örgütü) EÇEB' e ilişkin güncel raporları ile AB (Avrupa Birliği), UNESCO (Birleşmiş Milletler Eğitim, Bilim ve Kültür Örgütü), UNDP (Birleşmiş Milletler Gelişim Programı) ve Dünya Bankası raporlarına başvurulmuştur. 2024 yılında Birleşmiş Milletlerin İnsani Gelişim Raporu'nda (2024) belirtilen İnsani Gelişme Endeksi'ne (İGE) göre belirlenen ülkelerden ilk altı sıraya giren İsviçre, Norveç, İzlanda, Danimarka, İsveç ile 45. sırada olan Türkiye araştırmanın çalışma grubunu oluşturmaktadır. Bu çalışma grubu amaçlı örneklem yöntemlerinden ölçüt örneklem tekniği ile seçilmiştir. Araştırma betimsel tarama ile gerçekleştirilmiş olan bir nitel araştırmadır. Türkiye'nin EÇEB'de okullaşma ve ayrılan bütçe kapsamında ilgili ülkelerin gerisinde olduğu sonucuna ulaşılmıştır. EÇEB' de en az son bir yılın zorunlu ve ücretsiz olması gerektiği önerilmiştir.

Anahtar Kelimeler: OECD, erken çocukluk eğitimi ve bakımı, karşılaştırmalı eğitim

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* Corresponding author

[1] PhD student., Hacettepe University, Ankara/Türkiye, mhmtfthlc@gmail.com
[2] Prof. Dr., Hacettepe University, Ankara/Türkiye, sakbasli@gmail.com

Introduction

The intensified global and geopolitical relationships, rapid advancements in information and communication technology, the comfort and convenience of international travel, international economic and trade relations, and global diseases and pandemics are just a few reasons why the 21st century is referred to as the global century. The significant changes experienced compared to previous centuries have made it necessary for countries and societies to adapt to the times. Consequently, learning to learn in the global age, the intensity of international relations, and development appropriate for the global era necessitate educational reforms. Thus, due to the impact of globalization, changes in educational policies and systems around the world have become a priority for policymakers.

The impact of globalization has facilitated the intermingling of societies through changes and transformations in social, political, cultural, and economic areas. A new model of a person, needed for global development, has emerged. The way to cultivate this new type of individual is through education (Tezcan, 1998). In the new world where knowledge is equated with power, the role of the teacher is no longer to provide ready-made information but to teach how to access constantly changing and developing knowledge (Karaman, 2010). These reasons have led to global competition treating education with commercial concerns and structuring schools as commercial organizations (Giddens, 2000, as cited in Karaman, 2010).

Policies of renewal and change in education have aimed not only to develop systems that suit the positive impacts of globalization but also to combat its negative aspects. Influenced by global competition, power, and interest relations, countries have placed greater emphasis on education. Consequently, academics, policymakers, and practitioners have seen the need to develop new theories and methods, focusing on the analysis of global education systems (Beech, 2009). Countries have begun to study both their own and other countries' education systems, focusing on comparative education. Indeed, the increasing regional and global dimensions of educational problems have further emphasized the importance of comparative education, which highlights cross-cultural and international cooperation (Trethewey, 2014).

Although there is no common understanding of the definition of comparative education in the literature, it can be broadly considered as the examination of at least two educational phenomena or practices to identify their similarities and differences (Thomas, 1998, as cited in Crossley & Watson, 2003, p. 18). Kazamias (2009) states that comparative education has an added value in helping us understand our own education system through the study of foreign education systems. The global reading conducted in comparative education reveals the embedded values of regions that are foreign to us (Cowen, 2009, p. 338). When these definitions and many aspects of globalization are considered together, comparative education studies, which have become attractive internationally, help individuals better understand their education systems, satisfy their intellectual curiosity, and highlight inter-societal relationships. Additionally, by revealing similarities and differences in education systems, educational problems are understood, and new educational policies are formulated. This fosters international cooperation by creating interest and sensitivity towards different cultures and perspectives (Crossley & Watson, 2003, p. 19).

Examining the education systems of other countries and implementing innovations in their own systems is considered a practice dating back to earlier periods. It is likely that travelers who visited different countries brought back insights about educational differences to their own nations. The observations made by travelers during their journeys can be regarded as the early period of comparative education (Trethewey, 2014). Looking at the historical development of comparative education studies in Türkiye, it is seen that they began with the examination of the education systems of other countries. Indeed, during the Ottoman Empire, pedagogues were sent abroad as part of the modernization and reform movements. In the globalized world order, international competition and cooperation, the influence of neoliberalism, and other factors have made comparative education a necessity for educational reform and renewal efforts in Türkiye (Şahin, 2021, p. 12).

There are some issues in comparative education, such as adopting and implementing another culture's system exactly as it is. Crossley and Watson (2003) criticize the borrowing and application of macro systems and concepts from other systems. According to them, these attempts often end in failure. Sadler (1979) supports this view by stating that one cannot move whimsically among the world's education systems like a child picking flowers from a garden; the flowers and shrubs taken from these gardens cannot be transplanted into our own soil and revived (as cited in Beech, 2009, p. 341). Comparisons should be made considering the cultural codes and characteristics of each country.

Global and regional organizations established for development purposes after World War II have used comparative education to help countries improve their education systems. It is important to note that the founding and active work of international organizations such as Organisation for Economic Co-operation and Development (OECD), International Bank for Reconstruction and Development (World Bank), United Nations Educational Scientific and Cultural Organization (UNESCO), United Nations Development Programme (UNDP), United Nations International Children's Emergency Fund (UNICEF), International Monetary Fund (IMF), European Union (EU), and United Nations (UN) and the need for comparative education, coincided with the impact of globalization. Indeed, the transfer of educational knowledge has become part of the missions of UNESCO, the World Bank, and the OECD (Beech, 2009, p. 344).

As a mandatory requirement of globalization, policymakers initiating change and transformation in education are likely to prioritize early childhood education in their reforms. ECEC is typically designed to support children's early cognitive, physical, social, and emotional development, while also introducing young children to organized education outside of the family context. It also prepares children for entry into primary education by developing some of the skills necessary for academic readiness (UNESCO, 2012). ECEC typically occurs in two stages. The first stage, referred to as ISCED 01, covers the period from birth to 2 years of age. The second stage, referred to as ISCED 02, encompasses preschool education for children aged 3 to 5 years (UNESCO Institute for Statistics, 2011).

The political, cultural, and social changes associated with the Industrial Revolution and the increasing participation of women in the workforce have highlighted the growing societal need for ECEC. Initially, ECEC began as a service to support working women's childcare needs and later evolved, alongside its educational dimension, into a requirement of the social state principle (Alat, 2009, p. 185). In line with these developments, ECEC is considered the foundation for nurturing generations that will meet the needs of the century. According to the World Bank (2024), investment in early childhood is prioritized as it is believed to eliminate poverty, increase prosperity, stimulate economic growth, and develop human capital. Policymakers increasingly emphasize the critical role of early education and care in the cognitive and emotional development, learning, and well-being of children (OECD, 2023). Indeed, quality education and care services received between the ages of 0-6 are thought to be directly linked to future prosperity (Barnett & Yarosz, 2007). Many cognitive skills are acquired during childhood. Therefore, high-quality education received during this period is crucial for ensuring social, emotional, and cognitive development in later stages (World Bank, 2017). Children who participate in high-quality organized learning at an early age are more likely to achieve better educational outcomes as they grow. This is especially true for children from disadvantaged socio-economic backgrounds with insufficient learning environments at home (OECD, 2017).

This study aims to understand the place of early childhood education and care in Türkiye within the global context, emphasizing the importance of ECEC in education systems. Addressing the changes and transformations in education systems brought about by globalization within the scope of ECEC and examining them according to international standards is seen as a necessity. Consequently, the innovations occurring in today's education systems have endowed ECEC services with an international character and identity (UNICEF, 2019). The significance of the study is highlighted by its consideration of the OECD's latest report, Education at a Glance 2023, and recent reports from global organizations such as UNICEF, UNDP, UNESCO, and the EU, published in 2023 and 2024. The study is important for providing a global comparison of Turkey’s ECEC system and offering an opportunity for self-assessment in this field. It is hoped that the findings will provide valuable insights for policymakers, educational researchers, and practitioners in Turkey. In this context, an international comparison with the top six European countries according to the Human Development Index (HDI) in the United Nations Human Development Report (2024) is needed. This comparison will consider indicators such as the enrollment rate in ECEC services, ages of beneficiaries, compulsory education starting age, duration of education, student-teacher ratios, and allocated budget. In order to achieve the purpose of the research, answers were sought to the following research questions:

1. What are the similarities and differences between Türkiye’s enrollment rates in ECEC services and those of the selected countries based on the Human Development Index?
2. What are the similarities and differences between Türkiye and the selected countries in terms of ages of utilization, education durations, and starting age of compulsory education in ECEC services?

3. What are the similarities and differences between Türkiye and the selected countries regarding student-teacher ratios in ECEC services according to the Human Development Index?
4. What are the similarities and differences between Türkiye's budget allocation for ECEC services and the budgets allocated by the selected countries for ECEC services in terms of per-student expenditure, teacher salaries, and the share of expenditures by private institutions?

Method

This research is a qualitative study conducted using descriptive survey methodology. Qualitative research design is defined by Yıldırım and Şimşek (2018) as a strategy that guides and ensures the consistency of various stages of the research around a specific approach. In the survey model, the researcher attempts to present phenomena as they are without influencing or altering them (Karasar, 2014, p. 77). This study, as a descriptive qualitative research method, uses a comparative approach. Comparative education involves the examination of at least two educational phenomena or practices to highlight their similarities and differences (Thomas, 1998, as cited in Crossley & Watson, 2003, p. 18). In this study, the horizontal approach technique of comparative education will be employed.

Study Group

The study group consists of Switzerland, Norway, Iceland, Denmark, Sweden, which are the top six countries according to the Human Development Index (HDI) published in the United Nations Human Development Report (2024), and Türkiye, which is ranked 45th. This study group was selected using the criterion sampling technique, one of the purposive sampling methods. These countries were chosen because their HDI in the UNDP Human Development Report (2024) are closely related to education. Another reason for including these countries is their high levels of welfare and human living standards, which make them relevant for comparison with Türkiye. In criterion sampling, the primary aim is to study cases that meet a predetermined set of criteria (Yıldırım & Şimşek, 2018, p. 122).

Data Collection

To access statistical information about the countries specified by the Human Development Index of the United Nations, the 2023-2024 Human Development Report (2024) by the UNDP was reviewed. For data related to the research problem, reports on childhood education and care from UNICEF, current ECEC reports from the OECD, EU reports, UNESCO reports, and World Bank reports were utilized.

Data for this study, which aims to provide a general evaluation of Türkiye by comparing Switzerland, Norway, Iceland, Sweden, Denmark, and Türkiye in terms of certain indicators in Early Childhood Education and Care (ECEC), were collected through document analysis. Document analysis involves the examination of written documents containing information about the topics being researched. This method allows the researcher to obtain necessary data without the need for observation or interviews (Yıldırım & Şimşek, 2018, p. 189). As a systematic procedure, document analysis involves examining both printed and electronic

materials and can sometimes be the sole data source within an interpretive paradigm (Bowen, 2009). In this context, relevant reports have been accessed and data have been obtained in line with the research problem in this study.

Data Analysis

To prevent confusion in comparing and describing data between countries, the International Standard Classification of Education (ISCED) created by UNESCO (2011), which assists in compiling international educational statistics, was used as a reference. ECEC data were categorized as ISCED 01 for children aged 0-3 years and ISCED 02 for children aged 3-5 years. Prior to determining the research problem, a preliminary literature review was conducted. Once the research problem was identified, relevant and current data were reviewed in line with this problem. Data obtained were compared using the OECD country averages as a reference. Indicators such as the starting age of compulsory education, education durations, student-teacher ratios, and ECEC budget data were tabulated using OECD and European Union reports as primary sources. Thus, comparisons were made among OECD countries, and similarities and differences with Türkiye were identified using the generated tables.

Findings

The study analyzed enrollment rates separately for ISCED 01 and ISCED 02 levels in ECEC. According to Table 1, among OECD countries, 18% of children under 2 years old and 43% of 2-year-olds are enrolled in ISCED 01 programs.

Table 1. Enrollment Rates in ECEC (2021)

	Under 2 Years	2 Years	3 Years	4 Years	5 Years
Switzerland	-	-	2.3	48.7	98.1
Norway	41.2	94.1	96.7	97.6	97.7
Iceland	40.2	94.4	96.6	96.5	96.9
Denmark	38.1	86.5	95.7	97.4	98.1
Sweden	25.7	91.9	95.5	95.4	96.1
OECD	18.1	43	73.7	88	95.1
Türkiye	0.1	0.7	6.4	20.1	67.7

Source: OECD, 2023.

For ISCED 02 level enrollment rates, OECD countries show 73.7% at age 3, 88% at age 4, and 96.1% at age 5. In Switzerland, the starting age for ECEC is 4 years, so there is no official ECEC program for children under 4 (Educa, 2018, as cited in Sop, 2022, p. 253). In other countries, the enrollment rate for 2-year-olds is higher than the OECD average: 41.2% in Norway, 40.2% in Iceland, 38.1% in Denmark, and 25.7% in Sweden. In contrast, Türkiye's enrollment rate for children under 2 years old is only 0.1%, significantly lower than the OECD average. The enrollment rate for 2-year-olds is also very low in Turkey at 0.7%, compared to Norway (94.1%), Iceland (94.4%), Denmark (86.5%), and Sweden (91.9%). Regarding 3-year-olds, Norway has an enrollment rate of 96.7%, Iceland 96.6%, Denmark 95.7%, and Sweden 95.5%. In comparison, Switzerland has 2.3% and Türkiye 6.4%.

In general, enrollment rates for ISCED 02 level are higher. For 4-year-olds, 97.6% in Norway, 96.5% in Iceland, 97.4% in Denmark, and 95.4% in Sweden are enrolled in ISCED 02 programs. In Switzerland, the rate is 48.7%, and in Türkiye, it is 20.1%. Both Türkiye and Switzerland have lower enrollment rates at age 4 compared to the OECD average. For 5-year-olds, enrollment rates are 98.1% in Switzerland and Denmark, followed by Norway at 97.7%, Iceland at 96.9%, and Sweden at 96.1%. Türkiye's enrollment rate for 5-year-olds is 67.7%, placing it significantly behind these countries and below the OECD average.

To better analyze enrollment rates in ECEC programs across countries, the ages at which entitlement to ECEC programs begins were examined. According to Table 2, the age to start free education is 4 years in Switzerland, and 3 years in Sweden and Türkiye. These ages also correspond to the enrollment age for ISCED 02 programs.

Table 2. Ages of Access to Early Childhood Education and Care (2021)

	Age to Start Free ECEC	Age to Start ISCED 01	Duration of ISCED 01	Age to Start ISCED 02	Duration of ISCED 02
Switzerland	4	-	-	4	2
Norway	-	0	3	3	3
Iceland	-	0	3	3	3
Denmark	-	7 mo.	3	3	3
Sweden	3	1	2	3	4
Türkiye	3	0	2	3	3

Source: OECD, 2023.

In Norway, Iceland, and Denmark, there is no official rule regarding the age to start free ECEC. In these countries, the entitlement to free ECEC begins with enrollment in ISCED 02 programs. These data should not be confused with the mandatory school starting age. The information provided here is related to the entitlement to optional free education. In Switzerland, since official ECEC enrollment starts at age 4, there is no data available for ISCED 01. However, in Norway, Iceland, and Denmark, the ISCED 01 program lasts 3 years, while in Sweden and Türkiye, it lasts 2 years. The pre-primary education considered as ISCED 02 starts at age 4 in Switzerland and at age 3 in other countries. The duration of ISCED 02 programs is 3 years in Norway, Iceland, Denmark, and Türkiye, while it is 2 years in Switzerland and 4 years in Sweden.

The information regarding the mandatory school starting age and primary school starting age provides insights into which countries have mandatory ECEC programs. It also offers information about enrollment rates in ECEC programs across countries.

Table 3. Mandatory School and Primary School Starting Ages (2021)

	Switzerland	Norway	Iceland	Denmark	Sweden	Türkiye
Mandatory Education Age	4-5	6	6	6	6	6
Primary School Starting Age	6	6	6	6	7	6

Source: OECD, 2023.

Table 3 indicates that the starting age for primary school is 7 years in Sweden and 6 years in other countries. For mandatory education, Switzerland starts at ages 4-5, while in all other countries, it starts at age 6. This suggests that in Switzerland, mandatory education includes the last year before primary school. In Sweden, the mandatory education starts at age 6, meaning that the final year of ECEC programs is mandatory. In Norway, Iceland, Denmark, and Türkiye, ECEC programs are not mandatory.

Table 4 shows the number of students per teacher in ECEC services in selected countries and the OECD average. According to these findings, Iceland has the lowest teacher-to-student ratio in ECEC programs (ISCED 02) with 5 students per teacher. It is followed by Denmark with 10 students, and Norway with 11 students per teacher. In Türkiye, the ratio is 13 students per teacher. These ratios are lower than the OECD average. Sweden has a ratio of 14, and Switzerland has a ratio of 18.

Table 4. Teacher-to-Student Ratios in ECEC

	Early Childhood Educational Development (ISCED 01)	**Pre-primary (ISCED 02)**
Switzerland	-	18
Norway	6	11
Iceland	3	5
Denmark	5	10
Sweden	13	14
OECD	9	14
Türkiye	-	13

Source: OECD, 2023.

For ISCED 01 programs (ages 0-3), data is not available for Switzerland and Türkiye. In ISCED 01 programs, the teacher-to-student ratio is 3 in Iceland, 5 in Denmark, and 6 in Norway, which are below the OECD average. In Sweden, the ratio is 13.

To compare expenditures on the education and care of children aged 3-5 years, both annual per-student spending and the percentage of Gross Domestic Product (GDP) spent were examined. Table 5 shows that Iceland has the highest expenditure at $18,770 per child. Iceland allocates 1.2% of its GDP to the education and care of 3-5 year-olds, which is the highest percentage. Norway follows with $17,412, Denmark with $16,508, and Sweden with $14,934. Türkiye spends $4,968 per child annually.

Table 5. Expenditures on Education and Care for Children Aged 3-5 Years (Per Student, 2020)

	Percentage of GDP	Annual Expenditure per Child (USD)
Norway	1.0	17.412
Iceland	1.2	18770
Denmark	0.6	16 508
Sweden	0.9	14.934
OECD	0.6	10.025
Türkiye	0.3	4.968

Source: OECD, 2023

Compared to the OECD average, Türkiye's expenditure is significantly lower. As a percentage of GDP, Norway is at 1.0%, Sweden at 0.9%, Denmark at 0.6%, and Türkiye at 0.3%. The OECD average for this percentage is 0.6%, making Türkiye the lowest among these countries.

The data in Table 6 provide information on the ratio of countries' spending on private ECEC institutions to their total ECEC spending. In OECD countries, the share of spending on private institutions in total spending on ECEC programs is 14% in ISCED 02 programs, 26% in ISCED 01 programs and 15% in ISCED 0 (0-5 age) programs. When the share of spending on ISCED 01 programs in private institutions in ECEC spending is examined, it is seen that it is below the OECD average in Sweden, Denmark, Iceland and Norway. When the share of spending on private institutions in total ECEC spending in ISCED 02 programs is examined, it is seen that Denmark and Türkiye have the highest shares. In Norway, Iceland and Sweden, this share is below the OECD average. In terms of the share of spending on ISCED 0 programs in private institutions in ECEC expenditures, Norway, Iceland and Sweden are below the OECD average, while Denmark is above the OECD average. Since data on the spending of private institutions on ISCED 01 programs in Turkey could not be obtained, the share of private educational institutions in the expenditures of general early childhood and care programs (ISCED 0) could not be obtained either. Because, ISCED 0 programmes cover ISCED 01 and ISCED 02 programmes.

Table 6. Share of Total ECEC Expenditures for Private ECEC Institutions (%) (2020)

	ISCED 01 Expenditure	ISCED 02 Expenditure	ISCED 0 Expenditure
Norway	13	13	13
Iceland	8	12	10
Denmark	24	24	24
Sweden	6	6	6
OECD	26	14	15
Türkiye	-	16	-

Source: OECD, 2023

Teacher salaries are an important indicator for comparing education budgets across countries. Table 7 shows that Switzerland has the highest starting salary at $56,429, followed by Denmark

at $46,552, Türkiye at $46,333, Iceland at $42,593, Sweden at $42,374, and Norway at $39,337. The starting salaries in these countries are above the OECD average. Switzerland and Denmark have higher salaries compared to Türkiye, while Sweden, Iceland, and Norway have lower salaries than Turkey.

Table 7. Annual Legal Salaries of ECEC Teachers at Different Career Stages (2022) (USD)

	Starting Salary	Salary After 10 Years	Salary After 15 Years	Top Salary
Switzerland	56.429	70.367	-	86.368
Norway	39.337	47.854	47.854	48.588
Iceland	42.593	43.306	45.371	46.451
Denmark	46.552	52.261	52.261	52.261
Sweden	42.374	44.430	45.132	49.547
OECD	34.563	43.063	45.981	57.118
Türkiye	46.333	47.691	47.063	50.489

Source: OECD, 2023; OECD, 2022.

In terms of the highest salaries, Türkiye, Sweden, Iceland, Denmark, and Norway have salaries below the OECD average, while Switzerland exceeds the OECD average.

Conclusion and Discussion

When examining enrollment rates for children under 2 years old, Norway, Iceland, Denmark, and Sweden are above the OECD average, while Türkiye is below it. In Switzerland, since the age of starting ECEC is set at 4, there is no formal ECEC program for children under 4 (Educa, 2018, cited in Sop, 2022, p. 253). Although many countries have programs for children under 3, not all countries report the number of children enrolled in these programs (OECD, 2023, p. 169). It should be noted that the data in this study only covers formal education and care, excluding services provided by parents, caregivers, relatives, or nannies.

For 2-year-olds, there has been a rapid increase in enrollment rates in Norway, Sweden, Iceland, and Denmark compared to younger children. This may be related to the expiration of parental leave for working parents. Generally, working mothers are granted child care rights from the birth of their babies worldwide. In these countries, the enrollment rate for 2-year-olds is above the OECD average, while Türkiye's rate is very low and below the OECD average. One possible reason for this might be the higher number of working women in these countries compared to Turkey. The increased participation of women in the workforce worldwide has made ECEC a necessity (Gür & Çelik, 2009, p. 15). As employment gaps in countries close, registering in ECEC programs is considered important for working women to return to work (OECD, 2023). The rapid increase in registration rates for children aged 0-3 in Norway, Iceland, Sweden, and Denmark and their above-average OECD rates could be due to policymakers' awareness of the importance of ECEC in children's educational, cognitive, and emotional development (OECD, 2023, p. 167). Indeed, Heckman and Karapakula (2021) have noted the significant contribution of early childhood education and care to children's cognitive, social, and emotional development. Duncan and Magnuson (2013) have stated that ECEC programs from 20 years

ago have had lasting effects on children's lives in adulthood, increased their success, and reduced crime rates. In Türkiye, the lack of sufficient public institutions providing education and care for children aged 0-2, reliance on family and neighbor support for child care, and insufficient attention from policymakers to ECEC could be reasons for the very low enrollment rates compared to the OECD average. Indeed, the 20th National Education Council (Talim ve Terbiye Kurulu Başkanlığı [TTKB], 2021) emphasized the need to increase access to early childhood education for ages 0-3, direct charitable support to preschool education, and provide municipal support for preschool education, although details of these efforts were not specified.

Enrollment rates increase at age 3 compared to age 2 in all the countries studied. The enrollment rate for 3-year-olds is above the OECD average in Norway, Sweden, Iceland, and Denmark. In Denmark, Sweden, and Norway, ECEC services for 3-year-olds are provided free of charge, and there is a guarantee of placement for registrants (European Commission / EACEA / Eurydice, 2023). This may be a reason for the rapid increase in enrollment rates and the high figures above the OECD average in these countries. In Switzerland and Türkiye, the participation of 3-year-olds in ECEC programs is much lower than in other countries and below the OECD average. In Switzerland, the low enrollment rate for 3-year-olds and the lack of data for ages 0-2 might be due to the absence of a formal ECEC program for ages 0-3 and the non-compliance of 0-3 programs with ISCED 2011 criteria. For a program to be included in the ISCED 2011 classification, it must have a nationally recognized institutional structure that provides at least 2 hours of education daily, and staff must have graduated from accredited training programs (OECD/Eurostat/UNESCO Institute for Statistics, 2015, p. 20). The potential reasons for the low enrollment rate of 3-year-olds in Turkey differ from those in Switzerland. One possible explanation could be the relatively lower number of working mothers in Turkey compared to other countries. Additionally, working mothers in Turkey often leave their young children with relatives, and the absence of free daycare centers could be other potential contributing factors. In fact, in Turkey, 34.5% of working mothers leave their young children with their grandmothers, while 28% of working mothers care for their children themselves while working (ERG, 2017).

At age 4, enrollment rates in the countries under comparison are above 95%, while Switzerland’s rate is 48.7% and Türkiye’s is 20.1%, both below the OECD average. Türkiye is the only country with a 5-year-old enrollment rate below the OECD average, and this rate is very low at 67.7% compared to OECD countries. Türkiye’s position second to last after Saudi Arabia in the OECD ranking for 5-year-old enrollment rates is striking (OECD, 2023). Several factors contribute to Türkiye’s low enrollment rates in ECEC programs compared to the OECD average. One reason could be the collection of fees for school supplies and contributions in preschool education, which lowers the enrollment rate. Other potential reasons include the lack of compulsory ECEC programs beyond a certain age, no guaranteed placements in preschool registrations, and the absence of nutrition support for students, all of which could decrease enrollment rates. Additionally, the prioritization of 5-year-olds in enrollment due to inadequate physical facilities and classrooms in schools is another reason. However, our low enrollment rates for 5-year-olds compared to the OECD average also indicate that early childhood education in Türkiye has not kept pace with modern standards. The Ministry of National

Education's Regulation on Preschool Education and Primary Education Institutions (2014) states that priority should be given to children aged 57-68 months in enrollment, and children aged 45-56 months can be enrolled if physical facilities are sufficient. Despite this, the 20th National Education Council (TTKB, 2021) recommended increasing the enrollment rate for 5-year-olds by providing social, economic, and physical resources, yet no recommendation was made for making preschool education compulsory. In Switzerland, the enrollment rate at age 4 is 48.7%, while at age 5, it rises to 98.1%. The compulsory education starting at age 5 with the ISCED 02 program and the age of starting primary school at 7 have contributed to the rapid increase in the 5-year-old enrollment rate. Additionally, affordable and accessible ECEC services help retain parents in the workforce, contributing to the country's economic well-being and growth. This has increased governments' interest in ECEC services (OECD, 2018; OECD, 2016). The broad legal and regulatory definitions of ECEC rights in European countries and the EU policymakers' primary concern have ensured high enrollment rates from age 2 (European Commission / EACEA / Eurydice, 2023).

When examining data related to the ages at which children can benefit from ECEC, it is notable that in some countries, the age for free education corresponds to the ISCED 02 program. In such cases, it can be concluded that there are no public institutions offering free services for children aged 0-2. In Switzerland, Sweden, and Turkey, the right to free education begins with ISCED 02 programs. However, in Turkey, a contribution fee is collected to cover the basic needs, self-care requirements, and support for the educational program during the time children spend at school (Ministry of National Education [MEB], 2014). It is noteworthy that there are no free institutions for children under 3 years of age in Turkey, and there is no guaranteed placement or sufficient physical conditions for children over the age of 3. According to the Turkish Ministry of National Education Preschool Education and Primary Education Institutions Regulation (2014), priority is given to registering children aged 57-68 months, and if physical conditions permit, children aged 36-56 months are also registered. The inadequacy and fee-based nature of ISCED 01 programs, along with the lack of guaranteed placement in ISCED 02 programs in Turkey, are believed to contribute to the low enrollment rates in ECEC and negatively impact female employment in the workforce. In this context, the 20th National Education Council (TTKB, 2021) emphasized the need for efforts to ensure access to ECEC services for children aged 0-3. In Denmark, Iceland, and Norway, enrollment in ECEC programs is fee-based, while Sweden and Norway provide placement guarantees (European Commission / EACEA / Eurydice, 2023). In Switzerland, it is understood that ISCED 01 programs are not publicly registered. In other countries, the right to access ECEC services begins from birth. However, in Sweden, this right starts at the age of 1, and in Denmark, it starts from 7 months. A potential reason for this could be the policy of allowing babies to spend their initial care months with their mothers. When comparing the ages for starting primary school and compulsory education, it is found that in Sweden and Switzerland, preschool education is compulsory for a one-year period. In many countries around the world, ECEC services are fee-based, and the preschool period is not mandatory. In line with this, UNICEF (2017) calls on governments and all stakeholders to increase the budget allocated for ECEC services, facilitate access, and provide two years of pre-primary education services.

In terms of the number of students per teacher, Türkiye has 13 students per teacher, compared to the OECD average of 14. However, given Türkiye's very low enrollment rates in ECEC, this is not a positive outcome. In this case, if Turkey achieves a schooling target close to the OECD average, it is likely that the number of teachers will be very insufficient.

Regarding financial data for ECEC programs, Norway, Sweden, Denmark, and Iceland spend between 15,000 and 19,000 USD per child aged 3-5, which is above the OECD average. In Switzerland, due to ECEC programs starting at age 4, data for comparison are unavailable. The highest values for pre-primary education financing are observed in Iceland, Norway, and Sweden. In Türkiye, the budget spent per child aged 3-5 is 4,968 USD, which is lower than both the OECD average and that of the other countries. Türkiye 's budget for education and care of 3-5-year-olds is 0.3% of GDP, which is below the OECD average and that of the relevant countries. On the other hand, when the share of private expenditures in total expenditures on ISCED 02 programs in private ECEC institutions is compared, it is seen that the highest share is in Turkey after Denmark. This rate is below the OECD average in Sweden, Norway and Iceland. This situation shows that the share of public expenditures in total expenditures on ECEC programs in Türkiye is behind OECD countries. Indeed, if accessibility and quality of ECEC services cannot be provided in public institutions, parents will tend to send their children to private institutions. (Shin, Jung, & Park, 2009, as cited in OECD, 2023, p. 171). Data on teacher salaries can be seen as another indicator of the importance given to ECEC programs. In 2022, the starting salaries of ECEC teachers are above the OECD average in all countries. However, looking at the highest possible salaries, it is observed that other countries, except Switzerland, pay below the OECD average. This indicates that salary increases based on seniority are inadequate in Türkiye compared to other countries. Teacher salaries can vary based on education level, experience, and career in different countries (OECD, 2023, p. 379). However, such variations are less common in Türkiye. Switzerland has the largest difference between starting and maximum salaries. This discrepancy may be due to countries determining teacher salaries based on references such as experience, career, and education level.

Limitations, Future Research and Recommendations

Since international comparisons were made in this research, it was assumed that the richest sources available were the OECD, UNICEF, World Bank, UNDP and EU reports. These reports were published in 2023 and 2024, and it should be noted that the information in these reports may change in the future.

This study compares Türkiye with five European countries ranked in the top six in the Human Development Index published by the United Nations in 2024. Expanding the study to include countries from other continents could provide a more global perspective. Including countries at the top and bottom of the Human Development Index could offer a broader view of ECEC services worldwide and Türkiye 's position in this context. Increasing enrollment rates in ECEC could be a way to enhance employment opportunities for women and men in Türkiye. Indeed, Türkiye 's enrollment rates in ISCED 01 and ISCED 02 levels are far below those of OECD countries. To ensure children's cognitive and sensory development and improve their future

well-being, access to ECEC should be facilitated. In a world with increasing competition due to globalization, raising enrollment rates in ECEC should be a significant agenda for policymakers and decision-makers in Türkiye. With the support of public institutions, more educational institutions should be established for ISCED 01 (ages 0-3) and ISCED 02 (ages 3-5) in Türkiye, and these institutions should provide free services. At least one year of mandatory pre-primary education should be enforced for children aged 3-5. Fees for nutrition and self-care under the name of contributions should be eliminated in ISCED 02 programs, and these services should be provided for free. Families should receive monthly financial support for child care services for children aged 0-3. The budget allocated per child for education and care of 3-5-year-olds should be increased to exceed the OECD average. Salaries for ECEC teachers should be raised based on seniority and education level to be above the OECD average.

References

Alat, Z. (2009). Çeşitli ülkelerde okul öncesi eğitim [Preschool education in various countries]. In G. Haktanır (Ed.), *Okul öncesi eğitime giriş* (3rd ed.). Anı Yayıncılık.

Beech, J. (2009). Who is strolling through the global garden? International agencies and educational transfer. In *International handbook of comparative education* (pp. 341-357). Springer Netherlands.

Barnett, W. S., & Yarosz, D. J. (2007). *Who goes to preschool and why does it matter?* (Preschool Policy Brief No. 15). National Institute for Early Education Research.

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal, 9*(2), 27-40.

Cowen, R. (2009). Editorial introduction: The national, the international, and the global. In *International handbook of comparative education* (pp. 337-340). Springer Netherlands.

Crossley, M., & Watson, K. (2003). *Comparative and international research in education: Globalisation, context and difference.* RoutledgeFalmer.

Duncan, G. J., & Magnuson, K. (2013). Investing in preschool programs. *Journal of Economic Perspectives, 27*(2), 109-132.

ERG (Eğitim Reform Girişimi). (2017). *Türkiye'de erken çocukluk bakımı ve okul öncesi eğitime katılım.* İstanbul.

European Commission / EACEA / Eurydice. (2023). *Structural indicators for monitoring education and training systems in Europe – 2023: Early childhood education and care.* Publications Office of the European Union.

Gür, B., & Çelik, Z. (2009). Türkiye'de millî eğitim sistemi: Yapısal sorunlar ve öneriler [The national education system in Türkiye: Structural problems and recommendations]. *SETA Rapor.*

Heckman, J., & Karapakula, G. (2021). *The Perry preschoolers at late midlife: A study in design-specific inference* (IZA Discussion Paper No. 12362). Institute for the Study of Labor. https://doi.org/10.2139/ssrn.3401130

Kargı, E. (2011). Niçin okul öncesi eğitim. Retrieved February 1, 2024, from http://i-rep.emu.edu.tr:8080/jspui/bitstream/11129/2566/1/Ni%C3%A7in%20Okul%20%C3%96ncesi%20E%C4%9Fitim.pdf

Karaman, K. (2010). Küreselleşme ve eğitim. *Zeitschrift für die Welt der Türken/Journal of World of Turks, 2*(3), 131-144.

Karasar, N. (2014). *Bilimsel araştırma yöntemi* (26. baskı). Nobel Akademi Yayıncılık.

Kazamias, A. M. (2009). Comparative education: Historical reflections. In *International handbook of comparative education* (pp. 139-157). Springer Netherlands.

MEB (2014). *Okul öncesi eğitim ve ilköğretim kurumları yönetmeliği.* https://www.mevzuat.gov.tr/MevzuatMetin/yonetmelik/7.5.19942.pdf

OECD. (2023). *Education at a glance 2023: OECD indicators.* OECD Publishing. https://doi.org/10.1787/e13bef63-en

OECD. (2019). *Education at a glance 2019: OECD indicators.* OECD Publishing. https://doi.org/10.1787/f8d7880d-en

OECD. (2018). *How does access to early childhood education services affect the participation of women in the labour market? Education Indicators in Focus* (No. 59). OECD Publishing. https://doi.org/10.1787/232211ca-en

OECD. (2017). *Starting strong V: Transitions from early childhood education and care to primary education.* OECD Publishing. https://doi.org/10.1787/9789264276253-en

OECD/Eurostat/UNESCO Institute for Statistics. (2015). *ISCED 2011 operational manual: Guidelines for classifying national education programmes and related qualifications.* OECD Publishing. https://doi.org/10.1787/9789264228368-en

OECD. (2016). *Walking the tightrope: Background brief on parents' work-life balance across the stages of childhood.* OECD. http://www.oecd.org/social/family/Background-brief-parentswork-life-balance-stages-childhood.pdf

Sop, A. (2022). İsviçre'de erken çocukluk eğitimi. In D. Aslan (Ed.), *Farklı ülkelerde erken çocukluk eğitimi* (pp. 253). Pegem Akademi.

Sönmez, E. (2021). Karşılaştırmalı temel eğitim ve ortaöğretim. In M. G. Gülcan & F. Şahin (Eds.), *Karşılaştırmalı eğitim: Tematik bir yaklaşım* (pp. 67-84). Pegem Akademi.

Şahin, F. (2021). Karşılaştırmalı temel eğitim ve ortaöğretim. In M. G. Gülcan, & F. Şahin (Eds.), *Karşılaştırmalı eğitimin tanımı, kapsamı ve tarihçesi* (pp. 1-19). Pegem Akademi.

Talim ve Terbiye Kurulu Başkanlığı [TTKB]. (2021). *20. Millî Eğitim Şurası kararları.* https://ttkb.meb.gov.tr/meb_iys_dosyalar/2021_12/08163100_20_sura.pdf

Tezcan, M. (1998). Küreselleşmenin eğitimsel boyutu. *Eğitim ve Bilim, 22*(108). https://egitimvebilim.ted.org.tr/index.php/EB/article/view/5229

Trethewey, A. R. (2014). *Introducing comparative education.* Elsevier.

UNICEF. (2019). *A world ready to learn: Prioritizing quality early childhood education.* United Nations Children's Fund.

UNICEF. (2017). *Early moments matter for every child.* United Nations Children's Fund.

UNDP. (2024). *Human development report 2023-24: Breaking the gridlock: Reimagining cooperation in a polarized world.* United Nations Development Programme.

UNESCO. (2011). *Data mapping.* UNESCO Institute for Statistics. Retrieved April 2024, from https://isced.uis.unesco.org/data-mapping/

UNESCO. (2012). *International standard classification of education ISCED-2011*. UNESCO Institute for Statistics. Retrieved February 2025, from https://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf

World Bank. (2017). *World development report 2018: Learning to realize education's promise.* The World Bank.

World Bank. (2024, April 4). *Early childhood development.* The World Bank. Retrieved April 28, 2024, from https://www.worldbank.org/en/topic/earlychildhooddevelopment

Yıldırım, A., & Şimşek, H. (2018). *Sosyal bilimlerde nitel araştırma yöntemleri.* Seçkin Yayıncılık.

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A Model Explaining Reading Anxiety: Sleep Deprivation, Social-Emotional Learning Skills, And Reading Attitudes[1]

Aslı Kandemir[2]*, Mustafa Yıldız[3]

Abstract

This study was conducted to understand how the reading anxiety experienced by fourth-grade primary school students was explained by sleep deprivation, social-emotional learning skills, and reading attitudes by using a hierarchical regression model. The sample group of the study, which was conducted using a correlational screening model, consisted of 331 fourth-grade students, including 51.4% females (170 subjects) and 48.6% males (161 subjects). Data collection tools were the "Reading Anxiety Scale" developed by Çeliktürk and Yamaç (2015), the "Sleep Deprivation Scale for Children and Adolescents" developed by Kandemir et al. (2021), the "Social-Emotional Learning Skills Scale" developed by Coryn at al. (2009) and adapted to Turkish by Arslan and Akın (2014), and the "Reading Attitude Scale for Primary School Students" developed by McKenna and Kear (1990) and adapted to Turkish by Kocaarslan (2016). With the data collected with these scales, first, the prerequisite analyses necessary for regression analysis and then a hierarchical regression analysis were performed. According to the analysis results, it was determined that the established regression model explained reading anxiety. According to the results obtained in the first model, it was seen that sleep deprivation explained .11 (ΔR^2=11) of the variance in students' reading anxiety in the first model and that social-emotional skills explained .18 (ΔR^2=18) of the variance in students' reading anxiety in the second model. The findings were discussed in light of the literature and considering the limitations of the research. Finally, recommendations were made to researchers, practitioners, and program developers according to the research results.

Keywords: Reading anxiety, sleep deprivation, social-emotional learning, reading attitude, regression

Okuma Kaygısını Açıklayan Bir Model: Uyku Yoksunluğu, Sosyal Duygusal Öğrenme Becerileri ve Okuma Tutumu

Özet (Türkçe)

Araştırmada, ilkokul dördüncü sınıf öğrencilerinin yaşadığı okuma kaygısının uyku yoksunluğu, sosyal duygusal öğrenme becerileri ve okuma tutumu ile birlikte nasıl açıklandığını hiyerarşik regresyon modeli ile anlaşılması amaçlanmıştır. İlişkisel tarama modeliyle yapılan araştırmanın örneklem grubunu %51,4'ü kız (170 kişi), %48,6'sı ise erkek (161 kişi) öğrenci olmak üzere 331 öğrenci dördüncü sınıf öğrencisi oluşturmaktadır. Araştırmada veri toplama araçları olarak Çeliktürk ve Yamaç (2015) tarafından geliştirilen "Okuma Kaygısı Ölçeği", Kandemir vd. (2021) tarafından geliştirilen "Çocuk ve Ergenler için Uyku Yoksunluğu Ölçeği", Coryn vd. (2009) tarafından geliştirilmiş, Arslan ve Akın (2014) tarafından Türkçe' ye uyarlanmış "Sosyal Duygusal Öğrenme Becerileri Ölçeği", McKenna ve Kear (1990) tarafından geliştirilen ve Türkçe'ye Kocaarslan (2016) tarafından uyarlanan "İlkokul Öğrencileri İçin Okuma Tutumu Ölçeği" kullanılmıştır. Bu ölçekler ile toplanan verilerle, regresyon analizi için gerekli olan ön koşul analizleri yapılmış ve daha sonra hiyerarşik regresyon analizine geçilmiştir. Analiz sonuçlarına göre, kurulan regresyon modelinin okuma kaygısını açıkladığı belirlenmiştir. Birinci modelde elde edilen sonuçlarına göre, birinci modelde uyku yoksunluğunun öğrencilerin okuma kaygısına ilişkin varyansın .11'ini (ΔR^2=11) açıkladığı, ikinci modelde sosyal duygusal becerilerin öğrencilerin okuma kaygısına ilişkin varyansın .18'ini (ΔR^2=18) açıkladığı görülmüştür. Araştırma bulguları alan yazın literatürü göre ve araştırmanın sınırlılıkları dikkate alınarak tartışılmıştır. Son olarak makalenin sonuçlarına göre araştırmacılara, uygulamacılara ve program geliştiren uzmanlara önerilerde bulunulmuştur.

Anahtar Kelimeler: Okuma kaygısı, uyku yoksunluğu, sosyal duygusal öğrenme, okuma tutumu, regresyon

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* Corresponding author

[1] Produced from the doctoral thesis.

[2] Teacher, Ministry of National Education, Türkiye, kandemirasli86@gmail.com
[3] Prof. Dr., Gazi University, Ankara/Türkiye, mustafa@gazi.edu.tr

Introduction

Reading, which has an important place in human life, is a process of constructing meaning that involves the interaction between the reader and the writer, where prior knowledge is used as a language skill (Akyol, 2012). It also has a very notable place in learning activities. According to Oyeleye and Odunayo (2020), reading is the gateway to academic development and has a role in making a difference in students' strong reading skills, academic performance, career development, and personal success. For this reason, reading is the cornerstone of all kinds of learning activities and is a carrier skill that forms the basis of many skills in academic processes (Ball & Blachmen, 1991). According to Shala (2013), reading has significance in terms of extracurricular development, and reading skills are related to academic success and social competencies. Cognitive skills, such as comprehension, vocabulary acquisition, and fluency, are not enough to develop reading skills, which have an important place in an individual's school and out-of-school life. In other words, reading activity does not only include cognitive skills. Reading also has an affective dimension that is critical in terms of reading skills (Oyeleye & Odunayo, 2020). One of the affective aspects of reading that attracts the attention of researchers studying this skill is reading anxiety (Zhou, 2017). Anxiety is an expected consequence of psychological distress that occurs as a result of the perception of a potentially dangerous event (Larson et al., 2016). According to Chakraborty (2022), it is a complex psychological construct that can emerge in various forms and degrees of severity and is the response of the body to an environmental stimulus that requires attention. This response is characterized by a series of biochemical changes such as an increase in adrenaline and a decrease in dopamine levels that work to increase our awareness of the perceived threat. Spielberger (1966) divides anxiety into two groups: trait and state anxiety. While trait anxiety is a more stable and persistent type that is associated with personality traits, state anxiety is a temporary one experienced by the individual in situations perceived as threatening (Özgüven, 2007). State anxiety has been the subject of many studies with several school-related variables, such as exam anxiety, school anxiety, and math anxiety (Bozkurt, 2012; Ekşi, 1998; Zbornik & Wallbrown, 1991).

Reading anxiety, which is an important variable of the research, is a type of state anxiety that includes both cognitive and physical responses developed toward the act of reading (Zbornik, 2001). According to Goldston et al. (2007), reading anxiety is seen in situations where the act of reading is mandatory. It is an important reading problem or difficulty that students face (Oyeleye & Odunayo, 2020). It may lead to adrenaline release, trembling hands, sweating, headaches, stomach aches, increased respiratory rate, feeling of an overwhelming fear, feeling of helplessness, fear of being evaluated, fear of failure, inadequacy, and expectation of being devalued (Çevik et al., 2019; Jalongo & Hirsh, 2010, Zhou, 2017). Some studies have shown that reading anxiety is one of the main factors that hinder the learning process (Barzegar & Hadidi, 2016; Jafarigohar & Behrooznia, 2012; Shoa, 2014). According to Eysenck et al. (2007), reading anxiety is a condition that complicates the use of academic skills, hinders the use of reading strategies, and prevents the student from utilizing prior knowledge in the reading process. In a study by Yamaç and Çeliktürk Sezgin (2018) on fourth-grade primary school students, it was determined that reading anxiety significantly affected reading comprehension skills. Esen-Aygün (2021) claimed that fourth-grade students' reading anxiety strongly affected their reading comprehension skills. Similarly, Macdonald et al. (2021) reported that reading anxiety negatively affected the reading skills of students in the fourth and fifth grades. High-level reading anxiety is an affective characteristic that will make it difficult for short-term memory, which contributes to comprehension, to work (Shoa, 2014). According to Onovughe (2012), there is a positive relationship between students' academic success and reading skills, and a one-unit decrease in the level of reading anxiety will increase a student’s academic success by 9%.

Another notable variable used in the study to explain the causality of reading anxiety is sleep deprivation. According to Guyton (1996), sleep is a process that develops spontaneously, that is reversible as a result of interaction with external stimuli, and in which temporary unconsciousness is experienced. Sleep deprivation occurs when the body delays sleeping (Terman & Terman, 2005). According to Yetkin and Aydın (2014), an individual experiencing sleep deprivation may show some symptoms, such as irritability, anxiety, loss of attention, lack of control, and lack of energy during the day. There are studies in the literature indicating that sleep-related problems negatively affect the learning process (Carskadon 2002; Wang & Fan, 2023). In a study conducted by Wolfson and Carskadon(1998), it was determined that students who did not experience sleep deprivation had higher learning motivation, reading comprehension levels, and course grades than those who did. According to Walker (2005), sleep deprivation, which is effective in the coding and retention of information, is a condition that negatively affects the learning process before and after sleep. A review of the literature indicated that there were no studies addressing the relationship between sleep deprivation and reading anxiety. However, there were some studies handling the relationships between anxiety, exam anxiety, and sleep problems (Dewald et al., 2014; Wang & Fan, 2023). In a study conducted by Wang and Fan (2023), it was found that there was a strong positive relationship between students' academic stress and academic success and their sleep quality. In the same study, a similar level of relationship was observed between students' learning burnout and sleep quality. In a study conducted by Qin et al. (2022), a positive relationship was detected between primary school students' learning burnout and anxiety and sleep deprivation. Wolfson and Carskadon (1998) stated that sleep deprivation affected reading skills.

The next variable addressed in the study is social-emotional learning skills used to explain reading anxiety. Social-emotional learning, which has become a significant gain of the education system in recent years, refers to the development process of many skills, such as individuals' recognition and management of their own emotions, having effective communication skills, awareness of positive and negative personality traits, being sensitive to others' needs, and being able to act responsibly and ethically (Elias & Moceri, 2012; Körler, 2011). Coryn et al. (2009) addressed the requirements that supported these skills by providing the source of students' social-emotional skills in three sub-dimensions, namely task definition, peer relations, and self-regulation. Task definition, in other words, a sense of duty, is related to students' awareness of their responsibilities and the ability to make decisions in line with there sponsibilities (Totan & Kabasakal, 2011). Peer relations, which is the second sub-dimension of social-emotional learning skills, include students' communication and experiences with their circle of friends. Peer relations have an effective role in individuals' cognitive and problem-solving skills (Reitz et al., 2014). In addition, they have a noteworthy place in students' academic success and psychosocial development (Mclane, 1998). According to Risemberg and Zimmerman (1992), self-regulation, the third sub-dimension of social-emotional learning skills, is defined as developing strategies to achieve determined goals and being able to control the effects of these strategies. According to Cohen (1999), social-emotional learning skills have a significant place in solving many social and emotional problems, such as facilitating interpersonal relationships, ensuring lifelong learning, supporting academic success, resolving conflicts, and expressing emotions effectively. A stated by Carter (2016), students' social-emotional skills should be strengthened so that they can develop holistically and increase their academic success. It has been stated in the literature that social-emotional learning skills are an important factor in reading skills and anxiety management (Elias, 2004; McLeod & Boyes, 2021; Polychroni et al., 2024; Yu, Yu, and Tong, 2023). According to Elias (2004), students' language and reading skills have a positive correlation with their social-emotional learning skills. Similarly, in a study conducted by Esen-Aygün and Taşkın (2017), a positive relationship was detected between students' social-emotional learning skills and Turkish and mathematics

courses. However, they pointed to a negative relationship between social-emotional learning skills and different situational anxiety levels in the learning process. Students' academic stress decreases with the development of social-emotional learning skills (Çelik, 2015). According to McLeod and Boyes (2021), educational programs based on social-emotional learning skills such as self-awareness and self-management are functional for students experiencing exam anxiety. There were no studies on the relationship between reading anxiety, which is the affective dimension of reading, and social-emotional learning skills in the literature.

According to some studies in the literature, reading attitude is an important variable used to explain reading anxiety (Baki, 2017; Dursun & Özenç, 2019; Hussein & Csíkos, 2023). It expresses the individual's views, beliefs, feelings, and thoughts toward reading (Agustiani, 2017). Reading and individuals' attitudes toward reading are equally important (Tunnell et al., 1991). According to Aronson et al. (2004), attitude consists of emotional, behavioral, and mental elements. The emotional aspect of the reading attitude is what individuals feel when they perform the act of reading. The behavioral domain constitutes the act of reading when appropriate reading conditions are provided for individuals. The individual's beliefs and thoughts toward the act of reading make up the cognitive aspect of the reading attitude (Özbay & Uyar, 2009). Individuals who develop a positive attitude toward reading have the habit of reading, and those who develop a negative attitude toward it generally avoid it (Hagan, 2013). In other words, whether the reading attitude of individuals is positive or negative is effective in the sustainability of the act of reading. With a similar approach, Altun et al. (2022) stated that the attitude of individuals toward reading also affected their academic performance, continuity of reading, and reading choices. According to Alexander and Filler (1976), reading attitude is an element that increases or decreases reading effectiveness and starts developing when the child's reading experience begins. Accordingly, reading attitude starts to be structured as strongly positive or negative in the primary school period when the reading experience begins. The literature focuses on the relationships between reading attitude and variables, such as reading comprehension, reading self-efficacy, perception of creative reading, and academic success (Bayraktar, 2017; Rachmajanti & Musthofiyah, 2017; Yurdakal, 2019; Çevik et al., 2023). There were studies in which reading attitude and reading anxiety, which are related to the affective areas of reading, were addressed together. Reading attitude has mostly been associated with second language learning. There was limited research on reading during the primary school period when the reading experience begins and progresses intensively (Aykut, 2023; Brantmeier, 2005; Hussein & Csíkos, 2023). Eysenck et al. (2006) detected a positive relationship between reading attitudes and reading anxiety and reported that students who had positive thoughts and feelings about reading activity experienced less anxiety while reading. However, these results should be investigated extensively in the primary school period when the reading experience begins and turns into a strong responsibility. It can be said that the reading experience in the fourth grade, which is the last grade of primary school, is higher than in other grades of primary school, considering the number of courses and subject content (Kuru & Taş, 2024; MEB, 2018). According to Kuru and Taş (2024), the course content in the program is measured with tests starting from the fourth grade. Therefore, it can be said that the increase in the number of courses and their content is a difficulty that fourth-grade students must overcome and that their reading potential must be fully used to cope with these challenges. It has been explained in the relevant sections above that reading anxiety is very important in having a high level of reading potential and reading skills. In the fourth grade, where the reading experience is intense, a better understanding of reading anxiety, which is likely to affect reading potential, will be useful in terms of preventive studies. On the other hand, Tonka and Bakır (2020) claimed that the highest reading anxiety in middle school was in the fifth grade. The middle school period is when reading skills are tested at school and national levels, and the number of exams increases. The fourth grade, which is the last grade of primary school, is when

basic skills/early skills such as reading comprehension, decoding, and fluency are mastered, and these skills are expected to be used for other course outcomes (Chall & Jacobs, 1983). According to Macdonald et al. (2021), early interventions are important for later success and future potential in students who have difficulty in reading processes. Therefore, studies on reading anxiety in the fourth grade, which is the last step of the transition to middle school, will mean a preventive function for academic difficulties in the middle school period.
There was limited research into understanding the nature of reading anxiety that affected the reading process in the primary school period when students started reading and read quite intensively. In particular, causality studies on the exploration of fourth-grade primary school students' reading anxiety are quite limited. There were very few studies on the relationship between reading anxiety and some variables, such as sleep deprivation, social-emotional learning skills, and reading attitudes. Primary school students spend a significant portion of their twenty-four hours sleeping or are required to spend it sleeping. It is thought that children's need for sleep/sleep quality is very critical for their personal, social, and learning experiences. At the same time, emotional-social gains, which are as important as reading activity or academic gains in school life, contribute to the explanation of reading anxiety, which creates a strong causality for learning. Reflecting on all these, this study was conducted to understand how the reading anxiety experienced by fourth-grade primary school students was explained by sleep deprivation, social-emotional learning skills, and reading attitudes altogether by using a hierarchical regression model.

This section includes some explanations about the research method, characteristics of the study group, data collection tools, data collection process, and the data preparation process for analysis.

Research Model

The correlational screening model was employed in this study to reveal the relationships between the reading attitudes of fourth-grade primary school students and their reading anxiety, sleep deprivation, and social-emotional learning skills. This model tries to identify relationships between more than one variable and the degree of this relationship, if any (Karasar, 2009). Similarly, it reveals the effect or relationship between different quantitative variables through a correlation coefficient (Fraenkel et al., 2012). This study sought correlations between variables, and the covariance of existing variables and, if any, how it occurred were investigated. According to these definitions, since the correlational and predictive relationships between the students' reading anxiety, reading attitudes, sleep deprivation, and social-emotional learning skills were examined in the research, a correlational screening model was employed.

Participants

The convenience sampling method was employed in the study. This method is widely used in studies. Additionally, it is an economical method (Yıldırım & Şimşek, 2011). The sample of this study consisted of 331 fourth-grade students from five different primary schools located in the central county of Kırıkkale province. Of the participants, 51.4% were girls (170) and 48.6% were boys (161). Demographic data of the students included in the study are given in Table 1 below.

Table 1. The distribution of the demographic data of the research group

Schools	Variables	Categories	N	%	Mean	sd
A School	Gender	Girls	19	35.2	10.05	.49
		Boys	35	64.8		
	Age	9	5	9.3		
		10	41	75.9		
		11	8	14.8		
B School	Gender	Girls	45	58.4	10.22	.62
		Boys	32	41.6		
	Age	9	8	10.4		
		10	44	57.1		
		11	25	32.5		
C School	Gender	Girls	59	54.6	10.34	.58
		Boys	49	45.4		
	Age	9	7	6.5		
		10	57	52.8		
		11	44	40.7		
D School	Gender	Girls	35	53	10.23	39
		Boys	31	47		
	Age	9	5	7.6		
		10	41	62.1		
		11	20	30.3		
E School	Gender	Girls	12	46.2	10.30	.78
		Boys	14	53.8		
	Age	9	5	19.2		
		10	8	30.8		
		11	13	50		

Data Collection

The Reading Anxiety Scale

This scale was developed by Çeliktürk and Yamaç (2015) for elementary and middle school students. It consists of 29 five-point Likert-type items. Its validity study was conducted with 410 students from the fourth and fifth grades. A single-factor 29-item structure was obtained as a result of an exploratory factor analysis (EFA). Cronbach's alpha coefficient of the scale was found as .95 as a result of a confirmatory factor analysis (CFA) including 220 fourth- and fifth-grade students. The fit values of the scale were $x^2/df=2.2$, RMSEA=.076, SRMR=.055, CFI=.97, and NFI=.95.

The Reading Attitude Scale

This scale was developed by McKenna and Kear (1990) for elementary school students to measure their reading attitudes and it was adapted to Turkish by Kocaarslan (2016). It consists of 20 four-point Likert items. The Spearman-Brown reliability coefficient was 0.83, the Guttmann split-half coefficient was 0.83, and Cronbach's alpha, indicating the internal consistency of the scale, was 0.88. As a result of the item-total correlation analysis and 27% lower-upper group comparisons, conducted to determine the predictive power of the total score

and discriminative power of the items, it was concluded that the items on the scale were adequate in terms of these features.

The Sleep Deprivation Scale

The "Sleep Deprivation Scale for Children and Adolescents," developed by Kandemir et al. (2021), consists of 17 four-point Likert-type items. Exploratory and confirmatory factor analyses were employed for the validity and reliability studies of the scale. There were 201 individuals aged between 8 and 17 with an average age of 12.37 in the exploratory factor analysis, and the confirmatory factor analysis included 254 subjects aged between 8 and 17, with the average age being 11.87. The Kaiser-Meyer-Olkin (KMO) value was .94, Bartlett's test result was $\chi 2=1833.03$, and Cronbach's alpha internal consistency value was .94. According to the result of the confirmatory factor analysis, chi-square/degree of freedom (254.94/ 65) was 3.92, RMSEA value was .07, and RMR was .027. The fit coefficients for the model were determined as CFI=.94, GF3=.91, AGFI=.91, IFI=.96, NFI=.94, and TLI=.97. The lowest score that can be obtained from the scale is 15 and the highest is 60. As the scores on the scale decrease, sleep deprivation decreases, as well, and as the scores increase, sleep deprivation increases, too.

The Social-Emotional Learning Scale

This scale was developed by Coryn et al. (2009). It was adapted to Turkish by Arslan and Akın (2014). It has 20 five-point Likert-type items and three sub-dimensions, namely 'task definition,' 'peer relations,' and 'self-regulation.' Three hundred elementary school students were included in the adaptation process of the scale. The correlation value for the language validity of the scale varied between .72 and .95. The confirmatory factor analysis (CFA) indicated that the fit of the three-dimensional structure was quite adequate. Fit indices of the scale were RMSEA=.05, NFI=.96, CFI=.98, AGFI=.90, IFI=.98, RFI=.95, and GFI=.92. The internal consistency coefficient for the reliability of the scale was estimated to be .90, and the test-retest coefficient was .71.

Data Collection Process and Preparation of Data for Analysis

The research was related to the author's doctoral thesis, and the study was conducted after an ethics committee approval was obtained within this scope. The research data were collected by the researcher. The study data were collected by the researcher. During the data collection process, the researcher entered the classroom, introduced herself to the students, and provided information about the purpose of the scale and how to fill it out. It was emphasized that the process was not an exam, their data would not be shared with anyone, and that feelings and thoughts could be easily reflected while responding to the scale items. It took an average of one class hour (40 minutes) to fill out the scale. The data collected in the study, which aimed to explain students' reading anxiety with reading attitudes, sleep deprivation, and social-emotional learning skills, were entered into the SPSS software and then the data set was prepared for the analysis process. According to Tabachnick and Fidell (2001), normality, multicollinearity, and linearity analyses should be performed before regression analyses. Accordingly, these analyses were performed before moving on to the main statistics of the study. After the frequency distributions of the research data were examined, the Mahalanobis distances of the data collected from each student were studied. According to the results of the examination, to achieve a significance level of .01, two data sets with a Mahalanobis value above the chi-square value in the ratio of the number of independent variables were removed from the analysis, and

the data set was re-recorded. In addition, the Z values of each student were examined, and one data set was found to have an extreme value, which was not within the range of +3 and -3. The data of this subject was also removed from the data set, and the data were re-recorded. After the outlier and extreme value analyses, linearity analysis, which is another prerequisite for regression analysis, was carried out between variables. According to Tabachnick and Fidell (2001), there should be a linear relationship between dependent and independent variables before regression analysis. Accordingly, the correlation analysis results were examined to determine the linearity between variables and it was found that the correlations were at the level of .05. This showed that there was no linearity problem. The same analysis indicated that the correlations among variables varied from -.20 to .45 (Table 1). According to Büyüköztürk (2011), a correlation value of >.80 indicates a multicollinearity problem. So, it can be said that there was no multicollinearity problem between the variables of the study. Normality of data is another prerequisite for regression analysis (Tabachnick & Fidell, 2001). The skewness and kurtosis values of the study were examined to identify it. The results of the analysis are given in Table 2.

Table 2. Descriptive analysis values of the variables

Variables	Kurtosis	Skewness
Reading anxiety	.76	-.14
Sleep deprivation	.29	-.43
Social-emotional skills	-.80	.92
Reading attitudes	-1.09	1.29
Total		

As seen in Table 2, the skewness scores varied from -.14 to 1.29, and the kurtosis values were between -1.09 and .76. According to Bai and Ng (2005), values between +3 and -3 show normality of data. According to the results of the analysis, it can be said that the research data did not have a normality problem. After these analyses, hierarchical regression analysis was carried out to explain to what extent reading anxiety was explained by the independent variables. The findings from the analysis are given in the results section of the study.

Findings

The findings obtained from the research are presented in tables considering the research questions. The descriptive analysis results for fourth-grade students' reading anxiety, sleep deprivation, social-emotional learning skills, and reading attitudes are given in Table 2.

Table 3. Descriptive analysis of the variables

Variables	The lowest	The highest	Mean	Sd
Age	9	11	10.22	.67
Reading anxiety	1	4.55	2.04	.79
Sleep deprivation	1	4	2.11	.70
Social-emotional skills	1	5	3.78	.70
Reading attitudes	1	4	3.16	.59

As seen in Table 3, mean scores were 2.04 for reading anxiety, 2.11 for sleep deprivation, 3.78 for social-emotional skills, and 3.16 for reading attitudes. When the average scores were compared, it was seen that the mean reading anxiety score, which is the dependent variable of the study, was at an average level. The mean scores for social-emotional skills and reading

attitudes were high. The results of the correlation analysis conducted following the descriptive analysis to evaluate the relationships between the variables are given in Table 3.

Table 4. Correlations between variables

Variables	**1**	**2**	**3**	**4**
Reading anxiety (1)	1			
Reading attitudes (2)	-,27**	1		
Sleep deprivation (3)	,34**	-,33**	1	
Social-emotional skills (4)	-,34**	,45**	-,20**	

When Table 4, which shows the relationships between the variables in the study, was examined, a significant negative relationship was found between reading anxiety and reading attitudes ($r = -.27$, $p < .01$) and social-emotional learning skills ($r = -.34$, $p < .01$). There was a significant positive relationship between reading anxiety and sleep deprivation ($r = .34$, $p < .01$). Reading attitudes variable was detected to have a significant negative relationship with sleep deprivation ($r = -.33$, $p < .01$) and a significant positive relationship with social-emotional skills ($r = .45$, $p < .01$). There was a significant negative relationship between sleep deprivation and social-emotional skills ($r = -.20$, $p < .01$). The correlations and linearity between the variables were evaluated with correlation analysis, and then hierarchical regression analysis was performed to find out the predictive effect of the correlations.

Table 5. Results of the Hierarchical Regression Analysis Performed to Reveal the Causes of Reading Anxiety

Model	***Variables***	***B***	***sd***	***Beta***	***df***	***t***	***p***	***VIF***	***Durbin - Watson***
1	*Constant*	1.25	.13		1/329	9.63			
	Sleep deprivation	.38	.06	.34		6.47	.01	1.00	
2	*Constant*	2.57	.27		1/328	9.56			
	Sleep deprivation	.31	.06	.28		5.50	.01	1.04	
	Socio-emotional skills	-.31	.06	-.28		-5.55	.01	1,04	1.77
3	*Constant*	2.76	.33		1/327	8.50			
	Sleep deprivation	.30	.06	.26		4.99	.01	1.13	
	Socio-emotional skills	-.29	.06	-.26		-4.61	.01	1.26	
	Reading attitudes	-.08	.08	-.06		-1.05	.30	1.36	
Model 1:	*R=.34*	*R²=.11*	*ΔR²= .11*	*F(1,329)= 41.81, p<.01*					
Model 2:	*R=.44*	*R²=.19*	*ΔR²= .18*	*F(1,328)= 38.17, p<.01*					
Model 3:	*R=.44*	*R²=.19*	*ΔR²= .18*	*F(1,328)= 25.82, p<.01*					

A hierarchical regression analysis was conducted to determine whether reading anxiety was explained by sleep deprivation, social-emotional skills, and reading attitudes. The results of the

analysis are given in Table 5. Sleep deprivation was included in the first model of the hierarchical regression analysis, social-emotional skills in the second model, and reading attitudes in the last model. According to Field (2009), the order in which the variables in this analysis enter the model is determined according to the findings of previous studies among the variables and the researcher's choices. The sleep variable is thought to be a predictor that is important for life and is quite critical in terms of the existence of the individual. Accordingly, the sleep deprivation variable was used as a basic predictor in Model 1 in the analysis. Social-emotional learning skills were included in the analysis in Model 2. Social-emotional learning skills start to develop before students' school life and they are one of the antecedent predictors. The reading attitude variable was included in the last model. Reading attitude, which starts to develop after sleep and social-emotional learning skills, is evaluated as the variable closest to reading anxiety in terms of order. Kayaalp et al. (2015) stated that the variables showing the highest correlation with the dependent variable could be included in the model first. Reflecting on these evaluations, a regression model was established and analyzed. According to the results, the first model was significant ($F(1,329)= 41.81$, $p<.01$) and sleep deprivation explained .11 of the variance in students' reading anxiety ($\Delta R^2=11$). Accordingly, students' sleep deprivation predicted their reading anxiety positively and significantly ($\beta=.34$, $t(329) = 6.47$, $p<.01$). In the second stage, students' social-emotional learning skills were included in the model. According to the analysis results, it was seen that the second model was also significant ($F(1,328) = 38.17$, $p<.01$) and that social-emotional skills explained .18 of the variance in students' reading anxiety ($\Delta R^2=18$). Students' social-emotional learning skills negatively and significantly predicted their reading anxiety during reading ($\beta=-.28$, $t(329) = -5.55$, $p<.01$). Students' reading attitude was included in the model in the third stage. According to the analysis, the third model was significant, too ($F(1,327)= 25.82$, $p<.01$). However, the reading attitude included in the analysis in the third model did not have a predictive effect on students' reading anxiety alone ($\beta=-.06$, $t(327) = -1.05$, $p>.05$).

Conclusion and Discussion

In the present study, in which the reading anxiety experienced by fourth-grade primary school students was tried to be explained by sleep deprivation, social-emotional learning skills, and reading attitudes, significant correlations were found between reading anxiety and independent variables. There was a significant positive relationship between sleep deprivation, which is the main independent variable of the study, and reading anxiety. At the same time, the regression model indicated that the correlations between the variables turned into a predictive relationship. It is possible to say that the variable that most strongly affected students' reading anxiety was sleep deprivation. When the literature was examined, no studies into the relationships between sleep deprivation and reading anxiety were found. However, there were studies in the literature on the examination of the relationships between students' learning and success experiences and their sleep experiences (Wolfson & Carskadon, 1998; Dewald et al., 2014; Wang & Fan, 2023). For example, Wolfson and Carskadon (1998) claimed that students who were not deprived of sleep had higher learning motivation, reading comprehension levels, and academic success than those who were. In a study conducted by Qin et al. (2022), a positive relationship was found between primary school students' learning burnout, anxiety, and sleep deprivation. The quality of sleep is very important in information processing by short-term memory and the retention of information (Walker, 2005).

According to Torun Yazıhan and Yetkin (2018), sleep is a factor that strengthens or weakens individuals' cognitive processes, such as learning, memory, coding, retention, and understanding. Reading skills cover cognitive processes, such as comprehension, association, and memory (Zbornik, 2001). Therefore, sleep-deprived students are likely to experience

anxiety during reading activities, which are related to some cognitive processes, e.g., word recognition, comprehension, and fluency. Randazzo et al. (1998) supported this assessment in their study. They found that students between the ages of 10-14 who slept less than five hours had more difficulty in performing tasks requiring metacognitive skills, such as abstract thinking, verbal creativity, comprehension, and memory, and that they were more anxious. Stickgold et al. (2000) stated that sleep-deprived students had more difficulty in tasks related to cognitive skills requiring visual discrimination than students who were not. Reading activity is not only a psychomotor behavior but also includes cognitive processes in which symbols that require a lot of visual discrimination are combined and recalls (retention of information stored in memory) that include prior knowledge are made. When the short-term memory (working memory), which begins to analyze stimuli coming to the mind and processes prior knowledge, weakens, the reading process is also affected, thereby leading to reading anxiety (Macdonald et al., 2001). Hershner and Chervin (2014) stated that sleep deprivation was a condition that affected working memory. Stichgold (2005) similarly stated that students who were stuck in the RAM and NRAM 2 stages of sleep and could not move on to the stages representing sleep depth had problems with skills requiring verbal competence. It was also stated in the same study that these students had problems with short-term memory, that is, working memory. Therefore, as Macdonald et al. (2001) stated, students who begin to have difficulties in working memory may experience anxiety while reading.

One of the noteworthy results of the study was that social-emotional learning skills created causality for reading anxiety. In the study, students' social-emotional learning awareness was seen as a feature that reduced their reading anxiety. There were no studies in the literature that directly supported this result of the study. However, there were some studies showing a positive relationship between primary school students' reading skills and social-emotional learning skills (Alkhateeb, 2014; Connor, 2016; Elias, 2004; Esen-Aygün & Taşkın, 2017; Messo, 2023) and studies indicating that social-emotional learning skills affected some types of state anxiety, such as test anxiety, math anxiety, and learning anxiety (Guntur & Purnomo, 2024; McLeod & Boyes, 2021; Polychroni et al., 2024; Yu et al., 2023). In the literature, a positive relationship was shown between students' language and reading skills and social-emotional learning skills (Elias, 2004). In a study conducted by Ortiz et al. (2012), it was found that when kindergarten and first-grade primary school students had high levels of social-emotional skills, their word recognition and reading comprehension skills also increased. In a study conducted by Jögi et al. (2021) on primary school students, it was claimed that social-emotional competencies (empathy, positive relationship, etc.) were positively correlated with reading skills and negatively with stress levels. According to Firdaus (2017), students' social-emotional skills strongly affected their reading skills. Trentacosta and Izard (2007) stated that students with high social-emotional competence had better interactions with their teachers and classmates and were more successful in participating in activities. This increases students' competence in reading activities and helps them feel more emotionally comfortable while learning. At the same time, students with high levels of social-emotional learning skills already had advanced verbal skills, like vocabulary and reading comprehension. Therefore, students with advanced verbal skills, like reading skills, will feel better while reading (Hofmann & Müller, 2021). Yu et al. (2023) reported that the scenarios that students encountered while reading were similar to those they came across in social environments. Therefore, competence in social interaction (comprehension, empathy, emotional regulation, etc.) will affect competence during reading. In a study conducted on fifth-grade students, Alkhateeb (2014) found that students' high levels of social-emotional skills were an important factor that reduced their reading anxiety. Similarly, McLeod and Boyes (2021) reported that self-awareness was a variable that reduced exam anxiety. Awareness of strengths and weaknesses can help children manage the anxiety they will experience by making realistic assessments of what they can do during reading, learning, and

exam processes. The significant relationship between self-regulation, which is an important dimension of social-emotional learning skills, and types of academic state anxiety reported in the literature is noteworthy (Ocak et al., 2022; Jerath et al., 2015; Guntur & Purnomo, 2024). In a study conducted on seventh- and eighth-grade students, Ocak et al. (2022) reported a negative correlation between self-regulation skills and exam anxiety. Guntur and Purnomo (2024) stated in their study that primary school students' mathematics anxiety negatively and significantly affected their self-regulation skills, which is a dimension of social-emotional learning skills. In the same study, it was stated that self-regulation skills were an important feature in managing a person's behavior and emotions. Individuals with self-regulation skills are aware of themselves and their competencies and can use these characteristics at the highest level in the learning/performance process (Zimmerman, 2002). According to these explanations, individuals with social-emotional learning skills will be aware of their reading competence while reading and will transfer their reading skills to the act of reading at the highest level, so their anxiety levels toward reading will decrease. According to Beck (1964), cognitions and beliefs control and regulate emotions. Therefore, a student who attributes positive meanings to his/her characteristics and reading skills will be able to manage the anxiety he/she will experience during the reading process.

One of the important results of the study was the correlation between students' attitudes toward reading and reading anxiety. Accordingly, although there was a correlation between reading attitude, which was included in the third stage of the model, and reading anxiety, this relationship did not turn into a predictive correlation in the model. There are several studies on the relationship between the two variables in the literature (Melanlıoğlu & Bıyık, 2022; Murray & Janelle, 2003). For example, Melanlıoğlu and Bıyık (2022) found a negative correlation between reading anxiety and reading attitudes. However, whether reading anxiety was predicted by reading attitudes was not examined in the study. There were limited studies in the literature conducted to understand the relationships between both variables. In the present study, in which we tried to explain the reading anxiety of primary school students, it was seen that the relationship between reading attitude and reading anxiety did not turn into a predictive relationship. In the study, the predictive effect of the relationships between sleep deprivation and social-emotional learning skills and reading anxiety was revealed in the regression model. However, the reading attitude variable was found to have an insignificant effect in the regression model. Therefore, the strong effect of sleep deprivation and social-emotional learning skills in the model may have suppressed the effect level of reading attitude. In other words, inadequate sleep and social-emotional learning skills were strong variables that suppressed reading attitude in students' reading anxiety.

Although the model we tried to explain the reading anxiety of primary school students with the regression model was confirmed in the research, some limitations were noted in the research process. The other these was that studies on the relationships between the concepts of the research were limited in the literature. This situation also led to a certain limitation to the discussion of the findings. Therefore, examining the relationships between the variables with different research models is very important in terms of testing the research findings in different studies. In the research, it was found that sleep and social-emotional learning skills predicted reading anxiety more strongly than reading attitudes. In the model established in the study, the combined effect of sleep deprivation and social-emotional learning skills seemed to have eliminated the effect of reading attitudes. Since this is a very important result, it will be important to test it in future research. At the same time, studies in the literature on the relationships between these concepts were quite limited at the primary school level. Therefore, there is a need for more information on how reading anxiety is affected by sleep deprivation and social-emotional skills at the primary school level, where the act of reading is most intense and the foundations of reading are laid. Another limitation was that the study was conducted at

the fourth-grade level. It would be important to examine reading anxiety and other variables in the study in terms of grade and school levels. The model developed by Coryn et al. (2009) for social-emotional learning skills was examined in the study. However, there were some other models, like the CASEL model, in the literature. Different social-emotional learning skills can also be used to understand the nature of reading anxiety in future research.

The results of the study are very valuable for the stakeholders of the education system, especially classroom teachers. Sleep and social-emotional skills are basic needs for individuals. Knowing that these skills are critical in educational activities such as reading, learning, and motivation will affect practitioners' approaches. Psycho-education on sleep health involving parents will be useful in reducing reading and learning anxiety. Reading anxiety can be reduced by creating an empathic atmosphere in the classroom where students can express themselves and develop positive social relationships and which support sociability. During the development process of policies and programs for the education system, it would be beneficial to take into account basic physiological needs such as sleep and basic psychological requirements like social-emotional skills.

References

Agustiani, I. W. D. (2017). The correlation between students reading attitude and their reading comprehension achievement. *English Community Journal*, *1*(2), 75-85. https://doi.org/10.32502/ecj.v1i2.764

Akyol, H. (2012). *Türkçe ilkokuma yazma öğretimi*. Ankara: Pegem.

Alexander, J. E. & Filler, R. C. (1976). Attitudes and reading. Reading Aids Series.

Alkhateeb, H. M. (2014). Reading anxiety, classroom anxiety, language motivation, reader self-perception, and Arabic achievement of Arab-American students learning Arabic as a second language. *Psychological Reports*, *115*(3), 918-931. https://doi.org/10.2466/11.PR0.115c27z6

Altun, D., Tantekin Erden, F., & Hartman, D. K. (2022). Preliterate young children's reading attitudes: Connections to the home literacy environment and maternal factors. *Early Childhood Education Journal*, *50*(4), 567-578. https://doi.org/10.1007/s10643-021-01177-2

Aronson, Z. H., Shenhar, A. J., & Reilly, R. R. (2010). Project spirit: Placing partakers' emotions, attitudes and norms in the context of project vision, artifacts, leader values, contextual performance and success. *The Journal of High Technology Management Research, 21*(1), 2-13. https://doi.org/10.1016/j.hitech.2010.02.002

Arslan, S., & Akın, A. (2013). Sosyal duygusal öğrenme ölçeği: Geçerlik ve güvenirlik çalışması. *Sakarya Üniversitesi Eğitim Fakültesi Dergisi*, (25), 23-34.

Aykut, Ş. (2023). Müzikli okuma uygulamalarının ilkokul 4. sınıf öğrencilerinin okuma kaygıları ve tutumları üzerindeki etkileri [Yayımlanmamış yüksek lisans tezi]. Akdeniz Üniversitesi.

Bai, J., & Ng, S. (2005). Tests for skewness, kurtosis, and normality for time series data. *Journal of Business & Economic Statistics*, *23*(1), 49-60. https://doi.org/10.1198/073500104000000271

Baki, Y. (2017). Ortaokul öğrencilerinin okumaya ilişkin kaygı ve tutumlarının okuma alışkanlığı üzerindeki etkisi: Bir yapısal eşitlik modellemesi. *Eğitim ve Bilim*, *42*(191). http://dx.doi.org/10.15390/EB.2017.7223

Ball, E. W., & Blachman, B. A. (1991). Does phoneme awareness training in kindergarten make a difference in early word recognition and developmental spelling?. *Reading research quarterly*, 49-66.

Barzegar, R., & Hadidi, E. (2016). On the relationship between reading anxiety and performance on IELTS reading comprehension item types. *International Journal of Language Academy*, *4*(1), 97-114. http://dx.doi.org/10.18033/ijla.355

Bayraktar, İ. (2017). Ortaokul 7. sınıf öğrencilerinin okuma tutumları ile okuduğunu anlama becerileri arasındaki ilişki. *International Journal of Languages' Education and Teaching*, *5*(4), 582-594.

Beck, A. T. (1964). Thinking and depression: II. theory and therapy. *Archives of General Psychiatry*, *10*(6), 561-571.

Bozkurt, S. (2012). İlköğretim ikinci kademe öğrencilerinde sınav kaygısı, matematik kaygısı, genel başarı ve matematik başarısı arasındaki ilişkilerin incelenmesi [Yayımlanmamış yüksek lisans tezi]. İstanbul Üniversitesi.

Brantmeier, C. (2005). Anxiety about l2 reading or l2 reading tasks? a study with advanced language learners. *Reading*, *5*(2), 67-85.

Büyüköztürk, Ş. (2011). Veri analizi el kitabı. Ankara: Pegem A Yayıncılık.

Carskadon, M. A. (2002). Factors influencing sleep patterns of adolescents.

Carter, P. L. (2016). Educational equality is a multifaceted issue: Why we must understand the school's sociocultural context for student achievement. *RSF: The Russell Sage Foundation Journal of The Social Sciences*, *2*(5), 142-163.

Chakraborty, M. M. (2022). A Study to assess the effect of emotional freedom technique (EFT) on stress & anxiety among nurses working in covid ward at selected hospital. *Journal of Pharmaceutical Negative Results*, 5041-5045. https://doi.org/10.47750/pnr.2022.13.S08.661

Chall, J. S., & Jacobs, V. A. (1983). Writing and reading in the elementary grades: Developmental trends among low SES children. *Language arts*, *60*(5), 617-626. https://doi.org/10.58680/la198326312

Cohen, A. (1999). Relationships among five forms of commitment: An empirical assessment. *Journal of Organizational Behavior*, *20*(3), 285-308.

Connor, C. M. (2016). A lattice model of the development of reading comprehension. *Child Development Perspectives*, *10*(4), 269-274. https://doi.org/10.1111/cdep.12200

Coryn, C. L., Spybrook, J. K., Evergreen, S. D., & Blinkiewicz, M. (2009). Development and evaluation of the social-emotional learning scale. *Journal of Psychoeducational Assessment*, *27*(4), 283-295. https://doi.org/10.1177/0734282908328619

Çelik, M. (2015). Öğretmenlerin mesleki profesyonelliği ile tükenmişlikleri arasındaki ilişki [Yayımlanmamış yüksek lisans tezi]. Dumlupınar Üniversitesi.

Çeliktürk, Z. & Yamaç, A. (2015). İlkokul ve ortaokul öğrencileri için okuma kaygısı ölçeğinin geliştirilmesi: Geçerlik ve güvenirlik çalışması. *İlköğretim Online, 14*(1).

Çevik, A., Ayana, H., & Ayana, M. (2023). Ortaokul öğrencilerinin okuma iç motivasyonları, akademik başarıları, okuma tutum ve alışkanlarının arasındaki ilişkinin incelenmesi. *RumeliDE Dil ve Edebiyat Araştırmaları Dergisi*, (32), 117-130. https://doi.org/10.29000/rumelide.1252825

Çevik, H., Orakcı, Ş., Aktan, O., & Toraman, Ç. (2019). Ortaokul öğrencilerinin okuma kaygılarının çeşitli değişkenler bakımından incelenmesi. *Eğitimde Kuram ve Uygulama, 15*(1), 1-16. https://doi.org/10.17244/eku.398683

Dewald, J. F., Meijer, A. M., Oort, F. J., Kerkhof, G. A., & Bögels, S. M. (2014). Adolescents' sleep in low-stress and high-stress (exam) times: A prospective quasi-experiment. *Behavioral Sleep Medicine, 12*(6), 493-506. https://doi.org/10.1080/15402002.2012.670675

Dewald-Kaufmann, J. F., Oort, F. J., & Meijer, A. M. (2014). The effects of sleep extension and sleep hygiene advice on sleep and depressive symptoms in adolescents: A randomized controlled trial. *Journal of Child Psychology and Psychiatry, 55*(3), 273-283. https://doi.org/10.1111/jcpp.12157

Dursun, H., & Özenç, E. G. (2019). İlkokul 4. sınıf öğrencilerinin okuma kaygıları ile Türkçe dersine yönelik tutumları arasındaki ilişki (Kayseri ili örneği). *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, (51), 144-159.

Ekşi, P. (1998). *Sınav kaygısının üniversite adayı ergenlerde incelenmesi (İstanbul ili, Bakırköy ilçesi örneği)*[Yayımlanmamış yüksek lisans tezi]. Marmara Üniversitesi.

Elias, M. J. (2004). The connection between social-emotional learning and learning disabilities: Implications for intervention. *Learning Disability Guarterly, 27*(1), 53-63. https://doi.org/10.2307/1593632

Elias, M. J. & Moceri, D. C. (2012). Developing social and emotional aspects of learning: The American experience. *Research Papers in Education, 27*(4), 423-434. https://doi.org/10.1080/02671522.2012.690243

Esen-Aygün, H., (2021). İlkokul öğrencilerinin okuduğunu anlama becerisi ile okuma kaygısı arasındaki ilişkide okuma alışkanlığının aracı rolü. *Milli Eğitim Dergisi, 50*(231), 91-109. https://doi.org/10.37669/milliegitim.746081

Esen-Aygun, H. & Sahin-Taskin, C. (2017). Teachers' views of social-emotional skills and their perspectives on social-emotional learning programs. *Journal of Education and Practice, 8*(7), 205-215.

Eysenck, M., Payne, S., & Santos, R. (2006). Anxiety and depression: Past, present, and future events. *Cognition and Emotion, 20*(2), 274-294. https://doi.org/10.1080/02699930500220066

Eysenck, M. W., Derakshan, N., Santos, R., & Calvo, M. G. (2007). Anxiety and cognitive performance: Attentional control theory. *Emotion, 7*(2), 336.

Field, A. (2009). Discovering statistics using SPSS–SAGE Publications Ltd. *London, UK*, 264-315.

Firdaus, M. A. (2017). Looking at the link between emotional intelligence and reading comprehension among senior high school students. *Journal of Education and Instruction*, *4*(2), 18-28.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). How to design and evaluate research in education (7th Ed.). New York: McGraw-Hill.

Goldston, D. B., Walsh, A., Arnold, E. M., Reboussin, B., Daniel, S. S., Erkanli, A.,Nutter, D., Hickman, E., Palmes, G., Snider, E., & Wood, F. B. (2007). Reading problems, psychiatric disorders, and functional impairment from mid-to late adolescence. *Journal of The American Academy of Child & Adolescent Psychiatry*, *46*(1), 25-32. https://doi.org/10.1097/01.chi.0000242241.77302.f4

Guntur, M., & Purnomo, Y. W. (2024). Unravelling the interplay of self-efficacy, self-regulation, metacognition in alleviating math anxiety among primary school student: A conditional process analysis. *Education 3-13*, 1-17. https://doi.org/10.1080/03004279.2024.2396096

Guyton, A. (1996). *Tıbbi fizyoloji*. Nobel Tıp Kitapevi.

Hagan, E., (2013). Student reading attitudes in relation to the instructional approach (Doctoral dissertation, Northwest Missouri State University).

Hershner, S. D., & Chervin, R. D. (2014). Causes and consequences of sleepiness among college students. *Nature and Science of Sleep*, 73-84.

Hofmann, V.& Müller, C.M., (2021). Language skills and social contact among students with intellectual disabilities in special needs schools. *Learning, Culture and Social Interaction*, 30.

Hussein, Y. & Csíkos, C. (2023). The effect of teaching conceptual knowledge on students' achievement, anxiety about, and attitude toward mathematics. *Eurasia Journal of Mathematics Science and Technology Education*, *19*(2). https://doi.org/10.29333/ejmste/12938

Jafarigohar, M. & Behrooznia, S. (2012). The effect of anxiety on reading comprehension among distance efl learners. *International Education Studies*, *5*(2), 159-174.

Jalongo, M. R. & Hirsh, R. A. (2010). Understanding reading anxiety: New insights from neuroscience. *Early Childhood Education Journal*, *37*(6), 431-435.

Jerath, R., Crawford, M. W., Barnes, V. A., & Harden, K. (2015). Self-regulation of breathing as a primary treatment for anxiety. *Applied Psychophysiology and Biofeedback*, *40*(2), 107-115.

Jõgi, A. L., Pakarinen, E., Tolvanen, A., & Lerkkanen, M. K. (2022). Reading skills, social competence, and physiological stress in the first grade. *School Mental Health*, *14*(3), 624-639.

Kandemir, M., Bozdemir, E., Hayran, Y., Tonga, Z., & Kandemir, A. (2021). Çocuk ve Ergenler İçin Uyku Yoksunluğu Ölçeği. *Journal of Interdisciplinary Education: Theory and Practice*, *3*(1), 48-61. https://doi.org/10.47157/jietp.875187

Karasar, N. (2009). Bilimsel araştırma yöntemi: Kavramlar-ilkeler-teknikler. *Ankara: Nobel Yayın Dağıtım*.

Kayaalp, G. T., Güney, M. Ç., & Cebeci, Z. (2015). Çoklu doğrusal regresyon modelinde değişken seçiminin zootekniye uygulanışı. *Çukurova Üniversitesi Ziraat Fakültesi Dergisi*, *30*(1), 1-8.

Kocaarslan, M. (2016). "Garfield" görselli 1-6. sınıflar İçin okumaya yönelik tutum ölçeğinin Türkçe uyarlama çalışması. *İlköğretim Online*, *15*(4). https://doi.org/10.17051/io.2016.25140

Körler, Y. (2011). İlköğretim ikinci kademe öğrencilerinin çeşitli değişkenler açısından yalnızlık düzeyleri ve yalnızlık ile sosyal duygusal öğrenme becerileri arasındaki ilişkiler [Yayımlanmamış yüksek lisans tezi]. Anadolu Üniversitesi.

Kuru, O., & Taş, F. (2024). İlkokul dördüncü sınıf öğrencilerinin sınavlara dair düşünceleri. *Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, (46), 98-132. https://doi.org/10.14520/adyusbd.1413902

Larson, E., Patterson, D., Garberson, L., & Andrilla, C. (2016). Supply and distribution of the behavioral health workforce in rural America. Retrieved from Seattle, WA.

Macdonald, K. T., Cirino, P. T., Miciak, J., & Grills, A. E. (2021). The role of reading anxiety among struggling readers in fourth and fifth grade. *Reading & Writing Quarterly*, *37*(4), 382-394. https://doi.org/10.1080/10573569.2021.1874580

McKenna, M. C., & Kear, D. J. (1990). Measuring attitude toward reading: A new tool for teachers. *The Reading Teacher*, *43*(9), 626-639.

McLane, M. T. (1998). What general education teachers know about the social competence of students with disabilities and what are the sources of this knowledge?. State University of New York at Albany.

McLeod, C., & Boyes, M. (2021). The effectiveness of social-emotional learning strategies and mindful breathing with biofeedback on the reduction of adolescent test anxiety. *Canadian Journal of Education*, *44*(3), 815-847. https://doi.org/10.53967/cje-rce.v44i3.4869

MEB (2018). *İlköğretim Öğretim Programı*, Ankara.

Melanlıoğlu, D., & Bıyık, Z. (2022). Kovid-19 sürecinde ortaokul öğrencilerinin akıcı okuma becerilerinin okuduğunu anlama, okuma tutum ve kaygıyla ilişkisi. *Karadeniz Araştırmaları*, *19*(76), 1311-1330. https://doi.org/10.56694/karadearas.1220659

Messo, I. N. (2023). *Relationship between social competence and reading skills acquisition in primary school pupils: Teachers' knowledge, perceptions and practices* (Doctoral dissertation, University of Dar es salaam).

Murray, N. P., & Janelle, C. M. (2003). Anxiety and performance: A visual search examination of the processing efficiency theory. *Journal of Sport and Exercise Psychology*, *25*(2), 171-187. https://doi.org/10.1123/jsep.25.2.171

Ocak, G., Karafil, B., & Akar, F. (2022). Exploring the Relationship between self-regulation skill and test anxiety level of secondary school students. *Bulletin of Education and Research*, *44*(3), 55-76.

Onovughe, O. G. (2012). Internet use and reading habits of higher institution students. *Journal of Emerging Trends in Educational Research and Policy Studies*, *3*(1), 11-15.

Ortiz, M., Folsom, J. S., Al Otaiba, S., Greulich, L., Thomas-Tate, S., & Connor, C. M. (2012). The componential model of reading: Predicting first grade reading performance of culturally diverse students from ecological, psychological, and cognitive factors assessed at kindergarten entry. *Journal of Learning Disabilities*, *45*(5), 406-417. https://doi.org/10.1177/0022219411431242

Oyeleye, A. O., & Odunayo, O. O. (2020). Reading anxiety as correlate of students' performance in introduction to library studies in michael otedola college of primary education, Lagos state, Nigeria. *Library Philosophy and Practice*, 1-14.

Özbay, M., & Uyar, Y. (2009). İlköğretim ikinci kademe öğrencileri için okumaya yönelik tutum ölçeğinin geliştirilmesi: Geçerlilik ve güvenirlik çalışması özet. *E-Journal of New World Sciences Academy*, *4*(2), 1C0048.

Özgüven, İ. E. (2007). Psikolojik testler. Ankara: PDREM Yayınları

Polychroni, F., Antoniou, A. S., Kofa, O., & Charitaki, G. (2024, June). Reading self-concept, trait emotional intelligence and anxiety of primary school children with dyslexia. In *Frontiers in Education* (Vol. 9, p. 1371627). Frontiers Media SA.https://doi.org/10.3389/feduc.2024.1371627

Qin, L., Chen, S., Luo, B., & Chen, Y. (2022, October). The effect of learning burnout on sleep quality in primary school students: The mediating role of mental health. In *Healthcare* (Vol. 10, No. 10, p. 2076). MDPI. https://doi.org/10.3390/healthcare10102076

Rachmajanti, S., & Musthofiyah, U. (2017). The relationship between reading self-efficacy, reading attitude and efl reading comprehension based on gender difference. *Journal of English Language, Literature, and Teaching*, *1*(1), 20-26.

Randazzo, A. C., Muehlbach, M. J., Schweitzer, P. K., & Waish1, J. K. (1998). Cognitive function following acute sleep restriction in children ages 10–14. *Sleep*, *21*(8), 861-868. https://doi.org/10.1093/sleep/21.8.861

Reitz, A. K., Zimmerman, J., Hutteman, R., Specht, J., & Neyer, F. J. (2014). How peers make a difference: The role of peer groups and peer relationships in personality

development. *European Journal of Personality*, *28*(3), 279-288. https://doi.org/10.1002/per.1965

Risemberg, R., & Zimmerman, B. J. (1992). Self-regulated learning in gifted students. *Roeper Review*, *15*(2), 98-101. https://doi.org/10.1080/02783199209553476

Shala, M. (2013).The impact of preschool social-emotional development on academic success of elementary school students. *Psychology*, 4, 787–791.

Shoa, X. (2014). A study of Chinese college students' English reading anxiety. *American Journal of Educational Research*, 2(5), 299-303.

Spielberger, C. D. (1966). Theory and research on anxiety. *Anxiety and Behavior/Academic Press*, *17*.

Stickgold, R. (2005). Sleep-dependent memory consolidation. *Nature*, *437*(7063), 1272-1278.

Stickgold, R., James, L., & Hobson, J. A. (2000). Visual discrimination learning requires sleep after training. *Nature Neuroscience*, *3*(12), 1237-1238.

Tabachnick, B. G., & Fidell, L. S. (2001). Using multivariate statistics (4th ed.). Needham Heights, MA: Allyn & Bacon.

Terman, M., & Terman, J. S. (2005). Light therapy. *Principles and practice of sleep medicine*, *4*, 1424-1442.

Tonka, H., & Bakir, S. (2020). The examination of the relationship between the secondary school students' habit of reading and their reading anxiety. *Journal of Educational Issues*, *6*(1), 293-313. https://doi.org/10.5296/jei.v6i1.16986

Torun Yazıhan, N., & Yetkin, S. (2018). Uyku ve açık bellek arasındaki ilişki. *Journal of Turkish Sleep Medicine*, 5, 54-57.

Totan, T., & Kabasakal, Z. (2011). Sosyal ve duygusal öğrenme becerileriyle öz-kavram arasındaki kanonik ilişkiler. In *International Conference on New Trends in Education and Their Implications* (p. 248).

Trentacosta, C. J., & Izard, C. E. (2007). Kindergarten children's emotion competence as a predictor of their academic competence in first grade. *Emotion*, *7*(1), 77. https://psycnet.apa.org/doi/10.1037/1528-3542.7.1.77

Tunnell, M. O., Calder, J. E., Justen, J. E., & Phaup, E. S. (1991). Attitudes of young readers. *Reading Improvement*, *28*(4), 237.

Walker, M. P. (2005). A refined model of sleep and the time course of memory formation. *Behavioral and Brain Sciences*, *28*(1), 51-64. https://doi.org/10.1017/S0140525X05000026

Wang, H., & Fan, X. (2023). Academic stress and sleep quality among Chinese adolescents: Chain mediating effects of anxiety and school burnout. *International Journal of Environmental Research and Public Health*, *20*(3), 2219. https://doi.org/10.3390/ijerph20032219

Wolfson, A. R., & Carskadon, M. A. (1998). Sleep schedules and daytime functioning in adolescents. *Child Development*, *69*(4), 875-887. https://doi.org/10.1111/j.1467-8624.1998.tb06149.x

Yamaç, A., & Sezgin, Z. Ç. (2018). İlkokul dördüncü sınıf öğrencilerinin okuma kaygıları, akıcılıkları, motivasyonları ve okuduğunu anlamaları arasındaki ilişkiler. *Eğitim ve Bilim*, *43*(194). https://dx.doi.org/10.15390/EB.2018.7555

Yetkin, S., & Aydın, H. (2014). Bir semptom ve bir hastalık olarak uykusuzluk. *Türk Uyku Tıbbi Dergisi*, *1*(1), 1-8.

Yıldırım, A., Şimşek, H. (2011). Sosyal Bilimlerde Nitel Araştırma Yöntemleri. Seçkin Yayınevi.

Yu, L., Yu, J. J., & Tong, X. (2023). Social–emotional skills correlate with reading ability among typically developing readers: A meta-analysis. *Education Sciences*, *13*(2), 220. https://doi.org/10.3390/educsci13020220

Yurdakal, I. H. (2019). Examination of correlation between attitude towards reading and perception of creative reading. *European Journal of Educational Research*, *8*(2), 443-452. https://doi.org/10.12973/eu-jer.8.2.443

Zbornik, J. (2001). Test anxiety: Conceptualization and remediation strategies. *New York: American Psychiatric Association*.

Zbornik, J. J., & Wallbrown, F. H. (1991). The development and validation of a scale to measure reading anxiety. *Reading Improvement*, *28*(1), 2.

Zhou, J. (2017). Foreign language reading anxiety in a Chinese as a foreign language context.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, *41*(2), 64-70. https://doi.org/10.1207/s15430421tip4102_2

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The Predictive Role of Attention and Listening Comprehension in Phonological Awareness Skills in 60- to 72-Month-Old Preschoolers

Burak Öncü[1], **Aylin Yılmaz-Hiğde**[2]*

Abstract

Starting primary school marks a significant milestone for children. Learning to read and write is one of the fundamental skills expected from children when they begin primary education. Reading skills are crucial to become successful in both social and academic life. Early literacy skills lay the foundation for a child's later academic achievement and independent learning skills. It is thus essential to explore the relationships between attention, listening comprehension, and phonological awareness, which all form the basis of reading skills. This research aimed to explore the relationship between attention, listening comprehension, and phonological awareness in 60- to 72-month-old preschoolers. It used a correlational research design. The data of the study were collected through the "FTF-K Attention Test for Five-Year-Old Children", "Listening Comprehension Test" and "Phonological Awareness Scale". The data were analysed using descriptive statistics, correlation analysis, and multiple regression analysis. The analysis results showed a significant weak positive correlation between attention and phonological awareness skills. There was also a significant moderate positive correlation between listening comprehension and phonological awareness skills. Consequently, attention and listening comprehension skills were prerequisites for phonological awareness skills.

Keywords: Attention, listening comprehension, phonological awareness, preschool students, correlational research

60-72 Aylık Okul Öncesi Çocukların Fonolojik Farkındalık Becerilerinde Dikkat ve Dinleme Anlama Becerisinin Aracı Rolü

Özet (Türkçe)

İlkokula başlamak çocuklar için önemli bir dönüm noktasıdır. Okuma ve yazmayı öğrenmek, çocuklar ilkokula başladıklarında onlardan beklenen temel becerilerden biridir. Okuma becerileri hem sosyal hem de akademik hayatta başarılı olmak için çok önemlidir. Erken okuryazarlık becerileri, bir çocuğun daha sonraki akademik başarısı ve sonraki öğrenme durumları için temel oluşturur. Bu nedenle, okuma becerilerinin temelini oluşturan dikkat, dinleme anlama ve fonolojik farkındalık arasındaki ilişkileri araştırmak önemlidir. Bu araştırma, 60 ila 72 aylık okul öncesi çocuklarda dikkat, dinlediğini anlama ve fonolojik farkındalık arasındaki ilişkiyi araştırmayı amaçlamıştır. Bu araştırmada ilişkisel bir araştırma tasarımı kullanılmıştır. Araştırmanın verileri "FTF-K Beş Yaş Çocukları için Dikkat Toplama Testi", "Dinlediğini Anlama Testi" ve "Fonolojik Farkındalık Ölçeği" aracılığıyla toplanmıştır. Veriler, tanımlayıcı istatistikler, korelasyon analizi ve çoklu regresyon analizi kullanılarak analiz edilmiştir. Analiz sonuçları, dikkat ve fonolojik farkındalık becerileri arasında anlamlı, zayıf bir pozitif korelasyon olduğunu göstermiştir. Ayrıca, dinlediğini anlama ve fonolojik farkındalık becerileri arasında anlamlı, orta düzeyde pozitif bir korelasyon bulunmuştur. Sonuç olarak, dikkat ve dinlediğini anlama becerisinin, çocuklarının fonolojik farkındalık becerileri için ön koşul beceriler olduğu söylenebilir.

Anahtar Kelimeler: Dikkat, dinlediğini anlama, fonolojik farkındalık, okul öncesi çocuklar, ilişkisel araştırma

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* Corresponding author

[1] Dr., IELEV Schools, Turkey, brkoncu01@gmail.com
[2] Dr., Aydın Adnan Menderes University, Turkey, aylinnyilmz@gmail.com

Introduction

Literacy is one of the most crucial skills in the modern world, following language acquisition (Fischer, 2015). Along with language acquisition, children's phonological awareness skills begin to develop implicitly. This is because phonological awareness involves recognizing that spoken language can be divided into smaller components in various ways and sounds can be manipulated (Chard & Dickson, 1999). Phonological awareness is an oral language skill and refers to "the understanding that sentences are made up of words, words are made up of groups of sounds (syllables), and syllables are made up of individual sounds, or phonemes" (Allor, 2002, p. 48). Phonological awareness is a prerequisite for understanding the relationships between sounds and letters (Torgesen & Wagner, 1998). To understand these relationships, the reading process needs to be coordinated by certain cognitive mechanisms, such as attention control (Conners, 2009). Children must attentively listen to and comprehend spoken language to develop phonological awareness skills. This idea underlies this research.

Early literacy skills lay the foundation for a child's later academic achievement and independent learning skills. The acquisition of reading skills is a complex process fed by various cognitive and environmental factors (Myrberg & Rosen, 2008). It is thus essential to explore the relationships between attention, listening comprehension, and phonological awareness, which all form the basis of reading skills. This is because deficiencies in attention (Plaza & Cohen, 2007) or listening comprehension skills (Li et al., 2012) can lead to problems in acquiring phonological awareness skills. Children who lack phonological awareness skills face difficulties in learning to read. The challenges encountered by children who have a poor start in the process of learning to read often persist in subsequent years, leading to broader academic failures (Cunningham & Stanovich, 1997). Juel (1988), for instance, found that 88 out of 100 children who failed in reading at the end of first grade also failed by the end of fourth grade. Similarly, in a longer longitudinal study, Cunningham and Stanovich (1997) reported striking results, demonstrating that children's reading success in the first grade was predictive of their vocabulary, general knowledge, and reading comprehension in the eleventh grade. Most notably, reading problems identified in the first grade persisted throughout their academic careers (Cunningham & Stanovich, 1997). Scarborough (2001) also found that most students who experienced difficulties with reading and writing skills in the fourth grade continued to face these challenges in high school, which often led to school dropouts. All these studies indicate that difficulties that children encounter during reading acquisition impact their entire academic trajectory. Therefore, a detailed examination of phonological awareness in connection with attention and listening comprehension will play a preventive role, ensuring that future diagnostic and intervention work for students with reading comprehension difficulties yield meaningful outcomes. Figure 1 below shows the rationale and purpose of this research.

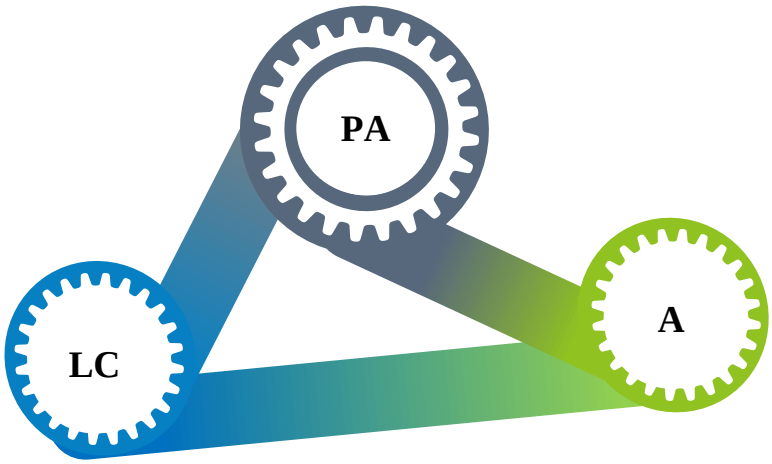

Figure 1. A Model for the Relationship between Attention, Listening Comprehension, and Phonological Awareness

As illustrated in Figure 1, the present research rests on the assumption that there is an interrelationship between attention, listening comprehension, and phonological awareness skills. This assumption is based on the fact that phonological awareness and listening comprehension skills are directly related to oral language experience and attention skills play a role in forming mental representations of oral language. In the model, phonological awareness refers to the ability to recognize, discriminate, and appropriately manipulate sounds that make up words in spoken language; listening comprehension is the ability to remember and make sense of spoken language to construct meaning; and attention represents the ability to consciously direct the mind to specific stimuli in the environment while disregarding other stimuli. The following sections elaborate on the roles of attention and listening comprehension skills in phonological awareness.

Relationship between Phonological Awareness and Attention

The reading rope model created by Scarborough (2001) is an important theory that explains the development of skilled reading. According to this model, children need to acquire phonological awareness skills as a prerequisite for reading acquisition. Phonological awareness develops hierarchically, progressing from larger to smaller units. Therefore, the acquisition of phonological awareness should be aligned with children's developmental stages (Anthony & Francis, 2005). Given the characteristics of developmental stages, the critical importance of fostering children's phonological awareness skills during the preschool years becomes evident. Phonological awareness is a significant predictor of reading ability, and deficits in phonological processing can lead to reading difficulties (Aalto et al., 2023; Nation & Snowling, 2004; Roepke & Brosseau-Lapré, 2023; Vellutino et al., 2004).

It is essential to focus on the acquisition of foundational skills, such as phonological awareness and the development of cognitive representations, during the preschool period (Derryberry & Reed, 1996). This emphasis is crucial because the cognitive development of children who can engage in focused reading differs significantly from those who cannot. Children who maintain focused attention have an enhanced learning capacity and can perceive environmental stimuli more quickly. This heightened perception contributes to their ability to establish relationships and solve problems by understanding the causes and consequences of events. This research focuses on attention skills which constitute a crucial component of executive functions involved

in the reading process. Executive functions refer to a set of cognitive skills such as working memory, inhibitory control, task switching, and attention (Röthlisberger et al., 2012). Attention skills play an active role in creating a mental representation of spoken language (Kintsch, 1998).

Attentional resources must be used effectively for automaticity in reading (Johnson, 2009). Automaticity or automatic processing, one of the cognitive processing theories in the science of reading, also emphasizes the importance of attention for reading. According to the theory of automaticity proposed by LaBerge and Samuels (1974), the duration of attentional resources is quite limited. If efforts are not made to enhance preschool children's ability to concentrate on tasks (such as colouring, doing an activity, or playing a game) for extended periods, it may be more challenging for them to keep their attention during reading. As the focus capacity of children with good attention skills increases, memory development and meaningful learning can be achieved (Öztürk et al., 2000). The difference between competent readers and struggling readers is also associated with the use of these limited attentional resources. Word recognition becomes automatic for readers who efficiently utilize their attentional resources. Considering phonological awareness as a component of word recognition skills, the theory of automaticity indirectly supports the relationship between attention and phonological awareness skills. As mentioned above, phonological awareness skills are connected to language acquisition and depend on the development of attention skills (Stewart, 2011). Given that listening begins with paying attention to speech (Ergin, 1990), phonological awareness requires the use of attention skills, as well as listening comprehension skills.

Why are listening comprehension skills important?

Starting primary school marks a significant milestone for children. Learning to read and write is one of the fundamental skills expected from children when they begin primary education. Reading skills are crucial to become successful in both social and academic life. From the initial years of primary school, reading proficiency predicts academic and social success (Cunningham & Stanovich, 1997). Reading involves seeking and attaining deep meaning beyond simple decoding, and comprehension is an indispensable part of the reading process (Beck et al., 1998).

Considering the significant impact of the reading process, the importance of listening comprehension skills acquired during the preschool period becomes evident. The strong relationship between listening comprehension and reading comprehension is grounded in the ‘simple view of reading’ put forward by Gough and Tumner (1986). The simple view of reading is one of the theories frequently referenced in the literature to elucidate reading comprehension skills and identify factors influencing their development. Gough and Tunmer (1986) posit that reading comprehension consists of two components: word decoding (phonological awareness, orthographic processing, and word recognition) and listening comprehension. They explained their view in the following formula: Word Decoding (WD) x Listening Comprehension (LC) = Reading Comprehension (RC). According to this formula, students’ reading comprehension performance can be predicted by their word decoding and listening comprehension skills. Students with strong word decoding and listening comprehension skills typically exhibit good reading comprehension, whereas those with poor skills usually fail to comprehend what they read. In essence, for a student to understand written text, they must also be able to understand spoken language (Farrell et al., 2010).

Particularly, children who are exposed to stories and listening activities from early childhood tend to have better listening comprehension, a more developed vocabulary, and an enhanced capacity to understand language (Joshi et al., 2012). Plenty of studies have demonstrated the influence of early-acquired listening comprehension skills on the development of reading

comprehension (Gernsbacher et al., Faust, 1990; Hagtvet, 2003; Kendeou et al., 2005; Mann, Shankweiler & Smith, 1984; Sinatra, 1990; Wise et al., 2007). The new developmental/instructional model proposed by Kendeou et al. (2005) also supports the view that early listening comprehension skills are crucial for later reading comprehension. The model emphasises that listening comprehension skills acquired in early childhood play a critical role in reading comprehension in subsequent years. According to this model, successful reading comprehension can only occur with the development of basic language skills and cognitive comprehension skills as early as possible. Otherwise, reading comprehension activities conducted without sufficient competence in these skills will be limited to decoding, and true comprehension will not be achieved. The primary reason why the researchers defined it as a new developmental model is that it demonstrates how children's future reading comprehension skills can be supported even before formal reading activities begin. Moreover, it helps identify potential difficulties in these skills at an early stage (Kendeou, 2005).

Based on the brief literature presented above, this research aimed to explore the relationship between attention, listening comprehension, and phonological awareness. Accordingly, the research question was formulated as follows:

1. What is the role of attention and listening comprehension in preschoolers' phonological awareness skills?

Method

Research Design

This research used a correlational survey design. It was preferred because it allows the correlations and predictive power between two or more variables to be investigated (Karasar, 2014). Phonological awareness skills were treated as the dependent variable, and attention and listening comprehension skills as the independent variables. The first stage of the research involved examining the relationship between attention, listening comprehension skills, and phonological awareness skills among 60- to 72-month-old preschoolers. The second stage involved investigating the extent to which preschoolers' attention and listening comprehension skills predict their phonological awareness skills.

Participants

This research was conducted with 110 preschoolers attending public kindergartens in the northern region of Turkey. Criterion sampling was used in the sample selection. It involves selecting participants or research objects based on predetermined criteria or characteristics (Büyüköztürk et al., 2020). The criteria for inclusion in this research were specified as follows: not having a diagnosed physical or mental disability, having Turkish as a native language, and being 60 to 72 months old. The parents of preschoolers were informed about the research beforehand, and they signed a consent form. Among 110 students, 57 (51.82%) were girls, and 53 (48.18%) were boys.

Data Collection

Phonological Awareness Scale: The Phonological Awareness Scale developed by Yangın et al. (2010) was used to measure preschoolers' phonological awareness skills. The original scale is in Turkish. It has five sub-scales: realising that sentences are made up of words, realising that words can rhyme, realising that words can start with the same sound, realising that words are made up of syllables, and realising that words can end with the same sound. Each sub-scale consists of seven items. Correct responses are scored with 1 point, and incorrect responses with

0 point. The highest possible score is 35. The reliability of the scale was found as KR-20 = 0.74 (Yangın et al., 2010).

Listening Comprehension Test: The Listening Comprehension Test designed by Ergin (2004) was used to measure preschoolers' listening comprehension skills The test was specifically developed for preschool children and is administered on a map with 11 pictures. In the test, children try to create a route on the map in line with the instructions that they hear from the practitioner. The instructions are told only once. Each correct route is worth 1 point, and the highest possible score is 9. The Cronbach's alpha reliability of the test was calculated as 0.71 (Ergin, 2004).

FTF-K Attention Test for Five-Year-Old Children: The test developed by Raatz and Möhling (1971) and adapted to Turkish by Kaymak (1995) was used to measure preschoolers' attention/concentration. The test consists of mixed shapes of pears and apples. In the test, children are asked to find and mark only pears within 90 seconds. Each pear marked is scored with 1 point. The total number of pears marked in the test constitutes the preschooler's raw score.

Data Collection Procedure

The data collection was conducted by one of the researchers for approximately one and a half months after ethical approval and parental consent were obtained. The data collection tools were administered in a room designated by school administrators. Each tool was administered separately by the researcher on different days.

Data Analysis

The normality of the data was tested using the Kolmogorov-Smirnov test because the number of participants was higher than 50. According to the test results, the data gathered from the three tools were not normally distributed ($p < .05$). However, given the assumption of normality stating that the skewness and kurtosis values should be between +1.5 and -1.5 (Tabachnick & Fidell, 2013), the data had a near-normal distribution according to the kurtosis and skewness values. Thus, statistical methods based on the assumption of normal distribution were used to analyse the data. The Pearson correlation coefficient was used to measure the correlation between the dependent and independent variables. Multiple linear regression analysis was used to model the relationship between the variables. Table 1 shows the analysis results.

Table 1. Normality Test

	Kolmogorov-Smirnov			$\bar{X}$	Median	Skewness	Kurtosis
	Statistic	df	p				
Attention Test	.095	110	.017	32.66	33.00	-0.324	-0.543
Listening Comprehension Test	.181	110	.000	6.91	7.00	-0.831	0.091
Phonological Awareness Scale	.199	110	.000	28.32	30.00	-1.015	0.380

Findings

Correlation Analysis

Correlation analysis was used to determine whether there was a significant relationship between the independent variables (i.e., attention and listening comprehension) and the dependent variable (i.e., phonological awareness). To this end, the Pearson correlation coefficients were computed. Tables 2 and 3 show the analysis results.

Table 2. Results for the Relationship between Preschoolers' Listening Comprehension and Phonological Awareness Skills

		Listening Comprehension Skills	Phonological Awareness Skills
Listening Comprehension Skills	r	1	.693**
	p		.000
Phonological Awareness Skills	r	.693**	1
	p	.000	

According to the results of the correlation analysis, there was a statistically significant moderate positive correlation between listening comprehension and phonological awareness skills (r = .693, p = .000, p < .05).

Table 3. Results for the Relationship Between Preschoolers' Attention and Phonological Awareness Skills

		Attention Skill	Phonological Awareness Skills
Attention Skill	r	1	.288**
	p		.002
Phonological Awareness Skills	r	.288**	1
	p	.002	

According to the results of the correlation analysis, there was a statistically significant weak positive correlation between attention and phonological awareness skills (r = .288, p = .002, p < .05).

Regression Analysis

Multiple linear regression analysis was run to determine the predictive value of attention and listening comprehension skills for phonological awareness skills. Table 4 shows the analysis results.

Table 4. Multiple Linear Regression Analysis Results for the Effect of Preschoolers' Attention and Listening Comprehension Skills on Phonological Awareness Skills

Variable	B	Standard error	B	t	p
Fix	15.206	1.735		8.766	.000
Attention Skill	.066	.050	.097	1.342	.182
Listening Comprehension Skill	1.583	0.172	.665	9.210	.000
R = .699 R2= .489 F(2,109)= 51.107 p = .000					

Before examining the results in Table 4, it would be useful to share the precondition analysis results of our model for multiple linear regression. Analysis showed that the Durbin-Watson test statistic of the model was 1.711. This value indicates that there is no autocorrelation in the model. In addition, VIF values for attention and listening comprehension variables were

calculated as 1.090. This indicates that there is no multicollinearity problem among the independent variables. These results indicate that the model works properly. Based on this, looking at the multiple regression results in Table 4, attention and listening comprehension jointly had a significant moderate effect on phonological awareness ($R = .699$; $R^2 = .489$; $p < .05$). Attention and listening comprehension skills explained approximately 48% of the total variance in phonological awareness skills. Looking at the standardised regression coefficients, the order of importance of the effect of the independent variables on the dependent variable was listening comprehension ($\beta = .665$) and attention ($\beta = .097$). According to the t-test results, only listening comprehension was a significant predictor of phonological awareness skills ($p < .05$). Attention was not a significant predictor of phonological awareness skills ($p > .05$). According to the results of the regression analysis, the regression equation for the prediction of phonological awareness skills by attention and listening comprehension is given below.

Phonological Awareness = 15.206 + 0.066*Attention + 1.583*Listening Comprehension

According to these results, attention and listening comprehension were variables that predict and explain phonological awareness skills. Although the contribution of both independent variables to the multiple regression model was positive, the contribution of listening comprehension to the model was greater than attention.

Conclusion and Discussion

This study set out to determine the predictive role of attention and listening comprehension in preschoolers' phonological awareness skills. This section discusses the research findings in relation to relevant literature.

First, the relationship between listening comprehension and phonological awareness was examined. The analysis results showed a significant moderate positive correlation between listening comprehension and phonological awareness skills. This finding is consistent with those of earlier studies (Cheung, 2007; Li et al., 2012; Solari, 2006). Listening comprehension refers to the ability to remember orally presented information and understand it by structuring it in the mind (Mayberry & Kelley, 2007). Phonological awareness refers to the ability to recognize that words in spoken language can be broken down into smaller phonetic units and consciously manipulate these units (Gillon, 2007). A close examination of the definitions of both skills reveals that they are fundamentally based on oral language experience. Therefore, the significant relationship between listening comprehension and phonological awareness skills can be attributed to their common foundation in oral language structures.

Second, the relationship between attention and phonological awareness was examined. The analysis results also showed a significant weak positive correlation between attention and phonological awareness skills. This finding was consistent with those reported in (Keser, 2020). However, when examining the literature from a broader perspective and considering attention as a component of executive functions and phonological awareness as a component of decoding, several studies have highlighted the relationships between executive functions, early literacy, reading, and comprehension skills (Miller et al., 2014; Öksüz & Akyol, 2023; Schmitt et al., 2017). Accordingly, the present result indirectly supports the relationship between attention and phonological awareness skills.

The ultimate goal of reading is comprehension (NRP, 2000). Thus, the science of reading has frequently been occupied with identifying factors affecting reading comprehension. Earlier research has shown that certain skills, such as phonological awareness and fluent reading are

prerequisites for comprehension and must be coordinated simultaneously (Perez, 2010). The coordination of skills involved in comprehension is also linked to the concept of executive functions. Executive functions refer to a set of cognitive skills like working memory, inhibition, task switching, and attention, which are essential for complex processes such as reasoning, planning, and organising (Röthlisberger et al., 2012).

Within the scope of this research, attention skills were considered a critical component of executive functions, which impact the reading process. Attention is the process by which an individual consciously directs their mental receptors towards specific stimuli in the environment while ignoring others (Irak & Karakaş, 2002). This process plays an active role in creating a mental representation of spoken language (Kintsch, 1998). Therefore, the acquisition of phonological awareness skills, which are related to spoken language, depends on the development of attention skills as part of executive functions (Stewart, 2011). The recognition, differentiation, and blending of phonetic units in spoken language inherently require the use of both listening comprehension and attention skills. The listening process begins with focusing attention on speech (Ergin, 1990). Moreover, the theory of automaticity, one of the cognitive processing theories in the science of reading, also emphasizes the importance of attention in reading skills. According to this theory developed by LaBerge and Samuels (1974), the duration of using attentional resources is highly limited. The difference between skilled and struggling readers is also related to the efficient use of these limited attentional resources. Readers who use their attentional resources efficiently turn word recognition into an automatic process. Considering phonological awareness as an aspect of word recognition skills, this theory indirectly supports the relationship between attention and phonological awareness skills.

Third, the research investigated whether attention and listening comprehension predicted phonological awareness skills. According to the analysis results, attention and listening comprehension jointly had a significant moderate effect on phonological awareness. Additionally, Attention and listening comprehension skills explained approximately 48% of the total variance in phonological awareness skills. These findings indicate that attention and listening comprehension are prerequisites for phonological awareness skills. These findings corroborate the findings of recent work (Cheung, 2007; Li et al., 2012).

The joint influential role of attention and listening comprehension on phonological awareness skills can be explained with reference to the ‘simple view of reading’, which is frequently referenced in the science of reading, and the ‘reading rope’ model, which is based on the principles of the former. The simple view of reading proposed by Gough and Tunmer (1986) explains that the process of comprehension, the primary goal of reading, is the outcome of two components: decoding and language comprehension. Accordingly, decoding consists of sub-skills such as phonological awareness, orthographic processing, and word recognition, while language comprehension is conceptualized as listening comprehension and includes the ability to make sense of spoken words or sentences in a text. According to the simple view of reading, any disruption in decoding or listening comprehension leads to difficulties in reading comprehension (Gough & Tunmer, 1986; Hoover & Gough, 1990). Several studies have so far contributed to the validity of this theory by demonstrating that phonological awareness as a component of decoding skills and listening comprehension are strong predictors of reading comprehension (Catts et al., 2006; Isbel et al., 2004; Kargın et al., 2017; Manyak, 2008; NRP, 2000). However, current research on reading comprehension has revealed that comprehension is not limited to decoding and listening comprehension alone, as indicated by the simple view of reading (Kocaarslan, 2019).

Scarborough (2001) advanced the assumptions of the simple view of reading, stating that the reading and comprehension process is much more complex. She created the 'reading rope' model that depicts the complex nature of proficiency reading. This model emphasises that task-specific processes like executive functions play an active role in this complex process, apart from the components of word recognition and listening comprehension, as presented in the simple view of reading. According to the reading rope model, executive functions including working memory, inhibition, task switching, and attention play a key role in directing cognitive resources and integrating various types of information during the reading process, thereby contributing to reading comprehension (Hudson et al., 2016). In this context, attention, as a component of executive functions underlined in the reading rope model, interacts with phonological awareness skills, a sub-dimension of decoding in the simple view of reading. Thus, the fundamental assumptions explained in the simple view of reading and the reading rope model support the notion that attention and listening comprehension are significant predictors of phonological awareness skills.

In conclusion, attention and listening comprehension skills are essential prerequisites for phonological awareness skills. The present findings support this view and indicate that improving attention and listening comprehension skills in preschool education is critical for students' future reading performance. The findings of the present research make several contributions to the current literature and have a number of important implications for future practice. First, the findings can broaden the perspectives of preschool teachers, encouraging them to devote more time to classroom activities aimed at developing attention and listening comprehension skills. Second, considering that phonological awareness is a significant predictor of reading skills (Snow et al., 1998; NRP, 2000), the findings can help teachers identify students' potential reading difficulties as early as the preschool years by looking at their attention and listening comprehension skills during these years. Third, since phonological awareness is a crucial predictor of component reading, identifying the factors influencing phonological awareness and understanding the relationships between these factors will provide a basis for intervention work. Effective intervention programs require the identification of factors affecting relevant skills. Therefore, the present results can guide researchers in designing intervention programs aimed at improving phonological awareness skills.

Limitations

Despite its contributions, this research has some important limitations. First, the research used a survey model. Therefore, the validity of the findings can only be interpreted within the framework of the positivist paradigm. There is a need for further studies that use qualitative or mixed-methods designs to better understand the role of attention and listening comprehension in phonological awareness skills. Second, the sample size was relatively small and consisted of preschoolers attending public kindergartens in a province in the northern region of Turkey. Therefore, future studies could be conducted with larger sample groups.

References

Aalto, E., Saaristo-Helin, K., & Stolt, S. (2023). Associations between early pre-reading and phonological skills in the light of auditory word recognition and lexical ability. *First Language*, *43*(3), 237-252.

Allor, J. H. (2002). The relationships of phonemic awareness and rapid naming to reading development. *Learning Disability Quarterly*, *25*(1), 47-57.

Anthony, J. L., & Francis, D. J. (2005). Development of phonological awareness. *Current directions in psychological Science*, *14*(5), 255-259.

Beck, I. L., McKeown, M. G., Hamilton, R. L., & Kucan, L. (1998). Getting at the meaning: How to help students unpack difficult text. *American Educator*, *22*(1), 66-71.

Büyüköztürk, Ş., Çakmak, E. K., Akgün, Ö. E., Karadeniz, Ş., D, F., & Demirel. (2020). *Scientific Research Methods*. Ankara: Pegem Academy

Catts, H. W., Adlof, S. M. ve Weismer, S. E. (2006). Language deficits in poor comprehenders: A case for the simple view of reading., *49*(2), 278–293.

Chard, D. J., & Dickson, S. V. (1999). Phonological awareness: Instructional and assessment guidelines. *Intervention in school and clinic*, *34*(5), 261-270.

Cheung, H. (2007). The role of phonological awareness in mediating between reading and listening to speech. *Language and Cognitive Processes*, *22*(1), 130–154. doi:10.1080/01690960500489487

Conners, F. A. (2009). Attentional control and the simple view of reading. *Reading and Writing*, *22*, 591-613.

Cunningham, A. E., & Stanovich, K. E. (1997). Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental psychology*, *33*(6), 934.

Derryberry, D., & Reed, M. A. (1996). Regulatory processes and the development of cognitive representations. *Development and Psychopathology*, *8*(1), 215-234.

Ergin, H. (2004). Validity, reliability and norm study of communication skills scales for preschool children. *Hasan Ali Yücel Faculty of Education Journal*, *1*(2), 181–199.

Ergin, M. (1990). *Turkish grammar. Istanbul: Bayrak Publications.*

Farrell, L., Davidson, M., Hunter, M., & Osenga, T. (2010). The simple view of reading: Research of importance to all educators. *Center for Development & Learning*.

Fischer, S. R. (2015). *History of language.* Istanbul: Iş Bankası Publications.

Gernsbacher, M. A., Varner, K. R., & Faust, M. E. (1990). Investigating differences in general comprehension skill. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *16*, 430–445.

Gillon, G. T. (2007). *Phonological awareness: From research to practice*. New York: Guilford Press.

Gough, P. B. & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, *7*(1), 6–10. doi:10.1177/074193258600700104

Guldenoglu, B., Kargın, T., & Ergul, C. (2016). The impact of phonological awareness skills on reading and reading comprehension: A longitudinal study. *Primary Education Online*, *15*(1).

Hagtvet, B. E. (2003). Listening comprehension and reading comprehension in poor decoders: Evidence for the importance of syntactic and semantic skill as well as phonological skills. *Reading and Writing: An Interdisciplinary Journal, 16*, 505–539

Hoover, W. A. & Gough, P. B. (1990). The simple view of reading. *Reading and Writing*, *2*, 127–160.

Hudson, N., Scheff, J., Tarsha, M. & Cutting, L. E. (2016). Reading comprehension and executive function neurobiological findings. *Perspectives on Language and Literacy, 42*(2), 23–29.

Irak, M. & Karakaş, S. (2002). Event-related potential and Gamma responses of individuals with high and low attention performance. *Clinical Psychiatrist, 5*.

Isbell, R., Sobol, J., Lindauer, L. & Lowrance, A. (2004). The effects of storytelling and story reading on the oral language complexity and story comprehension of young children. *Early Childhood Education Journal, 32*, 157–163.

Johnson, R. L. (2009). The quiet clam is quite calm: transposed-letter neighborhood effects on eye movements during reading. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *35*(4), 943.

Joshi, R. M., Williams, K. A., & Wood, J. R. (2012). Predicting reading comprehension from listening comprehension: Is this the answer to the IQ debate?. In *Reading and spelling* (pp. 319-327). Routledge.

Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology*, *80*(4), 437.

Kendeou, P., Lynch, J., van den Broek, P., Espin, C., White, M.J. & Kremer, K. (2005). Developing successful readers: building early comprehension skills through television viewing and listening. *Early Childhood Education Journal, 33*(2), 91-98.

Karasar, N. (2014). *Scientific Research Method (26th ed.). Ankara: Nobel Publishing.*

Kargın, T., Guldenoglu, B. & Ergül, C. (2017). Examining the prediction of listening comprehension skill on reading comprehension. Kastamonu Education Journal, *25*(6), 2369–2384.

Kaymak, S. (1995). *Attention gathering exercises with five-year-old children attending kindergarten.* (Master's thesis). Ankara University, Institute of Social Sciences, Ankara

Keser, M. (2020). *Examining the relationship between attention ability and geometry and phonological awareness skills of 60-72 month old children (Afyonkarahisar province sample).* (Master's thesis). Afyon Kocatepe University, Institute of Social Sciences, Afyon

Kintsch, W. (1998). *Comprehension: A paradigm for cognition*. UK: Cambridge University Press.

Kocaarslan, M. (2019). Reading comprehension for good and poor readers: A theoretical and empirical perspective. A*nkara University Faculty of Educational Sciences Journal of Special Education*, *20*(2), 369–393. doi:10.21565/ozelegitimdergisi.433448

LaBerge, D. & Samuels, S. J. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology*, *6*(2), 293–323. doi:10.1016/0010-0285(74)90015-2

Li, M., Cheng, L., & Kirby, J. R. (2012). Phonological awareness and listening comprehension among Chinese English-immersion students. *International Education, 41*(2), 4.

Mann, V.A., Shankweiler, D. & Smith, S.T. (1984). The association between comprehension of spoken sentences and early reading ability: The role of phonetic representation. *Journal of Child Language, 11,* 627–643.

Manyak, P. C. (2008). Phonemes in use: Multiple activities for a critical process. *The Reading Teacher*, *61*(8), 659–662. doi:10.1598/RT.61.8.8

Mayberry, S. & Kelley, K. (2007). *Listening Comprehsenion*. High Reach Learning, Inc,.

Miller, A. C., Fuchs, D., Fuchs, L. S., Compton, D., Kearns, D., Zhang, W., … Kirchner, D. P. (2014). Behavioral attention: A longitudinal study of whether and how it influences the development of word reading and reading comprehension among at-risk readers. *Journal of Research on Educational Effectiveness*, *7*(3), 232–249. doi:10.1080/19345747.2014.906691

Myrberg, E., & Rosén, M. (2008). A path model with mediating factors of parents' education on students' reading achievement in seven countries. *Educational Research and Evaluation*, *14*(6), 507-520.

Nation, K., & Snowling, M. J. (2004). Beyond phonological skills: Broader language skills contribute to the development of reading. *Journal of research in reading*, *27*(4), 342-356.

NRP. (2000). *Report of the National Reading Panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups*. *Panel, National Reading*.

Öksüz, H. İ. & Akyol, H. (2023). The effects of prior knowledge, verbal working memory and attention skills on reading comprehension skills. *Ahi Evran University Social Sciences Institute Journal, 9*(3).

Öztürk, M., Sayar, K., Tüzün, Ü., & Kandil, S. T. (2000). Methylphenidate and self-esteem in attention deficit hyperactivity disorder. *Clinical Psychopharmacology Bulletin, 10*(3), 139-143.

Perez, C.G. (2010). *The achievement impact of an early literacy intervention program for first grades students.* (Doctoral Dissertation). Available from ProQuest Dissertations and Thesis databases. (UMI No. 3431506).

Plaza, M., & Cohen, H. (2007). The contribution of phonological awareness and visual attention in early reading and spelling. *Dyslexia*, *13*(1), 67-76.

Raatz, U. ve Möhling, R. (1971). *Frankfurter tests für Fünfjährige-Konzentration (FTF-K)*. Weinheim: Beltz.

Roepke, E., & Brosseau-Lapré, F. (2023). Speech Error Variability and Phonological Awareness in Preschoolers. *American Journal of Speech-Language Pathology*, *32*(1), 246-263.

Röthlisberger, M., Neuenschwander, R., Cimeli, P., Michel, E. & Roebers, C. M. (2012). Improving executive functions in 5- and 6-year-olds: evaluation of a small group intervention in prekindergarten and kindergarten children. *Infant and Child Development*, *21*(4), 411–429. doi:10.1002/icd.752

Scarborough, H. S. (2001). Connecting early language and literacy to later reading (dis) abilities: Evidence, theory, and practice. D. Neuman, S., & Dickinson (Ed.), *Handbook for research in early literacy* içinde (ss. 97–110). New York: Guilford Press.

Schmitt, S. A., Geldhof, G. J., Purpura, D. J., Duncan, R. ve McClelland, M. M. (2017). Examining the relations between executive function, math, and literacy during the transition to kindergarten: A multi-analytic approach. *Journal of Educational Psychology*, *109*(8), 1120–1140. doi:10.1037/edu0000193

Sinatra, G. M. (1990). Convergence of listening and reading processing. *Reading Research Quarterly*, *35*, 115–130.

Snow, C. E., Burns, M. S. & Griffin, P. (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academies Press.

Solari, E. J. (2006). *Effects of listening comprehension versus phonological awareness interventions for kindergarten English learners.* (Doctoral Dissertation). Available from ProQuest Dissertations and Thesis databases. (UMI No. 3245937).

Stewart, E. D. (2011). *The Impact of Systematic Multisensory Phonics Instructional Design on the Decoding Skills of Struggling Readers.* (Doctoral Dissertation). Available from ProQuest Dissertations and Thesis databases. (UMI No. 3443911).

Tabachnick, B. G. & Fidell, L. S. (2013). *Using Multivariate Statistics* (6. bs.). Boston: Pearson.

Torgesen, J. K., Wagner, R. K. and Rashotte, C. A. (1994). Longitudinal studies of phonological processing and reading. *Journal of learning disabilities*, *27*(5), 276-286. E

Vellutino, F. R., Fletcher, J. M., Snowling, M. J., & Scanlon, D. M. (2004). Specific reading disability (dyslexia): What have we learned in the past four decades?. *Journal of child psychology and psychiatry*, *45*(1), 2-40.

Wise, J., Sevcik, R., Morris, R., Lovett, M. & Wolf, M. (2007). The relationship among receptive and expressive vocabulary, listening comprehension, pre-reading skills, word ıdentification skills, and reading comprehension by children with reading disabilities. *Journal of Speech, Language, and Hearing Research, 50,* 1093–1109.

Yangın, B., Erdoğan, Ö. & Erdoğan, T. (2010). Phonological Awareness Scale. *III. In International World Language Turkish Symposium* (pp. 210–218). Izmir: Dokuz Eylül University Buca Faculty of Education Congress Book.

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Translanguaging and English as a Lingua Franca in the Plurilingual Classroom by Anna Mendoza

Ömer Gökhan Ulum[1]

Abstract

Translanguaging and English as a Lingua Franca in the Plurilingual Classroom by Anna Mendoza, published by Multilingual Matters in 2023, offers a nuanced exploration of multilingual practices within the specific sociolinguistic context of Honolulu, Hawaii. Positioned within the broader discourse of multilingual education, this book examines how high school students, drawing from diverse linguistic backgrounds, utilise translanguaging and English as a Lingua Franca (ELF) in their daily interactions and learning processes. Mendoza's work significantly contributes to the field, bridging theoretical perspectives on translanguaging and ELF with empirical insights derived from linguistic ethnography. Through a detailed examination of classroom dynamics, this book challenges conventional notions of language use in education, proposing a more inclusive approach that recognises and values the full linguistic repertoires of students. This review will critically evaluate Mendoza's work, focusing on the context, content, critical analysis, comparisons, and conclusion.

Keywords: Translanguaging, Multilingual Education, English as a Lingua Franca (ELF), Linguistic Ethnography, Plurilingualism

Anna Mendoza tarafından kaleme alınan "Translanguaging and English as a Lingua Franca in the Plurilingual Classroom" adlı Eserin İncelemesi

Özet (Türkçe)

'Translanguaging and English as a Lingua Franca in the Plurilingual Classroom" adlı kitap, Anna Mendoza tarafından 2023 yılında Multilingual Matters yayınevi tarafından yayımlanmış olup, Honolulu, Hawaii'nin özgül sosyo-dilbilimsel bağlamında çok dilli uygulamaları ayrıntılı bir şekilde incelemektedir. Çokdilli eğitim söyleminin daha geniş bir bağlamında konumlandırılan bu kitap, farklı dilsel geçmişlere sahip lise öğrencilerinin günlük etkileşimlerinde ve öğrenme süreçlerinde translanguaging (dillerarası geçiş) ve İngilizceyi bir Lingua Franca (ortak dil) olarak nasıl kullandıklarını ele almaktadır. Mendoza'nın eseri, translanguaging (dillerarası geçiş) ve Lingua Franca (ortak dil) üzerine teorik perspektiflerle dil etnografisinden elde edilen ampirik içgörüler arasında köprü kurarak bu alana önemli katkılar sunmaktadır. Sınıf dinamiklerini ayrıntılı bir şekilde inceleyen kitap, eğitimde dil kullanımına ilişkin geleneksel kavramlara meydan okumakta ve öğrencilerin tam dilsel repertuarlarını tanıyan ve değer veren daha kapsayıcı bir yaklaşımı önermektedir. Bu inceleme, Mendoza'nın eserini bağlam, içerik, eleştirel analiz, karşılaştırmalar ve sonuç unsurlarına odaklanacaktır.

Anahtar Kelimeler: Dillerarası geçiş, çok dilli eğitim, Lingua Franca (Ortak Dil) olarak İngilizce, Dilsel Etnografi, Çok dillilik

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[1] Assoc. Prof. Dr., Mersin University, Mersin/Türkiye, omergokhanulum@gmail.com

Introduction

Anna Mendoza's Translanguaging and English as a Lingua Franca in the Plurilingual Classroom (2023), published by Multilingual Matters, offers an insightful and empirically grounded exploration of multilingual practices within the unique sociolinguistic environment of Honolulu, Hawaii. Against increasing global awareness of linguistic diversity in education, Mendoza's work examines how high school students from diverse linguistic backgrounds engage in translanguaging and English as a Lingua Franca (ELF) in their daily learning and communication. This study is particularly impactful because it integrates theoretical frameworks surrounding translanguaging, developed by scholars such as García and Li Wei (2014), with real-world classroom ethnographic data. By merging theory with empirical research, Mendoza challenges established monolingual ideologies, presenting a more inclusive view of language use that values the full linguistic repertoires of students. The study's context, Hawaii's culturally and linguistically rich environment, provides a compelling backdrop to understand how global and local languages intersect in an English-dominant educational system. Anna Mendoza composed this book to address a critical gap in the literature on multilingual education—precisely, the limited empirical research on how translanguaging and English as a Lingua Franca (ELF) function in real classroom settings. While theoretical discussions on translanguaging and ELF have been well-established, there remains a need for ethnographic studies that explore how students from diverse linguistic backgrounds navigate these practices in their daily interactions. Mendoza's work bridges this gap by providing an in-depth linguistic ethnography of multilingual high school students, offering insights into how translanguaging and ELF intersect in plurilingual classrooms to challenge monolingual ideologies and promote more inclusive pedagogical approaches. This review critically engages with Mendoza's work by analysing her approach through a broader lens. It will address the underlying theoretical frameworks she employs, evaluate her linguistic ethnography's methodological strengths and limitations, and consider the broader educational implications of her findings. Moreover, the review will explore how Mendoza's work fits within the broader scholarly discourse on multilingualism and translanguaging, offering comparisons with other significant studies in the field. This article aims to critically examine Mendoza's work by analysing its theoretical underpinnings, methodological framework, and empirical contributions while evaluating its broader implications for multilingual education and language policy.

Context

Translanguaging and English as a Lingua Franca in the Plurilingual Classroom by Anna Mendoza, published in 2023 as part of the Bilingual Education & Bilingualism series by Multilingual Matters, represents a significant contribution to the ongoing scholarly conversation surrounding multilingual education. This book is particularly timely, emerging amidst increasing global recognition of the complexities of educating linguistically diverse student populations. The context of the study is crucial to understanding its significance: it takes place in Honolulu, Hawaii, a region marked by a rich history of immigration and linguistic diversity. Honolulu's unique sociolinguistic environment, where English operates as a dominant language amidst numerous heritage languages, provides an ideal setting for examining the interplay of translanguaging and English-as-a-Lingua Franca (ELF) practices in a classroom context. The concept of translanguaging, initially developed by Williams (1994) in the context of Welsh-English bilingual education and later expanded by scholars like García (2009), has evolved into a critical framework for understanding how bilingual and multilingual speakers navigate their linguistic repertoires. Mendoza's work builds on this tradition, focusing on how

students in Hawaii's schools use their complete linguistic resources—including multiple languages and dialects—to communicate, learn, and negotiate identities in an English-medium educational system. This book is positioned at the intersection of several critical issues in language education: the need for pedagogical strategies that embrace linguistic diversity, the role of ELF in global communication, and the ongoing debate about the benefits and challenges of translanguaging in multilingual classrooms.

Content

Mendoza's book is organised into eight chapters, each methodically exploring different aspects of translanguaging and ELF in the classroom. The introductory chapter sets the stage by outlining the book's aims and situating the study within the broader field of multilingual education. Mendoza articulates a clear research agenda: to explore how multilingual students in Honolulu utilise translanguaging as a resource for learning and identity negotiation and how these practices intersect with English as a Lingua Franca.

The second chapter delves into the study's theoretical constructs, including plurilingualism, translanguaging, code-switching, stylisation, and ELF. Mendoza provides a thorough literature review, discussing how these concepts have been defined and employed in previous research. For instance, she critically engages with García and Li Wei's (2014) conceptualisation of translanguaging as using an individual's entire linguistic repertoire without regard to the boundaries of named languages. Mendoza also addresses the debates surrounding the psycholinguistic reality of distinct languages (Otheguy, García, & Reid, 2015), positioning her study within these ongoing scholarly discussions.

Chapters three through five present the empirical core of the book. Mendoza employs linguistic ethnography to investigate classroom interactions in two English classes in a Honolulu high school, focusing on how students from diverse linguistic backgrounds engage in translanguaging practices. Chapter three provides a detailed account of the research context, including the historical and sociolinguistic landscape of Hawaii, the demographics of the student population, and the specific school and classroom settings. Mendoza's methodological rigour is evident in her careful consideration of researcher positionality and the ethical implications of her work.

Chapter four examines the dynamics of translanguaging among linguistic majorities, minorities, and singletons in one of the English classes. Mendoza’s analysis reveals that while translanguaging is a common practice among students, it is mediated by their linguistic backgrounds, social identities, and classroom hierarchies. For example, Filipino students, who constitute a linguistic majority in the class, frequently translanguage between English and their heritage languages, creating a sense of linguistic solidarity and identity affirmation. However, this practice also raises challenges for students from minority linguistic backgrounds, who may feel marginalised or excluded.

In Chapter Five, Mendoza explores the relationship between translanguaging and critical language awareness (CLA) in the second English class, where students are encouraged to reflect on their language practices and the social power dynamics embedded in them. Mendoza argues that fostering CLA is essential for creating an inclusive and equitable classroom environment, mainly when students come from diverse linguistic and cultural backgrounds. She demonstrates how translanguaging can be a pedagogical tool to raise students' awareness of linguistic diversity and challenge monolingual ideologies.

Chapter six shifts the focus to individual students' identity trajectories, using case studies to illustrate how translanguaging and ELF practices shape their academic and social identities. Mendoza's nuanced analysis highlights the complexities of identity negotiation in multilingual classrooms, where students must navigate their linguistic repertoires and the expectations and norms imposed by teachers, peers, and the broader society.

The book's final chapters discuss the pedagogical implications of Mendoza's findings and the broader theoretical contributions of her work. In Chapter Seven, she offers practical recommendations for educators seeking to implement translanguaging and ELF strategies in their classrooms. Mendoza emphasises the importance of creating a classroom environment that values and legitimises all students' linguistic resources, regardless of their proficiency in the dominant language. She also highlights the need for teacher training programs that equip educators with the knowledge and skills to effectively manage linguistic diversity in the classroom.

The book concludes with a discussion of the study's limitations and directions for future research. Mendoza acknowledges that her study is context-specific and that the findings may not directly apply to other settings. However, she argues that the insights gained from this research can inform broader discussions about multilingual education and the role of translanguaging in promoting linguistic equity.

Critical Analysis

One of the primary strengths of Mendoza's work lies in its methodological rigour and the depth of its empirical analysis. By employing linguistic ethnography, Mendoza can capture the complexities of classroom interactions and provide rich, contextually grounded insights into how students navigate their linguistic repertoires. This approach allows her to move beyond monolingual versus multilingual education's simplistic binaries and explore language use's fluid, dynamic nature in multilingual settings. Mendoza's focus on ELF is another notable contribution, as it adds a layer of complexity to the study of translanguaging in classrooms. At the same time, much of the existing literature on translanguaging has focused on bilingual education in contexts where two or more languages are equally valued (e.g., García & Wei, 2014; Creese & Blackledge, 2010), Mendoza's work highlights the challenges and opportunities that arise when English, as a global lingua franca, interacts with local languages in a multilingual classroom. Her analysis demonstrates that ELF can serve as both a bridge and a barrier to communication, depending on how students use and perceive it. However, the book is not without its limitations. One potential weakness is the narrow focus on a single geographical and cultural context. While Mendoza provides a detailed and nuanced analysis of translanguaging practices in Honolulu, the specificities of this context may limit the generalizability of her findings to other multilingual settings. For instance, the linguistic dynamics in a classroom in Europe or Latin America, where different historical, social, and political factors shape language use, might lead to different outcomes. Another limitation is the book's emphasis on the positive aspects of translanguaging and ELF, which sometimes overshadows the challenges and tensions that can arise in multilingual classrooms. While Mendoza acknowledges that linguistic hierarchies and power dynamics can impact students' language practices, these issues could have been explored more deeply. For example, a more critical engagement with the potential for translanguaging to reinforce existing inequalities or create new forms of exclusion would have added to the book's analytical depth. Despite these limitations, Mendoza's work offers valuable insights into the role of translanguaging and ELF in multilingual education. Her careful and thorough analysis provides a strong foundation for future research and contributes to ongoing debates about the best ways to support linguistic diversity in educational settings.

Comparisons

Mendoza's book can be situated within the broader literature on translanguaging, bilingual education, and ELF. Compared to seminal works like García and Li Wei's Translanguaging: Language, Bilingualism, and Education (2014) and García's Bilingual Education in the 21st Century (2009), Mendoza's study offers a more localised and ethnographically grounded

analysis. While García and Li Wei focus on the theoretical and pedagogical aspects of translanguaging on a global scale, Mendoza's work provides a detailed case study that highlights the specific challenges and opportunities of translanguaging in a particular sociocultural context. Mendoza's emphasis on ELF also distinguishes her work from other studies in the field. While ELF has been explored in other contexts (e.g., Jenkins, 2007; Seidlhofer, 2011), Mendoza's integration of ELF into her analysis of translanguaging practices in a multilingual classroom is a novel contribution. This approach allows her to examine how global and local linguistic practices intersect in educational settings, offering a more comprehensive understanding of the linguistic dynamics at play. In addition, Mendoza's work can be compared to research on code-switching and multilingualism in education, such as Creese and Blackledge (2010) and Cook and Wei's The Cambridge Handbook of Linguistic Multi-Competence (2016). While these studies also explore the fluid and dynamic nature of language use in multilingual settings, Mendoza's focus on the specific context of Hawaii and her use of linguistic ethnography provides a unique perspective that enriches the existing literature.

Conclusion

The findings of this study offer valuable insights into how translanguaging can be effectively implemented across diverse educational contexts, particularly in classrooms where linguistic diversity is a defining characteristic. While the study focuses on a specific sociolinguistic environment, its implications extend to multilingual settings globally, including those where English is not the dominant language. Educators and policymakers can utilise these findings to develop translanguaging-informed pedagogies that embrace students' full linguistic repertoires while ensuring structured support for language learning (Prilutskaya, 2021). However, it is also crucial to acknowledge the potential risks of translanguaging in reinforcing existing inequalities or creating new forms of exclusion (Liberali & Swanwick, 2020). As the study reveals, power dynamics within classrooms may privilege specific linguistic backgrounds over others, leading to the unintended marginalisation of students who do not share the dominant translanguaging practices. Future research should explore strategies to mitigate these disparities by fostering equitable classroom interactions that validate all linguistic identities (Landsman & Lewis, 2023). While this study is contextually specific, its findings contribute to broader discussions on translanguaging, and future research could expand on its scope by examining similar dynamics in different educational systems. The minor limitations identified, such as the specificity of the study's context, do not undermine its significance. Instead, they highlight the need for further research to assess how translanguaging practices can be adapted and refined to support equitable learning environments in diverse, multilingual classrooms.

In conclusion, Anna Mendoza's Translanguaging and English as a Lingua Franca in the Plurilingual Classroom is a significant and timely contribution to multilingual education. The book provides a rich, contextually grounded analysis of translanguaging practices in a diverse educational setting, offering theoretical insights and practical implications for educators and policymakers. Mendoza's work is particularly valuable for its methodological rigour, focus on ELF, and critical engagement with linguistic diversity and equity issues in the classroom. While the book's focus on a specific geographical context may limit its generalizability, the insights from this research are nonetheless relevant to broader discussions about multilingual education. Mendoza's work challenges us to think more critically about the role of translanguaging and ELF in promoting linguistic equity and social justice in educational settings. As such, this book is recommended for scholars, educators, and policymakers interested in exploring the complexities of multilingual practices in education and their implications for pedagogy and social equity.

References

Cook, V., & Wei, L. (Eds.). (2016). *The Cambridge Handbook of Linguistic multi-competence*. Cambridge University Press.

Creese, A., & Blackledge, A. (2010). Translanguaging in the bilingual classroom: A pedagogy

for learning and teaching? *The Modern Language Journal*, *94*(1), 103-115. https://doi.org/10.1111/j.1540-4781.2009.00986.x

García, O. (2009). *Bilingual Education in the 21st Century: A Global Perspective*. Wiley-

Blackwell.

García, O., & Li Wei. (2014). *Translanguaging: Language, Bilingualism, and Education*. Palgrave

Macmillan.

Jenkins, J. (2007). *English as a Lingua Franca: Attitude and Identity*. Oxford University Press.

Landsman, J., & Lewis, C. W. (Eds.). (2023). *White teachers/diverse classrooms: Creating*

inclusive schools, building on students' diversity, and providing true educational equity. Taylor & Francis.

Liberali, F., & Swanwick, R. (2020). Translanguaging as a tool for decolonising interactions in a

space for confronting inequalities. *DELTA: Documentação de Estudos em Lingüística Teórica e Aplicada*, *36*(3), 2020360303. https://doi.org/10.1590/1678-460X2020360303

Otheguy, R., García, O., & Reid, W. (2015). Clarifying translanguaging and deconstructing

named languages: A perspective from linguistics. *Applied Linguistics Review*, *6*(3), 281-307. https://doi.org/10.1515/applirev-2015-0014

Prilutskaya, M. (2021). Examining pedagogical translanguaging: A systematic review of the

literature. *Languages*, *6*(4), 180. https://doi.org/10.3390/languages6040180

Seidlhofer, B. (2011). *Understanding English as a Lingua Franca*. Oxford University Press.

Williams, C. (1994). Arfarniad o Ddulliau Dysgu ac Addysgu yng Nghyddestun Addysg

Uwchradd Ddwyieithog [An Evaluation of Teaching and Learning Methods in the Context of Bilingual Secondary Education]. [Doctoral dissertation, University of Wales]. ProQuest Dissertations & Theses. https://www.proquest.com/openview/037459c4eede79ac6ff9de7eed57cc8b/1?pq-origsite=gscholar&cbl=51922&diss=y

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