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Anadolu University Journal of Education Faculty (AUJEF), which published its *first issue in 1984* (Print ISSN: 1300-5448, Online ISSN: 2602-2249) is a blind, peer-reviewed, open-access, free-of-charge international scientific academic journal published in educational sciences four times a year (March, June, September, and December). Besides, the AUJEF can publish additional issues in exceptional circumstances. AUJEF aims to present a compilation of up-to-date and innovative research papers, reviews, and argumentative essays on education in general and teacher education in particular. It is hoped that the studies published in AUJEF will provide the basis for timely discussions on the various areas of teacher education and give direction to innovative research and practices.

The papers published in AUJEF are also expected to raise issues related to teacher education in various fields, open up discussions related to those issues, and suggest different methods of handling those issues or solving the related problems. Authors who will contribute to AUJEF are expected to consider the following rules.

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- The authors can be carried out in quantitative, qualitative, or mixed-method research.
- Literature analyses, meta-analyses, meta-synthesis studies, and book reviews can be sent to AUJEF for reviewing and publication.
- AUJEF prioritizes research papers. Attention is paid to the issue of whether the number or quantity of review papers should overtake the number of research papers.

From the Editor

Dear Colleagues and Readers

We are pleased to bring you the latest and most comprehensive research studies in this issue (Volume 9, Issue 2). This issue features five original research articles addressing critical questions in contemporary education, examining key dimensions of digital reading and early childhood cognitive development, student well-being, language learning, and instructional innovation.

The first article of this issue, “The mediating role of forgiveness in the relationship between emotion regulation difficulty and relational aggression in high school students”, was prepared by Mehmet Şahan and Esra Ceyhan. This quantitative study investigates how forgiveness operates as a buffer between adolescents’ emotion regulation difficulties and their engagement in relational aggression. Drawing on data from 1,012 Turkish high school students and employing the Difficulty in Emotion Regulation Scale and the Relational Aggression in Friendship Relationships Scale, the authors demonstrate that emotion dysregulation predicts relational aggression, while forgiveness partially mediates this effect. Their findings suggest that interventions focusing on enhancing forgiveness may reduce aggressive peer behaviors among teens.

The second article, “Foreign Language Anxiety in Middle School Students: A Case Study”, was written by Başak Köksoy and Levent Deniz. They present a qualitative case study of 35

secondary students and 13 English teachers at a state school in Istanbul during the 2021–2022 academic year. Through semi-structured interviews and classroom observations, they map out the physical (e.g., stuttering, freezing), psychological (nervousness, fear), and cognitive (forgetfulness, low motivation) symptoms of foreign language anxiety and identify learner-, teacher-, and system-related causes. The study also catalogs coping strategies—such as peer learning and technology use—and underscores the need for teacher training and systemic reforms to alleviate anxiety and bolster student participation.

The third article, “Turkish Language Teacher Candidates' Thoughts on E-Readers, Digital Reading, and Reading Preferences”, was written by Serhat Al and Nazlı Gökçe. They explore the efficacy of active learning techniques within a Flipped Classroom Model for sixth-grade social studies in a public school in Zeytinburnu, İstanbul. Conducted as action research with 29 students, the study utilizes worksheets, self-assessments, and researcher diaries to track student engagement, motivation, and responsibility changes. Results indicate that pre-class preparation and in-class active learning increased participation and responsibility and fostered meaningful peer collaboration and self-reflection. The authors recommend expanding flipped, active-learning approaches across disciplines to sustain student interest and deepen understanding.

The fourth article, “Turkish Language Teacher Candidates' Thoughts on E-Readers, Digital Reading, and Reading Preferences”, was written by Münire Özden and Mehmet Çiçek. This qualitative study delves into the complex relationship between digital reading tools and traditional reading habits among Turkish language teacher candidates. Through a mixed-method survey of 116 participants from Giresun University, the research uncovers a striking paradox. While smartphones are universally used for digital reading, e-readers remain underutilized, with only 13.79% adoption. Students cited the convenience of digital platforms—such as instant access to information and portability—as key advantages. However, a strong preference for printed materials persists, driven by emotional factors like the “sense of ownership” and tactile satisfaction and concerns about eye strain and distractions during prolonged screen reading. The study highlights critical barriers to e-reader adoption, including limited awareness of their benefits (e.g., e-ink technology, customizable fonts) and perceptions of high costs. These findings challenge assumptions about the inevitability of digital dominance in education and underscore the need for targeted interventions. For instance, integrating e-readers into curricula, coupled with awareness campaigns about their health and pedagogical advantages, could bridge the gap between digital convenience and the enduring appeal of print. The authors advocate for a balanced approach to literacy education, where digital tools complement, rather than replace, traditional methods, ensuring future educators are equipped to navigate hybrid learning environments.

The fifth article, “The Predictive Power of Planning and Attention Skills on Mathematical Ability in the Preschool Period”, was written by Yıldız Güven and Diğdem Enerem. This relational survey study examines the interplay between executive functions and early mathematical development in 60–72-month-old children. Using the Cognitive Assessment System (CAS) and the Test of Early Mathematics Ability (TEMA-3), the authors analyzed data from 88 preschoolers in Istanbul. The results reveal a robust correlation between planning skills and mathematical achievement, with planning alone explaining 37% of the variance in scores. This underscores planning’s pivotal role in tasks requiring strategy, organization, and sequential problem-solving—cornerstones of early math learning. Interestingly, while attention skills moderately

correlated with math ability, they did not emerge as a direct predictor. This suggests that attention may operate indirectly by sustaining engagement during complex tasks or interacting with other cognitive processes like working memory. The findings challenge educators to rethink how executive functions are nurtured in early childhood. The authors propose embedding planning-focused activities, such as puzzles, structured games, and step-by-step problem-solving tasks, into preschool curricula to strengthen foundational math skills. They also call for further research into the nuanced roles of attention, particularly in diverse socio-economic contexts, to better tailor interventions for children at risk of academic challenges.

I trust the new issue of AUJEF will enrich academic discussions. Each article is qualified to contribute to developing innovative approaches in education by opening new horizons in its field. I trust that these articles' diverse methodologies and contexts will inspire further research and practice to improve student well-being, language acquisition, and instructional design. Besides, these articles illuminate two facets of modern education: integrating technology and cultivating cognitive foundations. Münire Özden and Mehmet Çiçek's work reminds us that technological adoption is not merely a logistical shift but a cultural one, requiring empathy for users' emotional and practical needs. Meanwhile, Yıldız Güven and Diğdem Enerem's research reinforces the importance of intentional skill-building in early childhood, where cognitive processes like planning lay the groundwork for lifelong learning. Therefore, I would like to thank all the authors who have found AUJEF to be a platform to publish their work. I would also like to thank my colleagues on the Editorial Board and the valuable stakeholders who served as reviewers for improving the quality of the studies published in AUJEF. See you again in the third issue of the ninth volume.

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RESEARCH ARTICLE

OPEN ACCESS

The mediating role of forgiveness in the relationship between emotion regulation difficulty and relational aggression in high school students^{*3}

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³ The research consists of a part of the first author's PhD thesis under the second author's supervision.

* Ethics committee approval (Annex-12-14/09/2021 dated and decision no. 142235) has been obtained from the Anadolu University Scientific Research and Publication Ethics Committee for Social and Human Sciences.

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Highlights:

- Emotion regulation difficulties in adolescents directly and negatively predict forgiveness.
- Relational aggression is directly and negatively predicted by forgiveness.
- The indirect effect of forgiveness on adolescents' emotion dysregulation and relational aggression was statistically significant.

Abstract

The increase in aggressive behavior during adolescence has led to both research on aggression and the identification of various types of aggression by considering aggression as a multidimensional structure. One of these is relational aggression. In this context, this study aims to examine the mediating role of forgiveness in the relationship between high school students' emotion regulation difficulties and relational aggression. The relational screening method and basic mediation model were used in the study. The study group of the research consists of 1012 students attending public high schools in the center of Eskişehir in the 2021-2022 academic year. The study used the Relational Aggression in Friendship Relationships Scale Adolescent Form, the Difficulty in Emotion Regulation Scale, and the Forgiveness Scale for Adolescents. According to the study's findings, adolescents' forgiveness is directly and negatively predicted by difficulties in emotion regulation. Relational aggression is directly and negatively predicted by forgiveness. The total effect of difficulties in emotion regulation on relational aggression was .19. When the mediator variable, forgiveness, is included in the model, the total effect decreases to .17, which is significant. The indirect effect of forgiveness on adolescents' difficulty in emotion regulation and relational aggression was found to be significant. The partial mediating role of forgiveness was found to be significant, but its effect level was low. In conclusion, all these findings indicate that high school students' difficulty in emotion regulation is a risk factor for relational aggression, while forgiveness is a protective factor.

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1. Introduction

In the process that starts from birth and continues until death, it can be said that each developmental period has its own characteristics and dominant figures. In the case of adolescence, peers and relationships with peers come to the fore. By establishing relationships with their peers, adolescents desire to get closer to them and make multidimensional comparisons to reveal themselves. Adolescence is when peer relationships gain intensity, and emotional ups and downs are frequently experienced. In the face of emotional problems in peer relationships, adolescents may sometimes resort to unwanted ways. These unwanted ways may sometimes include aggressive elements (Kim et al., 2022; Kokkinos et al., 2020). Because in the first years of adolescence, emotions or situations such as anger, guilt, loneliness, and aggression are experienced intensely with psychological, physical, and hormonal changes (Vernon, 1993). Adolescents exhibit more intense aggressive behaviors than in previous years. (Verlinden et al., 2000). In the studies conducted in the domestic literature, it is seen that aggressive behaviors during adolescence have increased compared to previous periods (Kılıç, 2022; Tuzgöl, 1998). This increase in aggressive behaviors during adolescence has led to many studies on aggression and the definition of different types of aggression by considering it a multidimensional structure (Connor, 2004).

Relational aggression, a special type of aggression, is observed as a destructive type of aggression exhibited intensely and popularly among adolescents (Flack, 2017; Jiang & Dong, 2022; Kurnaz & Kapçı, 2013; Kim et al., 2022; Lu et al., 2018; Tackett et al., 2014). Relational aggression is implicitly or explicitly ignoring, or maliciously talking behind one's back, rejecting or excluding one's close friends (Grottpeter & Crick, 1996). Relational aggression includes behaviors aimed at damaging an individual's social status by damaging interpersonal relationships. While relational aggression is observed in early childhood in the form of threatening to end a friendship and covering one's ears to avoid listening to what the other person says; in later years, it can be seen in a wide range of forms such as making rumors about the person, gossiping about the person, shaming the person, and excluding the person from the group (Archer & Coyne, 2005). Behaviors such as dominating a peer group, gaining status, seeking popularity, or undermining the dignity of others can be identified as causes of relational aggression. (Mayeux, 2014; Turner, 2007). It can be asserted that relational aggression aims to harm peer relationships and hurt others. In this context, all behaviors of adolescents against their peers, such as implicit or hidden ignoring, gossiping, threatening, excluding, and rejecting, are evaluated within the framework of relational aggression (Grottpeter & Crick, 1996). In summary, relational aggression seeks to damage an individual's social relationships (Crick & Grottpeter, 1995; Steinberg, 2007). However, behaviors involving relational aggression are often not recognized as aggression, despite their prevalence, because they are accepted as a regular part of interpersonal relationships. Consequently, they are frequently used in such interactions (Linder et al., 2002). For this reason, behaviors linked to relational aggression are challenging to recognize, and even victims of these behaviors may not view themselves as victims (Kurtyılmaz, 2011; Young et al., 2006). Although this situation leads to relational aggression being viewed as a normal aspect of relationships, this assumption ignores the fact that relational aggression encompasses destructive behaviors that can cause as much harm as other types of aggression (Gomes, 2007; Griffin & Gross, 2004). In this context, the factors associated with relational aggression become significant. When considering adolescent developmental characteristics, it is believed that difficulties in emotion regulation may be related to relational aggression.

It is seen that emotions are experienced intensely during adolescence (Kulaksızoğlu, 2001). This period is also a time when skills in regulating emotions are acquired. The fact that adolescents have complex and fluctuating emotional states causes them to use dysfunctional methods by experiencing inadequacy in emotion regulation skills (Casey et al., 2008). Due to the difficulties in coping with emotions, they tend towards more aggressive behaviors (Sullivan et al., 2010). In other words, it is stated that the trigger of aggressive behaviors is the emotion regulation difficulties experienced during adolescence (McLaughlin et al., 2011). Individuals must have some skills to realize the emotion regulation process. Gratz and Roemer (2004) listed the skills necessary for emotion regulation as (a) recognizing and understanding the felt emotion, (b) accepting the felt emotion and using the appropriate strategy for the

emotion, (c) controlling impulsive behaviors, and (d) creating behaviors according to the desired goal. The lack of one or some of these skills necessary for realizing the emotion regulation process is defined as emotion regulation difficulties (Gratz & Roemer, 2004). Gross (2013), on the other hand, defines dysfunctional ways that occur against the emotional state that the individual experiences and reacts to as emotion dysregulation.

During adolescence, relational aggression is sometimes observed due to difficulties regulating emotion in peer relationships (Kokkinos et al., 2019). In addition, adolescents may sometimes exhibit behaviors involving relational aggression to take revenge on their peers. Emotion dysregulation is a critical predictor of relational aggression for female adolescents (Bowie, 2010). Under conditions where an adolescent's negative experience is not revealed healthily; it can be thought that they exhibit a more aggressive attitude when they have difficulties in regulating emotions such as anger and anger, when they maintain these emotions and when they cannot replace these emotions with emotions such as compassion, empathy, tolerance, understanding, generosity. In this context, forgiveness emerges as a critical concept for the regulation of emotions when damaging behaviors such as aggression, which occur with the lack of regulation of emotions in close relationships and have the possibility of destroying social relationships (Allemand et al., 2007).

Through forgiveness, which is defined as the individual's giving up anger, resentment and revenge-like feelings towards the person who has hurt him/her, and accepting the person unconditionally (Enright et al., 1992), adolescents can cope with actions that may damage their social relationships. In other words, relational aggression can be thought to be related to forgiveness (McCullough, 2000), which is defined as the adolescent giving up negative attitudes and feelings such as anger and resentment towards a peer whom he/she thinks has harmed him/her and developing positive reactions such as compassion, tolerance, love, and empathy towards his/her peer. Moreover, forgiveness seems to contribute positively to interpersonal relationships, as it is an important way of coping with negative life experiences. (Yamhure Thompson et al., 2005). According to research, forgiveness acts as an important restorative when interpersonal relationships are disrupted (Hargrave & Sells, 1997; Miller & Worthington, 2010; Orathinkal & Vansteenwegen, 2006). Emotions such as anger, resentment, and revenge felt in the case of unforgiveness can be regulated with empathy and tolerance through the forgiveness process (McCullough et al., 1998). In this way, it is possible to change the negative emotions experienced with more positive ones and realize emotional healing (Hargrave & Sells, 1997). It is important to regulate emotions in the process of forgiveness, which is accepted as the conscious renunciation of emotions such as anger, resentment, or revenge against the peer whom the adolescent thinks is wrong, and building more positive emotions instead (Enright & Fitzgibbons, 2000; Küçüker, 2016). In this direction, it can be said that adolescents who tend to forgive by regulating emotions such as resentment, anger, and revenge that may occur after problems experienced among peers will not exhibit behaviors towards relational aggression.

When the literature is examined, studies are revealing the relationships between difficulties in emotion regulation and forgiveness, which are thought to be related to relational aggression (Derincegöz, 2019; Gülüm, 2022; Hodgson & Wertheim, 2007; Karataş, 2020; Küçüker, 2016). Considering these studies, it is stated that those who can regulate emotions or those who do not have difficulty regulating emotions tend to forgive. Mitrofan and Ciuluvica (2012) state that the inability to forgive is related to aggression, and emotion regulation is important in reducing aggressive behaviors. Freedman (2018) emphasizes that forgiveness helps adolescents express their emotions and move away from the adverse effects of anger. In parallel to this, Eaton and Struthers (2006) state that it can reduce aggression because the adverse effects of anger-like emotions are eliminated through forgiveness. In this context, it can be said that it is important to regulate emotions such as anger and revenge in forgiveness. Accordingly, it is important to examine the relationships between these variables in detail to prevent aggressive behaviors that adolescents tend to exhibit by regulating their emotions in the problems they experience in peer relationships. Relational aggression negatively affects not only the victims but also the individuals who exhibit relational aggression behaviors in terms of psychological health. For individuals to create socially

healthy relationships by removing structures that will damage a relationship, such as interpersonal insecurity and jealousy, there is a need to reveal behavioral patterns involving relational aggression, understand them better, and make intervention plans. Therefore, it is necessary to reveal the factors that may cause relational aggression (Kurtyılmaz, 2011).

When the literature in Turkey is examined, it is seen that studies on relational aggression are primarily conducted with preschool children (Erdoğan, 2009; Ersan, 2017; İkiz, 2015). In addition, studies conducted by Kurtyılmaz (2011) and Karaaslan (2019) with university students are among the limited studies in the literature. Apart from Ekşi's (2021) study on emotion regulation difficulties, aggressive behaviors, and parents' psychological and behavioral control, no study on relational aggression in adolescence was found. In this context, it is important to understand the structure of relational aggression in adolescence, a critical developmental period in terms of psychological health. It is thought that the findings to be obtained at the end of the research will be helpful for psychological counselors working with adolescents in their efforts to reduce behaviors involving relational aggression, because knowing adolescents' behaviors involving relational aggression and related factors will benefit the provision of guidance and counseling services for adolescents more systematically.

It is important to conduct protective and preventive guidance studies for adolescents and determine the relationships between emotion dysregulation and forgiveness variables to minimize adolescents' behaviors involving relational aggression. It is thought that fewer relational aggressive behaviors during adolescence may be a protective factor for adolescents' mental health. When the studies in the literature are examined, the fact that the studies on relational aggression are minimal and that there is no research examining the variables of relational aggression, emotion dysregulation, and forgiveness in adolescents together reveals the necessity of conducting this research. In this context, it is expected that addressing the variables of relational aggression, emotion dysregulation, and forgiveness in the research will contribute to the protective and preventive studies to be carried out in the future and the research to be carried out in the following years. In this framework, the research aims to determine the relationships between adolescents' relational aggression, emotion dysregulation, and forgiveness levels. In this direction, an answer to the question "Does forgiveness have a mediating role in the relationship between difficulties in emotion regulation and relational aggression in high school students?" was sought.

2. Method

2.1. Research Model

In this study, the relational survey model, one of the quantitative research methods, was used. The relational survey model aims to examine the existing relationship between two or more variables without any intervention and to reveal the cause-and-effect relationships between variables (Büyüköztürk et al., 2013). Accordingly, the study aimed to describe the relationships between adolescents' relational aggression, difficulties in emotion regulation, and forgiveness levels.

2.2. Research Group

The study used a cluster sampling method. In this method, each element in the sub-universe is equally likely to be selected (Karasar, 2015). The study group consists of 1012 students studying in 45 different public high schools in Eskişehir province in the 2021-2022 academic year, and it was determined by the cluster sampling method. Approximately 3.5% of the 41000 high school students in public schools in Eskişehir constitute the study group. The descriptive characteristics of the participants are presented in Table 2.1 below.

2.3. Measures

To collect the research data, ethics committee permission (Annex-12-14/09/2021 dated 14/09/2021 and decision no. 142235) was obtained from the Anadolu University Social and Human Sciences Scientific Research and Publication Ethics Board before the applications started. Afterwards,

permission to apply for the research was obtained from the Ministry of National Education. Parental permission and informed consent were obtained before the scale application. The researcher collected the data in October, November and December of the 2021-2022 academic year. Students who volunteered to participate in the study were informed about the purpose and importance of the study and how to fill in the measurement tools by the researcher, and the data were collected.

Table 2.1. Distribution of students according to schools, grades, and gender

School	Gender	Grade 9	Grade 10	Grade 11	Grade 12	Total
Fine Arts High School	Male	12	15	16	17	60
	Female	34	35	26	23	118
Anatolian High School with central placement points	Male	26	26	26	17	95
	Female	30	30	20	30	110
Anatolian High School with local placement points	Male	40	53	53	46	202
	Female	59	61	49	26	195
Vocational high school with central placement points	Male	16	13	15	16	60
	Female	14	16	17	17	64
Vocational high school with local placement points	Male	9	23	22	8	62
	Female	10	16	19	11	56
Total	Male	103	130	132	104	1012
	Female	147	158	131	107	

To collect the data for the study, Relational Aggression in Friendship Relationships Scale Adolescent Form (Kurtyılmaz et al., 2022) was used to determine relational aggression, Difficulty in Emotion Regulation Scale (Saritaş & Gençöz, 2011) was used to determine emotion regulation difficulties, and "Forgiveness Scale for Adolescents (Asıcı & Karaca, 2018) was used to reveal forgiveness levels. In addition, the "Personal Information Form" was used to determine the demographic characteristics of adolescents.

2.3.1. Relational Aggression in Dating Relationships Scale Adolescent Form

The validity and reliability of the Relational Aggression in Friendship Relationships Scale (ARILSÖ), which Kurtyılmaz developed, Can, and Ceyhan (2011) to determine the relational aggression of university students, was carried out by Kurtyılmaz, Şahan, and Ceyhan (2022). The 16-item scale is based on a 5-point Likert-type rating (1 = always, 5 = never). The scale consists of three sub-dimensions explaining 53.7% of the total variance. These sub-dimensions are named as exclusion, manipulation, and gossip. The lowest score obtained from the scale, which has no reverse-scored items, is 16, while the highest score is 80. The higher the score obtained from the scale, the higher the level of relational aggression. The internal consistency coefficient for the whole scale was found to be .91. The correlation coefficient between the two applications conducted with the test-retest method, 15 days apart, and with 96 participants was found to be .85 (Kurtyılmaz et al., 2022). In the present study, only the total score obtained from the scale was used, and the Cronbach's alpha reliability coefficient for the whole scale was found to be .91.

2.3.2. Difficulty in Emotion Regulation Scale

The scale developed by Gratz and Roemer (2004) to determine the emotion regulation difficulties of individuals was adapted to Turkish culture by Rugancı and Gençöz (2008) with university students. The adaptation study of the scale for adolescents was conducted by Saritaş and Gençöz (2011). The 36-item scale is scored between 1 and 5 points (1 = almost never, 5 = almost always). Consisting of 6 sub-dimensions, an increase in the score obtained from the scale indicates that emotion regulation is difficult. The internal consistency coefficient of the scale was found to be .93, and the correlation coefficient between the applications made with the test-retest method was found to be .83. In the present study,

the total score obtained from the scale was used and the Cronbach's alpha reliability coefficient for the whole scale was calculated as .96.

2.3.3. Forgiveness Scale for Adolescents

The "Forgiveness Scale for Adolescents" was developed by Asıcı and Karaca (2018) to determine adolescents' tendency to forgive in interpersonal relationships. The scale, which is based on a 5-point Likert-type scale (1=does not define me at all, 5=defines me completely), contains 21 items and consists of four sub-dimensions. The lowest score that can be obtained from the scale is 21, while the highest score is 105. An increase in the total score obtained from the scale means the adolescent's tendency to forgive increases. While the internal consistency coefficients of the subscales of the measurement tool ranged between .70 and .90, the correlation coefficients between the two applications performed with the test-retest method ranged between .65 and .80. The construct validity coefficients of the subscales of the scale ranged between .71 and .76. In the present study, only the total score obtained from the scale was used. The Cronbach's alpha reliability coefficient for the whole scale was calculated as .79.

2.3.4. Personal Information Form

A personal information form was developed to collect information about the demographic characteristics of the participants. In the personal information form, there are items related to the gender, school and class of the participants.

2.4. Data Analysis

The data analysis phase started with transferring the data collected with the measurement tools to the electronic environment. At this stage, the data of 172 participants who were thought to be filled in incorrectly, left blank or who could damage the reliability of the research results were removed from the research set. Before starting the analyses, whether the data set met the conditions required for multivariate statistical analysis was examined. Accordingly, outlier analysis was performed by looking at the Z scores for the univariate normality assumption. Data whose Z scores were not between -4 and +4 were removed. Then, Mahalanobis values were calculated for multivariate outlier analysis and the data above the chi-square value were removed. Skewness and kurtosis values were calculated and the condition between -2 and +2 was checked (George & Mallery, 2016). For the autocorrelation value, it was observed that the Durbin-Watson value should be between 1-3 and this condition (1.86) was realized in the current data set (Tabachnick & Fidell, 2007). After these procedures, the analysis continued with 1012 data sets.

The data were analyzed with the SPSS 22 package program. The PROCESS Macro plug-in downloaded from <http://afhayes.com/spss-sas-and-mplus-macros-andcode.html> was used to test the mediation model. In the study, Hayes' Model 4 was used to determine the effect of the mediating variable. The Bootstrap method was used to assess the significance level of the indirect effects of the mediation role. In the significance analysis of indirect effects, 5000 sample options were used with the bootstrap technique for bias-free results. As a result of the bootstrap analysis, whether the indirect effect is significant is decided by examining the 95% confidence interval values. Accordingly, indirect effects are significant if the confidence interval does not include "0", but not significant if the confidence interval includes "0". When interpreting the effect size, if the effect size is close to .25, it is interpreted as high effect, if it is close to .09, it is interpreted as medium effect, and if it is close to .01, it is interpreted as low effect (Gürbüz, 2021; Preacher & Kelly, 2011).

3. Results

3.1. Descriptive statistics

Before analyzing the research question, descriptive statistics of the research variables were determined. In this direction, the findings regarding the descriptive statistics of the research variables are given in Table 3.1.

Table 3.1. Descriptive statistics of adolescents' relational aggression, emotion dysregulation and forgiveness scores

	Variables	\bar{x}	SS	Min	Max	Skewness	Kurtosis
1	relational aggression	35.41	12.83	16	80	1.01	.51
2	emotion dysregulation	89.28	32.68	39	174	.51	-.74
3	forgiveness	58.74	13.41	21	105	.03	-.13

N: 1012 **p < .01

When Table 3.1 is examined, it is seen that relational aggression scores vary between 16 and 80. While the arithmetic mean (\bar{x}) of relational aggression scores was 35.41, the standard deviation (SD) was 12.83. Difficulty in emotion regulation scores ranged between 39 and 174. While the arithmetic mean (\bar{x}) of the difficulty in emotion regulation scores was 89.28, the standard deviation (SD) was 32.68. Forgiveness scores ranged between 21 and 105. While the arithmetic mean (\bar{x}) of forgiveness scores was 58.74, the standard deviation (SD) was 13.41.

3.2. Relationships between variables

Descriptive statistics were made before analyzing the research problem, and the relationships between the study's variables were determined. Accordingly, the findings regarding Pearson correlation coefficients are given in Table 3.2.

Table 3.2. Pearson correlation coefficient statistics between adolescents' relational aggression, emotion dysregulation and forgiveness scores

	Variables	1	2	3
1	relational aggression	-	.48**	-.24**
2	emotion dysregulation		-	-.29**
3	forgiveness			-

N: 1012 **p < .01

As seen in Table 3.2, there is a moderate and positive significant relationship between adolescents' levels of relational aggression and difficulties in emotion regulation ($r = .48$, $p < .01$). On the other hand, there are negative and moderately significant relationships between adolescents' forgiveness levels and relational aggression levels ($r = -.24$, $p < .01$), and negative and moderately significant relationships between forgiveness levels and emotion dysregulation ($r = -.29$, $p < .01$).

3.3. Findings on the mediating role of forgiveness in the relationship between difficulties in emotion regulation and relational aggression

We analyzed forgiveness's mediating role in the relationship between difficulties in emotion regulation and relational aggression in adolescents. Figure 3.1 shows the regression coefficients of the model's direct and indirect effects.

As seen in Figure 3.1, adolescent forgiveness is directly and negatively predicted by difficulties in emotion regulation ($\beta = -.12$, $p < .001$). On the other hand, forgiveness directly and negatively predicts relational aggression ($\beta = -.11$, $p < .001$). The total effect of emotion dysregulation on relational aggression was .19. When forgiveness was included in the model as a mediator variable, the total effect decreased to .17. This value was statistically significant.

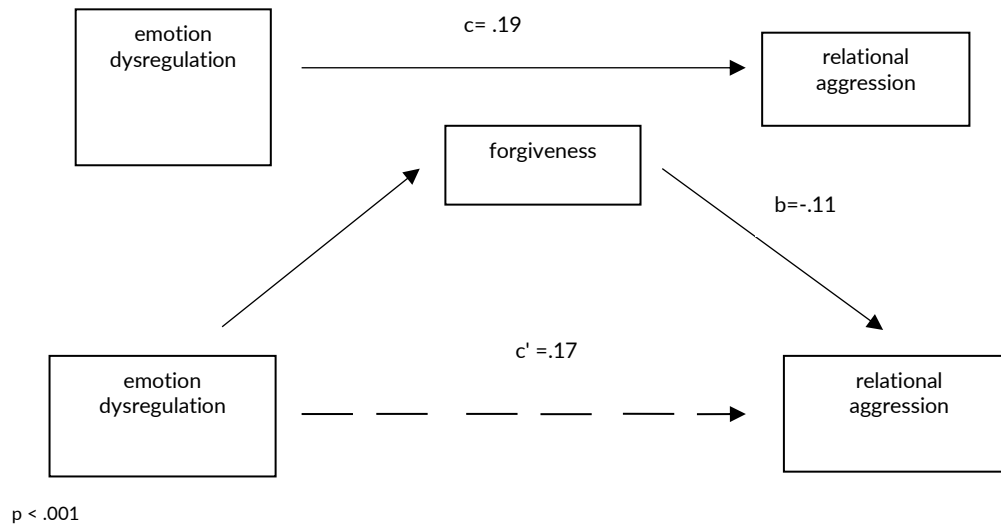


Figure 3.1. Model for the mediating role of forgiveness between difficulties in emotion regulation and relational aggression

As stated in the literature, if the relationship between the independent variable (difficulties in emotion regulation) and the dependent variable (relational aggression) decreases when the mediating variable (forgiveness) is included in the model, provided that it is different from zero (0), the mediation role is significant (Baron & Kenny, 1986). In this respect, forgiveness is a partial mediating variable in the relationship between adolescents' difficulty in emotion regulation and relational aggression levels.

To determine whether the indirect effect of the partial mediation role of forgiveness in the relationship between adolescents' emotion dysregulation and relational aggression levels is significant, an analysis was conducted with the Bootstrap 5000 sample option, and the values in the 95% confidence interval are presented in Table 3.3

Table 3.3. Bootstrapping results for the partial mediating role of forgiveness between high school students' emotion dysregulation and relational aggression levels

		95% confidence range			
		B	SH	Bott LLCI	Boot ULCI
Direct effect					
E. dysregulation	→ Forgiveness	-.29	.012	-.145	-.097
Forgiveness	→ Relational aggression	-.11	.028	-.163	-.055
E. dysregulation	→ Relational aggression	.44	.011	.152	.200
Total effect					
E. dysregulation	→ Forgiveness → Relational aggression	.47	.011	.166	.208
Indirect effect					
E. dysregulation	→ Forgiveness → Relational aggression	.03	.009	.016	.053

$p < .001$, based on a bootstrap sample of 5,000.

Table 3.3 shows that the indirect effect of forgiveness on adolescents' difficulties in emotion regulation and relational aggression levels is statistically significant (Bootstrap = .03, 95% CI = .016; .053). Since the upper and lower confidence intervals of the indirect effect of forgiveness did not include the zero value, the partial mediation role was statistically significant. In addition, the fully standardized effect size is .03. When interpreting the effect size, if it is close to .01, it is interpreted as low effect, if it is close to .09, it is interpreted as medium effect, and if it is close to .25, it is interpreted as high effect (Gürbüz, 2021; Preacher & Kelly, 2011). Therefore, the partial mediation effect of forgiveness was found to be low.

4. Discussion

The finding that there is a positive correlation between emotion dysregulation and relational aggression in adolescents shows that when adolescents experience problems in their friendships, they experience difficulties in regulating these emotions, leading to anger, and this causes relational aggression towards their friends. The finding that aggression increases when emotion regulation difficulties increase is consistent with other research findings in the literature (Akdemir, 2019; Caffarel, 2019; Christodoulou, et al., 2024; Dane & Marini, 2014; Ekşi, 2021; Hicks, 2018; Kayhan, 2017; Kyranides et al., 2024; Özdoğan, 2017; Robertson et al., 2012; Röhl et al., 2012; Skripkauskaitė et al., 2015). Similarly, Kawabata et al. (2011) argue that when emotion regulation skills cannot be used effectively, they cause aggression. In this context, considering that the lack of emotion regulation difficulties creates control over behaviors, it is also suggested that emotion regulation is a factor that reduces aggression (Cole et al., 1994). Chen et al. (2012) suggest that the inability to control impulse control, which may cause emotion regulation difficulties, may be related to aggression. It is seen that adolescents who have difficulties in coping with emotions such as anger or sadness that may occur in conflicts in peer relationships exhibit behaviors involving relational aggression more. It is seen that these adolescents have difficulties in creating positive alternative behaviors, as well as in getting rid of the effect of the emotion felt. It can be said that experiencing difficulties in changing the focus of thought with the felt emotion makes impulse control difficult and leads to the display of behaviors involving relational aggression.

Another result of the study is that relational aggression is negatively predicted by forgiveness. In other words, relational aggression decreases when forgiveness increases. When the literature is examined, it can be said that the research findings are in parallel with the previous studies (Camadan, 2014; Eaton & Struthers, 2006; Fincham & Beach, 2002; Jon et al., 2012; Naami et al., 2014). It is also shown that adolescents with lower relational aggression tend to regulate their emotions and forgive the anger they feel towards their friends in conflicts in peer relationships by spreading their emotions over time or changing the focus. Similarly, Eaton and Struthers (2006) state that forgiveness can prevent aggressive behaviors by regulating anger-like emotions and suggest that forgiveness can reduce aggression. Moreover, Camadan (2014) emphasizes that a low tendency to forgive leads to a preference for negative strategies in coping with stress and aggression. In this context, it is emphasized that forgiveness is critical when aggressive behaviors that may cause negative emotions are exhibited in friendships (Allemand et al., 2007). Therefore, it can be said that forgiveness plays an important role in repairing the hurt felt in conflicts experienced in close friendships.

One of the results of this study is the finding that emotion dysregulation negatively predicts forgiveness. In other words, forgiveness increases when difficulties in emotion regulation decrease. In the literature, there are research findings indicating that forgiveness is negatively predicted by emotion dysregulation (Derincegöz, 2019; Extremera & Rey, 2015; Hodgson & Wertheim, 2007; Küçük, 2016). In other words, individuals with difficulties in emotion regulation have lower levels of forgiveness. In cases where individuals have difficulty in emotion regulation, they may show more behaviors involving relational aggression instead of trying to forgive, because it can be said that having difficulties in regulating emotions, which is necessary for forgiveness to occur, is effective in the occurrence of relational aggression. Hodgson and Wertheim (2007) state that individuals with clearer emotions and self-regulating emotions tend to forgive. Dursun (2015) emphasizes that forgiveness decreases adolescents' negative emotions and increases their positive emotions. Mitrofan and Ciuluvica (2012) point out that unforgiveness and aggression are related and that emotion regulation is critical in preventing aggressive behaviors. In this context, it can be said that experiencing difficulties in regulating emotions that occur as a result of resentment and hurt experiences may lead to behaviors involving relational aggression.

5.1. Implications for theory and practice

In this study, it was found that forgiveness has a partial mediating role in the relationship between adolescents' emotion regulation difficulties and relational aggression behaviors. It was found that forgiveness constructs partially helped adolescents in case of difficulty regulating emotions due to the problems they experienced in their friendships. In other words, it was found that when adolescents had difficulty regulating emotion, they showed behaviors involving relational aggression instead of exhibiting forgiving behaviors. According to the findings of the study, it is seen that the regulation of emotions such as anger, resentment, and revenge is critical for adolescents to exhibit relational aggression. Accordingly, it can be said that when adolescents want to hurt or harm their close friends, they have difficulties in regulating (have difficulties regulating) their feelings of anger and revenge. They exhibit relational aggression because they cannot use their tendency to forgive as a protective factor. It was found that adolescents who exhibit behaviors involving relational aggression have limited access to emotion regulation strategies and have difficulties in creating alternative behaviors in case of negative emotions.

5.2. Limitations and directions for future research

Although the findings obtained from this study are valuable, the research also has some limitations. First, the data of this study were collected from students attending high schools in Eskişehir during the 2021-2022 academic year. Since it is thought that the variables addressed in the study may also be affected by cultural factors, it is thought that it may be useful to expand and renew the scope of the research with participants from different cultural regions in the future. Since the research was conducted using the cross-sectional method, the study variables could be measured once and instantaneously. Therefore, the data do not show changes that may occur over time. Since the data obtained could be collected once, it was limited to the current situation.

It was found that adolescents want to hurt or harm their friends as a result of the conflicts they experience in peer relationships and have difficulty in forgiving their peers. Accordingly, it is thought that it is important for guidance and counseling services in schools to identify students who show relational aggression behaviors and to conduct psycho-educational activities or individual interviews for these students. While preparing the content of psycho-educational activities, it is thought that it is important to emphasize the forgiveness process and the development of emotion regulation skills in addition to relational aggression. In the study, it was observed that adolescents had difficulties in forgiveness, especially in regulating anger. It is thought that the preparation of psycho-education or group counseling programs that aim to regulate the emotion of anger by differentiating its focus, providing impulse control, or spreading the emotion over time will contribute to the literature.

This study examined the relationship between relational aggression and emotion dysregulation. Since relational aggression is a new concept in the domestic literature, conducting further studies is recommended to uncover the relationships between relational aggression and various variables that may be risk factors. In this study, we explored the relationship between relational aggression and forgiveness. It is also recommended that the connections between relational aggression and other variables aside from forgiveness be studied, which is thought to be a protective factor in reducing relational aggression. According to the current study's findings, forgiveness was found to partially mediate between difficulties in emotion regulation and relational aggression. At this point, it is advisable to consider different variables that might play a partial or full mediating role in future research.

It was found that emotion regulation difficulties and forgiveness predicted adolescents' relational aggression. For this reason, it is thought to be important to prioritize preventive activities in school and classroom guidance activities in general and relational aggression in particular, while considering activities related to emotion regulation difficulties and forgiveness. In order to reduce the destructive effects of relational aggression, it is thought that it is critical to include parents and teachers, as well as students, in efforts to recognize, prevent, and reduce relational aggression. It is thought that it is important to overcome the limitation of the study due to the use of the cross-sectional method by using the longitudinal method. It is thought that repeating the study with the same data group in the future

with the longitudinal method and obtaining comparable data will contribute to the literature. Thus, it is thought that the change over time and the cause-and-effect relationship can be determined.

5. Conclusion

Within the scope of the study, the mediating role of forgiveness in the relationship between adolescents' emotion dysregulation and relational aggression was tested. It was found that there was a positive and significant relationship between relational aggression and emotion dysregulation. There was a negative and significant relationship between relational aggression and forgiveness. There was also a negative and significant relationship between forgiveness and difficulties in emotion regulation. Accordingly, in the model tested in the study, it was determined that adolescents' relational aggression was predicted by emotion dysregulation through forgiveness. In other words, forgiveness has a partial mediating role in the relationship between adolescents' emotion dysregulation and relational aggression. This finding indicates that when the adolescents included in the study experience emotion dysregulation, their forgiveness behaviors decrease and therefore their relational aggression increases.

Statement of Researchers

Researchers' contribution rate statement: Mehmet Şahan: Conceptualization, Methodology, Software, Investigation, Validation, Writing- original draft, Writing - review & editing, Data curation, Resources, Validation, Visualization, Formal analysis. Esra Ceyhan: Writing - review & editing, Validation, Software, Formal analysis, Project administration, Supervision.

Conflict statement: The authors declare that they have no conflict of interest.

Data Availability Statement: The data supporting this study's findings are available from the corresponding author upon reasonable request.

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Authors Biographies

Mehmet Şahan graduated from Gazi University, Faculty of Education, Department of Psychological Counseling and Guidance in 2004. In 2007, he completed his Master's Degree Program in Psychological Counseling and Guidance at Gazi University, Institute of Educational Sciences with his thesis titled "Investigation of some variables predicting aggression in high school students". In 2023, he completed his PhD thesis at Anadolu University, Institute of Educational Sciences, Department of Psychological Counseling and Guidance with the thesis titled "The mediating role of forgiveness in the relationship between emotion regulation difficulties and relational aggression in high school students: A mixed design study". He has been working as a guidance counselor at the Ministry of National Education since 2004. He is a member of Turkish Psychological Counseling and Guidance Association.

Esra Ceyhan completed her bachelor's degree in psychology at Hacettepe University in 1988. In 1991, she started her career as a guidance counselor at the Ministry of National Education. In 1992, she completed her master's degree in guidance and psychological counseling program at Hacettepe University and her doctorate in 1999. Since 1994, she worked at the Ministry of National Education in the General Directorate of Special Education and Guidance Services, and in 1997, she started to work as a lecturer at Anadolu University. In 1999, she was appointed as an assistant professor in guidance and psychological counseling. She was promoted to associate professor in 2007 and professor in 2012 in guidance and psychological counseling. Currently, she continues her academic studies at Anadolu University, Faculty of Education, Department of Guidance and Psychological Counseling, and she is also the director of the university's psychological counseling and guidance center. In recent years, her studies have focused on psychological problems of university students, problematic internet use and personality.

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RESEARCH ARTICLE

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Foreign language anxiety in middle school students: a case study^{3*}

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Highlights:

- Foreign language anxiety from the perspectives of students and teachers.
- Symptoms that will be useful in identifying students experiencing foreign language anxiety.
- The causes of foreign language anxiety and their interrelationships.
- Tested methods for coping with foreign language anxiety.

Abstract

The research aims to understand and analyse foreign language anxiety in secondary school students from both student and teacher perspectives across various dimensions. The research was designed as a case study involving a research group of 35 secondary students and 13 English teachers from the same state school in Istanbul during the 2021-2022 academic year. Data were collected through semi-structured interview forms and observation notes taken by the researcher and were analysed using the descriptive content analysis method. The results indicate that students exhibit physical symptoms (such as stuttering, trembling, and freezing), psychological symptoms (including nervousness and fear), and cognitive symptoms (such as forgetfulness and lack of motivation) associated with foreign language anxiety. The causes of this anxiety are related to the learner, the teacher, and the teaching system. Student-related causes include peer pressure, fear of making mistakes, insufficient knowledge, challenges in learning vocabulary, and an authoritarian family attitude, among others. Teacher-related factors causing foreign language anxiety include strict teacher attitudes, the provision of immediate and continuous feedback, and inadequate teacher qualifications. Factors related to the teaching system encompass an exam-oriented approach, grammar-focused instruction, limited teaching hours, and insufficient textbook coverage. The consequences of foreign language anxiety experienced by students include academic failure, learned helplessness, and a decline in interest and participation in the classroom. Both students and teachers employ various strategies to cope with foreign language anxiety, such as utilizing technology, promoting peer learning, and fostering a positive learning environment. The results show that although all students acknowledge the necessity of foreign language learning in their social lives and education, recognize its potential to facilitate their career choices, and agree that English is a universal language, every student in the study group, which included both students with and without foreign language anxiety, has experienced foreign language anxiety.

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1. Introduction

English is an international language widely recognized as a global means of communication. Therefore, learning English is vital in Turkey, and it is one of the compulsory subjects in the national education curriculum. Furthermore, foreign language learning now begins at an earlier age due to the introduction of the revised curriculum. Although English lessons are compulsory at all grade levels and foreign language learning starts early with enhancements to the curriculum, the effectiveness of language acquisition remains less than satisfactory compared to previous years (Coşkun-Demirpolat, 2015). Various studies have explored the reasons for this shortcoming in the language learning process, each providing different explanations (Durmuşçelebi & Suna, 2013). According to Demirel (1999), language learning is a complex process influenced by numerous variables. Among these, affective variables are particularly significant in elucidating the challenges faced in foreign language acquisition. Affective variables include motivation, language learning strategies, and anxiety, which can either facilitate or hinder a language learner's progress (Kılıç, 2017). Keskinçelik (2006) identifies anxiety, motivation, readiness, individual differences, and attention as key affective factors that impact learning. However, these affective factors are often overlooked in schools (Kuzgun, 2011).

Anxiety has long been recognized as a significant challenge for both foreign language teachers and learners. As one of the key factors influencing learning, anxiety manifests as foreign language anxiety within the context of language learning. Accumulated evidence indicates that anxiety consistently has a negative impact on foreign language learning (Teimouri et al., 2019). Horwitz et al. (1986) were the first to introduce the concept of foreign language anxiety as specific to language learning, defining it as a set of self-perceptions, emotions, and behaviors arising from the uncertainties of the learning process. MacIntyre and Gardner (1994) define foreign language anxiety as a fear that arises in situations requiring the use of a language by individuals who are not fully proficient. They describe it as tension concerning speaking, listening, and learning the target language. Numerous studies have concluded that foreign language anxiety negatively affects language learning. For instance, Wörde (2003, p. 1) found that students experiencing foreign language anxiety tend to learn less and struggle to demonstrate what they have learned. Consequently, these students experience more failures, which in turn exacerbates their anxiety. Similarly, Zhu (2024) stated that anxiety may make students more hesitant and self-censor in their language output, thus affecting their fluency and accuracy. According to Kianinezhad (2024), the impact of foreign language anxiety on language learners is profound and far-reaching, extending beyond the academic realm. It casts a shadow over their educational journey, leading to diminished performance, hindered language acquisition, and, in some cases, discouraging students from pursuing further language studies. Moreover, anxious learners adversely affect their engagement, motivation, and learning experience. Therefore, recognizing foreign language anxiety as a multidimensional concern is paramount for teachers and learners. In other words, to mitigate this issue, it is crucial to understand how both students and teachers perceive foreign language anxiety. Specifically, examining how teachers observe anxiety in the classroom, how they cope with these situations, the potential consequences of anxiety, and the strategies they employ to minimize it will contribute to a deeper understanding of foreign language anxiety and inform preventive measures. Similarly, considering students' perspectives on this issue will provide valuable insights for English teachers, researchers, and curriculum developers aimed at enhancing foreign language instruction. In this context, the research problem focuses on the lack of knowledge regarding the process of foreign language anxiety as perceived by both students and teachers.

The research distinguishes itself from other studies by examining foreign language anxiety in depth through a case study approach, informed by the researcher's long-term observations at her workplace. It also incorporates the perspectives of two study groups that experience foreign language anxiety most acutely. Understanding students' experiences with foreign language anxiety could assist English language teachers in planning and implementing effective educational strategies while providing new insights and perspectives. Furthermore, the thoughts and observations of English language teachers regarding foreign language anxiety in the classroom and the solutions they have implemented could offer valuable guidance to their colleagues. In this regard, the research gathers data from primary sources and interprets

the findings from multiple perspectives, analyzing foreign language anxiety from both learners' and teachers' viewpoints. This approach is expected to make a significant contribution to existing literature.

Given the prevalence of foreign language anxiety and its impact on language learning, it is reasonable to expect both foreign language students and teachers to be aware of it. Nevertheless, despite the importance of foreign language anxiety by researchers from various countries, the extent to which foreign language students and teachers recognize it as an issue remains an open question. Furthermore, it is unclear whether foreign language teachers and students accurately understand the nature of foreign language anxiety and whether they hold a positive or negative view of it (Tran et al., 2012). In this context, the research aims to explore the symptoms, causes, consequences, and coping strategies related to foreign language anxiety that secondary school students encounter while learning a foreign language, from both learners' and teachers' perspectives. In line with this overall objective, the research questions are as follows:

- a) What is the level of foreign language anxiety perceived by secondary school students?
- b) What are secondary school students' foreign language anxiety symptoms?
- c) What causes secondary school students' foreign language anxiety?
- d) What are the consequences of secondary school students' foreign language anxiety?
- e) How do you cope with secondary school students' foreign language anxiety?

2. Method

2.1. Research Design

The research was conducted as a case study, one of the qualitative research methods. A case study involves an intensive, holistic description and analysis (Merriam, 1998, p. 27). It is defined as a method of in-depth investigation into an event or situation encountered in daily life (Glesne, 2020) or as studies that examine a limited system and context, utilizing multiple sources of information (Creswell, 1998). The primary aim of a case study is to provide a detailed description of phenomena by focusing on a particular entity or phenomenon (the case), defined by the unit of analysis rather than the subject of inquiry. A specific program (a bounded system) chosen because it was typical, exceptional, or extremely successful, etc., would be the unit of analysis for the case study (Merriam, 2002). Given these characteristics, a case study was deemed appropriate for this research. It aims to explore foreign language anxiety (its symptoms, causes, consequences, and coping strategies) in depth within a particular unit, utilizing multiple sources of information such as student experiences and teacher opinions. The research was conducted as a case study with a holistic approach in a typical state secondary school, where the researcher (the first author of this article) works as an English teacher and has previously observed instances of foreign language anxiety. While a holistic approach is employed to understand the foreign language concerns of secondary school students, the study also incorporates the perspectives of both teachers and students involved in the process. Furthermore, an attempt has been made to reveal the interconnections among the various components of foreign language anxiety, including its symptoms, causes, and consequences. According to Merriam (1988), the case study serves as an ideal model for understanding and interpreting observations of educational situations and events. Therefore, since this research aims to investigate foreign language anxiety within educational contexts, it is most appropriate and effective to conduct the study as a case study.

2.2. Study Group

The study group consisted of 35 secondary school students (19 female, 16 male) attending a state school in the Sancaktepe district of Istanbul during the 2021-2022 academic year, as well as 10 English teachers (10 female, 3 male) employed at the same institution. The school is a state institution where the researcher has worked as an English teacher for seven years and is representative of typical state schools. To select the study group, which comprised both secondary school students and English teachers, the researcher employed the maximum variation sampling technique—a purposive sampling method. The aim of maximum variation sampling was to identify commonalities and patterns among students and teachers

with diverse characteristics, thereby providing a deeper and broader understanding of foreign language anxiety. To create heterogeneous study groups, the researcher interviewed teachers with varying backgrounds, including differences in their academic background, years of seniority, and gender. From these interviews, the researcher identified students who could participate in the study, ensuring the inclusion of those who represented the greatest diversity. This diversity was achieved by selecting students with distinct characteristics, such as grade level, anxiety level, academic achievement, parental knowledge of English, and gender, all of which can significantly influence foreign language anxiety. To assess the foreign language anxiety of the students, English teachers were interviewed, and based on their observations, students who were considered to have high anxiety, as well as those who exhibited no anxiety, were identified. These students were subsequently included in the study group based on their voluntary consent. Additionally, during the interviews, students were asked to evaluate their perceived level of anxiety by rating it on a scale from 1 to 4 (1- Not at all anxious, 2- Rarely anxious, 3- Quite anxious, 4- Very anxious). The inclusion of students who reported not experiencing foreign language anxiety in the study group was based on the researcher's professional observations, which indicated that even those students who did not appear anxious exhibited signs of foreign language anxiety in specific contexts. The demographic information, such as grade level, perceived foreign language anxiety, and academic achievement of the students in the study group, is presented in detail in Table 1.

Table 1. The demographic information about students

Student	Gender	Grade Level	Academic Achievement	Perceived Anxiety Level	Parental Knowledge of English	Private Lesson
S1	Female	5 th Grade	85-100	Quite Anxious	No	No
S2	Female	5 th Grade	85-100	Rarely Anxious	No	No
S3	Female	5 th Grade	45-54	Quite Anxious	No	No
S4	Female	5 th Grade	70-84	Very Anxious	Yes	No
S5	Male	5 th Grade	85-100	Not at all Anxious	Yes	No
S6	Male	5 th Grade	85-100	Rarely Anxious	No	No
S7	Female	5 th Grade (IFLC)	85-100	Quite Anxious	No	No
S8	Female	5 th Grade (IFLC)	85-100	Rarely Anxious	No	Yes
S9	Female	5 th Grade (IFLC)	85-100	Rarely Anxious	Yes	No
S10	Male	5 th Grade (IFLC)	85-100	Quite Anxious	Yes	No
S11	Male	5 th Grade (IFLC)	85-100	Not at all Anxious	No	Yes
S12	Female	5 th Grade (IFLC)	85-100	Quite Anxious	Yes	No
S13	Female	6 th Grade	85-100	Not at all Anxious	No	Yes
S14	Female	6 th Grade	85-100	Rarely Anxious	No	No
S15	Female	6 th Grade	85-100	Rarely Anxious	Yes	No
S16	Male	6 th Grade	85-100	Rarely Anxious	No	No
S17	Female	6 th Grade	85-100	Rarely Anxious	Yes	No
S18	Male	6 th Grade	70-84	Quite Anxious	No	No
S19	Male	7 th Grade	85-100	Rarely Anxious	No	No
S20	Male	7 th Grade	85-100	Rarely Anxious	Yes	No
S21	Male	7 th Grade	85-100	Rarely Anxious	Yes	No
S22	Female	7 th Grade	85-100	Not at all Anxious	No	No
S23	Female	7 th Grade	85-100	Quite Anxious	Yes	No
S24	Male	7 th Grade	70-84	Quite Anxious	No	No
S25	Male	8 th Grade	85-100	Rarely Anxious	No	No
S26	Female	8 th Grade	85-100	Quite Anxious	Yes	No
S27	Male	8 th Grade	85-100	Rarely Anxious	No	No
S28	Female	8 th Grade	45-54	Very Anxious	No	No
S29	Female	8 th Grade	85-100	Quite Anxious	No	No
S30	Male	8 th Grade (IFLC)	85-100	Quite Anxious	No	No
S31	Male	8 th Grade (IFLC)	70-84	Very Anxious	No	No
S32	Female	8 th Grade (IFLC)	70-84	Very Anxious	No	Yes
S33	Female	8 th Grade (IFLC)	85-100	Rarely Anxious	No	No

S34	Female	8 th Grade (IFLC)	85-100	Not at all Anxious	No	Yes
S35	Male	8 th Grade (IFLC)	85-100	Quite Anxious	No	No

A total of 35 students (19 female and 16 male) were selected for the study group, ensuring that at least five students were included from each grade level. Additionally, students enrolled in Intensive Foreign Language Classes (IFLC) were also part of the study. The academic achievement scores of the participating students ranged from 45 to 100. Among them, four students reported attending a course or taking private lessons to improve their English, while 31 indicated that they did not. Students were asked to rate their levels of foreign language anxiety during the interviews, and their perceived anxiety levels were evaluated. With the exception of five students, it was noted that the remaining students experienced varying degrees of anxiety. Ultimately, a study group was formed based on whether the students' parents were proficient in English. The demographic information regarding the teachers in the study group is presented in detail in Table 2.

Table 2. The demographic information about teachers

Teacher	Gender	Seniority Year	Grade Levels He/She Teaches	The Graduated Faculty	Teaching in IFLC
T1	Female	9 Years	5 th Grade	Faculty of Education	Yes
T2	Female	10 Years	5 th Grade	Faculty of Education	Yes
T3	Female	8 Years	8 th Grade	Faculty of Science and Literature	No
T4	Female	8 Years	5 th Grade	Faculty of Education	Yes
T5	Female	5 Years	5 th Grade 8 th Grade	Faculty of Education	Yes
T6	Female	10 Years	6 th Grade 8 th Grade	Faculty of Science and Literature	Yes
T7	Male	8 Years	7 th Grade	Faculty of Education	No
T8	Female	13 Years	6 th Grade	Faculty of Science and Literature	No
T9	Male	8 Years	7 th Grade	Faculty of Education	No
T10	Female	9 Years	5 th Grade 7 th Grade	Faculty of Education	Yes
T11	Female	8 Years	5 th Grade 7 th Grade 8 th Grade	Faculty of Science and Literature	Yes
T12	Male	10 Years	6 th Grade 7 th Grade 8 th Grade	Faculty of Science and Literature	Yes
T13	Female	19 Years	6 th Grade	Faculty of Education	No

Teachers were selected to represent a variety of factors, including years of seniority, gender, grade levels taught, the faculties from which they graduated, and their experience in intensive foreign language classes. In the school where the study was conducted, there are 17 English teachers, of whom 13 (ten female and three male) participated voluntarily. The seniority of these teachers ranged from 3 to 19 years. Eight of the participants graduated from the Faculty of Education, while five graduated from the Faculty of Science and Literature. Additionally, eight teachers reported having experience in intensive foreign language classes, whereas five indicated that they had never worked in such classes.

2.3. Data Collection Tools

After identifying the focus of the study, the researcher should collect data directly and comprehensively through interviews, observations, and documents to gather information about the situation (Creswell, 1998). To ensure a systematic and thorough data collection process, semi-structured interview forms and observation notes prepared by the researcher were used as data collection tools. The introduction section of the forms included demographic information about the students and teachers. During the preparation of the interview questions, the researcher reviewed relevant literature and previous studies, as well as conducted pilot applications. The pilot application of the semi-structured interview form for students was carried out with an eighth-grade student in an intensive foreign language class at the same state secondary school. The pilot application of the semi-structured interview form for

teachers was conducted with an English teacher who had eight years of professional experience at a state secondary school in the same region. This school shared similar characteristics, including student numbers, class size, facilities, and the competencies of the teaching staff. Based on the results of the pilot applications, the researcher made improvements to the interview forms by consulting the expert opinion of the thesis supervisor. In accordance with the expert feedback, it was determined that some questions received similar responses, leading to their subsequent consolidation. Two questions were found to be unclear, prompting the addition of new questions for clarification. Furthermore, based on the pilot applications and expert feedback, it was deemed necessary to incorporate additional questions into the interview. For instance, the emphasis on test anxiety during the pilot applications resulted in the inclusion of questions aimed at better defining the role of test anxiety in foreign language anxiety. Therefore, a question regarding which types of questions (e.g., open-ended questions, fill-in-the-blank, matching, etc.) cause foreign language anxiety in English exams was included in the interview forms. In the final version, the student interview form comprises eleven questions, three of which focus on their perceived foreign language anxiety and attitudes toward language learning. Three questions investigate the causes of foreign language anxiety, one addresses its symptoms, two examine its consequences, and two explore coping strategies. The final version of the teachers' interview form contains ten questions. The first question addresses students' general foreign language anxiety, while three questions explore its causes, one addresses the symptoms, two focus on the effects, and three examine coping strategies.

After completing the interviews, the observation process for the study was conducted by the researcher herself. As a practitioner, the researcher observed spontaneous events related to foreign language anxiety in the three classes she was teaching, ensuring systematic and continuous monitoring. To minimize bias in the observation notes, the researcher employed an observation form that encompassed the dimensions and sub-dimensions of foreign language anxiety, which were developed based on the findings from the interviews. The goal was to gain a deeper understanding of the data by analyzing the recorded observation notes. According to Yıldırım and Şimşek (2013), observation enables the researcher to examine the subject from multiple perspectives and achieve an in-depth understanding by directly observing behaviors. Therefore, to monitor foreign language anxiety, the researcher documented spontaneous instances of anxiety in the classroom as a natural part of the learning process.

2.4. Data Analysis

The data obtained from the study were analyzed using descriptive content analysis. In this approach, the findings are summarized and interpreted according to predetermined themes. The objective is to systematically and clearly describe the data, followed by an explanation and interpretation of these descriptions (Yıldırım & Şimşek, 2013, p. 256). The MAXQDA (2022) software was employed to identify and categorize themes and codes. Key sections of the interview forms imported into the MAXQDA software were coded and organized into relevant themes and sub-themes. For instance, expressions such as sweating, blushing, stuttering, and trembling hands were coded and categorized under the sub-theme of physiological symptoms of foreign language anxiety. Additionally, the MAXQDA software facilitated easy and rapid access to direct quotations.

In the initial phase of data analysis, the researcher transcribed each participant's audio file into text. To ensure thorough data immersion, it is essential for the researcher to listen to the interviews at least five or six times, take notes, and transcribe them. This process of data immersion significantly facilitated the development of codes and themes in the subsequent stages of analysis. After completing the interviews, the researcher conducted observations in the classrooms where she taught English, utilizing the codes and themes derived from the interview data. As both a teacher and an observer, the researcher refrained from interrupting the language learning process or disrupting the natural classroom environment. For instance, she observed and took notes when a student reading in English displayed physiological symptoms of foreign language anxiety, such as stuttering or blushing. All aspects and phases of the observation process were meticulously documented in the observation notes. The data collected were integrated with the information gathered from students and teachers, categorized under relevant

themes, and the situation of foreign language anxiety was analyzed in depth. The researcher organized all the data under common themes, addressing similarities and differences to answer the research questions.

2.5. Reliability and Validity

Creswell (2009) identifies eight validity strategies for verifying qualitative research findings and recommends that researchers apply at least two strategies to enhance their studies' trustworthiness and reliability. These strategies include triangulation, member checking, rich and thick description, addressing researcher bias, considering negative or discrepant information, spending *prolonged time in the field*, engaging in peer debriefing, and utilizing external auditors. Among these, the most effective way to ensure trustworthiness in qualitative studies is through prolonged time in the field. Continuous presence in the same environment fosters a positive, trusting relationship, ensuring accurate and comprehensive responses during the data collection phase (Streubert & Carpenter, 2011). In this context, the researcher's decision to conduct the study at the secondary school where she has worked for six years—where she possesses extensive knowledge of the school culture and the study group—along with her sustained presence in the field throughout all phases of the research, significantly enhances the study's reliability.

The researcher took notes and summarized key points during the interviews to facilitate a clearer and more efficient interview process, ensuring the discussion remained focused on the research topic. To conduct *member checking*, the researcher shared the participants' responses in summarized form both during and after the interview. This approach aimed to prevent misinterpretation and misunderstanding, thereby enhancing the validity and reliability of the study. Erlandson et al. (1993) note that member checking can be implemented in various ways. For instance, it can involve sharing the interview report with the participant after the interview or summarizing the data collected by the researcher and inviting participants to provide feedback on its accuracy.

Furthermore, the fact that interviews were conducted with both students and teachers, and that the data obtained from these interviews were synthesized with one another and with the observation notes presented directly to the reader, demonstrates that the research offers multiple perspectives and significantly contributes to its overall consistency. The researcher's use of both interviews and observations, along with the inclusion of diverse study groups, exemplifies the *triangulation* strategy. Triangulation involves the researcher's efforts to enhance the diversity of data collected during the research process and to incorporate as many different perspectives as possible (Merriam, 1998). According to Mays and Pope (2000), triangulation refers to the comparison of results from two or more data collection methods (e.g., interviews and observations) or, more simply, from two or more data sources (e.g., interviews with members of different interest groups). This approach allows the weaknesses of one method to be offset by the strengths of another (Streubert & Carpenter, 2011). Consequently, the researcher aimed to enhance the credibility of the study and minimize bias in the findings by utilizing multiple data sources through both observations and interviews with various study groups.

In descriptive content analysis, direct quotations are employed to effectively convey the perspectives of the individuals interviewed and observed. Consequently, direct quotations were frequently incorporated to ensure an accurate representation of the data obtained from the content analysis (Özdemir, 2010). In this approach, the researcher aimed to enhance the reliability and validity of the study by presenting quotations related to the identified themes exactly as they were stated. Additionally, all notes and voice recordings collected were preserved throughout the study and beyond to ensure the confirmability of the interview and observation data. The statements of both students and teachers, along with the researcher's observation notes, were included in the findings as unaltered direct quotations to maintain credibility. When presenting these direct quotations in the findings, the researcher utilized the codes T1 for teachers and S1 for students.

2.6. Research Ethics

First, ethical approval was obtained from the Marmara University Institute of Educational Sciences Research and Publication Ethics Committee. Subsequently, a Survey and Research Permission Document was acquired from the Istanbul Provincial Directorate of National Education to conduct interviews and observations at the school. The study was carried out meticulously within the framework of ethical guidelines. Before initiating the research, the researcher met with her colleagues to inform them about the study's content and to ascertain their willingness to participate voluntarily. She requested that her colleagues identify students they had observed who exhibited foreign language anxiety, as well as those who did not, in their classes. The study group was formed based on the list provided by the teachers, ensuring a balanced representation of students' genders, grade levels, and academic achievements. The researcher obtained parents' contact information from the class teachers and individually informed both parents and students about the study's content and purpose, confirming their willingness to participate. A parent permission form was distributed to the students who volunteered, and the interview process commenced. Prior to the interviews, students were reminded that participation was voluntary, and this was reiterated to ensure clarity. The interviews were conducted entirely during the students' and teachers' free time, with careful attention given to ensuring that no grievances arose in their classes.

3. Results

3.1. What Is the Level of Anxiety Perceived by Secondary School Students?

The interview process commenced with inquiries about students' feelings regarding their English lessons. This approach aimed to foster a comfortable environment and to gain a deeper understanding of their experiences with the subject. It was found that all students believed that learning English as a foreign language is both necessary and important for various reasons. The responses were categorized into four key areas: a) necessity in social life, b) advantages in career choices, c) the global significance of the English language, and d) educational objectives. However, the data collected from the participants indicate that students experience foreign language anxiety during English lessons. Participants T6 and T13 articulated this issue as follows:

T6 "Generally speaking, yes, I think they are anxious. They have fears because they are using a different language."

T13 "Yes, I believe that they are generally anxious."

The fact that both students recognize the necessity of learning English while simultaneously experiencing varying levels of anxiety underscores the importance of understanding foreign language anxiety and defining the associated processes. To assess this, the students were asked to evaluate their perceived anxiety by responding to the question, "If you were to rate your level of anxiety, what would it be? (1 - I have no anxiety at all, 2 - I am rarely anxious, 3 - I am quite anxious, 4 - I am very anxious)" during the interview process. As a result, it was found that the students exhibited a range of anxiety levels, except for five students who reported experiencing no anxiety whatsoever.

S33 "I forget or do not know the meaning of a word, the entire sentence disappears, and I feel anxious. I rarely experience anxiety; I do not feel anxious in my other lessons."

S1 "English is not my native language; I often feel quite anxious in English class, so my level of anxiety is moderate."

S32 "[My anxiety level is] 4. I experience a significant amount of anxiety, particularly in English class. In my other classes, I can manage my anxiety when I put in the effort, but I struggle to do so in English, which is why it feels more overwhelming."

In addition to these students, S5, S13, and S22, who reported experiencing no anxiety in English classes, also indicated that they felt no anxiety in other lessons. S5, who specifically stated that he was not anxious in English class, expressed his/her feelings as follows:

S5 "I never feel anxious. I have always liked English; I have never worried about it. I do not worry about my other lessons either."

To determine whether students' anxiety was a general state or specific to the English course, they were asked if they experienced similar anxiety in other lessons. The students' responses indicated they felt most anxious in Mathematics and English. While they attributed their anxiety in Mathematics to its difficulty, they struggled to articulate the reasons for their foreign language anxiety in English. This finding suggests that foreign language anxiety is a more complex construct. Furthermore, the fact that all students exhibited varying levels of anxiety, despite expressing enjoyment of English lessons and considering them fun, highlights how foreign language anxiety differs from other types of anxiety.

To gain a deeper understanding of the foreign language anxiety experienced by students, secondary school students in the 6th, 7th, and 8th grades were investigated regarding any changes in their anxiety levels compared to previous academic years. Additionally, teachers were consulted based on their professional experiences to identify the grade levels where they believed foreign language anxiety was most pronounced among students. The findings indicate a correlation between the data provided by students and teachers regarding this issue. While students reported feeling more anxious in the 5th grade, teachers concurred that foreign language anxiety was most prevalent in that same grade.

S18 "Last year [in 5th grade] I felt more anxious because I did not know any of my friends or teachers, and I had gaps in my knowledge from primary school."

T9 "I can say that the 5th grade is the most anxiety-inducing year, as students have just transitioned from primary school. Adjusting to secondary school can be particularly challenging, especially for those who may feel less prepared than their peers. Consequently, they often experience this state of anxiety more acutely."

3.2. What Are the Symptoms of Foreign Language Anxiety?

The students were asked to describe the symptoms of foreign language anxiety they experienced. At the same time, the teachers were requested to report on the behavioral changes they observed in students who they believed exhibited signs of foreign language anxiety. The study aimed to identify students' symptoms associated with foreign language anxiety. The findings revealed that foreign language anxiety manifests through physiological, affective, and cognitive symptoms. Furthermore, it was concluded that students frequently experience multiple symptoms simultaneously. While the students reported experiencing *physiological symptoms* of foreign language anxiety, such as trembling hands, a flushed face, freezing, sweating, rapid heartbeat, and stuttering, the teachers identified similar symptoms, including a flushed face, unresponsiveness (freezing), avoidance of eye contact, stuttering, and a trembling voice.

S16 "... We were taking an oral exam. I had not studied much, and my turn was approaching. At that moment, I became extremely stressed and anxious. My face began to flush, I started to sweat, and I felt pain in my stomach and head."

S28 "I freeze, stutter, and my hands shake as I fidget. Sometimes, I bite my lips. I feel like crying, but I restrain myself. I experience intense embarrassment because the more I struggle to express myself, the worse I feel."

T3 "They appear anxious when I pose questions, often remaining unresponsive, failing to answer, or not raising their hands. I can sense their anxiety during lessons, as they become overly excited, and their voices tremble."

In her observation notes dated February 27, 2023, the researcher documented the physiological symptoms of foreign language anxiety: "While reading the English text, the student struggles to read fluently, frequently taking intermittent breaths and swallowing, which indicates his anxiety." In another observation note from March 9, 2023, she recorded, "The student blushed significantly while performing a dialogue on the board and requested permission to go to the restroom after the reading was completed. I also observed that the same student's voice trembled during a reading activity in a different lesson." To determine whether these behaviors were linked to the student's personality or foreign language anxiety, the researcher engaged the student in conversation in his native language about everyday topics. She noted that the student could express himself fluently, confirming that the issue was related to foreign

language anxiety. Consistent with the findings reported by the teachers, the researcher also observed that the students read intermittently, stammered, and blushed.

Another symptom of foreign language anxiety is *affective symptoms*. Students describe these affective symptoms as feelings of anxiety, sadness, nervousness, embarrassment, and fear. Some students may not experience physiological symptoms but may only exhibit affective symptoms. Although teachers report difficulty identifying these affective symptoms in their students, they observe that students appear anxious, tense, and hesitant.

S17 "I cannot control my reaction, so I start crying. This happened once last year when I was in fifth grade during an exam. I was very worried because I had forgotten some words, and I began to cry. I immediately tried to compose myself without the teacher noticing."

S26 "Although I have no physical change, I sometimes feel anxious, overwhelmed, and fatigued. I sometimes experience a peculiar sensation that makes it difficult to hold back tears."

T13 "I understand that they hesitate to raise their hands. Even though I assure them there will be no negative consequences for making a mistake, they still feel uneasy."

Cognitive symptoms associated with foreign language anxiety are also present in the language learning process. Students have reported experiencing cognitive symptoms of foreign language anxiety, such as feelings of inadequacy, forgetfulness, and a lack of motivation. Teachers can observe these cognitive symptoms.

S24 "I feel inadequate; my English is poor. When I become anxious, I often feel inferior to others. It's a strange and unpleasant feeling."

T7 "When an individual becomes anxious, they tend to avert their eyes and avoid making eye contact. For instance, when they look at my face, it appears as though they have forgotten what they intended to say, and they often express this by saying, 'I forgot what I was going to say.'"

S1 "Sometimes I feel anxious while constructing a sentence, and I forget the words. Naturally, I dislike it when this happens."

One of the key findings to emphasize is the data from students who reported never experiencing foreign language anxiety. Interestingly, these students indicated that they sometimes felt anxious or frozen but managed to cope with their anxiety. This suggests that even students who claim that they never experience foreign language anxiety may exhibit signs of foreign language anxiety in specific contexts and may experience anxiety without being fully aware of it.

S34 "There is no change because I am not anxious. However, I sometimes freeze when I encounter something unfamiliar."

Recognizing the symptoms experienced by students in the learning environment and observed by teachers is crucial for identifying those who suffer from foreign language anxiety in English classes. This anxiety can significantly hinder the language learning process for affected students. Understanding the symptoms of foreign language anxiety is the first step toward managing it. With this awareness, educators can work to eliminate the situations that trigger such anxiety.

3.3. What Are the Causes of Foreign Language Anxiety?

The primary elements essential for effective learning are the classroom, the student, and the teacher. Meaningful learning takes place within the social environments created by these components. Disruptions from these elements can impede learning and result in negative experiences, such as foreign language anxiety. Research involving students and teachers has identified three sources of foreign language anxiety: the students themselves, the teachers, and the teaching system. Table 3 details situations that contribute to foreign language anxiety, organized by subheadings.

Student-Related Situations

Peer attitudes. Since negative peer attitudes encompass a wide range of behaviors, they were assessed through various sub-dimensions based on the participants' responses. For instance, the findings indicate that negative peer behaviors, such as laughing, giggling, and teasing, contribute to student-related causes of foreign language anxiety.

S7 "I went to the board with one of my friends, but I didn't know how to pronounce most of the words. Every time I mispronounced a word, the teacher corrected me, and I could hear giggles coming from the back rows, with many students laughing. This was my most anxious moment. The sound of my friends laughing was what worried me the most."

T2 "Peer pressure is a significant factor contributing to anxiety, particularly because children often lack empathy. This can lead to negative effects on their behavior. Even when they smile sarcastically, it may discourage them from participating, despite their initial willingness to engage."

Table 3. Situations that cause foreign language anxiety

Student-Related Situations	Teacher-Related Situations	Teaching System-Related Situations
Peer attitudes	Teacher attitude	Curriculum
Speaking activities	Teacher competencies	Exam-oriented education system
Listening activities	Feedback and correction	Distance education
Pronunciation	Teacher changes	Class size
Fear of making a mistake		Grammar-based teaching
Perfectionism		Textbooks
Lack of information		
Personality trait		
Prejudices		
Family attitudes		
Adolescence		
Economic conditions		

The researcher documented this situation in her observation notes dated March 16, 2023: "A student was newly enrolled in the class due to a change of city. I waited for her to acclimate to the class and the school for a while. However, after about a month and a half, I noticed she remained quiet during class. During an activity, I asked her why she never participated. The student explained that she wanted to engage but felt scared; her friends at her previous school often made fun of her, laughing at every incorrect answer, and she did not want to experience that again." Although he/she has not encountered such behavior in his/her current class, and it has been quite some time since they faced such treatment, this situation strikingly explains how the negative peer attitudes to which the student was exposed adversely affected his/her language learning process and caused foreign language anxiety. In addition to encountering negative peer attitudes, such as laughter and ridicule, students frequently experience anxiety as they compare themselves to their classmates.

S23 "I mean, what worries me the most is the reaction of my classmates, especially when I make a mistake. My friends in class are competent; they actively participate and achieve success. I often compare my abilities to theirs and question whether I am falling behind. If they can do it, why can't I?"

T5 "Five of my students experience foreign language anxiety because they compare themselves to their peers and feel that they are falling behind."

One of the primary objectives of this research is to identify the factors causing foreign language anxiety among secondary school students and to determine the sources of this anxiety. To achieve this goal and enhance the significance of the findings, students were asked to identify which of the four fundamental language skills (speaking, reading, writing, and listening) caused them the most anxiety and the reasons behind this anxiety. The results indicate that students predominantly experience foreign language anxiety in speaking, listening, and reading skills. According to teachers, students primarily encounter foreign language anxiety in speaking and listening skills.

Speaking activities. The findings gathered from the participants indicate that students experience anxiety during speaking activities. The researcher's observational notes confirm that foreign language anxiety is prevalent in these contexts. In her observation note dated March 28, 2023, the researcher articulated this situation: "It is a lesson in which we are engaged in a speaking activity, and the class is once again tranquil. As in every speaking activity, everyone sinks into a deep silence, as if they are reluctant for me to ask them a question." This silence during speaking activities and the decline in participation demonstrate that students feel anxious in these situations.

Numerous factors cause students' anxiety during speaking activities. In this context, during the interview, students who reported experiencing foreign language anxiety in speaking tasks were asked to explain the reasons behind their heightened anxiety. One significant factor identified was the pressure associated with *oral performance and communication in the classroom*. Students believe they must excel in these areas to effectively comprehend questions and provide immediate responses, leading to increased foreign language anxiety.

S23 "I get anxious about speaking activities because I have to provide an answer immediately. I often spend two hours organizing my thoughts in my mind, and everything becomes tangled."

T3 "They are very clearly anxious about speaking. It is understandably challenging for them to express themselves, as they need to produce a coherent message. Additionally, they face the pressure to respond quickly while speaking. They may need to employ multiple skills simultaneously to communicate effectively."

In addition, the belief among students that they lack competence in vocabulary and grammar causes anxiety during speaking activities. In other words, the participants reported experiencing foreign language anxiety because of their *difficulties in constructing sentences*.

S32 "I feel anxious when speaking because I try to formulate sentences independently. I cannot prepare myself now, as I do not know what the other person will say. I have to respond immediately, which causes me to panic."

T7 "The students are anxious when it comes to speaking. They struggle to express themselves because the English taught in schools is essentially the same as what we learned in primary school: simple sentences like 'Ali holds the ball' and 'Ali looks at the horse.' We are unable to teach children the underlying logic of the language, which causes their anxiety. The structure of our language and the logic behind constructing sentences differ significantly from English."

Listening activities. In addition to speaking activities, listening activities can induce foreign language anxiety. A primary source of this anxiety among students during listening tasks is their difficulty in comprehending audio materials. One significant factor causing the incomprehensibility and anxiety associated with listening activities is the *speed* at which the listening texts are presented.

T11 "... Some listening materials are too fast for the students' proficiency level. When they struggle to understand, they become reluctant to listen, which increases their anxiety. In other words, listening exercises can induce anxiety in students."

S29 "I feel anxious while listening because I cannot understand. Sometimes, I misunderstand many things because they speak too quickly. When that happens, I feel anxious."

This situation regarding the listening texts is one of the elements observed by the researcher. According to the researcher's observation notes dated March 22, 2023: "We were conducting an activity in which students had to fill in the blanks of a short dialogue lasting approximately 35 seconds. I played the listening text, and at the first blank, I was met with a unified reaction from the students: 'Oh, teacher, we do not understand; it is too fast. Can't we slow it down?' We listened several times and encouraged them to write down what they could comprehend. However, I could not elicit the same level of participation as in previous activities, and their motivation had already waned. Additionally, the students appeared more anxious about their answers because they were uncertain about what they had written compared to other activities." Another source of anxiety for students during listening activities is the *variation in accents* found in the listening texts.

S21 "I feel anxious during listening activities because I have difficulty understanding words due to the accent..."

T8 "Students experience anxiety while listening due to variations in accents present in some of the listening texts. For example, when speakers use a rounded pronunciation, children may struggle to understand, leading to missed information. When this occurs, their anxiety tends to escalate."

According to the researcher's observation notes dated May 4, 2023: "We were conducting one of the listening activities from the textbook, where the students had to fill in the blanks in the dialogue. After listening twice, I asked them if they wanted to hear it again. One of my students, who typically

makes an effort to participate in every activity, said, 'Teacher, I do not understand anything; their accents sound very confusing.' It was evident from the student's attitude and tone of voice that he had completely lost his motivation for the lesson." Although the researcher noted that the student was attempting to engage, he also recognized that he felt helpless due to his inability to comprehend the listening texts. This situation led the student to develop a negative perception of his capabilities regarding listening tasks and to experience foreign language anxiety.

Pronunciation. The findings revealed that participants reported experiencing foreign language anxiety, particularly concerning their speaking and reading skills. This anxiety stemmed from *their lack of knowledge about word pronunciation, the perceived difficulty of the words, and their inability to articulate them correctly.*

T1 "The reason they feel anxious about English is related to pronunciation; they worry about mispronouncing words. While they can express themselves more easily in subjects like Turkish and Social Studies, where they feel comfortable raising their hands, they experience foreign language anxiety in English concerning how to read and pronounce words, even when they know the correct pronunciation."

S20 "In speaking activities, I often worry about saying the wrong word. At times, I also feel anxious about reading; I fear that I will mispronounce the words. Since the pronunciation of certain words varies, I frequently mispronounce them, which adds to my anxiety."

Fear of making mistakes. According to the participants, another student-related cause of foreign language anxiety is the fear of making mistakes. This fear can hinder individuals, diminish their abilities, and lead them to avoid various activities. Since language learning is a communication-based endeavor that requires active participation, students should not succumb to such fears. However, during this process, students often perceive making mistakes as detrimental, which intensifies their anxiety. This fear of making mistakes is not only experienced by the students but is also observed by their teachers.

S3 "I am afraid of making mistakes. For example, the teacher plays very enjoyable word games, but I refrain from participating in them for fear of making errors."

T13 "Foreign language anxiety intensifies primarily due to his fear of making mistakes. Although he is willing to try and possesses the knowledge, he refrains from raising his hand and participating in class. This reluctance to speak and engage in lessons adversely impacts his anxiety levels."

The researcher also observed that the students were apprehensive about making mistakes because they felt unable to express themselves adequately in the target language. According to the researcher's observation notes dated October 4, 2023: "We were conducting an activity in which students acted out the dialogues they had written at a basic level on the board. After allowing everyone a specific amount of time to write and rehearse their dialogues, they took turns performing them. When it was the turn of one of my male students, he expressed reluctance to read his dialogue. I approached him and asked why. The student replied, 'I do not know if it is right.' After reviewing what he had written and correcting a few minor errors (such as omitting the suffix -ing in a sentence), I reassured him that it was acceptable to make mistakes; the important thing was that he participated in the lesson. However, the student insisted that he did not want to make a mistake and was unwilling to go to the board to read the dialogue with his friend at their desk."

Students often fear making mistakes. To understand this fear better, they were asked to identify the situations that triggered it. The students reported that key factors contributing to their fear include the possibility of losing the teacher's favor and the risk of being humiliated in front of their peers.

S16 "I am afraid of making a mistake. Because I believe that if I make a mistake, my teacher's perception of me will change."

S23 "I fear making mistakes because I tell my teacher I cannot do it when I struggle. Admitting this makes me feel humiliated in front of my friends."

Perfectionism. Foreign language learning encompasses both conscious knowledge and exposure to the target language. Many students overlook this process and aspire to perform at an advanced level,

even when they are still in the initial stages of language acquisition. Consequently, any challenge they face can disrupt their learning and lead to foreign language anxiety. In other words, the findings from the participants indicate that *students' beliefs about their ability to express themselves flawlessly in a foreign language* cause their foreign language anxiety.

T2 "That they must be perfect leads to anxiety. However, they can overcome this anxiety if they acknowledge that perfection is unattainable. Unfortunately, this realization often eludes them. While they strive for perfection, they tend to withdraw at the first sign of a mistake."

S14 "I do not want to make mistakes in my English lessons. I always strive to do everything correctly and properly. Therefore, I feel disheartened when I make errors, and I often feel embarrassed in class."

Lack of knowledge. Teachers believe that one of the primary causes of foreign language anxiety is a lack of knowledge, which makes students anxious about what they do not understand. This deficiency in knowledge during English lessons is particularly associated with distance education and is thought to arise from inadequate foundational learning in primary school.

T5 "This foreign language anxiety primarily stems from a lack of knowledge. If there are deficiencies in a student's education from primary school, they may begin secondary school with increased levels of anxiety."

S24 "I feel anxious due to my lack of knowledge. In primary school, we had a teacher who would write on the board and then erase it immediately. I struggled to understand anything during that time. When I reached secondary school, I felt like I was beginning to learn English. I had many gaps in my understanding, and then the pandemic occurred, preventing me from addressing those gaps. As a result, I now face even greater difficulties and anxiety."

Personality trait. The participants indicated that personality traits are crucial in foreign language learning. They noted that students with *timid personalities* tend to experience higher levels of anxiety during the learning process. In contrast, those with high self-confidence are less affected by anxiety.

S23 "... I cannot overcome my shyness in English, which makes me more anxious."

S30 "I think someone who is sociable and likes to talk will learn English more easily, I am hesitant. I am shy, so I worry more."

T4 "The character of a child is essential... If they are shy or extroverted, I do not observe much desire in them to participate and engage. They tend to prefer remaining in a passive, observational mode."

Prejudices. The beliefs that learners develop about what they will learn, which form the foundation of the learning process, play a crucial role in the quality of that learning. In this context, the source of foreign language anxiety stems from students' perceptions of themselves and their language learning abilities. According to both students and teachers, these personal perceptions are often rooted in prejudices and fears.

S31 "Sometimes, I struggle to complete tasks due to my own prejudices. I find myself unable to answer even the simplest questions because I doubt my abilities. Since I have never succeeded in answering them before, I believe I cannot do so now."

T10 "Students... have prejudices. For instance, I have a student who consistently responds, 'Teacher, I don't know; don't ask me' during every lesson. He is consistently resistant in this manner. Additionally, some students come to class with the assumption that their peers already know the subject. However, everyone has the opportunity to learn during the lesson. If they were less biased, they would be able to grasp the subject matter; unfortunately, their prejudices hinder them, and they often lack the courage to take that first step."

Family attitudes. While students indicated that family attitudes contributed to pressure and increased their foreign language anxiety, teachers stated that *oppressive or authoritarian family dynamics, as well as competition among peers*, played a significant role in exacerbating students' foreign language anxiety.

T7 "Family attitude is very important in anxiety. When a family respects a child's preferences, choices, and decisions throughout their development, the child is more likely to express themselves freely. Although none of them may articulate their thoughts perfectly in English, they feel comfortable communicating. For instance, when I explain my problem and the teacher understands me, I feel reassured. I can make mistakes; I also make errors when speaking Turkish, and the child rightly understands that there is nothing wrong with that. However, if the family is oppressive, the situation becomes quite the opposite: the child experiences increased anxiety and worry in situations where they need to express themselves."

S31 "The family also has an impact on anxiety. For example, if I receive a low score or something similar, they immediately respond with, 'No phone, no this, no that during summer vacation,' as a form of punishment. This reaction only increases my anxiety."

S8 "My parents always want me to be the best, so I am so afraid of making mistakes that I constantly wonder if they will be upset or angry if I do something wrong. I worry a lot because of my parents."

According to the researcher's observation notes dated February 28, 2023: "I administered a vocabulary quiz to my fifth-grade students after the unit, which focused on the unit's words. Afterward, I asked the students to both repeat the words and evaluate their own quizzes. I noticed that one of my students, who had made several mistakes, appeared very distressed, with tears in his eyes. When I asked him what happened, he replied, 'Teacher, I made so many mistakes. Will you send the results to the parent WhatsApp group? My parents get angry with me even when I score below 95 on an exam.'" The fact that parents assess their children based on their scores, often setting an unreasonably high standard, causes foreign language anxiety in the student. Furthermore, considering the students' concern about their parents' anger and reactions, it is evident that harsh parental attitudes exacerbate the students' experience of foreign language anxiety.

Adolescence. Students undergo rapid physical, emotional, cognitive, and social changes during adolescence. They place greater importance on their circle of friends, and the opinions of their peers become extremely significant during this period. These factors contribute to various challenges in education. As noted by English teachers, one such challenge is that adolescence and its accompanying changes can lead to foreign language anxiety.

T1 "I think anxiety is also linked to puberty. For instance, the voice changes experienced by male students and the tendency of female students to conceal their features may contribute to this anxiety."

T13 "As children grow older and enter puberty, their anxiety often increases. Sometimes, I sense that a student may be reluctant to read aloud because they feel uncomfortable with their own voice. I observe that their anxiety heightens when they experience psychological discomfort related to the changes in their voice during adolescence."

Economic conditions. The final student-related factor causing foreign language anxiety is economic conditions. Teachers believe that *economic circumstances and unequal opportunities* are significant reasons for students' foreign language anxiety.

T4 "Economic conditions can cause anxiety. For instance, I have observed that students who participate in private lessons or courses outside of school, particularly those aimed at improving English-speaking skills, exhibit a significantly higher level of readiness. Even if their classroom education is insufficient, these students actively enhance their English proficiency without losing motivation. Their enthusiasm remains consistent or may even continue to grow. Conversely, if a student's economic situation is inadequate and language learning is restricted to the school curriculum, English becomes indistinguishable from any other subject. As a result, the child may experience increased anxiety regarding the lesson."

Teacher-related Situations

Teacher attitude. The participants believe that *the teacher's harsh and oppressive attitude* is one of the main factors that causes foreign language anxiety. In this context, the findings gathered from both teachers and students support one another.

T9 "Teacher attitudes significantly affect student anxiety. If a teacher is harsh, their approach to students can also be severe, which may hinder their ability to establish effective communication with

children, often without realizing it. As a result, students may perceive the teacher as angry with them. In such situations, I believe the teacher's attitude is both critical."

S28 "My teachers' reaction concerns me. For instance, during a weekend course, I mispronounced a word in a sentence, and the teacher remarked, 'Can you not remember something so simple?' in front of the entire class. This made me feel very uncomfortable, and I never returned to that teacher's class again. When similar incidents occurred two or three more times, I decided to stop attending the course altogether."

Feedback and correction. Feedback is an indispensable component of the teaching and learning process, and how it is delivered is just as important as the feedback itself. The findings pertain to how students respond to and evaluate the feedback they receive and the shortcomings of the feedback process. Students expressed discomfort with their *teachers' immediate and ongoing feedback and corrections*, noting that these interventions made the learning experience more exhausting and heightened their anxiety while attempting to articulate their thoughts. One student, S5, who claimed to never feel anxious during English lessons, highlighted that receiving instant and continuous feedback induced feelings of anxiety.

S5 "Sometimes, I mispronounce words while reading. The teacher corrects me immediately, which I find disruptive. I am constantly interrupted, so I stop, reread the passage, and become increasingly anxious. If she corrects me later, I feel less worried."

T10 "...Teachers provide immediate corrections; however, students may refrain from participating due to a fear of being subjected to instant feedback, which can lead to anxiety."

Teacher competencies. Students reported that their *teachers' lack of knowledge and ineffective teaching styles* caused varying levels of foreign language anxiety.

S29 "I believe that a teacher's knowledge is crucial. Our teacher is generally interested and tries to help, but struggles to explain concepts clearly. Instead, they expect us to grasp the material solely from the tests. As a result, we find ourselves confused and do not study effectively from the textbook. Although my English skills are strong, my lack of understanding only increases my anxiety."

S22 "It also varies significantly depending on the teacher's instructional methods. For example, you may become disengaged if your teacher teaches the language through rote memorization. However, it will be very different if your teacher incorporates games and activities that reinforce your speaking skills."

Classroom management is a significant factor causing foreign language anxiety among students. Many students have reported that excessive noise in the classroom hinders their ability to comprehend the lesson, which, in turn, exacerbates their foreign language anxiety.

S20 "I enjoy English; it is an important subject. However, I sometimes feel overwhelmed because there is much talking in the classroom, which creates a noisy environment. As a result, I struggle to understand what is being said, and I feel anxious during those moments."

Change of English teacher. The findings show that *students' frequent changes in English teachers* throughout their education and training contribute to increased foreign language anxiety.

T2 "Students often become accustomed to teachers' techniques and methods, forming an emotional bond with them. I emphasize this bond, as it motivates students to engage actively in lessons. However, when a new teacher arrives, students must adjust to their different teaching style, which can be time-consuming. Each educator has a unique approach, and adapting to these variations can be challenging for both the child and the teacher. While change can sometimes be beneficial, frequent transitions are detrimental and can heighten students' anxiety regarding foreign language learning."

Teaching System-Related Situations

Curriculum. According to the participants' findings, the English curriculum is inadequate for students to develop the four fundamental language skills, particularly speaking and listening. Additionally, the curriculum's objectives cannot be effectively taught within the planned lesson hours, especially given the large class sizes in state schools. *This discrepancy between the curriculum and the scheduled class hours* causes students to experience foreign language anxiety.

T3 “The curriculum and lesson hours conflict with one another. For instance, the class hours allocated for the 5th grade are insufficient. The minimum class size is already 30 students; if I allocate 5 minutes for each student to participate in a speaking activity, my entire weekly lesson is consumed by this single activity. Additionally, since not every student can speak at the same pace or respond simultaneously, I believe this affects both their success and anxiety levels.”

The ineffectiveness of the curriculum; the fact that the subjects or activities in the curriculum are not useful for students in real life and do not facilitate their daily lives easier also cause foreign language anxiety.

T7 “Children do not consider English a communication tool that will be useful in their daily life.”

S17 “I experience anxiety when it comes to learning longer words—specifically, those whose meanings are difficult to infer and are not part of my daily vocabulary. Because I do not encounter these words in real life, I find it challenging to teach them, which, in turn, increases my anxiety.”

The exam-oriented education system. Eighth-grade secondary school students take the centralized High School Transition System (LGS) exam, which consists of ten English questions. Additionally, students must complete four English exams at each grade level: two in standard English and two in Elective English. Many students have reported that both the LGS and the traditional exams, which are part of the assessment and evaluation process, increase their anxiety. Furthermore, even those students who claimed to have never experienced foreign language anxiety admitted to feeling anxious during traditional exams, particularly in open-ended questions.

S22 “I am not anxious; however, open-ended questions can be challenging. For instance, I was constructing a sentence in the future tense, and I am uncertain about where to incorporate words such as ‘definitely’ or similar terms.”

S19 “I believe that the situations causing anxiety are exams, as they occur only once or twice and offer no opportunity for compensation, such as the LGS. Consequently, we, as students, experience heightened anxiety regarding our ability to succeed.”

T4 “I have observed that students enjoy learning in grades 5 and 6, but often disengage from English in grades 7 and 8. For these students, the subject becomes merely another course to pass, reduced to the status of an exam. I believe that it transforms into an obligation. If the education system were not centered on exams, these children would continue to learn English in a more natural and engaging manner. However, the current system compels us to prioritize test preparation after a certain point, increasing anxiety among students.”

The impact of exam stress on foreign language anxiety, as reported by a seventh-grade student, was documented in the researcher's observation notes dated November 4, 2023. The notes state: “After the first semester exams, while evaluating the students’ exams in the classroom, I noticed that one of my typically engaged students received surprisingly low scores. I asked him why, assuming he had not studied for the exam. The student replied in a tearful voice, ‘Teacher, I studied a lot, but during the exam, I forgot everything, so I couldn’t answer anything.’” This situation illustrates that despite the student's enthusiasm for the lesson and active class participation, he was unable to respond to questions on the exam, which were relatively easier than the material covered in class. This indicates that the foreign language anxiety he experienced is a consequence of the exam-oriented education system.

Distance education. During the distance education process necessitated by the COVID-19 pandemic, students reported difficulties in following and comprehending lessons due to technical deficiencies, disruptions, and the inefficiency of live classes. Consequently, they experienced high anxiety in English lessons, stemming from their lack of foundational knowledge at the beginning of the semester and the challenges associated with individualized learning in pandemic conditions.

S5 “In distance education, my internet connection was constantly dropping, making it impossible to follow the lessons. Additionally, I struggled with the virtual environment, and my English skills regressed that semester, which was concerning to me.”

S28 “My English was excellent in the 5th and 6th grades, but after the pandemic, I isolated myself. I rarely went out, and I felt uncomfortable and increasingly anxious when school reopened.”

T13 “This year's fifth graders present notable differences from previous cohorts. For example, when teaching them how to tell time, many students struggle with basic counting and do not even recognize

numbers. Ideally, children should be able to count to at least 50 to tell time. Unfortunately, the pandemic and the transition to distance education in primary school hindered productive learning. Consequently, we are encountering students who are academically underprepared and exhibit higher levels of anxiety than the fifth graders I taught in previous years."

Class size. The students reported that the classes were excessively crowded, which hindered their ability to express themselves effectively. Consequently, large class sizes became a source of anxiety for them.

S10 "There are thirty-one students in our class, and I am increasingly concerned about the overcrowded environment. At times, it is not even my turn to participate. If there were fewer students, the teachers might be able to manage the class more effectively. However, with so many students, everything becomes more challenging."

T12 "Classes are overcrowded, making it challenging to meet the diverse needs of all students. It is essential to maintain a manageable number of students in each class. For example, I assign simple exercises to help struggling students experience success. However, this strategy can bore high-achieving students and diminish their interest in the lesson. In smaller classes, both high-performing and struggling students and anxious and non-anxious students can receive more individualized attention. I believe this approach is more effective, as the current state of overcrowded classrooms often heightens anxiety among students."

Grammar-intensive teaching. Students reported experiencing anxiety due to the differences between English and Turkish grammar structures. Meanwhile, teachers observed that students tend to feel more anxious when grammar topics are emphasized. Furthermore, the lack of development and implementation of alternative and contemporary methods, as opposed to traditional approaches in grammar instruction, also causes foreign language anxiety.

T3 "In Turkey, grammar is a problem at a very early age. It is difficult to expect a child to grasp such concepts in English when they have not yet mastered Turkish subjects, actions, and verbs. This year, I had to teach adjectives and adverbs, but the child is not yet familiar with these concepts in Turkish. When grammar is involved, language learning ceases to be a pleasant experience for children and becomes a source of anxiety."

S16 "Now we have begun to go deeper, more into the details of the language. We need to know the vocabulary, use it in sentences with appropriate patterns [grammar rules], and have a dialogue with the teacher. This process can be challenging, which makes me quite anxious this year."

Textbooks. Teachers consider *the content of English textbooks inadequate and incomplete*, believing that this increases students' foreign language anxiety.

T11 "I have observed that the eighth graders hate their textbooks. When this occurs, expecting students to engage with the lessons is unreasonable. Additionally, the fifth-grade textbook is quite ineffective. Many activities are repetitive, and the content is lacking, particularly in the fifth grade. The exercises are confined to a narrow scope, offering little variety; the topics are limited, and the activities primarily consist of question-and-answer formats. This approach diminishes student motivation and heightens their anxiety."

English teachers believe that the textbooks are not only *visually unappealing and outdated but also unsuitable for students' proficiency levels*. The presence of vocabulary that exceeds students' comprehension and content that does not align with their social and cultural experiences causes foreign language anxiety among students.

T8 "It is obvious that the textbooks are highly ineffective, as the activities fail to motivate the child sufficiently. For instance, in speaking activities, the child struggles to find tasks that resonate with their life, excite them, or engage them in the subject matter. Often, these activities involve looking at photographs (typically of poor quality and lacking realism) and stating, 'man is doing this now; this man is doing that now'. Child lacks the desire to speak, which I believe causes to increased anxiety."

T13 "I utilize supplementary materials alongside the national education textbooks to accommodate the varying readiness levels of my students. In crowded and heterogeneous classrooms, particularly with my current fifth graders, implementing the activities outlined in the textbook is often impractical, as they are significantly above the students' comprehension levels. The anxiety experienced by students arises from textbooks that are not aligned with their abilities and lack real-world relevance. Furthermore, the listening texts frequently do not match their proficiency levels."

3.4. What Are the Consequences of Foreign Language Anxiety?

The findings indicate that students experience foreign language anxiety at varying levels. Even those who claim not to feel any anxiety may still experience it in certain situations. According to the students, the consequences of foreign language anxiety on their language learning include failing English lessons, developing a sense of learned helplessness that hinders their ability to learn the language, making more mistakes due to their feelings of failure, and experiencing a negative impact on their in-class participation. Consistent with the teachers' experiences and observations, the results of foreign language anxiety are reflected in students' classroom performances, leading to failures in English lessons, feelings of learned helplessness, and reduced class participation.

Academic failure. Based on the teachers' statements, it can be concluded that high levels of foreign language anxiety cause academic failure. Furthermore, the participants' findings indicate an inverse relationship between high foreign language anxiety and academic success. English teachers emphasize that students who experience significant anxiety often struggle to achieve success despite their willingness to learn.

T10 "I can assert that excessive foreign language anxiety leads to student failure. While a certain level of anxiety can be beneficial, a completely anxiety-free student is not necessarily ideal. However, when anxiety exceeds this optimal level, the student may struggle to focus on the material before them; they may not even perceive the lesson. Even if the subject matter is straightforward and easily manageable, the student might think, 'Oh my God, I cannot do this in English; it is so difficult.' This negative mindset can completely obstruct their perception, ultimately hindering their success. It undoubtedly has a detrimental effect on their performance."

S16 "This is a significant issue, teacher, as it leads to negative consequences. For instance, during periods of intense anxiety, I consistently experienced a decline in my performance; my success diminished as my anxiety escalated. I believe other students face similar challenges as well."

In addition, one consequence of foreign language anxiety is that students reported *making more mistakes* during English lessons. For instance, a student experiencing foreign language anxiety may misread a word that he or she can normally read during a reading activity. This initial mistake can trigger further errors, resulting in an accumulation of mistakes.

S27 "When I feel anxious, I tend to forget what I know. If I make a mistake due to that anxiety, I then experience even more anxiety, which leads to additional mistakes."

Students often make attempts in the language learning process; however, these efforts frequently result in failure. This ongoing experience of failure can lead students to develop a belief that they are incapable of achieving success. This phenomenon is known as *learned helplessness*. In summary, both students and teachers recognize learned helplessness as a sub-dimension of failure that arises from foreign language anxiety, emphasizing it as one of the consequences of such anxiety.

S31 "As long as my anxiety persists, I don't believe I can achieve success or make any meaningful progress. I mean, I study English diligently every day, yet I still struggle to alleviate my anxiety. While I have made some improvements, they feel insufficient, which discourages me. I often feel as though I will always fail and never succeed."

S25 "... When you are unable to succeed consistently, you may stop trying, convinced that you cannot achieve your goals. This mindset results in poor performance and failure, as I have experienced."

T12 "The most significant consequence is that students come to believe they cannot succeed. Some genuinely feel that they are incapable of learning and speaking English. They often express their inability to do so, which ultimately hinders their foreign language acquisition. This mindset often stems from past failures, despite their willingness to learn. It resembles a state of learned helplessness."

In-class participation. According to the findings, as students' foreign language anxiety increases, their academic achievement and in-class participation decline. This anxiety causes students to struggle to articulate their thoughts, even when they are confident in their knowledge, leading to diminished

participation. Teachers have also reported that anxious students often become withdrawn and silent, which further affects their engagement in class.

S12 "I used to experience extreme anxiety and fear; I couldn't even raise a finger due to my apprehension. I would immediately lower it without lifting it, insisting that I didn't want to participate in the lesson, even if the teacher noticed me. This behavior placed me in a challenging position in the eyes of the teacher, as I was unwilling to engage with the material I understood. I believe this was one of the most detrimental consequences of my anxiety."

T10 "For instance, we play a simple game during the lesson, such as hangman in English; however, he or she does not participate at all. I believe he or she wants to be involved in the lesson but seems afraid. Perhaps he or she is more talkative in other subjects, but in English, I notice that his or her participation diminishes due to anxiety and fear."

3.5. What Are the Ways of Coping with Foreign Language Anxiety?

The findings regarding how participants cope with foreign language anxiety show that several methods employed by teachers and students overlap. The participants utilize technological support, motivation, peer learning, vocabulary acquisition, teacher assistance, and preparation to manage their foreign language anxiety.

Technological support. In the school where the research was conducted, the availability of smart boards and internet access in every classroom greatly facilitates the use of technology. For this reason, teachers stated that it is a very effective method for addressing foreign language anxiety, and they benefit from incorporating technological applications into their English lessons as much as possible. The educational websites utilized by the teachers include *Okulistik*, *Morpha* (T3), *EBA* (T9), *innovative board applications from textbooks*, and *YouTube* (T7). Additionally, many teachers reported that educational word games, such as *Quizlet* and *Cram* (T12), are beneficial on these websites.

T2 "Technological tools, such as competitions and online quiz shows, effectively alleviate anxiety. Therefore, I utilize various technological resources that are appropriate for the subject. This can include slides, music, and games. I have observed that students who typically struggle to engage in lessons become more enthusiastic when we incorporate a game from the application. Even if they cannot succeed, they still desire to participate. I believe that their enjoyment of these activities demonstrates an anxiety reduction."

As noted by T2, teachers prefer technological opportunities because they are engaging and educational. This approach helps to reduce instances of foreign language anxiety in the classroom. Students who utilized these technological resources reported improvements in their English skills and a decrease in foreign language anxiety through applications and educational websites such as *Duolingo* (S12), *Cambly* (S22), *Newsinlevels* (S34), *Quizlet* (S11), and *course videos from Tonguç Akademi* (S21).

S22 "Last year, I felt anxious during speaking activities and even feared misreading while reading. However, I have completely overcome this fear. I used the *Cambly* app during my summer vacation, and it significantly helped me alleviate my anxiety. By the time I reached 7th grade, I no longer experienced any anxiety at all."

Peer learning. Numerous studies have emphasized the significance of classroom interaction and peer relationships in foreign language learning. Research indicates that peers can influence the language acquisition process in both positive and negative ways. While negative peer attitudes lead to foreign language anxiety, many teachers and students assert that positive peer attitudes and collaborative learning are crucial for alleviating this anxiety. The dual role of peers (both contributors to anxiety and as a means of reducing it) highlights the importance of peer dynamics in language learning. Observing the positive effects of peer learning on anxiety, teachers address foreign language anxiety by implementing classroom activities that create opportunities for peer collaboration. Similarly, students report that they seek assistance from their peers to alleviate and manage their foreign language anxiety. They learn from one another and engage in speaking activities together, which not only reinforces their understanding of the subject but also helps reduce their anxiety.

T1 "I attach great importance to peer learning. Even the student sitting next to a learner experiencing anxiety plays a crucial role. Some children possess high social intelligence; they not only complete their own tasks but also assist their peers. I have observed that anxious students become more

successful and motivated, and their anxiety diminishes through peer learning and support. To help reduce anxiety, I allow students to change seats during activities and emphasize pair work. Those students who I notice are positively impacted often ask if they can sit with their friends during these activities. I permit this because I know they will collaborate and learn together rather than socialize."

S11 "For example, I sometimes speak in simple English with my friend. This practice is enjoyable, reinforces the topics I wish to discuss, and helps alleviate my anxiety."

S27 "My best friend is quite proficient in English, and he frequently repeats words and sentences from the videos he watches. He sometimes speaks to me in English, and I find that I understand his well. His words resonate with me. Because he shares this experience with me regularly, it stays in my mind, and the more I comprehend, the less anxious I feel. Friends play a crucial role in alleviating foreign language anxiety."

Vocabulary learning. Vocabulary learning, much like peer attitudes, causes foreign language anxiety and serves as a coping mechanism. These findings indicate that students can effectively cope if they understand the factors that lead to foreign language anxiety, actively address them, and improve their circumstances. Participants emphasize that vocabulary acquisition is crucial in learning foreign language and that an expanded vocabulary significantly reduces anxiety.

S5 "Being proficient in English requires a strong vocabulary. The more words you learn, the more confident you will become, reducing any feelings of anxiety. I feel completely at ease now because I have expanded my vocabulary significantly, and I can express myself effectively."

T5 "I believe vocabulary acquisition is crucial, as students often experience anxiety from their limited vocabulary knowledge. This anxiety arises from a fear of the unknown. Therefore, expanding their vocabulary is the most significant step for them to develop a sense of understanding. I focus on enhancing vocabulary knowledge to alleviate this anxiety."

Motivation. It is a crucial factor in the learning process. A motivated student attends lessons regularly, listens attentively, and demonstrates consistency in their studies, all of which positively influence their learning outcomes. Recognizing the significance of motivation, teachers strive to inspire and encourage students as much as possible, assisting them in managing foreign language anxiety in the short term. Teachers provide positive reinforcement for students' responses during lessons, ensuring that they do not judge or make students feel they have made mistakes. This approach aims to empower students, helping them recognize their capabilities, overcome any negative biases they may hold, and enhance their motivation to learn. Similarly, students report that they manage their foreign language anxiety by using self-affirming language and maintaining positive thoughts when faced with challenges in language learning.

T1 "I try to motivate my students, even in their responses to the simplest questions. When I do this, they exert effort, even during challenging activities, yielding positive results. This approach helps me cope with anxiety; I believe that allowing students to express themselves and providing positive feedback for their answers—along with encouraging phrases such as, 'Oh great, you completed this! That is wonderful; you understood this!'—is highly effective. This is why motivating students is beneficial in the short term."

S17 "When I feel anxious, I initially experience a sense of unhappiness. However, I then strive to motivate and support myself by reminding myself that not knowing the answer to a single question does not reflect poorly on my English skills. This shift in perspective completely transforms my mood; I become happier, and my anxiety diminishes."

Teacher support. Teacher support encompasses instances in which educators provide guidance during English lessons. Students have reported receiving teacher assistance in managing their foreign language anxiety. Additionally, teachers indicate that they assist students and help them find ways to alleviate their foreign language anxiety. They try to cope with this anxiety by engaging in conversations with students about their anxiety and offering guidance either directly or through the school's counseling services.

S27 "I expect support from my teacher when I feel anxious. I strive to do my best in those moments, and my teacher typically offers assistance and guidance. For instance, when I struggle to begin a sentence due to my anxiety, he initiates the sentence, and I continue from there. His approach helps me feel more at ease."

T7 "I frequently engage in conversations with children. I recommend age-appropriate applications they can install, resources they can study, movies they can watch, singers they can listen to, and books they can read, ensuring they understand what they can do and how to do it. I believe that exposure to the language will help reduce anxiety, and I provide suggestions to my students in this regard. In other words, my primary approach to alleviating anxiety involves talking, guiding, and spending one-on-one time with students. I have observed that this strategy effectively reduces their anxiety in the short term."

Preliminary Preparation. Teachers have observed that students often experience heightened anxiety when they arrive at English lessons unprepared or when they are unexpectedly called upon to answer questions in English. Teachers encourage students to prepare for their lessons to alleviate this anxiety. Additionally, students have reported that being well-prepared for class significantly reduces their foreign language anxiety, resulting in lower anxiety levels when they come to class ready to participate.

T9 "In speaking activities, particularly during exercises where I prompt students to express themselves, many students often experience anxiety. To alleviate this discomfort, I first encourage them to practice among themselves. Sometimes they practice individually, while at other times they collaborate with their classmates, which helps them feel more at ease due to their prior preparations. Occasionally, I assign a topic for them to research at home, informing them that we will engage in an activity related to it the following day, such as delivering a speech. To minimize anxiety, I ensure that they come to class well-prepared and have completed the necessary preparations in advance."

S10: "I study at home to alleviate my anxiety regarding our current topics and assignments. Being informed about what we will cover and preparing in advance significantly reduces my anxiety. When I attend class without studying, I feel considerably more anxious; therefore, I prioritize studying for about an hour each day."

4. Discussion and Conclusion

Although this study aims to describe the foreign language anxiety experienced by secondary school students in all its dimensions, understanding their feelings about language learning and their perceived levels of foreign language anxiety provides valuable insights for this research. The results indicate that, while all students acknowledge the importance of foreign language learning in their social and educational lives, recognize its potential to enhance their career opportunities, and agree that English serves as a global language, they experience different levels of foreign language anxiety. Horwitz and Cope (1986), who conducted extensive research on the impact of foreign language anxiety on language acquisition, emphasized the significance of language learning across multiple fields. They concluded that individuals who understand this significance are more likely to experience foreign language anxiety. Therefore, it can be inferred that students experience anxiety for similar reasons. The key conclusion at this stage is that, although students recognize the necessity of foreign language learning, they simultaneously experience foreign language anxiety.

When analyzing the foreign language anxiety perceived by the students, it was found that only five students reported no anxiety. However, the results from the interviews revealed that the students exhibited symptoms of foreign language anxiety, such as freezing and stuttering in certain situations, and had experienced foreign language anxiety in previous years. This indicates that all students in the study group, including those with and without current foreign language anxiety, had experienced it in some form. In summary, even the students selected for the study because they did not currently experience foreign language anxiety were found to have faced it in their past educational experiences. It was concluded that nearly all students had experienced foreign language anxiety at various levels.

Understanding how students react when they feel anxious about language learning is crucial, as these reactions are the initial indicators of whether students are experiencing anxiety. In this study, these reactions are categorized into physiological, affective, and cognitive symptoms of foreign language anxiety. The results indicate that all participating students experienced at least one of these symptoms. Furthermore, it was concluded that some students do not exhibit physical symptoms of foreign language anxiety but only display affective or cognitive symptoms. The absence of physiological symptoms, coupled with the presence of only affective or cognitive symptoms, complicates the determination of

whether students are experiencing foreign language anxiety and hinders the provision of adequate support for coping with it. Therefore, teachers' awareness and knowledge of physiological, cognitive, and affective symptoms would assist them in identifying students who are experiencing foreign language anxiety. Additionally, this understanding could help diminish and cope with situations that trigger foreign language anxiety. For this reason, in order to cope with foreign language anxiety of students, it is recommended that all educators should first be encouraged and trained to identify the symptoms of foreign language anxiety and implement coping strategies for them.

Identifying the situations that induce anxiety in students and minimizing these triggers within the learning environment can enhance students' confidence and reduce their anxiety levels. These situations are the underlying causes of foreign language anxiety. In this study, the causes of foreign language anxiety were categorized into three dimensions: student, teacher, and teaching system. Peer attitudes emerged as one of the most significant factors affecting students. Negative criticism among students in the classroom, along with reactions such as laughing, giggling, and correcting one another during speaking activities, creates pressure and heightens anxiety. According to Tokur and Kaçire (2015), in language learning environments dominated by peer pressure, students' fears of adverse reactions from their peers lead to anxiety and result in avoidance of participation. Students have reported feeling uneasy and anxious due to fears of mispronunciation, embarrassment, and adverse reactions from others, which are most pronounced during speaking activities. Therefore, guidance services and English teachers in schools are recommended to collaborate to eliminate peer pressure that adversely affects students' foreign language learning experiences.

In this study, students experienced the highest levels of foreign language anxiety during speaking tasks. The necessity to simultaneously employ various skills, such as vocabulary and grammar, during speaking activities contributes to this anxiety. Similarly, Borisova et al. (2024) found that students' anxiety increases when they are unable to select the appropriate words to express themselves or when they struggle to recall ideas while speaking in English. MacIntyre and Gardner (1991) also noted that speaking activities can exacerbate anxiety. However, in this study, students also reported experiencing foreign language anxiety during listening activities and speaking tasks. The results indicated that students' foreign language anxiety during listening activities is primarily attributed to the speed and accent of the listening texts. According to Buck (2001), accent plays a crucial role in listening comprehension; when listeners encounter an unfamiliar accent, their comprehension process is disrupted, making it nearly impossible to grasp the content. Similarly, as speech speed increases, listeners do not have sufficient time to process grammatical structures and vocabulary, leading them to miss parts of the text and ultimately hindering complete comprehension. These challenges contribute to students' anxiety and discourage them (Orakçı, 2018). For this reason, it is recommended that classroom activities and course materials be reorganized and adapted to the students' proficiency levels.

Peer attitudes, pronunciation, and the fear of making mistakes are closely interconnected. For instance, research has shown that one of the situations students fear most is mispronouncing words. They often believe such errors will lead to ridicule or mockery from their peers. Consequently, students report making more mistakes in these situations. In a study, Gregersen (2003) concluded that anxious students are more prone to making errors. Therefore, it can be asserted that high levels of foreign language anxiety increase the likelihood of making mistakes during the language learning process. To reduce foreign language anxiety, it may be recommended to conduct awareness-raising studies aimed at preventing students from creating threatening and mocking classroom environments, whether these behaviors stem from peers or teachers.

Students' personality traits and family attitudes are significant factors contributing to foreign language anxiety. The results indicate that when families exhibit oppressive, authoritarian, perfectionistic behaviors, or maintain excessive expectations, students are more likely to experience anxiety related to foreign language learning. Furthermore, these family attitudes can lead to grade anxiety, characterized by a fear of receiving low grades. This anxiety regarding poor academic performance is commonly referred to as test anxiety in literature. Yıldız (2007) revealed that parental attitudes play a crucial role in

influencing test anxiety. Additionally, Chan and Wu (2004) found that students' foreign language anxiety increased under family pressure, while it decreased with family encouragement and support. The family plays a pivotal role in shaping both students' personalities and their anxiety levels. While openness and extroversion contribute to lower foreign language anxiety (Qin & Li, 2024), timid and shy students tend to experience heightened levels of foreign language anxiety in English classes. According to Tez (2017), shyness is the most significant variable affecting foreign language anxiety. Bjelica and Milanović (2022) also concluded that parental attitudes influence shyness. In summary, a healthy relationship between parents and children, along with a supportive parental attitude, positively affects students' personality development and can help alleviate one of the causes of foreign language anxiety. For this reason, educators and counseling services should be made aware of the significance of the relationship between parents and students. The impact of family attitudes on students' foreign language anxiety should be emphasized through training programs organized for parents as part of school-family collaboration. Parents should be encouraged to adopt a more constructive approach and support students throughout the language acquisition process. Additionally, another notable result is the sub-dimension of perfectionist family attitudes. It is well-established that family attitudes contribute to foreign language anxiety; however, this study identifies explicitly perfectionist family attitudes as a significant cause of such anxiety. Therefore, researchers are recommended to evaluate foreign language anxiety by incorporating the perspectives of parents to describe out-of-school anxiety factors better.

Feeling academically inadequate also causes foreign language anxiety. During the emergency distance education period of the pandemic, many students struggled to follow lessons due to factors such as lack of internet access, inadequate hardware, and the limited technological knowledge of their parents (Demir & Kale, 2020). These challenges resulted in knowledge gaps, which, in turn, led to anxiety when they transitioned to face-to-face education. Furthermore, research has shown that students who struggle with vocabulary acquisition and feel inadequate in this area develop negative personal beliefs, fears, and prejudices, all of which contribute to an increase in foreign language anxiety. Kocaman (2017) found that students experienced the most difficulty with vocabulary knowledge, which hindered their ability to derive sufficient benefit from lessons. Similarly, Songbatumis (2017) and Suryani et al. (2020) stated that inadequate vocabulary knowledge is the most significant obstacle students face in language learning and the most common problem they encounter when improving their language skills. The difficulties that students experience in learning vocabulary, combined with their inability to benefit from distance education, lead to a lack of knowledge and feelings of inadequacy. This situation heightens students' anxiety in the classroom. Studies addressing students' knowledge gaps will help reduce their foreign language anxiety. For this reason, it is recommended that schools systematically implement practices to identify and eliminate students' knowledge deficiencies.

All the causes of student-related foreign language anxiety are interconnected and influence one another. For instance, many students, particularly adolescents, are reluctant to participate in activities due to the fear of negative peer judgments or the possibility of making mistakes. This apprehension heightens their anxiety, especially during speaking activities. These factors are interrelated and collectively contribute to foreign language anxiety, affecting various dimensions such as test anxiety, communication anxiety, and speaking anxiety. Duman et al. (2017) defined students' speaking anxiety as the fear of making mistakes, anxiety stemming from past negative experiences, fear of the classroom environment, and a lack of self-confidence. In this context, it can be asserted that negative peer attitudes, the fear of making mistakes, and certain personality traits adversely affect speaking anxiety in the target language. Their findings align with the results of this study. Therefore, it is crucial to communicate to students that making mistakes is a natural part of the learning process and that they will not face judgment based on their errors from teachers or peers. (Kianinezhad, 2024). In summary, this research demonstrates that the factors contributing to student-related foreign language anxiety, as discussed in previous sections, are interrelated in multiple ways. These findings further confirm that foreign language anxiety possesses a complex structure.

While students' individual efforts are crucial in language learning, teachers play an equally important role. The impact of teachers on language learning can either mitigate or exacerbate foreign language anxiety, with certain teacher-related factors causing it. The study results reveal that harsh and judgmental teacher attitudes increase foreign language anxiety in students. Numerous studies have shown that teacher attitudes and behaviors create foreign language anxiety in students (Aydın & Zengin, 2008; Baş, 2014), particularly anxiety related to the fear of negative evaluation by their teachers (Duman et al., 2017), and teacher attitudes are directly linked to foreign language anxiety (Bekleyen, 2004). In addition, the study found that teachers who provide immediate and continuous corrective feedback could cause foreign language anxiety. Excessive feedback may overwhelm students (Gözütok, 2000), and negative feedback, along with harsh, judgmental attitudes that consistently correct students' mistakes, can restrict communication and increase anxiety (Tokur, 2016). Therefore, it is crucial to acknowledge that such situations can induce foreign language anxiety in language learning environments, and efforts should be made to minimize these occurrences to alleviate anxiety. For instance, Zhao (2024) contends that feedback should be delivered indirectly to reduce students' anxiety during the feedback process.

In addition to teacher attitudes, a lack of effective classroom management skills and insufficient knowledge, skills, and qualifications can contribute to foreign language anxiety among students. For instance, students have reported feeling more anxious when they do not understand lessons delivered by teachers who struggle with classroom management. Anşin (2006) emphasized that teachers should approach classroom management with a strong pedagogical focus, highlighting that positive student-teacher relationships enhance foreign language learning. Anşin also noted that teachers should avoid fostering a competitive atmosphere in the classroom. According to Anşin (2006), a teacher's ability to maintain control and authority in the classroom leads to positive outcomes for language learning. In summary, it is crucial to understand the situations in which teachers inadvertently induce anxiety to ensure the successful implementation of the language learning process. By identifying these factors, measures can be taken to address and mitigate foreign language anxiety. For instance, educators are encouraged to foster a supportive and constructive student-teacher relationship. Additionally, they should continually enhance their teaching techniques by incorporating contemporary methods. Since students have reported that game-based and activity-oriented teaching significantly alleviates foreign language anxiety, such activities should be integrated more frequently into the language learning process. Chan et al. (2024) discussed the significance of game-based learning and endorsed the recommendations presented in this study. They noted that, since foreign language acquisition can be a considerable challenge for students learning a second language, educational practitioners should consider developing play-based English curricula. Such curricula could help alleviate the learning anxiety that children experience during English lessons and enhance their language skills.

Students, teachers, and the teaching system are the three primary elements that complement one another and ensure the success of the foreign language learning process. The study concluded that certain deficiencies or inadequacies in the teaching system cause foreign language anxiety. One significant issue is that the weekly course hours specified in the curriculum are insufficient to meet its objectives. This inadequacy hinders the balanced emphasis on the four fundamental skills in language learning, thereby increasing foreign language anxiety. Additionally, the curriculum's lack of functionality and irrelevance to students' real-life needs render the lessons abstract and difficult to comprehend, increasing anxiety. Similarly, Tunç (2021) emphasized that the activities conducted by teachers were unsuitable for the students' age and learning characteristics. She also highlighted that the activities recommended in the curriculum were impractical for the classroom environment, and the time allocated for these activities was insufficient. All these issues result in a loss of interest in lessons, which, in turn, leads to challenges and increased anxiety in language learning.

In language learning, students often face anxiety not only due to the fear of making mistakes during adolescence and the challenges of mastering grammar rules but also because of the pressure associated with exams (Littlewood, 1984). The study indicated that all students experienced anxiety during English exams, with some students feeling this anxiety exclusively in English assessments. Baş

(2014) found that students tend to experience higher levels of anxiety in foreign language exams, concluding that these assessments induce more anxiety than exams in other subjects. Şahin et al. (2018) suggested that shifting away from an exam-focused approach in English lessons and emphasizing language as a tool for communication could help alleviate exam-related anxiety. Therefore, it can be argued that the exam-centered education system causes foreign language anxiety. Adopting contemporary assessment and evaluation methods would be a more effective strategy rather than concentrating solely on exams. Wu et al. (2025) study found that utilizing online testing methods, such as group projects, book reports, and presentations, instead of traditional paper-based tests, significantly reduced test anxiety. These innovative approaches can be evaluated and incorporated into our current curriculum. By blending technological applications with modern pedagogical strategies, teachers can create learning environments that are less anxiety-inducing for students.

According to another result related to the teaching system, the lack of knowledge stemming from ineffective online lessons, students' inability to access distance education due to technical issues, and their alienation from school culture contribute to foreign language anxiety. Ünal and Ekinci (2021) assert that distance education is restrictive due to the inability to engage sensory modalities, a lack of diverse materials, and the limited application of various methods and techniques. Consequently, learning remains constrained because teachers are unable to provide sufficient variety. While these issues cause foreign language anxiety in distance education, one of the most significant anxiety-inducing factors in face-to-face education is overcrowded classrooms. In such environments, students struggle to follow the lesson, teachers have insufficient time to meet students' expectations, and there are fewer opportunities for engaging activities, all of which exacerbate foreign language anxiety. Overcrowded classrooms hinder effective foreign language instruction (Anşın, 2006; Tunç & Kozikoğlu, 2022), and excessive noise in these classes leads to a decline in motivation during the language learning process (Ünal, 2018). A study conducted by Tunç (2021) concluded that students faced challenges in following lessons in overcrowded classrooms, that teachers could not provide adequate guidance, and that students lacked sufficient opportunities for speaking practice. In this context, it is recommended that class sizes be adjusted to a level conducive to meaningful learning. Additionally, students should be taught in foreign language classrooms or laboratories where English lessons are conducted and target language materials and resources are readily available. Creating learning environments that engage students' interests will motivate them to bridge their knowledge gaps.

Grammar is a crucial component of the foreign language learning process; however, lessons that are overly focused on grammar can induce anxiety among students. Many learners find grammar challenging and believe excessive emphasis heightens their anxiety. A study conducted by Can and Işık-Can (2014) noted that foreign language lessons often prioritize knowledge acquisition and memorization, are evaluated through grades, and are heavily grammar-oriented, which poses a significant challenge in foreign language learning. Nikolov (2009) stated that young learners, who may not yet be cognitively prepared, can be adversely affected by the direct teaching of grammar rules, grammar exercises, and tests. Conversely, Wang (2012) found that one of the sources of anxiety for students learning English as a foreign language in the UK is the stress associated with mastering English grammar. The failure to develop and implement alternative, contemporary methods of grammar instruction, as opposed to traditional approaches, results in difficulties in grammar acquisition and exacerbates anxiety among students. Kırkıç and Boray (2017) emphasize the necessity for modern methods and techniques that address classroom needs and overcome local barriers in language learning, rather than relying on traditional methods that do not recognize language as a tool for communication. Therefore, foreign language instruction should shift from a grammar-centric approach and adopt communication-focused strategies that employ contemporary teaching methods, facilitating effective language use.

Another factor related to the teaching system that causes foreign language anxiety is the textbooks. The limited range of topics and insufficient exercises in these materials create challenges for students, leading to increased anxiety. Furthermore, research indicates that textbooks often fail to align with students' cognitive levels, and the visuals are frequently outdated. This situation diminishes

students' interest in the lessons and exacerbates their anxiety. Similarly, Kırmızı (2009) noted that foreign language textbooks are inadequate in terms of content, subject sequencing, paper quality, visual elements, relevance to daily life, and topic coverage. Özmat (2017) also pointed out that the absence of communication skills and relevant texts in English textbooks contributes to students' boredom during lessons, resulting in decreased effectiveness. Students' boredom and lack of engagement make it difficult to comprehend the material, further increasing their foreign language anxiety. Therefore, it is crucial to recognize that textbooks are the primary resources for language instruction in schools. Rezai et al. (2025) emphasize the importance of educational materials that should engage students in cognitive, affective, and physical dimensions. For instance, textbooks could include problem-solving activities, project-based tasks, and real-world scenarios that challenge learners to apply their knowledge practically. Furthermore, this study reveals a significant finding: the subjects presented in these textbooks often do not align with the cultural and social backgrounds of the students, which can lead to increased foreign language anxiety. In this context, the perception that textbooks are inadequate in various respects and contribute to foreign language anxiety underscores the need for improvements in these educational resources. The content and scope of textbooks should be enhanced to meet students' language learning needs effectively. To gain a clearer understanding of this issue, it is recommended that further studies be conducted on the content of English textbooks.

Students reported that the most significant consequence of foreign language anxiety is academic failure. The study concluded that the academic success of students who experience foreign language anxiety is lower than that of their peers who experience less anxiety or none. Research indicates that foreign language anxiety is a critical factor influencing success in foreign language learning. High levels of foreign language anxiety have been shown to impact academic achievement negatively (Aida, 1994; Batumlu & Erden, 2007; Chan & Wu, 2004; Çakıcı, 2015; Doğan, 2008; Gardner, 1985; Horwitz et al., 1986; Horwitz, 2001; Hu et al., 2024; Öner & Gedikoğlu, 2007; Zhu, 2024). The study also concluded that students who experience academic failure due to foreign language anxiety often develop learned helplessness. According to Güler (2005), learned helplessness refers to the belief that one's reactions and behaviors are ineffective in achieving desired outcomes, leading to anxiety and fear stemming from the inability to fulfill personal aspirations, which diminishes motivation to exert control over results. Students with foreign language anxiety frequently make mistakes, even in areas where they are knowledgeable, due to their anxiety. These errors subsequently lead to further mistakes, reinforcing the belief that they will never succeed. This pattern exemplifies the experience of learned helplessness. Another consequence of foreign language anxiety is the decline in students' classroom performance. Johnson's (1981) study, which investigated the behavioral consequences of learned helplessness in children who struggled academically and examined the relationship between learned helplessness, school success, and self-concept, yielded similar findings. Johnson discovered that students with high levels of learned helplessness exhibited lower academic performance than their peers. In summary, students who experience foreign language anxiety and do not receive recognition for their efforts may develop learned helplessness, resulting in decreased performance and academic failure. These three interrelated factors (decline in classroom performance, learned helplessness, and academic failure) are key consequences of foreign language anxiety.

The results reveal that students experience varying levels of foreign language anxiety and adopt different strategies to cope with it. The most preferred method for managing this anxiety is the use of technology. The study concluded that various smart board and smartphone applications, such as EBA, Morpha, Okulistik, Quizlet, Cambly, online books and activities, and Duolingo, effectively reduce foreign language anxiety. Consequently, both students and teachers benefit from these technological resources. Technology plays a crucial role in language learning by enabling students to apply what they have learned (Yeşilyurt, 2012). Furthermore, it is emphasized that technology-supported learning is essential for developing the knowledge, skills, and lifelong learning processes necessary to succeed in a rapidly changing world (Domalewska, 2014). Hung (2009) utilized an electronic blog application in his study, which provided students with the opportunity to practice speaking English and found a decrease in

students' speaking anxiety levels. This study observed that as students increased their use of the language outside of school through technological applications, their language learning success improved, and their foreign language anxiety diminished. Similarly, in the study conducted by Yang et al. (2022), the researchers developed an online simulation game. They found that, compared to onsite instruction, the online simulation game was more effective in reducing foreign language anxiety among students with low, moderate, and high anxiety levels, thereby facilitating their English vocabulary learning. For this reason, technology should be integrated into language teaching, and educators must possess digital competence. Additionally, it is recommended to utilize educational technological applications that promote and develop foreign language learning both in the classroom and outside of school.

Although some peer attitudes can induce anxiety, participants utilize peer learning as a strategy to cope with foreign language anxiety. Teachers foster learning environments conducive to peer learning by enhancing classroom interaction through group activities and pair work. The findings indicate that students' foreign language anxiety diminishes when they engage in small group activities, rather than working individually in the classroom. Similarly, Liu and Jackson's (2008) study on the foreign language anxiety experienced by Chinese students revealed that while most students were willing to participate in group discussions, they felt uncomfortable speaking English in front of the entire class. In summary, the implementation of pair or group activities within the classroom environment significantly contributes to reducing students' anxiety and promoting interaction among peers (Scarcella & Oxford, 1992). Consequently, as peer interaction increases, negative peer attitudes in the classroom are minimized, the pressure on students is alleviated, and foreign language anxiety is mitigated. Similarly, Hoffman (2023) stated that positive peer relationships in the classroom appear to contribute to lower levels of anxiety. Therefore, it is recommended that educators increase positive classroom interactions by incorporating group activities, study groups, and pair work. Additionally, they should create opportunities for students to collaborate and support peer learning.

Teacher attitudes are comparable to those of peers. While harsh and judgmental attitudes can heighten anxiety, teachers who provide positive reinforcement, motivate and encourage students, and emphasize that making mistakes is a natural part of the learning process can help alleviate foreign language anxiety. Furthermore, research indicates that when teachers offer students opportunities to develop their self-efficacy beliefs and design their lessons with this in mind, it positively influences students' foreign language anxiety. Numerous studies support the notion that self-efficacy beliefs significantly reduce language anxiety and negative evaluations (Çimen, 2011; Ercanlar, 2019; Li et al., 2024; Orakçı et al., 2019). Finally, when teachers encourage students to come to class prepared and allocate time for preparation, students experience less anxiety. Therefore, it can be concluded that teachers' constructive criticism, support, and efforts to help students discover their potential and realize their abilities are crucial in reducing anxiety.

4.1. Limitations and Directions for Future Research

In conclusion, alongside the recommendations provided above for educators, several suggestions can be made for future research. This study was conducted as a case study in a typical public school and has inherent limitations regarding generalizability, despite offering in-depth and significant insights into foreign language anxiety. Therefore, it is recommended that future studies involve larger sample sizes to enhance generalizability, utilizing the qualitative data obtained from this research.

This study found that even students who believed they did not experience foreign language anxiety exhibited signs of such anxiety in certain situations. This finding highlights both the limitations and the valuable results of the research. Due to the lack of an anxiety scale appropriate for secondary school students, the anxiety levels of the participants were assessed based on their perceived foreign language anxiety and information gathered from their teachers. However, data collected during the interview process indicates that these students experienced foreign language anxiety at some point in their educational lives. Therefore, future research should investigate foreign language anxiety across different age groups using suitable scales. Finally, this study revealed several interrelated factors

contributing to foreign language anxiety. Thus, conducting future studies that focus specifically on the causes of foreign language anxiety may provide a more comprehensive understanding of this phenomenon.

Statement of Researchers

Researchers' contribution rate statement:

BK: Conceptualization, data curation, formal analysis, investigation, methodology, project administration, software, resources, supervision, validation, writing- original draft preparation, writing - review & editing. LD: Formal analysis, investigation, methodology, project administration, software, resources, supervision, validation, writing, review, and editing.

The authors contributed equally to the study.

Conflict statement:

The authors declare that they have no conflict of interest.

Data Availability Statement:

The data supporting this study's findings are available on request from the corresponding author. However, due to privacy or ethical restrictions, they are not publicly available.

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RESEARCH ARTICLE

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Employing active learning methods in flipped social studies classes: an action research^{*3}

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- The Flipped Classroom Model in Social Studies encouraged students to prepare before class.
- The Flipped Classroom Model also promoted active engagement in class activities.
- Students maintained a positive attitude throughout the learning process.

Abstract

This study explores how active learning methods can be implemented in Flipped Classroom-based Social Studies lessons. Designed as action research within a qualitative research framework, the study was conducted with 29 sixth-grade students (21 male, 8 female) attending a public school in Zeytinburnu, Istanbul, during the 2021-2022 academic year. Data were gathered using multiple tools, including student worksheets, self-assessment forms, and a researcher-teacher's diary to obtain in-depth insights. These qualitative data sources were analyzed using content analysis techniques. The findings suggest that integrating the Flipped Classroom Model into Social Studies lessons supported students' preparation before class, increased their participation in classroom activities, and improved their motivation and responsibility toward learning. Moreover, the model encouraged peer collaboration, self-reflection, and more meaningful engagement with the course content. Overall, the research highlights that the Flipped Classroom approach is an effective strategy for promoting active learning and sustaining student interest and involvement in Social Studies education.

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1. Introduction

Social Studies is a course based on content from social and human sciences. The primary objectives of this course are to teach students the cultural values of the society they live in and to nurture active citizens. Furthermore, it aims to equip individuals with essential attitudes and skills through various methods to navigate a changing and evolving world. Additionally, the course focuses on identifying daily life problems and developing the ability to make knowledge-based decisions to address these problems (Aktaş, Tokmak & Kara, 2021; Erden, n.d.; Öztürk, 2015; Tokmak et al., 2023). Learning environments are critical in teaching knowledge, skills, and attitudes. Environments where students actively participate in the learning process help diversify learning activities and provide students with different experiences. When students plan the learning process, they become more successful in anticipating each stage of the process, as this approach encourages them to take greater responsibility for their learning journey (Bonwell & Eison, 1991; Göçer, 2019; Ün Açıkgöz, 2014).

A comprehensive literature review has revealed various challenges and issues in teaching Social Studies classes. Alataş (2008) notes that students often approach Social Studies with a rote-learning mindset, primarily due to the lack of practice-oriented activities implemented by teachers. Studies indicate that despite numerous learning outcomes in the Social Studies curriculum, limited class time prevents sufficient opportunities for hands-on activities. Additionally, students' lack of class preparation leads to direct instruction, leaving little room for practical, activity-based learning (Çelikkaya, 2011; Mutluer, 2013; Yılmaz & Tepebaş, 2011). Moreover, several studies frequently highlight that teachers face significant time constraints during lessons and are unable to implement active learning strategies due to the heavy outcome load of the curriculum (Gönenç & Açıkalın, 2017; Karadeniz & Ulusoy, 2015; Koçoğlu & Egüz, 2019; Malkoç & Kaya, 2015; Metin Göksu, 2020; Taşkıran et al., 2016).

Genuine development is achieved through applying theoretical knowledge into practice by learners in teaching and learning processes. Therefore, the need for contemporary learning models and theories is increasingly recognized to help students effectively use their knowledge and skills in everyday life. The influence of the constructivist learning theory in our country has led to the implementation of modern and innovative learning models in educational settings. One such innovation is the method known as the Flipped Classroom Model (FCM).

The FCM is an approach that enriches the learning process through various activities during pre-class, in-class, and post-class phases. In the pre-class phase, the theoretical content prepared by teachers is shared with students in advance, providing them with the fundamental knowledge they need to acquire during the lesson. To encourage active student engagement before class, teachers may also incorporate various preparatory activities into the content. During the in-class phase, teachers focus on activities designed to develop students' higher-order skills. Students create products related to the lesson content, are encouraged to think outside the box, and have the opportunity to apply what they have learned in practice within the classroom. As a modern learning model, the FCM facilitates such activities in school and educational environments. Utilizing this model in Social Studies classes can help address challenges such as the extensive scope of topics and time constraints, allowing more time for students to acquire the knowledge, skills, and attitudes they need. Additionally, sharing lesson content with students beforehand can effectively reduce individual differences (Alharbi, 2015; Alsancak Sarıkaya, 2015; Çibik, 2017; Hamida & Maaloul, 2016; Turan & Göktaş, 2015; Zhang et al., 2015).

In a study on the impact of the FCM regarding students' academic achievement, self-efficacy, readiness, and motivation, Alsancak Sarıkaya (2015) concluded that the students in the experimental group performed better in terms of both their attitudes towards the course and knowledge retention compared to those in the control group. Similarly, Alharbi (2015), who employed the FCM in health sciences courses, discovered that students experienced both in-class and out-of-class learning through social media tools and expressed high levels of satisfaction with this approach. In their study regarding Flipped English teaching, Zhang et al. (2016) observed notable improvements in the experimental group's vocabulary acquisition, attitudes towards the course, and classroom behavior.

Çibik (2017), who employed the FCM in English language teaching, found that this approach enhanced learner autonomy and improved the overall learning process. Similarly, Tekin (2018) demonstrated that using the FCM in Mathematics class positively influenced the students' perceptions of the course, academic achievement, participation, and communication skills. Debbağ and Yıldız (2020), applying the FCM in the Teaching Principles and Methods course, reported positive effects on the students' attitudes towards the course and their self-efficacy beliefs. Orhan (2019) observed that the FCM bettered students' academic achievement in Social Studies classes, while Bursa (2019) highlighted that the FCM in Social Studies lessons enhanced students' knowledge retention and their ability to successfully complete tasks. In a study investigating students' perceptions utilizing the FCM in Social Studies classes, supported by the Education Informatics Network (EBA) under the Fatih Project, Evrensel (2021) noted that students were able to study without time or location constraints and came to class prepared and motivated. Uyanık (2022), in his action research on implementing the FCM in primary school Social Studies course, explored the impact of this model on the course. Implementing the FCM for the active citizenship learning domain in Social Studies, Gedik (2023) emphasized that it improved students' academic achievement, enhanced their motivation, and provided opportunities for diverse classroom activities. Similarly, Seçgin (2024), comparing the FCM and the Argumentation Method, found that the former contributed to the students' development across various areas, fostered learning, and actively engaged them in both in-class and extracurricular activities.

The primary goal of Social Studies is to cultivate active citizens and develop students' knowledge-based decision-making skills by equipping them with the necessary knowledge and skills. Achieving these outcomes requires implementing various activities in the classroom. The FCM is a method through which such activities and practices can be successfully carried out in Social Studies courses. Thus, this research aims to determine how active learning methods can be employed in Flipped Social Studies classrooms. To achieve this, the following questions have been addressed:

1. How do students feel about and perceive the Flipped Classroom Model in which active learning activities are implemented?
2. What is the quality of active learning activities that students engage in when implementing the Flipped Classroom Model?

2. Method

This section provides information about the study's model and design, participants, data collection methods, data analysis, and reliability and validity procedures.

2.1. Research Model

This study evaluates the impact of active learning strategies implemented through the FCM in Social Studies classes. With its basic learning approach, data collection methods, and sample selection, this research was designed in line with qualitative research methodology and carried out within the action research framework. Action research is an important method conducive to developing teachers' scientific research skills as practitioners. It eases solving real-life problems by thoroughly examining their root causes and seeking effective solutions. Recognized as a method led by individuals or groups, it plays a key role in addressing problems and fostering the implementation of innovative practices (Johnson, 2019).

2.1.1. Participants

The study was conducted in a public school in Zeytinburnu district of Istanbul during the 2021-2022 academic year. The participants consisted of 29 sixth-grade students – 21 females and 8 males – from the same school. Since the researcher focused on the development and implementation of a new model, the "active citizenship" learning domain and the skills intended to be cultivated within this domain were specifically chosen. Opting for convenience and purposive sampling method, the researcher

surveyed the classrooms she taught to select the group with the most reliable internet access at home. Two students who did not meet the required criteria were provided with a laptop and internet connection. This study adopted the criterion sampling method, a qualitative sampling technique, which is based on the researcher's knowledge about the research universe or the goal of the research. This method allows for detailed examination of cases that are believed to have rich information (Yıldırım & Şimşek, 2021).

2.1.2. Data Collection and Analysis

This study adopted an approach that incorporates active learning activities within Social Studies classes via the FCM. Before applying this model, the researcher frequently utilized lecturing, questioning, and demonstration techniques in the classroom. To address the research questions, the researcher-teacher's diary, self-assessment forms, and worksheets were employed as data collection tools. Given the fundamental characteristics of these tools and the study's design, the data were analyzed through content analysis, an approach aimed at uncovering the underlying concepts within the data and the relationships among these concepts. This method serves to explain the concepts embedded in the data and their interconnections. The primary goal is to understand and elucidate the key concepts in the data and the relationships among them (Yıldırım & Şimşek, 2021).

Various activities (lectures, intermediate tasks, and main activities) were developed based on the learning outcomes, and corresponding lesson sets were prepared. Each weekly lesson set included activities that could be collected from the teacher's diary, self-assessment forms, and worksheets. Data analysis steps were conducted based on the joint decision of the monitoring committee formed for this research. Accordingly, each week's lesson set was subjected to content analysis. The insights gained from the content analysis determined the adjustments to planned and proposed activities, such as additions or modifications. The analysis process was presented weekly to the validity committee and resumed only after receiving approval. The data collected during the implementation phase were coded according to content analysis principles, and themes were generated based on these codes. To enhance reliability and validity, the notes handwritten by the students during the activities were selected for the findings section. The data were also checked for reliability by a second researcher. The primary researcher shared how she analyzed the self-assessment forms and student works with the second researcher. The analysis was completed based on predefined criteria, with specific criteria tailored to the nature of each activity. The second researcher was also asked to rate the activities according to the same criteria. For instance, the activities of "Practice II", which were assessed using five criteria, were rated as "Highly Qualified (10-9 points)", "Qualified (8-6 points)", "Average (5-3 points)", "Improvable (2 points)", and "Absent" according to the points they received. The following are the criteria employed to rate the activities:

- Articulating the importance of judicial independence with reasoning in an opinion column.
- Including sentences emphasizing the importance of the rule of law in the column.
- Creating a title that reflects judicial independence for the column.
- Answering three or more questions in the True-False activity correctly.

The quality of the students' work was determined by scoring each activity according to the above criteria.

2.1.3. Research Ethics

The ethical compliance of this study was approved by Anadolu University's Social Sciences and Humanities Scientific Research and Publication Ethics Committee under protocol number 44562, dated June 24, 2019. A preliminary application was submitted via ayse.meb.gov.tr to collect data and conduct the study at a middle school affiliated with the Ministry of National Education in Zeytinburnu, İstanbul. Following this application, the relevant permissions were taken from the Provincial Directorate of National Education with document number E-59090411-20-21519408, dated March 2, 2021, allowing the research to be conducted at a public middle school in Zeytinburnu, İstanbul. Furthermore, the names used in the study are not the real names, but the pseudonyms created by the researcher.

2.1.4. Conducting the Validity and Reliability Study of the Research

In qualitative research, meeting the criteria of credibility, transferability, dependability, and confirmability is essential to ensure validity and reliability (Yıldırım & Şimşek, 2021). In this study, particular attention was paid to presenting the research process and findings in a detailed and comprehensible manner. To verify the accuracy of the collected data, a validation process was conducted using the formula developed by Miles and Huberman for assessing internal consistency (Miles & Huberman, 1994; Tavşancıl & Aslan, 2001). The data were independently evaluated by a second researcher at a different time. Based on the calculations of agreement and disagreement, the consistency rate for the practices was 77.5%, while the consistency rate for the self-assessment forms was 94.5%. These results led to the conclusion that the obtained data were reliable. Additionally, a validity and reliability committee was formed for the research. Consisting of Expert 1 and Expert 2 with a Ph.D. in social studies education, this committee held nine online meetings. The committee members provided the researcher with essential support for collecting, analyzing, and interpreting the data. Activities and practices were planned, implemented, and restructured in line with their recommendations. The discussions and decisions made during these meetings were recorded in the minutes.

2.1.5. Role of the Researcher

The researcher, a Social Studies teacher at a middle school under the Ministry of National Education in Zeytinburnu, Istanbul, conducted the study at her school and classroom. Planning the process, designing the action plans, and carrying out the implementation were personally undertaken by the researcher. During the process, the researcher administered data collection tools and gathered data. By establishing an empathetic relationship with the participants, the researcher sought to obtain sincere and genuine responses while striving to remain impartial and ensure the data was recorded accurately as it was provided.

Throughout the study, the researcher prioritized the use of diverse strategies for data collection. Data sources, including committee decisions, self-assessment forms, student feedback, and photographs, were analyzed in depth. To maintain objectivity, the researcher made a conscious effort to document personal reflections without bias, avoided incorporating emotional interactions into the study, and remained committed to preserving an impartial perspective. During the implementation phase of the action plans, regular meetings were held with the validity and reliability committee within the predetermined timeframe, and decisions were executed based on unanimous agreement. Aware of the responsibility inherent in conducting a scientific study, the researcher followed the expertise and recommendations of specialists in the field rather than making individual decisions.

2.1.6. Applying the Flipped Classroom Model in Social Studies Classes: Procedure

Image 2.1 illustrates the steps for directing both pre-class and in-class activities based on the information in the action plans. Implementing the Flipped Classroom Model in Social Studies classes followed the sequence outlined in Image 2.1. The findings were systematically aligned with this sequence and utilized at the relevant stages of the research. The process began with preparing lesson videos before the class and concluded with watching the videos and completing the activities. During the lesson, the topic was explored through introductory questions, and the process was finalized by drawing general conclusions. The research was initiated according to the steps outlined in the implementation procedures and action plans developed for the FCM. However, some issues emerged during the implementation process. Specifically, it was discovered that some students had not watched the pre-class content. To address this, actions were taken based on the decisions of the validity committee, which included asking parents to send messages to the WhatsApp group chat after the content was viewed. This intervention successfully resolved the issue in a short time. As a result, it was confirmed that students participating in the class had watched the lesson content and completed the required intermediate activities.

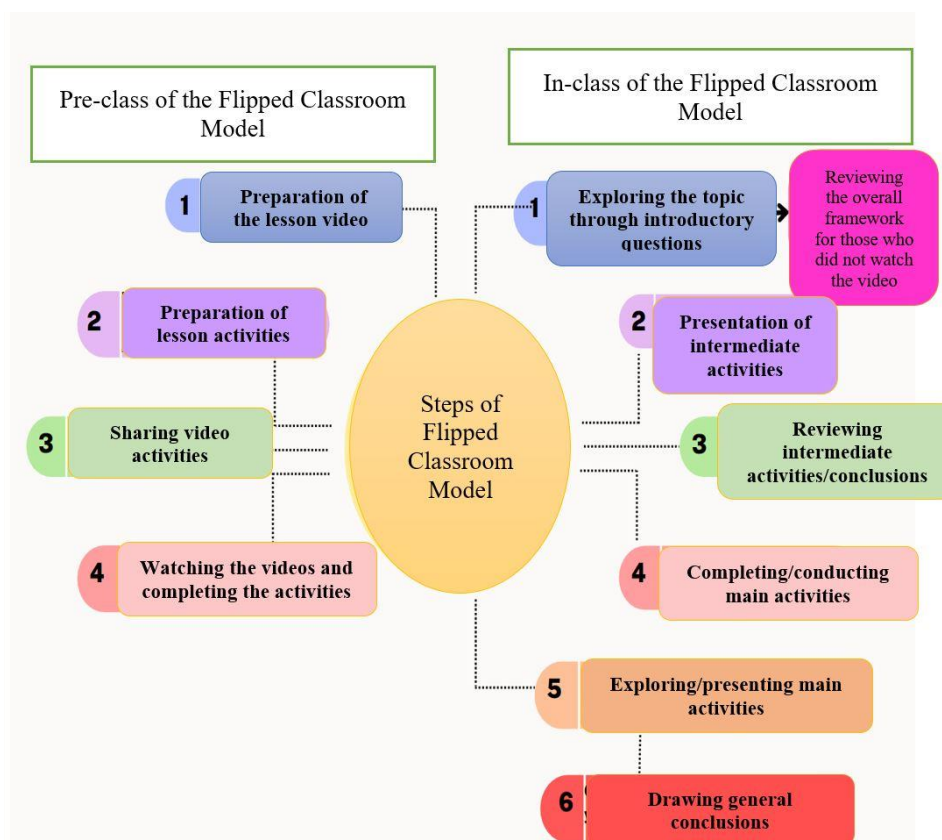


Image 2.1. Steps of the Flipped Classroom Model

Table 2. 1. Outcomes, methods, and techniques specified in the action plans

Action Plans	Outcomes	Methods and Techniques
1.	SS.6.2.5. Explains the role of historical trade routes in political, cultural, and economic relations among societies.	Game-based learning (Activity-based) / FCM
2.	SS.6.6.1. Compares different forms of governing regarding the fundamental principles of democracy.	Game-based learning (Activity-based) / FCM Question & Answer technique
3.	SS.6.6.2. Explains the relationship between the Republic of Turkey's legislative, executive, and judicial powers.	Collaborative learning method / FCM Question & Answer technique
4.	SS.6.6.3. Analyzes the factors affecting the administration's decision-making process.	Active learning method / FCM Question & Answer technique
5.	SS.6.6.4. Explains the importance of democracy in our social life.	Station method/ FCM Question & Answer technique
6.	SS.6.6.5. Explains that their rights and responsibilities as an active citizen of the Republic of Turkey are protected by the constitution.	Case study method / FCM Question & Answer technique
7.	SS.6.6.6. Recognizes women's value in social life by referencing examples from Turkish history and contemporary society.	Multiple intelligence theory / FCM Question & Answer technique

Table 2.1 presents the methods and techniques used in the teaching and learning process to achieve the outcomes in the Citizenship learning domain. The selection of methods and techniques was guided by the literature on the effectiveness of specific methods and techniques in achieving particular outcomes, with careful consideration given to students' interests and developmental characteristics.

Table 2.1 demonstrates seven action plans followed during the implementation, specifying the methods and techniques chosen for each learning outcome. The implementation process was carried out in accordance with the action plans' content, and assessment and evaluation procedures were conducted at the end of each session. When issues were identified, necessary adjustments were made during the process. Clearly defining and categorizing the tasks in the action plans provided valuable support to the researcher throughout the implementation process.

3. Results

The findings are categorized based on the research questions. The current research provides a detailed explanation of how the pre- and post-lesson activities were conducted, the students' and teachers' perspectives regarding these activities, and the criteria used to assess the activities prepared by the students.

3.1. How do students feel about and perceive the Flipped Classroom Model in which active learning activities are implemented?

A self-assessment form (SAF) designed in tandem with the FCM standards was used to determine the students' feelings and thoughts about social studies classes. As part of the form, students were asked, "How did you feel during the activities?" The detailed responses to this question are presented in Table 3.1.

Table 3. 1. Responses to "How did you feel during the activities?"

Theme	Code	SAF1	SAF2	SAF3	SAF4	SAF5	SAF6	Total
		f	f	f	f	f	f	
Positive Feelings	Happy/Amused	26	21	23	26	23	27	146
	Excited/Curious	8	11	27	24	13	16	99
	Active/ Successful	5	-	-	4	-	3	12
Negative Feelings	Sad	-	-	1	-	-	-	1
	Standard	-	-	1	1	2	-	4
	Stressed	-	-	-	-	3	-	3
								8

Table 3.1 illustrates that the students most frequently reported feeling "Happy/Amused" (146 times) and "Excited/Curious" (99 times) during the activities. Additionally, in some activities, the students felt "Standard" (4 times), "Stressed" (3 times), and "Sad" (1 time). Selected responses from the forms are provided below.

Ayşe's emotional reflections in response to the question, "How did you feel before, during, and after the lesson?" from the self-assessment form administered at the final stage of the lesson are presented in Image 3.1. Ayşe expressed that the lesson was exciting, and she felt happy during and after the lesson.

Ders Öncesi: Heyecanlı ve iyi.

Ders İçi: İyi ve mutlu.

Ders Sonrası: İyi ve mutlu.

Image 3.1. Ayşe's Reflections on the Lesson

Mehmet stated that he felt excited before the lesson, happy during the lesson, and good at the end. His responses are given in Image 3.2.

Ders Öncesi: ... yapacağım çalışmalar için heyecanlıyım.....
 Ders İçi: Kendimi iyi hissediyordum.....
 Ders Sonrası: Kendimi mutlu hissediyordum çünkü bu çalışmaların bana
 enesi olmak beni mutlu ediyor.

Image 3.2. Mehmet's Reflections on the Lesson

Ders Öncesi: ... heyecanlıyım.....
 Ders İçi: ... mutluymuşum.....
 Ders Sonrası: ... güzel hissettim.....

Image 3.3. Sami's Reflections on the Lesson

Sami mentioned that he felt excited about the upcoming activities before the lesson, felt good throughout the lesson, and was happy at the end of the lesson for completing the activities. His responses are shown in Image 3.3.

Below are the statements expressed by other students:

- Ahmet: "...The activity was very enjoyable..."
- Yağmur: "...I felt extremely happy..."
- Veysi: "... I felt energetic and successful..."
- Ebru: "... The lessons became even more fun..."

Based on the self-assessment forms, the researcher-teacher's diary, and photographs captured during the process, the students found the FCM-based Social Studies classes enjoyable, they felt happy, and the lessons became more engaging.

The findings highlight the impact of the FCM on students' feelings in Social Studies classes. Students were happy and energetic, and the FCM made the lessons more enjoyable.

3.2. What is the Nature of Active Learning Activities the Students Engage in During the Implementation Process of the Flipped Classroom Model?

Focusing on the "Active Citizenship" learning domain in the 6th-grade Social Studies curriculum, six different learning outcomes were targeted in the research process. These outcomes were addressed through various pre-class and in-class tasks, worksheets, and activities. The findings regarding the design and assessment of these activities were obtained throughout the research process. Due to page limitations, the endeavours for adapting the FCM to the social studies course are presented in detail for only one practice, while the results of the other practices are summarized below.

3.2.1. Using the FCM in Social Studies Course: Practice I

The learning outcomes, duration, methods, and techniques used for the first FCM approach applied in the Social Studies course are outlined in detail below.

- *Course:* Social Studies, 6th Grade
- *Learning Outcome:* SS.6.6.1. Compares different forms of governing in terms of the fundamental principles of democracy.
- *Duration:* 40 +40+40

Pre-Class Activities

The lesson content covered the evolution of democracy from past to present in detail and was supported by various audio and visual materials. After reviewing the lesson content, the students were tasked with assessing the presented information and completing exercises such as matching, grouping related concepts, and designing a poster highlighting the importance of democracy.

In-class Activities

At the beginning of the first lesson, the researcher-teacher introduced the topic through questions regarding the learning outcome. After ensuring that the students watched the lesson content, the class proceeded with activities related to the topic. The main activity (creating a puzzle) was successfully carried out following the intermediate activities. After this stage, students were allowed to evaluate the entire process by completing a self-assessment form.

Initially, the topic was addressed with introductory questions, and the presentation of intermediate activities was recorded using various data collection methods. One of the data collection tools, the researcher's diary notes, include the following:

At the beginning, the teacher asked the students whether they had watched the lesson content, to which all the students responded affirmatively, stating that they had completed the given practice examples. The teacher then asked questions related to the topic, such as "What are the different forms of governing?", "Which form of government do you think is the most democratic?", and "What comes to mind when you think of democracy?" Many students participated by answering these questions, raising their hands, and sharing their thoughts and feelings about the questions. Subsequently, the students finalized one of the intermediate activities they had prepared on the topic, namely "creating posters and developing mind maps," and presented their work to their classmates.

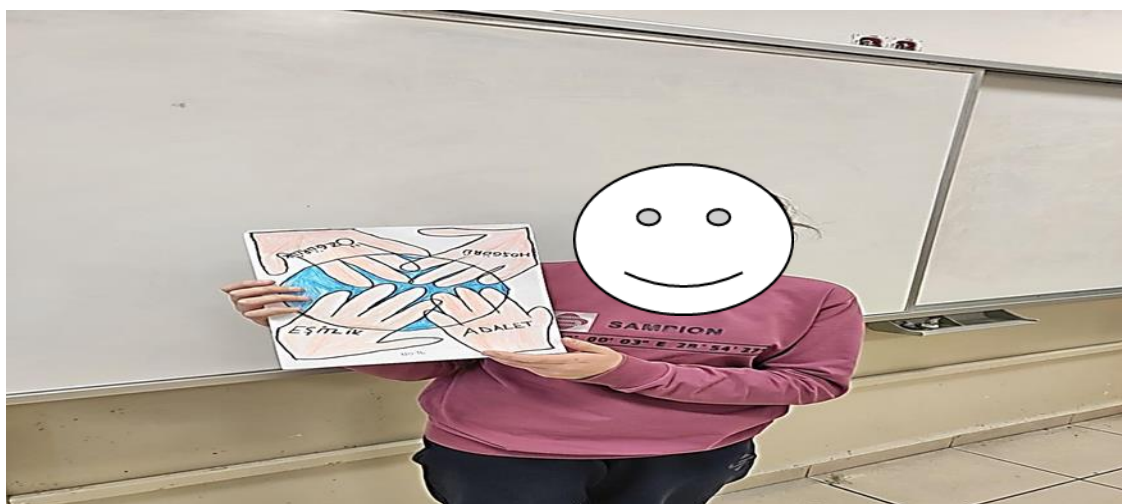


Image 3.4. Arzu Presenting an Intermediate Activity to the Class

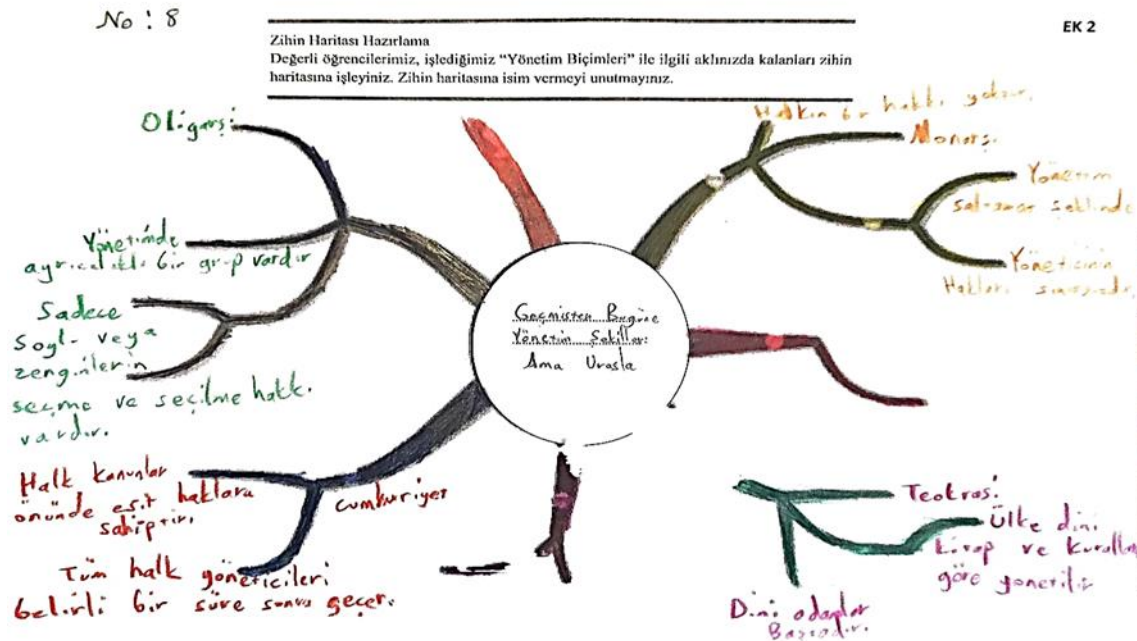


Image 3.5. Buse's Mind Map

Based on the lesson content she watched prior to the class, Buse prepared a mind map including information about the forms of governing such as oligarchy, republic, monarchy, and theocracy. The mind map prepared by Buse is important in that it shows she was able to visualize key concepts related to the topic and she retained the information.

In the first practice, the main activity was creating a puzzle. Students were asked to write questions about the topic and write the answers into the puzzle they created. The puzzle prepared by Murat and Nihat includes questions related to democracy and forms of government.



Visual 3.6. Students Working to Complete the Main Activity

The main activities completed by the students were presented to the rest of the class, and based on the information included in these activities, everyone tried reflecting on and drawing conclusions about the topic. The puzzle prepared by Murat and Nihat is shown in Image 3.7.

No: 28-13

Bulmaca Hazırlama Yönergesi

Sevgili öğrenciler, "Geçmişten Günümüze Yönetim Biçimleri" konusunu hep beraber çeşitli etkinliklerle işledik. Şimdiki uygulamamız ise öğrendiğiniz konularla ilgili bulmaca hazırlamanız gerekmektedir. Bulmacada sorular aşağıda sorulara ayrılan bölüme yazılırken cevaplar büyük harfle sağdan-sola, aşağıdan-yukarıya doğru işaretlemeniz yeterli olacaktır. Bulmacanızı sıra arkadaşınızla ortak hazırlayabileceğiniz gibi bireysel de hazırlama özgürlüğünüze sahipsiniz. Bulmacanız toplam 20 sorudan oluşmalıdır. Hazırladığınız bulmacaya isim vermeyi unutmayınız.

.....SABİH..... BULMACASI

Ö	Z	G	Ü	R	L	Ü	K	A	C	S	K	O	P	H
M	M	G	C	L	T	S	Ü	R	O	S	T	M	U	
T	İ	K	U	E	S	İ	T	L	İ	K	İ	O	S	K
A	E	L	M	Ü	P	R	Z	S	T	K	L	M	A	V
S	U	S	H	A	B	S	M	Y	C	N	L	P	S	K
M	M	S	U	C	E	A	W	N	İ	A	O	H	E	Ü
O	K	U	R	K	U	E	R	N	Z	T	M	Y	R	S
N	P	D	İ	N	İ	K	İ	T	A	P	L	A	R	T
A	K	L	Y	M	C	B	T	K	Z	R	T	O	K	U
R	U	O	E	S	R	L	A	N	P	O	A	R	T	U
S	T	P	T	T	E	O	K	R	A	S	İ	Z	O	L
İ	L	O	Z	O	R	T	R	H	P	R	T	S	O	Ü
E	A	M	B	Ü	C	L	A	Z	A	L	E	A	L	Ü
B	E	R	V	G	B	U	L	İ	R	E	İ	R	M	Ü
D	E	M	O	K	R	A	S	İ	H	M	V	K	A	

SORULAR

1. Din kitaplarıyla yönetilen yönetim biçimi nedir?
2. Babadan oğula geçen yönetim biçimi nedir?
3. Halkın eşit haklara sahip yönetim biçimi nedir?
4. Yönetimde oylarla, bir grup olan yönetim biçimi nedir?
5. Kişinin başkalarına zarar vermeden dilediği gibi yapabilmesi demokrasinin hangi ilkesidir?

Image 3.7. The Puzzle Prepared by Murat and Nihat

The content of the puzzle displayed in Image 3.7 shows that the students created questions about the topic at hand, and the relevant answers were included within the puzzle.

The students recorded the activities they conducted during the implementation process in detail on the self-assessment form, which is one of the data collection tools.

- Ramazan: "... I prepared a poster, conducted an activity, and created a puzzle..."
- Özge: "... In class, we had the opportunity to work in groups, and I felt happy because I got to spend time with my friends..."
- Hüseyin: "...While working on this activity, I felt happy and successful. I learned new information and used it to create a puzzle. I felt proud for accomplishing these tasks..."
- Doruk: "... I had fun while doing these activities. I created a puzzle for the first time, and I enjoyed doing something in Social Studies class that I had not done before. With this method, I learned how to prepare a puzzle..."
- Yasin: "...We had the opportunity to listen to the Social Studies class with more interest. Although I thought the activities in class might be difficult, I felt they were enjoyable..."
- Şevin: "...Thanks to this practice, I believe I took on a more active role..."

The students' responses to the self-assessment forms reflect that with the new model, they engaged in both individual and group work activities, enjoyed themselves before and during the lessons, expressed their thoughts more effectively, and, therefore, took on a more active and self-confident role in the lessons.

Within the framework of conducting a Social Studies lesson with the FCM, several activities were developed for each practice, and they were assessed according to various criteria. The activities for "Practice I" included a mind map, a poster, and a puzzle. These activities were assessed based on 10 different criteria, and as a result, the students' works were categorized into "Highly Qualified (16-20 points)," "Qualified (15-10 points)," "Average (9-5 points)," "Improvable (4 points)," and "Absent ". The assessment results of "Practice I" activities are presented in detail in Table 3.1.

Table 3. 1. Practice I Assessment Results

Practice I	Quality of the Activity	f
Mind Map Poster Puzzle	Highly Qualified	11
	Qualified	8
	Average	5
	Improvable	2
	Absent	3
Total		29

Table 3.1 shows that 11 students' outputs for "Practice I" were "Highly Qualified," while 8 works were found "Qualified." Two students' activities were "Improvable", and 3 students were "Absent" due to various reasons.

The "Practice II" activities consisted of a True-False exercise and writing an opinion column about the outcome, and these were assessed based on 5 different criteria. As a result, 10 students' works were categorized as "Highly Qualified (10 points)," 7 activities were "Qualified (6-8 points)," 2 were "Average (4 points)," 5 were "Improvable (2 points)," and 3 students were "Absent ". The assessment results of "Practice II" activities are provided in detail in Table 3.2.

Table 3. 2. Practice II Assessment Results

Practice II	Quality of the Activity	f
T-F Matching Writing a Column	Highly Qualified	12
	Qualified	7
	Average	2
	Improvable	5
	Absent	3
Total		29

Table 3.2, demonstrates that 12 of the "Practice II" activities were classified as "Highly Qualified," whereas 7 were evaluated as "Qualified." The number of activities deemed "Improvable" was 5, and the number of "Absent Students" was determined to be 3 due to various reasons.

Several intermediate activities were prepared for "Practice III." These activities were designed in a way that would direct students to search about the non-governmental organizations (NGOs) in Türkiye and that would increase their participation in these organizations' efforts. The assessment results for the students' works in "Creating a Non-Governmental Organization" activity are given in detail in Table 3.3.

Table 3. 3. Practice III Assessment Results

Practice III	Quality of the Activity	f
Creating a Non-Governmental Organization	Highly Qualified	9
	Qualified	8
	Average	3
	Improvable	4
	Absent	5
Total		29

Table 3.3. illustrates that 9 works within "Practice III" were classified as "Highly Qualified," and 8 were rated as "Qualified." 4 outputs were found "Improvable", and 5 students were "Absent" due to various reasons.

Practice IV activities included conducting an "interview" with a family member regarding the role of democracy in social life, and participating in "Virtual Museum" tours focused on the importance of democracy. The assessment results of Practice IV are given in Table 3.4.

Table 3. 4. Practice IV Assessment Results

Practice IV	Quality of the Activity	f
Interview Virtual Museum	Highly Qualified	10
	Qualified	8
	Average	4
	Improvable	4
	Absent	3
Total		29

Table 3.4 indicates that 10 of the "Practice IV" activities were rated as "Highly Qualified," while 8 were classified as "Qualified." The number of activities categorized as "Improvable" was 4, and the number of missing ("Absent") activities was 3.

For Practice V, the students were to produce a "Collage" and "Multiple Intelligence Worksheets" about the rights and freedoms learned during the lesson. The works were analyzed according to 5 pre-determined criteria, and Table 3.5 presents the assessment results.

Table 3. 5. Practice V Assessment Results

Practice V	Quality of the Activity	f
Collage Preparation Multiple Intelligence Worksheets	Highly Qualified	10
	Qualified	11
	Average	4
	Improvable	2
	Absent	2
Total		29

According to Table 3.5, 10 of the "Practice V" activities were classified as "Highly Qualified," while 11 were rated as "Qualified." The number of activities categorized as "Improvable" was 2, and the number of "Absent" works was 2.

In Practice VI, "Creating a Poem" and "Writing a Composition" activities were carried out to emphasize the importance of Turkish women in the society. The works were analyzed based on 5 pre-established criteria. Table 3.6. displays the assessment results for Practice VI.

Table 3. 6. Practice VI Assessment Results

Practice VI	Quality of the Activity	f
Creating a Poem Writing a Composition	Highly Qualified	10
	Qualified	10
	Average	4
	Improvable	4
	Absent Students	1
Total		29

Table 3.6 indicates that 10 of the "Practice VI" activities were classified as "Highly Qualified," while 10 were found "Qualified." The number of activities categorized as "Improvable" was 4, and the number of "Absent" activities was 1.

The findings regarding the activities developed in line with the learning domain of "active citizenship" indicate that the students played an active role in participating in the activities and completing the tasks. Additionally, the products created by the students varied in quality depending on the type of the activity. Overall, the number of "Highly Qualified" and "Qualified" works was significantly higher than the others.

4. Discussion

Designed as action research, this study aimed to explore students' feelings and thoughts about the Flipped Classroom Model (FCM) implemented through active learning activities and assess the quality of these activities. Various studies' findings regarding adapting the FCM to social studies were discussed in terms of their similarities and differences from the current findings. The study revealed the following findings regarding the quality of the active learning activities students engaged in during the FCM learning process and their feelings and thoughts about the FCM.

The findings regarding the students' feelings and thoughts about the FCM were derived from the data collected through worksheets, teacher's diaries, and self-assessment forms. According to the findings from the analyses conducted at the end of the implementation, the students reported feeling excited before attending the lessons and felt happy, lively, entertained, creative, and confident during them. The participants expressed that, by assuming different roles in pre-class activities, they perceived themselves as knowledgeable and inquisitive individuals. The presentation of activities they prepared during the lessons and the quality of the products shared at the end made them proud and more enthusiastic. The variety of activities enhanced the students' experiences through individual and group work, helping them feel free to express their emotions and thoughts. The findings indicated that the students actively participated in the Social Studies lessons with the FCM, took on different responsibilities, approached the activities with curiosity and excitement, and felt happy and lively during the lessons. Additionally, the students were pleased with their easy access to lessons and activities whenever they wanted. These results demonstrated that the FCM positively influenced the students' attitudes and motivation toward the lessons. Previous research has also shown that lessons with the FCM facilitate knowledge recall and retention (İşçi, 2024; Gedik, 2023; Seçgin, 2024; Özcan, 2024). Furthermore, in a study on the use of the FCM in Social Studies classes, the participating teachers noted that the lessons were more productive and that the students were more active, benefiting from adequate time to engage in activities and complete tasks (Arslan, 2024).

Alsancak Sarıkaya (2015) highlights that the FCM helps students address their individual shortcomings and develop higher-order skills. Additionally, several studies have shown that students' access to materials prior to class enhances their participation during in-class activities (Herreid & Schiller, 2013; Hsin & Cigas, 2013). Similarly, Öztürk and Alper (2019) note that the FCM offers middle school students the opportunity to access course content not only during class hours but also at any time they wish. They also conclude that the model increases students' communication with each other and with their teachers, and the integration of multimedia content in the FCM motivates students to engage more with this blended system. Özbay and Sarıca (2019) underline that research on the FCM indicates an increase in student motivation and participation in lessons. Şahin (2020) reports that the FCM implementation process is welcomed by students as they express positive emotions and thoughts regarding the model. Consistent with the results of this study, it has been concluded that the FCM positively influences students' attitudes toward Social Studies courses. In another study, Nayci (2017) stated that the students' interest in the lessons increased, and they came prepared for the lessons thanks to the FCM's extracurricular learning activities. He also concluded that being prepared for the lesson motivated the students. Dursunlar (2018) reported that the FCM helped students feel more comfortable and happier during lessons and noted positive changes in their interest and enthusiasm for the topics. Kaptanoğlu (2018) and Tekin (2018) observed that access to content related to in-class topics before the lesson increased the students' participation during class. Bursa (2019) concluded that the students actively participated in the lessons and came prepared. Evrensel (2021) and Şengün (2021) found that

the FCM encouraged the students' active participation in Social Studies class and made them more enthusiastic about the class. Uyanık (2022) stated that students enjoyed and had fun in the Social Studies lesson with the FCM, underlining that this model allowed the students to review lessons and progress at their individual pace. Gedik (2023) noted that the students were happy in the Social Studies class with the FCM and that students who had been indifferent to the course displayed positive attitudinal and behavioral changes. Similarly, Seçgin (2024) concluded that the students showed positive attitudes and behaviors towards Social Studies lessons. Özcan (2024) also found that the FCM in Social Studies classes was effective on students' academic achievement and knowledge retention. These studies, consistent with the results of the current research, indicate that the FCM can be effectively used in Social Studies classes, contributing particularly to students' affective development.

The assessment results for the students' works indicated that "Highly Qualified" and "Qualified" products were high both numerically and proportionally. These results show that the implementation of the FCM increased students' active participation, ensured they prepared better before class, gave teachers more time to conduct active learning activities during class, and created space for students to express their feelings and thoughts. Additionally, there are no studies in the literature focusing on the assessment of students' activities. Other research has found that the FCM offers students opportunities for individual work, increases both in-class and extracurricular learning, helps students apply various activities more effectively, generates curiosity about the lessons, makes students eager and excited about the lessons, facilitates enjoyable learning during the lessons, and contributes to students' enjoyment of the lessons (Albert & Beatty, 2014; Alsancak Sarıkaya, 2015; Bursa, 2019; Debbağ & Yıldız, 2020; Gedik, 2023; Herreid & Schiller, 2013; Hsin & Cigas, 2013; Kaptanoğlu, 2018; Karaman, 2018; Seçgin, 2024; Tekin, 2018). This research concludes that Social Studies classes with the FCM make students more active before and during the lesson, increase their interest and enthusiasm for social studies, furnish them with a positive and curious attitude towards learning, and stimulate their creativity while designing new products. Based on the study's results, several suggestions can be made for future practice and research. Firstly, students expressed that similar practices in other subjects could also yield positive results, indicating that active learning techniques utilized in the Flipped Classroom Model (FCM) should be extended to other disciplines. Additionally, it was observed that students were inclined to engage in behaviors that support the development of key skills emphasized in the Social Studies curriculum, such as self-regulation, observation, creativity, and critical thinking. This suggests that future implementations of the FCM can be designed to foster the acquisition of a wider range of skills within the curriculum. Furthermore, conducting comparative studies examining the strengths and limitations of the FCM in relation to other teaching methods and learning techniques may provide a deeper understanding of its overall effectiveness. Finally, considering the time constraints frequently mentioned by teachers in both public and private schools, it is recommended that educators be introduced to the FCM through various workshops and in-service training programs, enabling them to apply the model more effectively within the limited instructional time available.

Statement of Researchers

Researchers' contribution rate statement:

First author: contributed to the literature review, data collection and analysis process.

Second author: contributed to the planning of the process, data analysis and results discussion sections

Conflict statement: The authors declare that they have no conflict of interest.

Data Availability Statement: Data supporting the findings of this study are available upon request from the corresponding author. However, due to confidentiality or ethical restrictions, the data are not publicly available.

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RESEARCH ARTICLE

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Turkish language teacher candidates' thoughts on e-readers, digital reading, and reading preferences^{3*}

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Highlights

- Students prefer digital reading tools because they find them portable and practical.
- Despite the advantages of on-screen textbooks, students may prefer printed books because of the sense of ownership.
- Low student interest in e-readers and insufficient awareness of their advantages prevent widespread use.
- Digital tools may not be equally effective or important for everyone; some may prefer traditional reading.
- Special programs and strategies should be created for students to develop digital reading habits.

Abstract

This research aims to determine teacher candidates' thoughts, experiences, and expectations about digital reading and e-readers and examine students' reading habits comprehensively. The research study group consists of 116 teacher candidates studying in the Turkish Language Teaching program. This qualitative research investigated many important factors, such as students' daily reading time, digital and traditional reading preferences, the software they use in digital reading, e-readers, and the reasons for preferring these devices. The study's findings were made more meaningful by comparing the data obtained with other studies in the literature. The study results show that students prefer digital platforms, but using e-readers is less common than using digital applications. However, it was concluded that students prefer reading from printed sources to reading from digital tools. This indicates that printed books are still a strong preference and that students face some barriers in transitioning to digital reading tools. Regarding the interest and usage rate of e-readers, it is understood that students mostly prefer printed books, and it will take time for their digital reading habits to develop. Furthermore, the study concluded that digital reading tools and e-readers may not be equally effective or important for all users. This shows that digital reading habits may vary according to the user's preferences, age, technological predisposition, and reading habits. In this context, it can be said that design, accessibility, and ease of use should be considered for digital reading tools to appeal to a broader user base.

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1. Introduction

As a social being who wants to communicate effectively with society and improve himself, a person should be able to use his language skills effectively; in this context, reading has an important place in developing comprehension skills. Reading is one of the basic learning areas that contributes significantly to the positive development of the human mind (Güneş, 2016). At the same time, it has a function that supports other skills and provides a source for these skills. Keskin and Akyol (2014) emphasize that reading has critical importance due to its contributions to the individual's social, cultural, and cognitive development. Grabe and Stoller (2002) define reading as "the process of creating meaning from the text, extracting and interpreting meaning from words". In this process, "understanding or making sense of what is read" emerges from combining the text, the reader, the reader's grammar background, reading strategies, and the interactions between the reader and the environment (Yükselir, 2014). When the reader completes the reading process effectively and consciously and evaluates the text from a critical perspective, he can "make sense of what he reads." This process offers the opportunity to restructure his thought development. (Block, 2004; Uzunkol, 2013). Therefore, it can be said that the act of reading plays a decisive role in the cognitive and cultural development of individuals and contributes to the process of creating meaning through various interactions.

While reading skills have maintained importance from the past to the present, technological developments in the 21st century have significantly changed traditional reading sources. In addition to conventional sources such as books, newspapers, and magazines, new generation electronic devices such as tablets, computers, and phones that can be used for reading purposes have emerged. This evolution in media and communication tools has expanded the scope of the concept of text, which forms the basis of the act of reading. The decrease in printed texts and the increase in multifunctional digital texts reflect this transformation (Cull, 2011). Digital texts are multifunctional forms of traditional written and oral narrative types in a technological environment (Çiğerci, 2015). Since digital texts contain elements beyond written texts, such as sound, images, tables, and graphics, digital texts simultaneously activate many sensory elements. These qualities make reading on digital screens more attractive than traditional written texts (Ateş, 2013; Cull, 2011). Kress (2010) and Van Leeuwen (2011) state that texts are read and understood through written language and visual signs or elements such as shapes, pictures, graphics, and colours.

Each sign has a distinctive potential that adds meaning to the text (Van Leeuwen, 2011). In this context, the concepts of "multimodal" and "multisemiotic" texts have emerged, visually addressing the text as a whole. "Multimodal text" defines narrative types that include visual and auditory elements. In contrast, "multisemiotic text" defines texts that include only visual and written elements, such as newspapers or magazines (O'Halloran, 2008). However, it is seen that the concept of "multimodal" is widely used for both types in the literature (Caple, 2018). Multimodal texts transform reading habits and ways of accessing information in digital environments, providing a richer and more interactive reading experience. In light of technological advances, there have been changes in the understanding of reading and comprehension. Literacy skills are no longer limited to the ability to read printed texts; instead, literacy has transformed into a broader understanding of skills that require the ability to understand and interact with various texts through digital and mobile technologies (Lankshear & Knobel, 2006). In the digital world, literacy has expanded from the linear and single-format understanding of printed text to a multiform, visually-oriented, interactive, and time-space-independent understanding of text. This transformation is associated with rapid advances in information and communication technologies and the reflections of these technologies on social practices (Dalton & Proctor, 2008).

In recent years, with the increase in digital reading devices, software, and their preference by users, reading from digital screens has become increasingly widespread. Electronic books (e-books), electronic readers (e-readers), smartphones, and tablets provide users with portability and ease of access. Digital platforms offer interactive and versatile reading experiences by combining various media formats. In addition, blogs, articles, and social media content on the internet accelerate and diversify access to information (Wolfe et al., 2016). E-readers and e-books have begun to be used as much as traditional

printed books and other physical materials with the advancement of digital technologies. This transformation significantly affects reading habits and ways of accessing information.

In this research, e-readers were defined in detail in the light of developing technological infrastructures; the users' thoughts, preferences, and reading habits towards this new technology were examined comprehensively. The research aims to determine the perspectives, experiences, and expectations of the Giresun University Turkish Education program students towards this technology.

1.1. What is an E-reader?

E-readers are electronic devices specifically designed to read digital books and periodicals. Among the digital reading tools, E-readers were first introduced in 1998 with the 'Rocket eBook' launched by NuvoMedia. This device is considered a pioneering product that first introduced the concept of digital book reading to consumers. However, many users did not adopt it due to its limited technical features. Nevertheless, this early device significantly contributed to the emergence of e-reader manufacturers such as Amazon and Kobo and the evolution of the e-book industry (Öngöz, 2023; Soydan, 2012).

Although the first e-reader was launched in 1998, the first widely accepted and used e-reader was the Amazon Kindle, which was commercialized in 2007. The Kindle is considered a significant milestone in e-reader technology (Anand et al., 2009; Cuddy, 2008). This device was designed to provide users with a comfortable and convenient reading experience. E-readers like this support modern reading habits by blending the portability and flexibility of digital devices with the readability of traditional printed books (Wolfe et al., 2016). E-readers come equipped with features such as a lightweight design, large storage capacity, long battery life, and eye-friendly screen technology, allowing users to easily access digital content and enjoy a personalized reading experience (Howell, 2014; Ragen, 2008). These devices typically use electronic ink (e-ink) technology, which mimics the appearance of ink on paper. E-ink technology minimizes screen glare and eye fatigue, providing comfortable reading even in bright light. Additionally, these screens offer high contrast and wide viewing angles, creating a visual experience similar to reading from traditional paper and enhancing user comfort during extended reading sessions (Öngöz, 2023). Furthermore, e-readers have long battery lives due to their energy-efficient e-ink screens, enabling usage for weeks on a single charge. Because of this feature, users can enjoy an uninterrupted reading experience without worrying about charging (Öngöz, 2023). It can be said that e-readers are easy to carry and possess long battery lives (Culén & Gasparini, 2011), particularly for users who travel frequently or wish to read for extended periods, providing a significant advantage.

E-readers offer significant advantages in terms of portability, allowing users to store thousands of books on a single device, thus providing access to a large digital library. These devices eliminate the physical burden of books thanks to their lightweight structure, allowing readers to easily access their book collections wherever and whenever they want, whether at home or while traveling (Sackstein et al., 2015). E-readers also allow users to customize font size, style, and line spacing to personalize their reading experience. This flexibility significantly improves reading comfort by enhancing text readability, especially for users with different visual needs (Anderson, 2018). Another important feature of these devices is that books can be downloaded instantly from online digital libraries via a Wi-Fi connection. This feature allows users to quickly access the books they want and simplifies the selection process from a wide range of digital content. Online access also makes book shopping more practical, allowing users to obtain new books with just a few clicks, without needing to visit physical stores (Howell, 2014; Myrberg & Wiberg, 2015; Öngöz, 2023). Many e-readers offer various additional features to facilitate and enhance the user experience. These features include built-in dictionaries, note-taking, highlighting text, adding bookmarks, and listening to audiobooks (Hancock et al., 2016). Such additional functions allow readers to create detailed notes on the text, highlight important sections, and develop personal reading preferences (Anderson, 2018).

1.2. Purpose of the Research

In consideration of the information above, the purpose of this research, which was prepared based on digital reading, e-readers, reader preferences, and thoughts, is to provide information about digital reading sources and e-readers and to determine users' reading preferences. E-readers transform modern reading habits by providing easy access to digital books and periodicals. The advantages of these devices, such as portability, personal reading experience, long battery life, and eye-soothing screen technology, offer significant opportunities, especially for individuals receiving education (Anand et al., 2009; Ragen, 2008). In particular, e-readers provide students with easy access to reading materials, increase reading comfort, and the ability to customize personal reading experiences, which strengthens the educational potential of these devices (Anderson, 2018; Öngöz, 2023).

Many studies are in the literature on the widespread use of screen-reading habits. In particular, today's digital reading habits have made it common for students and general users to read on digital platforms. Wang & Lee (2017) and Smith (2020) emphasize that the use of digital reading tools has transformed traditional paper-based reading habits and that digital media use is rapidly increasing. These studies reveal that digital devices, especially e-readers, have significantly changed the reading experience. However, the number of studies conducted to improve the quality of screen reading is quite limited (Howell, 2014; Myrberg & Wiberg, 2015). With the increase in screen reading habits, concerns have also been expressed that this form of reading may negatively affect eye health. It is stated that reading on screens for a long time can increase eye fatigue and lead to visual impairment (Dillon, 2019; Manganelli, 2018).

Unlike traditional screens, e-readers have features that do not cause screen glare and minimize eye fatigue, indicating that these devices offer a healthy reading experience for users (Howell, 2014; Öngöz, 2023). E-ink screens offer long-term reading experiences, especially protecting eye health (Ragen, 2008). On the other hand, e-readers are still not widely used, and why users prefer these devices has not been sufficiently investigated (Anderson, 2018; Culén & Gasparini, 2011). Considering the advantages of e-readers, it is thought that increasing the use of these devices, especially in education, can play an important role in transferring students' reading habits to the digital environment (Anand et al., 2009; Myrberg & Wiberg, 2015). The spread of the new generation's reading habits on screens reveals the importance of educating teachers who have much more information and are experienced in this regard (Cuddy, 2008; Sackstein et al., 2015). Properly directing students' digital reading habits can be critical in developing their reading skills. At this point, it is understood that Turkish teachers need to gain the ability to use digital reading tools effectively. Determining the digital reading habits of Turkish teacher candidates and how e-readers can be used more efficiently in education will support the integration of digital reading tools in education. This research was conducted to contribute to similar field studies and understand Turkish teacher candidates' educational experiences and expectations, especially regarding e-readers. In particular, emphasizing the importance of teachers providing students with the ability to teach the effective use of digital reading tools will ensure that digital reading habits develop more healthily in educational processes (Anderson, 2018; Myrberg & Wiberg, 2015). It is seen that the benefits offered by e-readers should be examined in depth in the context of creating effective reading experiences, and the feedback from the target audience, along with the quality of the materials used in line to improve language skills in Turkish education, is of significant value for potential use in this area. It is thought that Turkish teacher candidates have various experiences and expectations regarding digitalizing reading habits and skills, such as understanding, interpreting, and analysing texts.

2. Method

This research was conducted on students of the Turkish Language Education program at Giresun University Faculty of Education to examine their thoughts, experiences, and expectations regarding screen reading and e-readers. Research permissions were obtained in accordance with ethical principles before the research.

2.1. Research Design

Qualitative research requires an inquisitive and interpretive approach to understanding the dynamics of the problem in its natural environment (Klenke, 2016) while also providing flexibility in the research process. This flexibility allows the researcher to develop new approaches at each stage and make arrangements that can increase the impact of the research (Creswell & Clark, 2017). In the study, a mixed questionnaire/survey containing mixed questions that can be used in quantitative and qualitative research was preferred to understand the participants' reading preferences and the factors that affect these preferences in more depth. This mixed questionnaire, prepared by the researcher and structured by obtaining expert opinion, includes open-ended and closed-ended questions.

2.2. Participants, Procedure, and Ethical Considerations

Teachers and students are at the centre of reading and reading education, and it is seen that reading resources are increasingly diversified in parallel with digital developments and the impact of technology on education is increasing (Anderson, 2018; Howell, 2014; Sackstein, 2015); It is thought that university students studying in the field of Turkish Education programme are more prone to new tendencies in reading and reading comprehension due to their experience with both digital and traditional education methods. Considering that they will work as Turkish teachers after graduation, it can be stated that these students are at the centre of the reading process both through their current student roles and their future teacher professions. It is assumed that these students use digital reading and e-readers more effectively than other departments due to their interest in language, literature texts, and their professional needs, and that they can evaluate the role of these devices in their educational processes more deeply. However, Turkish Education program students are intensely interested in reading materials, language education, and texts. Since digital reading and e-readers are technologies that can affect text reading and review habits, the thoughts and experiences of students in this department directly coincide with the target of the research. While students in other departments may be interested in this technology, it is assumed that Turkish Language Education program students tend to evaluate it more critically regarding their education and professional life. For these reasons, it was thought that focusing on this department would ensure that the research achieves its purpose and that the data obtained is meaningful.

The study group is selected depending on the research's purpose, time, and resources (Lewis, 2015; Patton, 2005). In qualitative research, the quality of the study group is considered more important than quantity. Therefore, instead of many participants, a study group that meets the research objectives and provides reliable and detailed data can be preferred (Coyne, 1997; Morgan & Morgan, 2008). The priority of the research is to obtain reliable and meaningful data instead of collecting a large amount of data (Ekiz, 2003; Karasar, 2012). In this direction, the study group comprises students in the Turkish Education Programme at Giresun University.

The convenience sampling method was preferred in the study. This method was used because it provided time and cost advantages and easy access to the participants. Although there were 209 students actively registered in the Turkish Education program, this number could not be reached due to the lack of compulsory attendance, students who were not in class during the application, or who did not want to participate in the study. 116 students participated in the study voluntarily. The students were informed in detail about the study, and their voluntary consent was obtained. The gender and age information of the students participating in the study is presented in the table below.

Table 1. Demographic characteristics of the participating study group

Variable	Category	f	%
Gender	Female	88	75,86
	Male	28	24,14
Age	18-19	23	19,83
	20-21	52	44,83
	22-23	34	29,31
	24 and over	7	6,03

When Table 1 is examined, it is seen that the number of female students is more than the number of male students and most participants are between the ages of 20-21.

2.3. Data Collection Tools

In the study, a mixed question form prepared by the researcher regarding digital and traditional reading comprehension was applied to students studying in the Turkish Education programme at Giresun University. The form was designed to include multiple-choice and open-ended questions. The obtained data were examined and interpreted using the descriptive analysis method. In order to ensure the content validity of the questions in the form, opinions were received from a total of 6 experts specialized in Turkish Education and Assessment & Evaluation. These experts evaluated the questions in terms of their suitability for the research purpose, comprehensibility, and content accuracy. Information about the experts is presented in the table below.

Table 2. Experts whose opinions were consulted for the mixed questionnaire

Field	Category
Turkish Education	5
Assessment& Evaluation	1

2.4. Validity and Reliability

The validity and reliability of the data collection tool were established according to the Lawshe technique. The content validity measurement tool (Lawshe technique) is one of the earliest and most widely used methods to quantify content validity. It is a type of validity that evaluates whether the content of a measurement tool covers all aspects of the subject or concept intended to be measured (Lawshe, 1974; Wilson et al., 2012). If each item in the tool has sufficient content validity, content validity is considered to be achieved. However, if there are items with low suitability, content validity can be improved (Lawshe, 1975). The evaluation process is critical to increase reliability and validity and helps to design the measurement tool in accordance with its purpose. Analyses made after expert opinions reveal the content validity rates of each item, determine the suitability of the content of the prepared measurement tool for the purpose and enable the necessary corrections to be made (Ayre & Scally, 2014).

In the formula used in the calculation of content validity, the terms "Nu" and "N" reveal the importance of the evaluation of each item in the measurement tool by experts (Ayre & Scally, 2014; Wilson et al., 2012). "Nu" represents the number of experts who stated that an item is appropriate, and "N" represents the total number of experts who expressed their opinions about that item. The formula used to determine the content validity of the developed measurement tool is based on expert opinions in determining the suitability level of each item. In this process, the number of experts who stated that each item was suitable (Nu) and the total number of experts who gave their opinions about that item (N) were considered.

$$KGO = \frac{Nu - \frac{N}{2}}{\frac{N}{2}}$$

According to this technique, the researcher prepared a mixed questionnaire form consisting of open and multiple-choice questions. After the questions in the form were prepared, expert opinion was sought regarding the suitability of the items in the measurement tool. The tool was rearranged by evaluating the feedback from the experts. After the expert's opinion, each item's content validity rate (CVR) was calculated using the Lawshe technique. At least 5 experts are required to apply the Lawshe technique, and the number of experts whose opinions were received in this study is 6. The table below presents the content validity rates of each item based on expert opinions.

Table 3. Content validity rates of the items in the measurement tool as a result of expert evaluation

Item Number	Essential	Not Essential	Essential but needs revision	CVR
1	6	0	0	1,00
2	5	1	0	0,67
3	3	0	0	0,00
4	4	2	0	0,33
5	4	2	0	0,33
6	4	2	0	0,33
7	4	2	0	0,33
8	6	0	0	1,00
9	6	0	0	1,00
10	5	1	0	0,67
11	6	0	0	1,00
12	5	1	0	0,67
13	6	0	0	1,00
14	6	0	0	1,00

The significance value of content validity ratios may vary depending on experts' attitudes in evaluating the items. According to some standards stated in the literature, if more than half of the experts rate an item as "essential", the content validity ratio takes a value between 0 and 0.99 (Ayre & Scally, 2014). Suppose all experts rate the item as "essential". In that case, the CVR value is calculated as 1, while when the number of experts rating the item as "essential" is more than half but less than all, the CVR value varies between 0 and 1; when less than half of the experts rate the item as "essential", the CVR value becomes negative (Wilson et al., 2012, p.199). These standards are critically important in determining the items' content validity. These values, calculated based on experts' attitudes, have an important place in evaluating the suitability of the content of the measurement tool for the purpose.

According to the information in Table 3, it is seen that the items in the mixed questionnaire, except for item 3, are at the level of acceptability. This shows that most experts found the items appropriate, and the content validity of the measurement tool was ensured. However, since the content validity rates of items 2, 4, 5, 6, 7, 10, and 12, which were stated as "essential but needs revision", were determined to be low, it was concluded that these items should be rearranged in line with the feedback from the experts and the item 3, which was stated as "not essential", should be removed from the form. In this process, expert feedback on the necessity of the items in the measurement tool for the analysis of the reading action and the sub-objectives of the research was taken into account and the items were rearranged accordingly. This way, the measurement tool was ensured to serve its purpose more appropriately and effectively.

The mixed question form prepared as a measurement tool was applied to Turkish Education programme students after the corrections were made in line with expert evaluations and a pilot study was conducted. This study aimed to determine how the form works in practice and possible problems. During the pilot study, the form's understandability, validity, and reliability and its effect on students were observed and evaluated. Factors such as how students perceived the form and how accurately they answered the questions were considered.

The pilot study results were used to evaluate the effectiveness of the form, and the comprehensibility and consistency of the questions were examined. These evaluations are important to increase the usability of the form in the next stages. The final evaluation confirmed that the content of the form was suitable for measurement and reliable. The pilot study observed that the mixed question form measured the targeted topics accurately and was in line with student expectations. The repeatability and consistency of the results measured the reliability of the measurement tool. The data obtained during the pilot study showed that the mixed questionnaire was reliable and had high internal consistency and stability. As a result, since the final evaluation results showed that the content of the mixed questionnaire was suitable for the purpose of measurement, reliable, and valid, the form was created correctly and compatible with the target group, it was decided to implement it without any changes in its content.

2.5. Data Collection Process

The researcher created the mixed questionnaire form used in the study and adjusted it with expert opinions. The form was applied to students in the Giresun University Turkish Education program. The application was carried out voluntarily, and a Voluntary Consent Form was obtained from each participant. The research was conducted in the 2023-2024 Spring Term, and the data collection phase was started after the pilot application. The data collection process consisted of the following steps:

- The mixed questionnaire was applied face to face.
- Data were collected and recorded.
- Statistical analyses were performed, and the results were interpreted.
- Findings and results were reported.

2.6. Data Analysis

The descriptive analysis method was used in the study. Descriptive analysis is an analysis method that systematically organizes, explains, and interprets data using descriptive statistical information such as tables, graphs, and themes. It is widely used, especially in qualitative research (Creswell, 2013). This type of analysis focuses on making an existing phenomenon more understandable rather than developing a new theory by presenting the current situation as it is (Yıldırım & Şimşek, 2018). For this reason, this type of analysis, which includes stages such as organizing, classifying, and interpreting data to make an existing situation more understandable, was preferred in this study. The obtained data were examined, and the participants' views on digital reading and e-readers were systematically categorized. Direct quotes from the participants were grouped with similar data to create codes. During the coding process, frequency (f) and percentage (%) information regarding the frequency of expressing opinions was calculated. After coding, the frequency of expression of each category and code was determined, and frequency (f) and percentage (%) information were analysed. The study included these data to show which themes the participants focused on more and which opinions were more common. The codes were interpreted by considering cause-and-effect relationships. The participants' thoughts and experiences were considered at this stage, and the findings were enriched.

3. Results

The findings were presented in tables under the subheadings below when the data obtained were analyzed. The data is also shown graphically below the tables.

3.1. Digital Tools

Table 4. Devices used by students for reading from the screen

Digital Tools	f	%
Smartphone	116	100
Laptop	58	50
Tablet	36	31,03
Computer	29	25
E-Reader	16	13,79

According to Table 4, all students participating in the research have a smartphone, but the number of students using e-readers is quite low compared to the number of participants.

3.2. Screen Reading Durations

Table 5. Students' daily screen reading durations

Digital Tools	f	%
0-1 hr	38	32,75
1-2 hr	61	52,58
2 hr and over	17	14,67

When Table 5 is examined, it is seen that 52.58 percent of the participating students read on screen for an average of 1-2 hours a day. The frequency and percentage data in the table are given below as a column chart.

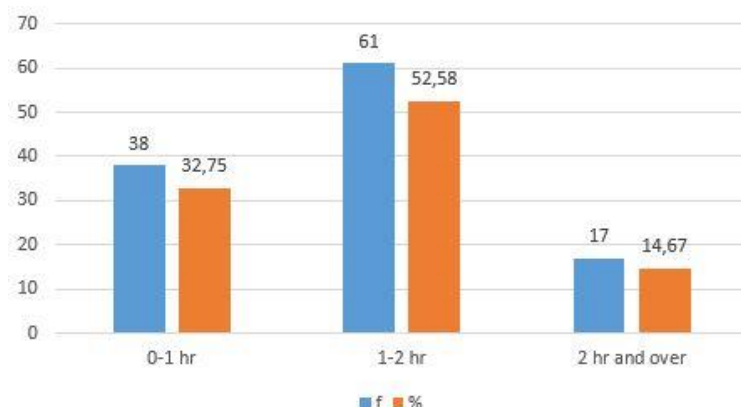


Figure 1. Students' daily screen reading durations frequency and percentage data

3.3. Software Used by students

Table 6. Software used by students for screen reading

Softwares	f	%
Google Play Books	14	12,06
PDF read	12	10,34
Wattpad	7	6,03
El-Kitap	4	3,44
Storytel	4	3,44
I don't use Apps	75	64,65

When Table 6 is examined, it is seen that only 35 percent of the students participating in the research use software for reading on the screen. The most preferred and used software among the students is Google Play Books. The data in Table 6 is given below as a column chart.

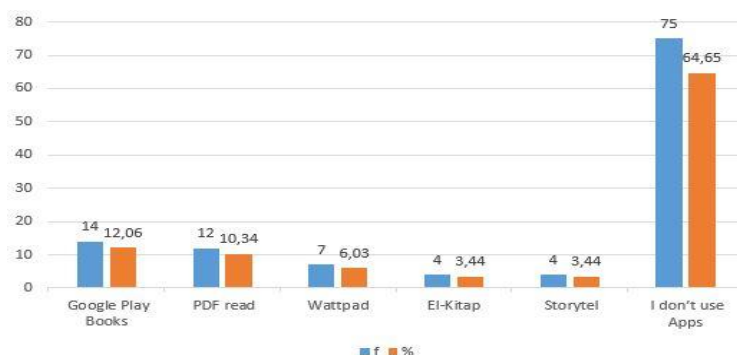


Figure 2. Software used by students for screen reading

3.4. E-reader Devices Used by students

Table 7. E-reader devices used by students for screen reading

E-reader Devices	f	%
Amazon Kindle	7	6,03
Calibro	3	2,58
Onyx Boox	3	2,58
Kobo	3	2,58
I don't use an E-reader	100	86,20

When Table 7 is examined, it is seen that a total of 16 students use e-readers. This number constitutes 13.77% of the total number of participating students. It is understood that the most preferred e-reader device is Amazon Kindle, and the other 3 e-readers are used at the same rate. However, when Tables 6 and 7 are examined, it is determined that most students do not prefer any software or e-readers for reading on the screen. The data in Table 7 is given below as a column chart.

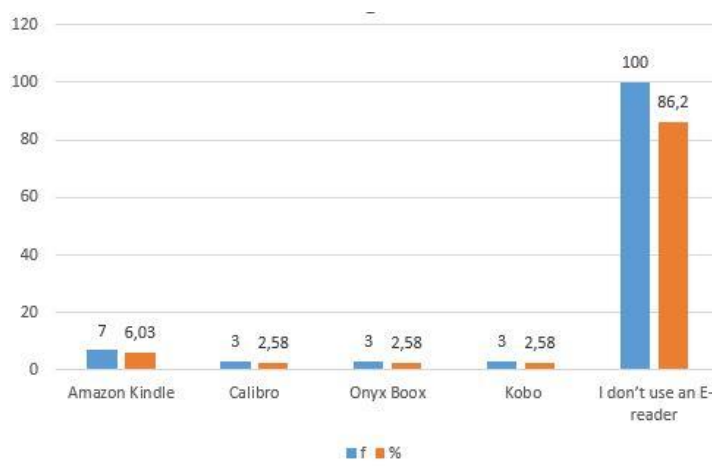


Figure 3. E-reader devices used by students for screen reading

3.5. Reasons for Screen Reading

Table 8. Students' reasons for screen reading

Reasons	f	%
Fast access to information	30	25,86
Ease of transportation	24	20,68
Attractiveness	22	18,96
Reader interaction	11	9,48
No influencing factors	29	25

When Table 8 is examined, it is determined that the factors that most affect the use of digital tools are providing quick access to information, ease of transportation, being attractive, and increasing reader interaction. In addition, 25% of the students stated that no factor affected them. The relevant column chart for the table is given below.

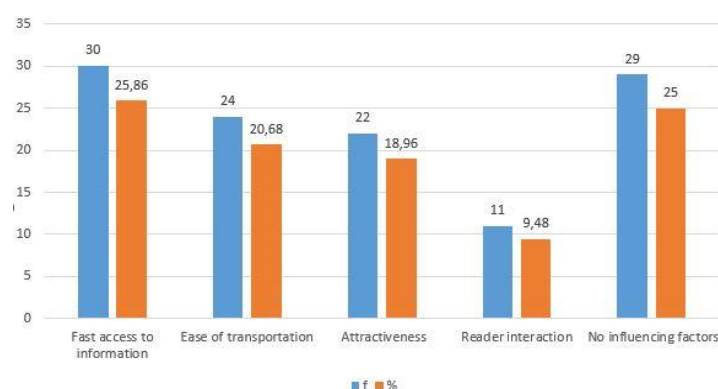


Figure 4. Students' reasons for screen reading

Some of the reasons students read from screens include:

- "... quickly accessing the information on my phone whenever I want gives me confidence and happiness."
- "... being able to read and respond to the comments made by other readers about what I read affects me."

- *"I also like reading books, but the phone offers a wide variety of text/images on a subject, it makes it easier for me to understand."*
- *"Some images are more interesting, which increases my desire to read on the screen."*
- *"... the phone fits in my pocket, it is not heavy like a book. I can carry it easily so I can take it anywhere, and since I also use it to call someone, it is always with me anyway..."*
- *"... there is nothing psychologically affecting it, I can read on screen or on paper if I want..."*
- *"... since the screen images are various, they interest me and I want to read it, but this is not always the case. Touching the book makes me happier."*

The findings obtained from the research were evaluated and interpreted in the discussion and conclusion section.

4. Discussion and Conclusion

In this study, students stated that the attractiveness and portability of digital reading, screen-based reading software, and e-book readers are among the reasons for their preference. This shows that students consider features such as the practicality and portability of digital tools important. Being able to carry only one device instead of many books and having access to various reading materials on this device offers great advantages to students. In addition, the attractiveness of digital tools and encouraging reader interaction are other important factors that increase the value of using these tools. Wulandari (2023) stated that e-book readers play an important role in developing multi-literacy skills such as reading, digital literacy, and visual literacy of foreign language learners (EFL); e-book readers increase students' interest by providing them with access to a variety of materials anytime and anywhere, which strengthens motivation and comprehension in the learning process. These research findings confirm this observation.

However, despite the advantages of reading on screen, students may prefer printed books as a reading source. The main reason for this preference is the sense of ownership of printed books. According to the research conducted by Kaban (2021), e-book readers improve reading comprehension skills in education and promote positive digital attitudes among students. However, students still stated that reading from the screen was not very effective, apart from features such as being easy to carry and attractive. Similarly, it can be concluded that digital tools may not be equally effective or important for every user. Some users may prefer traditional methods, such as reading on paper. The findings of this study support this situation.

Similarly, in the study by Alamri (2019), students' reading preferences for course materials were 65.98% in the direction of printed books, while the rate of those who preferred e-books remained at 17.60%. Although students were satisfied with their experiences with e-books, they were reluctant to purchase e-books. The main reasons for this preference include ease of use, price advantage, sense of ownership, and health concerns. This situation shows that improvements are needed in terms of design and accessibility in order to make digital reading materials more attractive to students.

According to the findings obtained from the research, when the results regarding e-readers, digital reading habits, and the use of digital tools were examined, it was observed that all students had smartphones. However, the number of students using e-readers was low. The reasons for the low use of e-readers despite the widespread use of smartphones are that students have a low interest in using e-readers, and the advantages provided by e-readers are not sufficiently recognized. This shows that e-readers have not yet become a habit. In addition, Sedyati (2018) reported that electronic devices encourage students to interact with literature in the digital age in an easy, accessible, and affordable way. However, it can be said that the high cost of e-readers in our country is a factor that prevents students from accessing these devices.

It has been determined that 45% of students spend 1-2 hours a day reading on screens. This rate indicates that more than half of the students do digital reading and shows that digital reading habits are becoming widespread. However, this rate also reveals that digital reading habits should be managed

healthily. Digital reading, unlike traditional book reading habits, can have various negative effects, such as prolonged use of the screen, eye health, and distraction (Baron,2021). Therefore, strategies should be developed to positively shape students' digital reading habits.

4.1. Suggestions for Future Research

In future studies, the reasons for the low usage rates of e-readers can be examined in more depth. Research can be conducted on the obstacles behind students not using these technologies (cost, access difficulties, habits) and their motivations for using these tools. Surveys or interviews on user experience can reveal which aspects of these tools are liked and which aspects need to be improved. A study can be conducted to understand students' thoughts on purchasing e-readers. In this study, variables such as e-reader models, pricing, and ease of use can be tested. A survey study can be conducted to determine the effect of long-term digital reading on eye fatigue. In addition, experimental studies can be conducted on reading times and sources. Teaching strategies and programs can be developed to support students' digital reading habits. These programs can show students how to use digital resources effectively and efficiently. For example, applications designed to develop digital reading skills, monitoring of reading processes, and digital reading activities that guide students can be planned. In addition, digital materials must be presented in a personalized way, not only in terms of content but also according to the needs of the students. In order to develop digital reading habits, customized programs and strategies should be created according to the needs of the students. This not only reinforces the digital reading habits of the students but also increases their digital literacy levels and enables them to use technology more efficiently. As a result, it is thought that a better understanding and explanation of e-readers' advantages and ease of use can contribute to a broader adoption of this technology among users.

Statement of Researchers

Researchers' contribution rate statement:

Both authors contributed equally to all chapters.

Conflict statement:

The authors declare that they have no conflict of interest.

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RESEARCH ARTICLE

OPEN ACCESS

The predictive power of planning and attention skills on mathematical ability in the preschool period*

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Highlights:

- The relationship between planning, attention skills, and mathematical abilities in preschool children
- There is a positive and significant relationship between planning skills and mathematical abilities during preschool.
- Despite a positive relationship between attention skills and mathematical abilities, attention skills are not a significant predictor.
- Together, planning and attention skills are significant predictors of mathematical abilities.

Abstract

This study examined the relationship between planning and attention skills and mathematical abilities in preschool children and then assessed the predictive power through regression analysis. In addition, the prediction power of children's planning and attention skills on mathematics ability was also investigated. The study, conducted using a relational survey model, consisted of 88 children aged between 60 and 72 months attending a preschool institution in Istanbul. The measurement tools used in the study were the "Cognitive Assessment System (CAS)" and the Test of Early Mathematics Ability (TEMA-3). The findings showed a moderate, positive, and significant relationship between early mathematical ability and planning skills ($r = .60, p < .01$). A lower yet still significant relationship was found between attention skills and early mathematical ability ($r = .40, p < .01$). According to multiple regression analysis results, planning and attention skills together accounted for 37% of the total variance in early mathematical ability ($R^2 = .37, p < .001$). Standardized regression coefficients indicated that planning skills ($\beta = .68$) were a significant predictor of early mathematical ability ($t = 5.23, p < .001$). However, attention skills ($\beta = -.11$) were not found to be a significant predictor ($t = -0.83, p > .05$). These results suggest that planning skills play a critical role in mathematical achievement during the preschool period. While a significant relationship was found between attention skills and mathematical ability, attention skills were not identified as a direct predictor of mathematical ability. This study highlights the importance of supporting planning skills in early childhood to enhance mathematical development.

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1. Introduction

Executive functions attract significant interest in developmental neuropsychology due to their importance in learning. Interrelated cognitive processes required for purposeful, goal-oriented behaviors are encompassed by the umbrella term " executive functions " (Barkley, 1997; Montgomery & Koeltzow, 2010; Rajendran & Mitchell, 2007). Executive functions help to monitor and control thoughts and actions that contribute to purposeful behavior (Meltzer, 2013) and include skills such as self- regulation, inhibitory control, planning, flexibility, error correction, perception, resistance to distraction, and working memory (Diamond, 2013; García et al., 2016; Welsh et al., 1991).

The early acquisition of executive function skills is one of the most critical tasks of childhood. Developing these skills early is essential for healthy growth in middle childhood and adolescence (Center on the Developing Child at Harvard University, 2014). Various studies indicate that children 's early executive function skills influence their academic performance cross-sectionally and longitudinally (Bull et al., 2011; Matthews et al., 2009). Research suggests that developing executive function skills as early as age three may be particularly crucial, as significant improvements in these skills are observed between the ages of three and five (Carlson & Moses, 2001; Kochanska et al., 2000). Furthermore, strong positive relationships have been established between executive function skills and math achievement during the preschool period (Allan et al., 2014; Blair et al., 2014; Purpura et al., 2017), and this relationship is bidirectional (Fuhs & McNeil, 2013). In particular, executive function skills developed in the early years of life guide later math and reading success (Fuhs et al., 2014; Razza et al., 2012). Research indicates that preschool children with lower executive function skills encounter more significant difficulties in academic areas such as reading and math, and this disparity widens over time (McClelland et al., 2006). Longitudinal studies show that academic learning enhances executive functions and contributes to academic success (Fuhs et al., 2014; Welsh et al., 2010). Since executive functions are critical for reasoning-intensive domains such as math and reading, these areas also require the effective use of executive function skills.

Additionally, studies highlight the significance of cultivating executive function skills beginning in preschool (Anderson, 2002; Diamond, 1990; Garon et al., 2008; Viterbori et al., 2015). Research has also concentrated on the effects of various components of executive functions (such as planning, attention, flexibility, and working memory) on learning (Brocki & Bohlin, 2004; Hanna-Pladdy, 2007; Miyake et al., 2000). Planning is a crucial element of executive functioning skills that play a role in the goal-setting process (Brocki & Bohlin, 2004; Hughes & Graham, 2002; Zelazo, Carter, Reznick, & Frye, 1997). Planning processes enable programming, organization, and verification of behaviors and are responsible for various actions, such as questioning, problem-solving, and self-monitoring (Naglieri & Gottling, 1997). Additionally, planning encompasses a range of skills, including working memory and error correction, which are vital for executive functions in problem-solving contexts (Marcovitch & Zelazo, 2009). Cognitive control, effective utilization of processes and knowledge, and self-regulating planning skills are essential to achieve a desired goal (Naglieri & Das, 1997, as cited in Naglieri & Rojahn, 2001). A child who excels in planning can assess different stimuli and effectively organize and analyze them (Naglieri & Kaufman, 2001). Researchers have noted that preschoolers begin to exhibit basic planning skills in familiar, uncomplicated tasks (Anderson et al., 2001; Welsh et al., 1991). Nearly any academic task, such as counting objects, necessitates planning to execute the various components correctly and appropriately. Students with underdeveloped planning skills may struggle to regulate their cognition (Locascio et al., 2010).

Researchers have shown intense interest in the effect of attention, an important component of executive functions, on learning. Attention is the ability to select and organize material perceived at the peripheral level; it is the strategy used by the organism to collect information from the surroundings (Motavalli, 2000). Attention involves focusing on the desired stimulus among the various stimuli in the environment, ignoring the undesired ones, and maintaining focus on goal-directed behaviors (Anderson, 2002). Flavell (1999) argues that as children age, they become better at controlling their attention and develop a greater interest in significant events and issues in their surroundings. Children with better attentional control learn more quickly than their less attentive peers (Clark, Pritchard, & Woodward,

2010; Geary, 2013). Researchers emphasize the importance of attention, as students with higher attentional skills also exhibit strong numerical mathematics skills (Cueli et al., 2020). Conversely, experts have noted that children experiencing attention processing difficulties during preschool are at higher risk of facing learning challenges in the future (Kroesbergen et al., 2003).

Experts have observed significant correlations between executive functions and academic achievements starting in preschool (Brocki & Bohlin, 2004; Bull, Espy, & Wiebe, 2008; Cueli et al., 2020; Duncan et al., 2007; Schmitt et al., 2017). For example, mathematical ability correlates with many aspects of executive functioning in typically developing individuals; moreover, executive functioning deficits are often found in individuals facing mathematical difficulties (Friso-van den Bos et al., 2013; Peng et al., 2018; Peng & Fuchs, 2016). Clements and Sarama (2019) showed that children with higher executive functioning skills, such as attention, working memory, and inhibitory control, achieve higher levels in mathematics. Evidence suggests that executive functioning skills play a significant role in solving complex mathematical problems as children mature (Swanson, 2006). For instance, research has indicated that attention skills are associated with mathematics performance, as they influence the ability to focus on stimuli (Cueli et al., 2020; Cowan et al., 2018; Steinmayr et al., 2010; Pappas et al., 2019; González Castro et al., 2014). Therefore, attention skills are crucial for children with mathematics difficulties (Bull & Scerif, 2001; Landerl & Kölle, 2009; Szucs et al., 2013). In preschool, focusing attention and ignoring distractions enhance learning in counting and associating numbers with specific symbols (Geary, 2013). Kroesbergen, Van Luit, and Naglieri (2003) found that students with learning disabilities in mathematics scored lower than their peers on all scales of the Cognitive Assessment System (CAS). Their cognitive deficits are particularly striking, especially in planning and sequential cognitive processing.

Regarding executive functions, several studies have focused on preschool children's planning and attention skills, considering variables such as age, gender, IQ, developmental disabilities, region of residence, and parents' education level (Bull et al., 2004; Carlson et al., 2004; Drake & Palmer, 2000; Freier et al., 2015; Naglieri et al., 2007; Ni et al., 2011; Sonuga-Barke et al., 2002). Some studies have shown strong correlations between preschool children's executive functioning skills and their mathematics achievement and academic skills (Blair & Razza, 2007; Kroesbergen et al., 2009; Ribner et al., & The Family Life Project Investigators, 2017) and demonstrate that executive functioning predicts academic skills in both preschool and later years (Allan et al., 2014; Blair & Razza, 2007; Blair, Kline, & Gamson, 2008). On the other hand, it is well known that teachers face challenges in recognizing the diverse characteristics of their students and providing appropriate individualized education at every schooling level. This leads to many negative outcomes, such as poor academic performance and lack of motivation for many students. It is anticipated that this study will guide teachers in the areas of planning, attention skills, and mathematical ability, thereby contributing to the development of individualized approaches for students (Schmitt et al., 2017; Kaçan & Halmatov, 2017; Montoya et al., 2019). The primary purpose of this study is to analyze the relationship between preschool children's planning and attention skills and their mathematical abilities. The predictive power of children's planning and attention skills on their mathematical ability is also addressed. In our country, since we aim to improve learning, achievement, and behavioral outcomes for students, focusing on enhancing executive function skills in early years is a necessary and valuable goal. Therefore, investigating whether there is a relationship between executive functions and early math skills in preschool children is crucial for the early identification of children with these skills.

2. Method

2.1. Research Design

This study is based on a relational survey model, which aims to determine the presence and/or degree of change between two or more variables (Karasar, 2013). This study examined the relationship between planning and attention skills and the mathematical ability of 60-72-month-old children, and the predictive value of planning and attention skills on mathematical ability.

2.2. Study Group

In this study, the sample is formed through convenience sampling starting from the most easily accessible participants until the group reaches the desired size (Büyükoztürk et al., 2020) due to several reasons. The individual application of the three measurement tools applied to each child, the long duration of the application, and the intensity of the daily education program of the school/schools caused delays in the application. On the other hand, there was no expected level of response from the families regarding the permission requested by the parents to apply the measurement tools to the child individually. For these reasons, the convenience sampling method was preferred. To reach the study group, the preschools affiliated with a district municipality on the Anatolian side of Istanbul were visited, and the purpose of the study was explained to the institution director. First, communication was established with the institution administrators to provide information about the study. It was learned that 237 children were attending the relevant institution during the 2022-2023 academic year when the study was conducted. Subsequently, families were informed about the study, and consent forms were obtained from those who wished to participate. The study was carried out with children who volunteered to take part. In conclusion, the study sample consisted of 88 children, 44 girls and 44 boys, between the ages of 60-72 months ($\bar{x}=64.86$), attending preschool educational institutions in Istanbul.

2.3. Data Collection Tools

2.3.1 Cognitive Assessment System (CAS)

CAS is a test developed by Naglieri and Das (1997) for 5- 17-year-old children based on the PASS theory developed in line with Luria's (1973) research in neuropsychology to measure skills in four main cognitive processes (Planning, Attention-Arousal, Simultaneous, and Successive). CAS is organized as three separate yet interrelated score levels: individual subtests, PASS (Planning, Attention, Simultaneous, and Successive) composite scales, and a Full-Scale quotient. CAS has twelve subtests, each of which generates a scaled score. The instructions and materials for each subtest are divided into age-specific groups (5-7 years and 8-17 years). The validity, reliability, and norming study of CAS for 5-year-old children was conducted by Ergin (2003), and the analysis showed that the scale was both valid and reliable for 5-year-old children. The test-retest procedure showed that all subtests of the CAS, all scales in the Basic and Standard Batteries, and full-scale scores yielded statistically significant results. Reliability analyses showed that the internal Cronbach-Alpha coefficients of the CAS subtests and the Basic and Standard Batteries were .71 and above, and the scale was reliable. Pearson Product-Moment Correlation coefficients calculated for the scale's validity showed that the relationships between subscales were statistically significant at the $p<.01$ level.

The Planning Scale measures the student's ability to design and implement strategies to solve new problems. The subtests are Planned Codes, Planned Connections, and Matching Planned Numbers. Planned Codes require the individual to write specific codes. Planned Connections requires the person to connect a series of digits, numbers, and letters of increasing length and difficulty in a specific order as quickly as possible within a given time limit. In Planned Number Matching, each item presents the learner with an eight-row page. Each row has six numbers, and the learner is asked to find and underline two identical numbers on each row within a time limit (Best, et al., 2011; Ergin, 2003).

The attention Scale involves focusing attention on a specific activity. All CAS Attention subtests present children with activities having competing stimuli that require attention, requiring them to sustain focus throughout the performance of the activities. The Attention Scale subtests are Expressive Attention, Number Detection, and Receptive Attention. Expressive Attention is designed to measure selective and discriminative attention skills. Number Detection measures selective attention, asking to focus on a particular stimulus and resist distracting stimuli. Receptive Attention involves finding pairs of objects or letters that are apparently or lexically identical (Ergin, 2003; Naglieri & Otero, 2017; Naglieri et al., 2004).

The Simultaneous Cognitive Processing Scale measures how well one can combine separate stimuli into a conceptual whole. The Simultaneous Cognitive Processing Scale consists of the Matrices,

Verbal-Spatial Relationships, and Shape Memory subtests. Matrices use spatially or logically related shapes and geometric layouts. Verbal-Spatial Relationship is a 6-item multiple-choice subtest in which each item consists of six drawings with a simple question at the bottom of each page. Shape memory asks the child to identify a recognizable geometric shape within a more complex design (Ergin, 2003; Naglieri & Otero, 2017).

The Sequential Cognitive Operations Scale was developed to test whether children understand the serial organization of events and, if yes, the extent of their understanding. The Sequential Cognitive Operations Scale comprises the Word Series, Sentence Repetition, and Visual Digit Span subtests. Word Series includes one-syllable, commonly used, and familiar words from everyday language. Sentence Repetition asks the child to repeat each sentence as it is presented. Visual Digit Span asks the child to recall a series of numbers in the order in which they are presented (Ergin, 2003; Naglieri & Otero, 2017; Naglieri et al., 2004).

Only the Planning and Attention subscales were used in this study because these domains are most relevant to the research objectives. These subscales specifically assess cognitive processes related to goal-directed behavior and attentional control, which are central to the study's focus.

2.3.2. *Test of Early Mathematics Ability-3 (TEMA-3)*

The Test of Early Mathematics Ability (TEMA) was developed by Ginsburg and Baroody (1983) to assess the mathematical abilities of children aged three to eight years and eleven months. In 1990, it was revised and published as TEMA-2. The validity and reliability study of TEMA-2 in Turkey was conducted by Güven (1997), and it was determined that the scale is valid and reliable. Later, the TEMA-2 test was revised again and developed as TEMA-3 in 1993. In TEMA-3, Forms A and B use materials such as pictures, mathematical symbols, and countable small objects. The validity and reliability study of TEMA-3 for children aged 60-72 months was conducted by Erdoğan and Baran (2006). In the test-retest reliability study, TEMA-3 Form A was administered to 100 children, and Form B was administered to 100 children, for 200 children. The correlation results (reliability coefficients) between the scores of the first and second administrations were as follows: Form A to Form A .90, Form A to Form B .88, Form B to Form B .90, and Form B to Form A .90. To test the reliability, the internal consistency coefficient was calculated, and the KR20 values for internal consistency were found to be .92 for Form A and .93 for Form B. To examine the criterion validity of TEMA-3, the mathematical ability levels of six-year-old children were taken as an external criterion. Based on teacher evaluations, TEMA-3 was administered to the top and lowest thirty children in terms of mathematical ability, and the Mann-Whitney U test results showed that the mathematical scores of the thirty children with the highest mathematical ability were significantly higher than those of the thirty children with the lowest ability, for both Form A and Form B. This finding demonstrates that TEMA-3 can differentiate between children with high and low mathematical abilities.

The test is administered individually to each child. It begins with a question corresponding to the child's chronological age, which is calculated beforehand. The test ends when the child fails five questions consecutively, and each response is marked as correct or incorrect. The number of correct answers is used to calculate the raw score, which is then converted into mathematical quotients. Based on the child's chronological age, the raw score helps determine the child's mathematical score from a score chart.

Practitioner training and permission for application were secured for the scale's use. In this study, Form A was utilized. The original scale demonstrated strong psychometric properties with high internal consistency. The reliability analysis recorded a KR-20 value of .92 for Form A, indicating high reliability and consistency (Erdoğan & Baran, 2006).

2.4. Data Collection

In this study, Pearson correlation analysis was conducted to determine the relationships between the variables. Multiple regression analysis investigated the predictive value of children's planning and attention skills on mathematical ability.

At the beginning of the study, the approval of the Maltepe University Ethics Committee was obtained on 30.05.2022, decision 2022/16-2 and number E-10267653-050.01.01-199963. Additionally, the necessary permissions were obtained within the "Collaboration Protocol in Education" framework, conducted between the municipality to which the preschools are affiliated and the institution where the researchers work. The researcher who administered the measurement tools completed the training and obtained the required certificates and permissions. After completing all required permissions before the study, the families were informed about the study in the preschool institutions; families interested in participating in this study first contacted the researcher by phone. The researcher gave preliminary information about the content of the study on the phone. At the end of this preliminary contact, "informed consent forms" were sent to the families who agreed to participate in the study through the administrators/teachers of the institutions. After the consent forms were signed, they were returned to the researcher. Then, the study was scheduled and conducted in the areas assigned at the institutions. Before starting the study, a short game was played with the children, and additionally, a 15-minute break was given between the administered measurement tools. Both measurement tools were applied as explained in the data collection tools section. The average duration of the administration was 90 minutes.

2.5. Data Analysis

Data was analysed by using SPSS 26.0. Before starting data analysis, potential errors were corrected by checking for missing data, outliers, and incorrectly entered values, as recommended by Pallant (2016). In the first stage, a box plot was used to check and remove outliers. In the second step, the normality of the data was tested. The skewness values were between -.226 and .436, and the kurtosis values were between -.225 and -.312. The values between +1.5 and -1.5 were accepted to show normal distribution (Tabachnick & Fidell, 2013). On the other hand, George & Mallery (2010) state that skewness and kurtosis values between -2 and +2 indicate normal distribution. Accordingly, the data distribution was normal, and Pearson correlation and multiple regression were used in the analysis. The number of participants in the study group meets the sample size requirement recommended in the literature for multiple regression models (Field, 2009; Green, 1991).

To begin with, after conducting Pearson Correlation Analysis, the assumption of a significant positive correlation between Early Mathematics Ability and the Planning ($r = .60, p < .01$) and Attention ($r = .40, p < .01$) subscales of CAS has been met. After revealing the interrelationships, multicollinearity between variables was checked before proceeding to multiple regression analysis. In this regard, VIF, CI, and tolerance levels were analyzed. As a result of these analyses, the VIF value was 2.29 for both variables, the tolerance was .44, and the CI value was below 30. So, it was decided that there was no multicollinearity between variables.

Another assumption that should be met for multiple regression analysis is that the error terms are normally distributed (normality), and their variance is constant (homoscedasticity). Figure 1 shows that the distribution of the error scores is normal and that the assumption of constant variance of the error terms (homoscedasticity) is met.

3. Findings

The relationship between early mathematical ability and the planning and attention subscales was examined using Pearson Correlation Analysis as presented in Table 1.

Table 1. Pearson Correlation Analysis for Tema-3 and planning and attention subscales of CAS

	Tema-3	Planning CAS	Attention CAS
Tema-3	-		
Planning	.601**	-	
Attention	.404**	.750**	-

As it is seen in Table 1, there are moderate and statistically positive and significant relationships between Early Mathematics Ability and the Planning sub-dimension ($r=.60$, $p<0.01$) and the Attention sub-dimension ($r=.40$, $p < 0.01$).

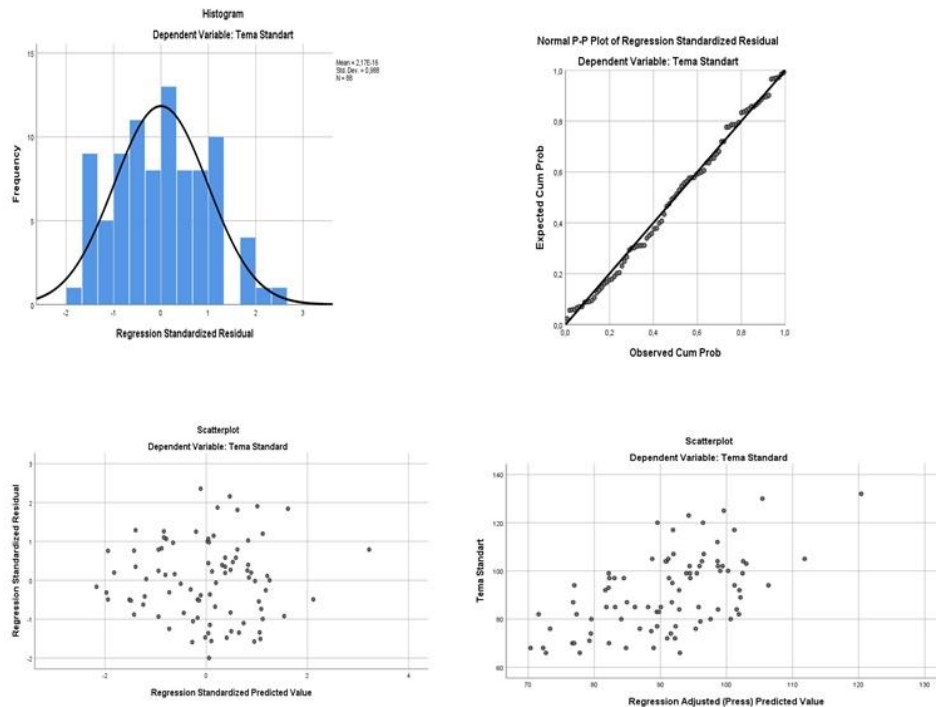


Figure 1. Distribution of error terms and homoscedasticity in multiple regression analysis

The results of the multiple regression analysis predicting early mathematics ability by the Planning and Attention sub-dimensions of CAS are shown in the table below.

Table 2. The results of the multiple regression analysis on the early mathematics skills total score and predictor variables

Variable	B	Standard Variation	β	t	p	Binary r	Partial R
Constant	32.34	12.39		2.61	.01		
Planning	.73	.14	.68	5.23	.00	.60	.49
Attention	-.15	.18	-.11	-.83	.41	.40	-.09
R=.61		R ² = .37					
F (2, 85)= 24,611		p=.000					

As shown in Table 2, all predictor variables together explain 37% of the variance in the total score of early mathematics skills in a statistically significant manner ($R = .61$, $R^2 = .37$, $F (2, 85) = 24.611$, $p<0.001$). According to the standardized regression coefficients (β), the relative importance of the predictor variables on early mathematics skills is as follows: planning (.68) and attention (-.11). When examining the t-test results regarding the significance of the regression coefficients, it can be seen that planning ability ($t = 5.23$, $p < 0.001$) is a significant predictor. In contrast, attention ability ($t = -0.83$, $p < 0.001$) does not have a significant effect.

4. Discussion

This study examines the relationship between early mathematical skills in preschool children and the core components of executive function, namely planning and attention skills. The following results were obtained. It demonstrates that planning significantly predicts early mathematical skills and explains a moderate portion of the variance in early mathematical abilities. On the other hand, attention skills were not found to significantly contribute to predicting early mathematical ability. These findings

highlight the importance of planning skills in early mathematical development and suggest that interventions to improve planning skills could positively impact preschool children's early mathematical abilities.

These results are consistent with previous studies in the literature that have identified the role of executive functions in the development of mathematical skills. Many studies report a direct relationship between developing executive functions across a wide age range and children's early mathematical skills (Blair & Razza, 2007; Bull et al., 2008; Clements et al., 2015; Harvey & Miller, 2017; Kroesbergen et al., 2007; Kroesbergen et al., 2009; Kroesbergen et al., 2003; Peng et al., 2018; Ribner et al., 2016). Best, Miller, and Naglieri (2011) have emphasized a similar relationship by pointing out that mathematics is a complex skill involving many executive function components. Studies in the literature show that planning skills are moderately related to academic achievement (Naglieri & Das, 1997; Naglieri et al., 2011; Naglieri et al., 2011; Best et al., 2011; Naglieri & Rojahn, 2004). Best, Miller, and Naglieri (2011) found a significant, moderate relationship between planning and mathematical skills in 5-year-old children. Specifically, planning may affect children's skills in solving mathematical problems, organizing tasks, and progressing step by step. The contribution of these types of executive functions to mathematical thinking processes lays the foundation for mathematical skills during the preschool period. Some experimental studies have shown that children with weak planning skills significantly benefit from cognitive strategy instruction that emphasizes planning in mathematical skills (Naglieri & Gotting, 1997; Naglieri & Johnson, 2000).

On the other hand, the limited role of attention skills on early mathematical skills in this study suggests that children's attention abilities are less determining in predicting mathematical achievement. However, there is research indicating a strong relationship between mathematical skills and attention skills (Altemeier et al., 2008; Blair et al., 2008; Brueggemann & Gable, 2018; Cueli et al., 2020; Walcott et al., 2010). According to researchers, executive function skills are the strongest predictors of mathematical problem-solving skills throughout development (Bull et al., 2008; Swanson, 2006; Van der Ven et al., 2012; Viterbori et al., 2015). Rabiner et al. (2000) reported that first-grade students' reading and mathematics skills and attention skills predicted their reading and mathematics success after the fifth grade. Duncan et al. (2007) also found that attention skills significantly predicted the mathematical skills of preschool children aged 60-72 months. In this sense, the inconsistency between our results and some previous studies may suggest implications for daily classroom activities. On the other hand, interventions focusing on executive functions may contribute to developing early mathematical skills, while stimulating early mathematical skills may support children's executive functions.

In a classroom environment, a child is expected to have the skills to sustain their attention by blocking out competing stimuli such as peer conversations, remembering information, following instructions, and switching their attention between tasks, for example, focusing on a task or the teacher (Morrison et al., 2010). The ability to perform such skills may enable children to participate in learning processes that are critical for academic success, and evidence suggests that children with high levels of executive function demonstrate better academic. (Van der Stel & Veenman, 2014). Rabiner et al. (2000) found that in the absence of activities aimed at developing attention skills in preschool, children may be at risk of academic failure when they start elementary school. According to this view, underdeveloped attention skills in elementary school may hinder the acquisition of basic academic skills and reduce the benefits children gain from formal education. However, experts argue that promoting mathematical skills can also enhance children's executive functions (Cueli et al., 2020). In line with this perspective, children who struggle with preparation-phase mathematical skills risk facing difficulties learning mathematics. Similarly, examining how preschool students with low executive functions progress in elementary school and how their mathematical skills develop is important.

In this study, while the effect of planning skills is significant, the lesser importance of attention suggests a need to re-evaluate educational policies and preschool programs. Specifically, focusing on planning skills in interventions to develop mathematical skills may help achieve more substantial and lasting mathematical success. However, attention skills should also be important for children's overall

cognitive development. Given the potential interactions between attention, planning, and other executive functions, educational strategies that develop all these skills holistically should be created. Toplak, West, & Stanovich (2013) state that due to the complexity of the structure of executive functions, it is impossible to assess them with a single measurement tool.

In conclusion, the findings of this study suggest that interventions aimed at developing planning skills at an early age may contribute to mathematical achievement. However, a deeper examination of the role of attention and how these two skills work interactively is an important area for future research. This study has several limitations. First, using a convenience sampling method restricts the generalizability of the results. Future research conducted with larger and more socio-economically diverse samples could enhance the applicability of the findings to a broader population. Second, the measurement tools used in this study assess only specific components of executive functions. Given the multidimensional nature of executive functions, future studies are encouraged to incorporate different assessment methods (e.g., observations, performance-based measures, teacher or parent evaluations). Third, due to the study's design, causal relationships between variables cannot be established. Therefore, longitudinal studies could provide valuable insights into how the relationship between executive functions and mathematical skills evolves over time. Finally, it lasted approximately 90 minutes to conduct both measurement tools for participants.

Based on this study's findings and the existing literature, the following recommendations are considered to contribute to the literature. Future studies using mixed methods, supported by observation and interview data, can strengthen scientific research. Additionally, it is recommended that future studies include other components of executive function such as self-regulation, inhibitory control, flexibility, error correction, perception, resistance to distraction, and working memory. Performance-based executive function tasks should be used in studies with different groups, along with teacher or parent assessments. The relationship between planning, attention, and mathematical skills in preschool children from different socio-economic backgrounds can be examined. Considering that executive functions may be related to other psychological symptoms such as anxiety or emotional difficulties, a more detailed examination of the role of reaction time in the development of mathematical skills is suggested. Longitudinal studies can be conducted with different groups by rating these perspectives. Due to the time the study instruments are administered, different measurement tools may be used to assess children's mathematical skills and the execution of functional skills. Children who show low performance in preparatory mathematical skills and executive functions should be supported with educational interventions that improve their performance during the preschool period. Activities should be planned with a holistic approach. Teachers and teacher candidates may learn the importance of implementing a program that enhances planning and attention skills.

Statement of Researchers

Researchers' contribution rate statement:

YG: Conceptualization, investigation, resources, writing. DE: Conceptualization, data collection, methodology, writing – original draft preparation, writing – review & editing, data curation.

Conflict statement:

The authors declare that they have no conflict of interest.

Data Availability Statement:

The data supporting this study's findings are available on request from the corresponding author. However, the data are not publicly available due to privacy or ethical restrictions.

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