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Table of Content

Dear Readers,

We are delighted to present the second volume of the 10 th issue of e- Kafkas Journal of Educational Research. Our goal with this issue is to provide you with a diverse selection of insightful and thought-provoking articles from esteemed researchers and scholars in the field of education. This issue contains thirteen articles, each offering a unique perspective on current educational research topics. Our contributors have explored the complexities of education and presented innovative ideas and research findings that are sure to provoke discussion and debate.

- In the study titled "Exploring EFL Teachers' Perceptions on 21st Century Skills" by Eker Uka and Bedir (2023), English language educators' utilization of 21st-century learning and innovation skills was examined. Using qualitative and quantitative methods, a case study approach was employed. 105 English teachers participated via convenience sampling, responding to a questionnaire. Additionally, 10 teachers were interviewed and completed a KWLA chart after a research seminar. They then created lesson plans incorporating 21st-century skills, providing reflection reports. Results indicated awareness of 21st-century skills' importance, yet participants sought more support from managers and government. Understanding of skill integration timing and methods requires enhancement.
- Geçkin (2023) conducted a study focusing on the use of macro and micro strategies in responding to compliments in a second language. Advanced Turkish learners of English participated, completing a written task where they responded to compliments and evaluated their responses' appropriateness on a 1 to 5 scale. The study investigated gender's impact on response strategies and metapragmatic judgments. Response strategies were categorized using Boori's (1994) framework. Results showed females tended to accept and males to reject compliments as macro strategies. Micro strategies like appreciation, commenting, and returning compliments were common for both genders. Females significantly differed from males in responding to possession and appearance compliments. Females' perceived appropriateness in responding to skill compliments was also higher. The research underscores gender's role in compliment responses and perceived appropriateness.
- Yılmaz and Saraç (2023) investigated how attitudes toward supervision relate to self-efficacy among physical education teaching majors. They studied gender and academic year (1st to 4th) differences in self-efficacy perceptions and supervision attitudes and examined the link between these aspects. Participants included 147 teacher candidates (72 women, 75 men), with mean ages of 21.51 and 21.65, respectively. Data were collected via the Demographic Information Form, Teacher Sense of Self-Efficacy Scale-Short Form, and Attitudes Toward Supervision Scale. Results indicated no significant gender or academic year variations in self-efficacy perceptions and supervision attitudes. Both self-efficacy and supervision attitudes scored high. A positive yet weak correlation existed between self-efficacy perceptions and supervision attitudes. In conclusion, Yılmaz and Saraç's study revealed physical education teacher candidates possessed strong self-efficacy and positive attitudes toward supervision. Additionally, a tendency emerged: higher self-efficacy linked to more positive attitudes toward supervision.
- Coşkun (2023) examined variables affecting print awareness skills in six-year-olds attending kindergarten. The study investigated relationships among child gender, maternal education, writing readiness skills, and print awareness skills. A total of 316 participants (183 girls, 133 boys) were assessed. Spearman correlations and regression analysis were employed. Results showed these variables accounted for around 9% of print awareness skills variance. This highlights the interconnectedness of child gender, maternal education, writing readiness skills, and print awareness skills in promoting emergent literacy. Implications include supporting children's writing readiness skills for better outcomes.

- Buldu (2023) highlights the importance of science education in early life not just as a foundation for future scientific understanding, but also for nurturing young children's thinking and learning appreciation. Hence, creating playful learning environments for science education has become crucial. The study aimed to investigate how such environments contribute to children's science learning, using data from four US early childhood setups. Analysis revealed that children's playful exploration enhanced their scientific skills and learning. The design of these environments and the choice of materials encouraged interaction among children, fostering more play and exploration. The study suggests the necessity of innovative practices to shift from traditional learning methods and promote play-based learning. It emphasizes the need to create exemplary practices and raise awareness, starting with teacher candidates.
- Zencir and Haskan Avcı (2023) explored metaphors used by fathers of 0-6-year-old children to describe their experiences of becoming a father. Using a qualitative phenomenological method, the study included 90 fathers with children aged two months to six years. Data was collected through online and face-to-face interactions, asking fathers to complete the sentence "Becoming a father is like/similar to... because..." Content analysis via MAXQDA (20.2.2) ensured 81% data reliability. Fathers provided 96 metaphors, with common expressions like "being a superhero," "great plane tree," and "rebirth." These metaphors often conveyed positivity. Three main themes emerged: Interaction with the Child, Contribution to Fathers' Well-Being, and Perceived Fatherhood Duties. Within Interaction with the Child, categories included the learning-teaching process and gamification. Contribution to Fathers' Well-Being encompassed relaxation metaphors, positive life news, and basic needs. Perceived Fatherhood Duties yielded categories "Responsibility and Accessibility" and "Being a Role Model."
- Büyükçolpan and Karacan Özdemir (2023) underscored the need for humane working conditions, listing attributes of decent jobs like safety, leisure time, aligned values, fair pay, and health access. They aimed to validate the Future Decent Work Scale in Vocational and Technical Anatolian High School students, measuring their perceptions of future decent work. Data from 545 students were analyzed using Confirmatory Factor Analysis (CFA) for construct validity and examining criterion-related validity. Reliability was assessed via Cronbach Alpha and McDonald's Omega coefficients. CFA indicated good (GFI=.93, AGFI=.90) and acceptable ($\chi 2/df=3.943$, RMSEA=.074, SRMR=.069, CFI=.85) fit indices. The internal consistency coefficient (Cronbach Alpha) was .77, affirming the scale's reliability. In conclusion, Büyükçolpan and Karacan Özdemir's study confirmed the validity and reliability of the Future Decent Work Scale among Vocational and Technical Anatolian High School students.
- Yılmaz, Babatürk, and İnalgöz (2023) investigated the link between foreign language learning motivation and anxiety in students, with a focus on language-related anxiety. The study included 305 B1-level students from Kyrgyz-Turkish Manas University's language preparation program, using a relational survey model. Data were collected using the Motivation in Learning Turkish as a Foreign Language Scale and Anxiety in Learning Turkish as a Foreign Language Scale. Descriptive statistics, t-tests, ANOVA, and Pearson correlation coefficients were employed for analysis. Participants had the highest instrumental motivation and lowest cultural motivation. Motivation views varied based on gender, mother tongue, and instrumental motivation. Anxiety was highest in listening and lowest in writing. Negative, significant relationships were found between internal motivation, motivation to learn Turkish, and anxiety in speaking, writing, and learning Turkish. The findings underscore the complex interaction between motivation and anxiety in foreign language learning.
- Bolat (2023) emphasized classroom management's pivotal role in effective learning environments, addressing the need for teachers' skill development. To assess teachers' reward and praise strategies, a valid measurement tool is essential. Bolat's study introduces the Teacher Reward and Praise Scale, a novel approach. The research employed a quantitative,

descriptive survey model. A pilot form with 25 items was administered to 465 teachers, revealing a 13-item, 2-factor structure ("teacher praise behaviors" and "teacher reward behaviors"). The factors exhibited high reliability (0.87 and 0.92). Confirmatory Factor Analysis with data from 271 teachers affirmed this structure. Concurrent validity was established through relationships with other scales. In conclusion, the Teacher Reward and Praise Scale is presented as a reliable tool for assessing classroom management behaviors, valuable for researchers and practitioners.

- Mutlu and Kaya (2023) investigated the influence of an online decision-making skills psychoeducation program based on cognitive behavioral therapy on university students' decision-making styles. Using a nested design, the study integrated quantitative and qualitative approaches. Quantitative data were collected from 22 participants (11 experimental, 11 control) using the "Melbourne Decision Making Questionnaire." Qualitative data came from the 11 experimental group participants via a "Semi-Structured Interview Form," "Session Evaluation Form," and "Psychoeducation Programme Evaluation Form." Quantitative analysis involved various statistical tests, while qualitative data underwent content analysis. Results revealed that the psychoeducation program led to partially significant increases in decision-making self-esteem and vigilant decision-making, alongside partial decreases in avoidant and procrastinating decision-making styles. The program didn't significantly affect the hypervigilant style. Participants found the program's content satisfactory, awareness-raising, and practically beneficial. In conclusion, the study highlighted the positive effects of the psychoeducation program on decision-making styles among university students.
- Banko-Bal and Akman (2023) investigated preschool teachers' awareness of anti-bias education in diverse classroom environments. They aimed to validate "The Self-Awareness Scale toward Anti-Bias Education" and assess teachers' self-awareness in this context. The scale's items were generated from literature and expert input. The initial study involved 270 preschool teachers, confirming the scale's psychometric properties. Exploratory Factor Analysis yielded satisfactory results, and Confirmatory Factor Analysis confirmed the model fit for the 11-item scale presented in a 5-point Likert format. In the second study, with 120 preschool teachers, findings indicated high self-awareness in anti-bias education. Moreover, teachers with more professional experience exhibited more positive self-awareness in anti-bias education than less experienced counterparts. In summary, Banko-Bal and Akman's study validated "The Self-Awareness Scale toward Anti-Bias Education" and highlighted the crucial role of teachers' awareness in promoting anti-bias education in preschools.
- Aldemir Engin (2023) conducted a qualitative case study on an online Digital Storytelling Workshop for mathematics teachers. The participants, four master's degree students working as mathematics teachers in Turkish secondary schools, engaged in the study. Data collection involved online lessons, interviews, reflective diaries, and digital stories. Content analysis revealed challenges in formulating questions and multimedia use. Emphasis was on dramatic questions, sound, and music in evaluating sample digital stories. The online format saved time but limited interaction. The workshop improved technological skills and highlighted potential benefits of using digital stories in math classes. The digital stories created during the workshop exhibited improvement among participants. This study sheds light on the dynamics of an online workshop for math teachers, addressing challenges and benefits for enhancing mathematics education.
- İstanbullu and Horzum (2023) delved into the importance of meaningful learning experiences for students. Real-life encounters enhance learning's significance, necessitating environments that facilitate such experiences. However, traditional teaching methods often fall short due to factors like student profiles, large class sizes, limited hours, technology, and unforeseen events. This shortfall impacts learning outcomes and psychomotor skills. To counteract this, effective real-life experiences are vital to enhance student achievements and skills. This study aimed to gauge learning achievements and psychomotor skills of college students in an ICT

course. Augmented reality applications and simulations were substituted for real-life experiences. Data were collected from 63 students. Descriptive statistics, two-way ANOVA, and the Wilcoxon Signed Rank Test were utilized for analysis. Results indicated that augmented reality and simulation-based learning were as effective as real-life experiences in enhancing student achievements and psychomotor skills in the ICT course. In conclusion, İstanbullu and Horzum's study highlighted the potential of augmented reality and simulations as substitutes for real-life experiences in learning environments, particularly when such experiences are limited.

We would like to express our sincere appreciation to the authors who have contributed their work to this issue. Additionally, we extend our gratitude to our diligent reviewers who have worked tirelessly to ensure the articles' quality and rigor. To our readers, we offer our deep appreciation for your unwavering support and interest in our journal. It is our hope that this edition proves to be informative and captivating for you, and we eagerly await your feedback.

We extend our gratitude to our esteemed readers and researchers once again for their valuable interest. With hopes that the year 2023 will bring bright days to our country and all of humanity, we celebrate the Victory Day on August 30th and wish for peace and tranquility for all.

Sincerely,

Assoc. Prof. Dr. Ali İbrahim Can GÖZÜM

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e-Kafkas Journal of Educational Research e-KJER Research Article

Exploring EFL Teachers' Perceptions on 21st-Century Skills: A Case Study

Ecem Eker Uka[1] Hasan Bedir[2]

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Abstract

This study investigated how English language teachers perceived and used 21st – century learning and innovation skills in their classrooms. Data were collected both in qualitative and quantitative methods and an exploratory case study was employed. The convenience sampling method was used and 105 voluntary teachers of English participated in the questionnaire. To support the quantitative data, 10 English language teachers were interviewed and they completed a KWLA chart after attending a seminar regarding the research. Then, following conducting their session, they were expected to create lesson plans that included 21st – century skills and reflection reports. Results demonstrated that the participants in this study are aware of 21st – century skills and their importance in English language learning and teaching. Although they are aware of them, they nevertheless require assistance from their managers and the government. Their understanding of how and when to use these skills needs to be improved, along with their horizons.

Keywords: Professional development, life and career skills, digital literacy skills, 4Cs, 21st – century skills,

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Introduction

In terms of education, social sciences, academics, and work-life balance, we are living in a new century that is significantly different from prior centuries. Teaching key courses using conventional teaching methods is insufficient to raise students as productive citizens, workers, and leaders in this era, often known as the 21st – century. Taylor (2009) claimed that the old techniques of teaching and learning need to be abandoned which mostly focus on core subjects' mastery and innovative methodology must include the skills of the new era including critical thinking, creativity, collaboration, and communication (the 4Cs), career and life skills, and digital literacy skills. To understand these skills better, several seminars, conferences, professional development activities and training programs have been conducted and educators, teacher trainers and researchers have been attending these activities. Additionally, to implement the 21st – century skills, a variety of frameworks have been developed. According to a study, the frameworks of 21st – century skills in teaching and learning, provide a guideline for both learners and teachers with a scaffolded approach that helps to construct the understanding of fundamental concepts, while guiding how and when to utilize these abilities (Ambrose, et al., 2010).

Enlightened eclectic teachers of the 21st – century are supposed to provide affordances to the learners, additionally they must understand the significance of integrating the 21st – century innovation and learning skills. Teachers should build a well-constructed education program and teaching context aiming to integrate these skills into core subjects for learners. Since communication has been made easier among individuals worldwide as a mutual language as a result of globalization, especially, for English language learning, the 21st – century learning and innovation skills are crucial for pupils (Wang, 2016). Furthermore, professional development activities should be a guide for teachers since they are fundamental and crucial in terms of guaranteeing quality in students' learning process (Marcelo, 2009). To increase the capacity to use these abilities pedagogically, continuous professional development activities provide teachers to gain a wider perspective about 21st – century skills, thus they will be aware of how to use, when to conduct and in which ways to present them.

To be a part of the global community, teaching and improving 21st – century skills should be the main purposes of educators. According to these general ideas, the current study focused on exploring EFL teachers' perceptions of 21st – century skills and their awareness and the utilization of these skillsets in their education context.

Literature Review

The purpose of pupils' education in the 21st – century is for them to interact with, use, and exploit the language rather than knowing it for its own sake (Eker, 2020). One of instructors' primary objectives should be teaching and improving the target language of their learners in order to provide them a place in a part of the global community and pupils need to be creative, they should exercise analytical thinking. Being creative, communicative, and innovative is essential for students in order to overcome the problems in case of encountering challenges in their real lives and careers (Zivkovic, 2016).

Both learners and teachers, educators, leaders, and administrators must be aware of and knowledgeable about 21st – century skills. Owing to the rapid changes in education and teaching context, the 21st – century skills awareness, usage and importance have been spreading and developing among individuals who are in the learning and teaching context. Therefore, these skills must be recognized especially by teachers and educators, in addition that teachers and educators must follow them closely and be able to successfully utilize them in their educational context (Ilhan, 2004).

In order to become fluent and accurate in English, learners have been developing several skills and they are trying to learn English in different ways. These skills directly specify the quality, facility and proficiency which means an acquisition through training and practice (Dweck, 2000). As Wagner (2008) stated, the 21st – century skills such as problem-solving and critical thinking, effective collaboration and communication skills, creativity and imagination skills, leadership, using initiative, information processing skills, mental agility and adaptation ability should be carried by students. According to World Bank (2011), the skills are critical for future educational and economic progress, therefore, the 21st –

century skills have become essential for the success of learners in the 21st – century since they enable the learners to regulate themselves, adjust and meet the requirements of the 21st – century at the hands of their scaffolders which are the teachers, educators and trainers.

In English as a Foreign Language (EFL) classrooms, practicing and processing of the 4Cs (critical thinking, collaboration, communication and creativity), applying cross-cultural and self-directional skills should be given to the pupils by their teachers (Fandiño, 2013). Teachers are supposed to be the starting point of the change since they are the appliers, decision-makers in education, it is essential for teachers to be cognizant of the 21st – century skills and their implementations in their educational context and the environment (Rusdin, 2018). Hence, teaching requires many commitments and competencies which should be recognized as a challenging and complex activity, a stronger focus on these skills and knowledge of instructor are needed globally. In addition, improving the teacher quality and thereby the quality of teaching can impact student achievement. If teachers understand their role in helping students understand the value of 21st – century skills and successfully integrate these skills into the learning process by focusing on pupils' academic and extracurricular activities, education quality may rise and reach higher levels both locally and globally.

According to these ideas about teachers, it is obvious that continuing professional advancement is a need for instructors which includes the necessities, requirements and qualifications of the 21st – century learning and innovation skills. In 2013, Gibson and Brooks stated that professional development focuses on teachers' needs and interests, gives importance to the 21st – century skills, it increases awareness and implementation of these skills and with the aid of continuous professional progress, instructors can broaden their viewpoints and increase their understanding of the new teaching techniques, forming and shaping their teaching context to reflect 21st – century skills.

The competencies and necessities are being investigated by teachers and researchers in order to fulfill the demands of the 21st – century. Several frameworks have been developed to organize plans and indicate a set of standards to understand these skills and their implementations about what learners and educators are able to do and should know. In 2006, Partnership for 21st – century Skills (P21) was originated, in 2003, En Gauge Framework was prepared in 2010, The Assessment and Teaching of 21st – century Skills Framework (ATC21S) and in 2018, Cambridge Life Competencies framework were formed as current conceptual frameworks for 21st – century skills. Those frameworks are the key elements for educators, teachers and researchers to find out the answers of several questions about the 21st – century innovation and learning skills such as what to conduct, how to implement and when to apply (Eker, 2020).

As a part of the 4Cs, communication a tool to communicate, mostly defined as exchanging knowledge through talking, writing, or using another form of communication. While communicating, people use various ways to convey the message, both verbal and non-verbal, aiming to transfer the message to the receiver. OECD (2009, p.10) defined communication as it follows: "In order to prepare pupils to be not only life-long learners but also active participants in broader communities with a voice and a sense of responsibility for others, communication is crucial." In teaching context and the environment, it is impossible to think the opposite and that communication is crucial for teachers and language learners and they must be aware of effective communication skills and the usage of these skills properly, which establishes a solid foundation for the usage and implementations of 21st – century skills.

Collaboration is one of the four Cs, and it is commonly understood to mean working with others skillfully and successfully to advance not just the academic and personal lives of instructors, but also the accomplishments and growth of students in their learning setting. Bedir (2019) stated that in order to work skillfully with others in groups, collaboration should be seen as a commitment. In the idea of collaboration, various teams can support to find out different perspectives to reach the target which indicates the importance of group work. Collaboration is seen as a part of communication where members of the group are accountable for their actions, they interact and respect individual's lifestyle,

abilities and ideas, as a conclusion that collaboration increases the efficacy of learning and teaching by contributing to the process.

The word creativity, which is directly related to the word "innovation", is the capability to analyse and think differently. Among the 4Cs, creativity is one of the important skills and traits of the 21st – century whether it is an innate and acquired skill or it is an ability and aptitude (Piirto, 2011). Creativity should be integrated into the teaching and learning contexts, and it must be provided with the main courses including science, maths and literacy and it can not be separated from other subjects (Robinson, 2011). Creativity in education is always thought of as a cognitive concept and generally, it is referenced to being innovative, imaginative and creative thinking. With the presence of creativity, it is obvious that learning becomes easier and more meaningful since both hemispheres are active during the learning and teaching processes which mean creativity is beneficial not only for learners but also for teachers. As evidence of this idea, Dornyei (2007) stated that there exists a positive correlation in between creativity and academic performance. In the situation of usage of both hemispheres, with the aid of creative abilities, learning becomes more meaningful, compelling, and enjoyable, learners can explore, engage and the language can be emerged by students in every level of teaching and learning processes (Maley & Bolitho, 2015). The importance of creativity has been emphasized for years by many scholars and researchers.

The skill of critical thinking is one of the key components for learners to provoke their schema and mind, in order to improve academically and learn more; additionally, it brings success in their daily lives. Critical thinking is generally seen as a capability to utilize a wide range of skills of cognitive processing including analysing, constructing and creating ideas, evaluating and problem-solving and this situation refers learners to solve unfamiliar problems and think deeply to reach their targets (Kivunja, 2015). In order to acquire critical thinking skills, learners should gain the capacity to employ thought processes, make judgements and choices and resolve issues with the help of reasoning effectively (Yeni, 2018). Therefore, in order to emphasize the importance and improve critical thinking skill, more significant questions needs to be directed, various responses, opinions and perspectives have to be assessed and better solutions, innovative and conventional methods are required in teaching and learning environment (Trilling & Fadel, 2012).

Apart from the 4Cs, there exist some other significant skills and they should be taken into consideration, therefore, importance should be given to these skills which are digital literacy skills and career and life skills. Understanding how to use and give value these abilities may have a significant influence on language learning and teaching procedures. Recently, we have been experiencing the coronavirus pandemic all around the world and this leads teachers, learners and researchers to use digital tools effectively and meaningfully. The ability to know and integrate digital literacy skills into lessons includes creating and evaluating media tools effectively, accessing and transferring the information via digital platforms and technological devices, using and managing the information as well as exchanging the information in education (Yeni, 2018). The coronavirus has prevented instructors from conducting face-to-face lectures and by virtue of those challenges and changes teaching and learning continued online, learners and students have started to learn digital literacy skills naturally and subconsciously without realizing that they are learning but they are in the process (Andersen, 2002).

As well as the skills mentioned above, career and life skills are the supporters and scaffolders for individuals to build opportunities during their life and these skills open a path for both teachers and students to use the 21st – century innovation and learning skills in their academic and personal lives. A teacher of the 21st – century must instruct and prepare learners for their future lives and careers, hence, teachers need to know that they should be flexible according to their students and be aware of the changes in order to adapt themselves (Eker, 2020). Three categories are used to divide life and career skills which are formed as (a) well-developed and effectively managed organizational efforts, (b) effective coordination of organization and information, (c) production development to solve issues and difficulties during any phase of career and life (Jenkins, et al., 2006).

To be able to remain relevant with the 21st – century and worldwide developments, teachers should be aware that they are the beginning point of any transformation and to be able to improve their students' perspectives and skills, they need to know the value of professional development. According to Jackson and Davis (2000), professional development includes a range of informal and formal processes and activities that present suggestions and research for teachers to exploit, engage and encounter teaching and learning outcomes not only inside but also outside the school, aiming to improve teaching, knowledge and skills. To be an effective 21st – century teacher, awareness of the skills and the essential acknowledgement is important to recognize similarities and differences between the actual in-class applications and 21st – century skills' requirements and with the help of professional development, this need can be fulfilled. The following is how Gibson and Brooks (2013) define experiences with continual professional growth:

- Supported by the administration and controlled by educators
- Focused on collaboration, modeling and affordances for feedback and practice
- Connected to active learning
- Delivered in significant ways
- Focused on content and curriculum
- Based on teachers' and students' needs
- Related to more chances for professional development
- Consistent and related to academic objectives
- Intensive and ongoing

By implementing an exploratory case research in a private college in Adana, Turkiye, this study aimed to observe instructors' opinions on 21st – century learning and innovation abilities in light of these broad backdrops and relevant literature review. Additionally, this research focused on increasing awareness of 21st – century skills and supporting teachers' and educators' continuous professional development. With the help of this study, it is aimed to increase teachers' knowledge of these abilities, as well as their awareness and use of them in the classroom. Furthermore, the study's findings would provide experts, educators and instructors with clarity for future research and implications.

These questions were created with the research's objectives in mind:

1- What are the perceptions of EFL teachers on 21st – century learning and innovation skills?

2- How do professional development activities contribute to EFL teachers' understanding of 21st – century skills?

Method

Research Design

In order to investigate EFL instructors' perspectives on 21st – century learning and innovation abilities and to assist them develop their pedagogical applications of the skills through professional development activities at a private college in Adana, Turkiye, this study used an exploratory case study. This research consisted of two phases which were known as qualitative and quantitative data collection ways and a mixed-method research strategy, as Dörnyei (2007b) indicated, yields more trustworthy data for a study.

Furthermore, in order to increase the validity and reliability of the study, a variety of data collection tools were employed.

Data Collection Tools

This study involved a group case study with an in-depth investigation (Zainal, 12007), for that reason a wide range of instruments was used to conduct the study. A questionnaire was used as the initial phase of the study's case analysis to gather qualitative data, and 105 people participated in the questionnaire. Following the completion of the questionnaire, a semi-structured interview with 10 participants who were part of the focus group and who taught English at different levels in the same private institution as the researcher was done. As a follow-up to the interviews, a seminar was organized for the same participants who attended the interviews, the topic of the seminar was "My Recipe… Looking at the 21st – century" which was briefed by a teacher trainer, Elna Coetzer. During and after the seminar, the same 10 participants also known as the focus group were asked to complete a KWLA chart (know,want-to-know, learn, action). As a last step of the study, the researcher asked participants to prepare lecture plans including the 4Cs and the 21st – century learning and innovation skills, additionally, they were supposed to prepare reflection papers about their lecture plans and emphasize the key events which they might experience or face with during their implementations of these lesson plans in their teaching context.

Participants

In order to facilitate easy access for the researcher and to invite all subjects to participate in the study without any specific criteria, 105 English language teachers from various regions of Turkiye were used for the quantitative portion of the study. Both a paper-pen format and an online format were used to collect data from the questionnaire and the open-ended survey (Saunders, Lewis, & Thornhill, 2012).

This sequential mixed methods exploratory case study's qualitative portion involved 10 English language teachers who had been working with students at a private school in Adana, Turkiye. They were chosen as a focus group of the study and their ages are between 24–45. Some of them had their Master's Degree and all of them had different previous teaching experiences. The difference between participant teachers' ages, previous experiences and educational backgrounds contributed to the validity of this study. These people answered the questionnaire and participated in the quantitative portion of the study as well. Then, they were interviewed in accordance with the aim of the study. After the interviews and questionnaire, they participated in a seminar which was organized for this study and completed a KWLA chart before, during and after the interview. As a last step, the participants were asked to prepare lesson plans including the 21st – century skills. After conducting their lessons, they wrote reflection papers about their teaching process with these skills. Since the researcher had taught English at the same school for three years, selecting participants by using convenience sampling made it simpler and easier to get pertinent data for this issue.

Data Collection Procedure

In this research, a five-point Likert scale questionnaire (always true for me, usually true for me, sometimes true for me, usually not true for me, never true for me) was used and the closed type section consisted of forty items, on the other hand, six items were open-ended questions, additionally, participants had the chance to rate how well they used their 21st – century learning and innovation abilities on a table.

The questionnaire was prepared in English for English language teachers and it was developed by Bedir's study (2017) of 21st – century skills. The questionnaire has items which incorporate statements about 21st – century learning and innovation skills and their sub-categories. The researcher created semi-structured interview questions pertaining to the study's goal and its research questions as part of its qualitative component. Prior to the seminar and reflection paper, ten English language teachers were interviewed. The ten interview questions were designed to elicit teachers' perceptions of 21st – century skills, awareness of these skills, and pedagogical implementations of these skills in the classroom.

As a part of the research, the researcher organized a seminar regarding the research and made up a KWLA chart for the same participants who had participated in interviews as the focus group. After

conducting the data collection procedure, as the last phase of the research, the participants were requested to make a lesson plan involving 21st – century skills and a reflection paper according to their lesson plans. The purpose of reflection papers was to analyze the challenges, advantages, disadvantages, students' reactions and teachers' feelings when they conduct a lesson including the 4Cs.

Stages	Data Collection Tools
Stage I	Questionnaire with 105 participants as case analysis
Stage II	Interviews with 10 participants (Focus Group)
Stage III	Seminar and KWLA Chart with 10 participants (Focus Group)
Stage IV	Lesson plans and Reflection Papers with 10 participants (Focus Group)

Figure 1. Procedure of the Study

Data Analysis

The researcher created semi-structured interview questions pertaining to the study's goal and its research questions as part of its qualitative component. 10 English-speaking people were interviewed. Both qualitative and quantitative methods were used in the data collection and analysis process. The interviews were promptly and verbatim transcribed. The researcher chose emergent coding and employed content analysis to create codes and categories by using ATLAS.ti. Emergent coding creates codes with categories and their subcategories after the texts (Stemler, 2001). By using ATLAS.ti for the qualitative analysis, networks and memos were created and commonly-used words and phrases were selected to create a valid and general answer for the interview questions. The qualitative part of the survey was analysed by following the same technique and the most frequent and similar answers were selected as general responses. Apart from these, the responses of KWLA chart were analysed in three different categories by following Patton's research (2002) to increase reliability, validity and quality of the study. Field notes and key events were noted during and after the seminar by participants and the data were analyzed in qualitative ways for the overall analytical strategy. As a last step, the reflection papers were categorized and grouped by the researcher and each stage of the lessons was analysed by following a systematic approach in qualitative ways. The researcher asked for details to the participant teachers when it was needed to see the whole picture clearly. To sum up, qualitative data were analysed in appropriate ways which include coding and categorizing in systematically to empower the reliability of this study.

For the questionnaire, descriptive statistics which presents a summary of data with mode, median and mean (Ali & Bashkar, 2016), were used. Teachers' responses to the questionnaire were entered into Statistical Package for the Social Sciences (SPSS) and negatively worded statements were recorded before calculating the composite scale scores. With the help of SPSS, frequencies, percentages, mean scores and deviations were calculated to analyze data. All in all, using more than two types of data collection tools and a variety of data analysis techniques provide triangulation and this increases the trustworthiness of the research.

Findings

Findings of Quantitative Data

Table 1 displays information from the questionnaire, including some of the questions, and shows how instructors are aware of and using 21st – century learning and innovation abilities.

Table 1.
Descriptive Results of Implemantations and Awareness of the 21st – century Skills (with the Main Categories of the Questionnaire)

	Question	Mean	Std. Deviation
Communication and Collaboration	I can articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts.	4,35	0,82
Creativity and Innovation	I can create new and worthwhile ideas.	4,29	0,85
Critical Thinking and Problem Solving	I can ask questions at all levels of Bloom's Taxonomy of Thinking, but match the purpose with the correct type of question.	3,90	0,99
Reflection and Awareness	I reflect critically on my learning experiences and processes.	4,42	0,75

Except for one item about the ability of critical thinking and problem-solving, most of the items related to 21st – century learning and innovation skills generated mean scores above 4, as shown in the table. The items above a mean score of 4 show a positive inclination and these items belong to communication and collaboration, creativity and innovation and reflection and awareness. However, the critical thinking skill item had the lowest mean score, which was under 4, hence it can be inferred that instructors should concentrate more on honing this talent than the other 4Cs. The questionnaire had 40 items and 39 of them indicated a mean score above 4, which indicates that English language teachers in Turkiye are aware of 21st – century skills and they have been using these skills actively in their teaching contexts. In addition to these 40 questions, the questionnaire included a chart to indicate how much emphasis was being placed on 21st – century skills. (see Table 2).

Table 2.
The Level of Emphasis 21st – century Skills (%)

Skills	Strong Emphasis	Moderate Emphasis	Little Emphasis	No Emphasis
Critical Thinking	46,7	37,1	14,3	1,9
Creativity and Innovation	49,5	36,2	11,4	2,9
Problem Solving	57,1	29,5	11,4	2,0
Communication	75,2	16,2	5,7	2,9
Collaboration	63,8	23,8	10,5	1,9

Note. (n=105)

As shown in Table 2, among the 4Cs, communication is mostly used by English language teachers who participated in the questionnaire and this skill is followed by collaboration. It is observable that critical thinking skills have the lowest score on "strong emphasis", which stands with Table 1. According to this table, critical thinking and creativity and innovation skills should be developed and usage of these skills should be increased in teaching contexts. Table 2 sums up the usage and implementations of the 21st – century learning and innovation skills.

Findings of Qualitative Data

The qualitative data were obtained from the open-ended part of the questionnaire, interviews, KWLA chart, lesson plans and reflection papers with the focus group of the study.

Findings of the Open-Ended Response Part of the Questionnaire

Questions	Responses
Do you think these skills are effective in language learning/teaching? Please explain briefly.	According to the answers, The majority of the participants agreed that these skills had an impact and were crucial. Their perceptions on 21st – century skills are mostly positive. *These are undoubtedly helpful when it comes to English teaching. All of the skills must be taken into account when attempting to teach any subject... (P89)*
Describe a specific activity or strategy you used in your classroom that addresses these skills.	Most of the participants have been implementing a variety of activities and strategies to grab students' attention and achieve their targets. *I made the decision one day to let my pupils pick the subject they wanted to talk about in class. They also created some more resources and planned a discussion. I believe this is a solid illustration of the 4C skills taught in the lesson. (P103)*
Describe your confidence in teaching these skills after you completed your teacher preparation program.	According to the answers, most of the participants claimed that the level of their working experience and the level of their confidence are interrelated with each other. *Well, as time goes on, I feel more comfortable imparting these skills. It has to do with how well you can adapt to your students given the time and experience you have. It always takes time to comprehend and interpret those. (P24)*
What could be the underlying rationale that led to the introduction of these skills into the curriculum?	Participants said that a variety of factors, including technology, the pandemic, global changes, globalization, new developments and requirements to be a successful individual in the 21st – century. *More emphasis should be placed on preparing students for the future than just academic success in the 21st – century,… In order to prepare students for increasingly complex life and work environments, it is essential to place a strong emphasis on creativity, critical thinking, communication, and collaboration. (P103)*
Please provide us with any additional comments you may have about the 21st learning and innovation skills.	This question aimed to find out teachers' thoughts about 21st – century skills. Most of the participants recommended that in order to develop and integrate these skills and raise awareness towards them, educators need developments in their professional fields. *Collaboration, critical thinking, communication, creativity, digital literacy, and problem-solving skills are just a few of the competencies that 21st – century education emphasizes and advocates believe schools should teach in order to prepare both students and teachers for success in the modern world.. (P66)*

Figure 2. Open-Ended Response Part of the Questionnaire

Findings of Interviews

Interviews were conducted with 10 participants who have been working at the same school as English language teachers and they were audio-recorded. Interviews were transcribed verbatim immediately after conducting them. The interviews aimed to investigate participants' perceptions, ideas and beliefs about being a 21st – century skills teacher, find out their definitions and understanding about these skills and gather information about their level of implementations and classroom practices of these skills. Additionally, the participants answered a set of questions about barriers and the MoNE (Ministry of National Education).

The participants were asked a number of questions about their knowledge and awareness of these skills, and it can be seen from their responses that most of the participants are aware of these skills, especially the 4Cs, but some of them aren't, and they gave different responses when they were asked to identify these skills. Additionally, they claimed that with the help of 21st – century learning and innovation skills, students would become more eager to learn, they would be more active during the teaching and learning process and this situation would be easier for teachers' to garner students' interests, attention and participation.

Among interview questions, one was seeking answers to the meaning of being a 21st – century skills teacher and participants answered this question in similar ways by highlighting the importance of professional development activities, keeping up to date with the changes in the world, professional growth and improvement with the help of administrators and government and being able to integrate and manage these skills with the help of continuous professional development.

> *A teacher with 21st – century skills can come up with unusual ways to capture students' attention, use their minds to be more creative, and get them interested in the lessons. A teacher of 21st – century skills should constantly provide opportunities for professional growth in order to keep up with societal changes. (Respondent 10)*

In the interview, there were two questions about promoting 21st – century skills and using them in educational settings with the support of the Ministry of National Education (MoNE). The participants asserted that even though MoNE is aware of these skills, the support and training provided for instructors and students are insufficient. Most of the participants indicated that they need to be supported by the government, administrators and MoNE in order to improve these skills and implement them effectively in their teaching context. Seminars, training programs, professional development activities and conferences can be organized for teachers and learners to develop awareness and conduct these skills in daily and academic lives.

The researcher asked some questions about the implementations and usage of these skills such as sample activities that they and their school implement, classroom practices to increase usage of these skills and possible barriers and limitations that prevent teachers from conducting and integrating them in their teaching environment. The majority of participants said that they focused their lessons on communicative and collaborative tasks, in addition that they were using technological tools actively and effectively in order to grab students' attention since they were surrounded with the latest technological tools as they are the new generation.

The researcher's final question to the interviewees focused on the obstacles and constraints that prevent the application and use of 21st – century skills. Their answers were similar which were about lack of support from the government and MoNE, students' background and readiness to change, course books, technological tools, and gadgets were insufficient, and teachers' knowledge, awareness, and application of these skills were lacking.

Findings Obtained with the KWLA Chart

Among qualitative data collection instruments of the study, the researcher developed a KWLA for the participants which were the focus group of the study and a seminar was organized for this study by the researcher. The seminar's theme was "My Recipe... Looking at the 21st – century," and it was delivered by teacher trainer and educator Elna Coetzer. The participant replies are shown in Table 3 for each column.

Table 3.
Responses of the KWLA Chart

What I Know	What I Want to Learn	What I Have Learned	What Action I Will Take
21st – century skills help learning and teaching effectively, prepare students for their future careers.	I wish to discover how to combine those skills into a lesson and I want to learn how to prepare my learners for the future.	I've mastered incorporating these abilities into my lessons and be open to changes. I have learned how to help my learners to use these skills.	I'll include these activities and skills in my lesson plans and help my learners by showing them the usage of these skills.
I know about the 4Cs.	I want to learn how to develop professionally.	I have learned about new techniques, methods and activities to use.	I will continue developing professionally and broaden my horizons.

Results of Instructors' Reflection Papers about Their Lessons

The participants were required to create a lesson plan that included the 4Cs as the final step of the current study and to critically reflect on their lessons. The aim of the researcher is not only to support the qualitative data but also to investigate the challenges, difficulties, strengths, weaknesses, advantages and disadvantages that the teachers encountered during their lessons. Additionally, these reflection papers and lesson plans helped the researcher to visualize the flow of the lesson and they were used to find out students' behaviors, reactions and attitudes towards the lesson. Some of the participants' responses are as follows:

> *My students were thrilled to work together to finish the job after I taught a lesson that included the 4Cs. They did this by using their critical thinking and problem-solving abilities to evaluate and organize the activity's components. They all employed the 4Cs in an integrated manner when I separated them into groups and asked them to develop their own scenarios using the target language, and their happiness with the class was evident right away. I recognize the value of using these talents once more as a teacher in the twenty-first century. (Teacher 1)*

> *Regarding the students' opinions, it should be noted that they considered this exercise to be both quite helpful and fascinating. When students needed to make decisions as a team or group, they discovered a new method of learning that involved using their own resources and fresh guidelines on how to accomplish newly formed objectives and desires. (Teacher 9)*

As presented above, the findings are consistent with one another, and information acquired using both qualitative and quantitative approaches was connected. The study's conclusions indicate that although instructors are aware of the 21st – century learning and innovation skills, they still require assistance and training to become proficient in these abilities and implement them effectively. Furthermore, professional development activities are required for teachers and MoNE should support teachers and educators in terms of this issue.

Discussion, Conclusion, and Suggestions

The study sought to investigate English language teachers' perceptions on 21st – century learning and innovation skills and their pedagogical implementations. Furthermore, with the help of this study, English language teachers' awareness about these skills was explored.

According to the findings of the study, the participating teachers indicated that they are aware of these skills and they have knowledge of them. They strongly claimed that these skills are as important as the mastery of core subjects for their learners' academic and professional lives. Teachers have highlighted that they are supposed to provide and integrate these skills in their teaching context, for this purpose

they need to be trained and supported by administrators and the Ministry of National Education (MoNE). Erdoğan (2019) stated that in order to succeed in academic and work lives, 21st – century skills are fundamental essentials, therefore teachers need to prepare learners for their future with these skills. She also indicated that unless these skills are provided to the students, they graduate without the knowledge of them and as a result of this situation they will have problems in society and work.

Although teachers emphasized that they have the knowledge and awareness of 21st – century skills, they also admitted the lack of experience and training to develop and implement these skills effectively in their teaching context. Professional development is crucial especially in this era, it is a key process for teachers in order to engage inside and outside of their teaching context, it should be continuous, ongoing and it should open a path for teachers to improve their knowledge, awareness and practices of these skills (Jackson & Davis, 2000).

As it is observed in the results, conducting a seminar with a KWLA chart and preparing a lesson plan including reflection papers are some activities of professional development. Therefore, this research was designed as an exploratory case study which is accepted as a direct interference for teachers and educators in order to improve their professional growth and development (Hensen, 1996). With the help of this study and the seminar, participating teachers claimed that they became more enlightened and experienced in terms of integrating and implementing the 21st – century learning and innovation skills. Additionally, they admitted that they feel more comfortable and confident since they know how, when and in what ways to apply these skills and how to prepare their students for their future. Orak (2019) concluded in her study that participating teachers were highly motivated to provide these skills and develop them in their teaching contexts.

The participants in the research have emphasized that they were aware of the 21st – century skills, however, they need to be supported and trained professionally by MoNE, the government and their administrators. Teachers emphasized that "inadequate curricular standards and a rigid culture of test-based evaluation" (Bedir, 2017) prevent them from developing and implementing these skills even though they have an interest and desire to use them effectively. As a result of this situation, it is observed that the importance of professional development should be addressed and adaptations should be established since they are the requirements of this new era (Guoyuan et al., 2018). According to Happ (2013), the 21st – century learning and innovation skills are needed to be promoted by teachers and placed in the curricula in order to develop competent individuals in this global world.

The current study focused to find out English language teachers' perceptions on 21st – century skills and their pedagogical implementations in their teaching contexts, in Turkiye. Additionally, this study aimed to contribute to the literature in the field of English language teaching in the 21st – century.

The 21st – century learning and innovation skills, communication, collaboration, creativity, critical thinking (the 4Cs), digital literacy skills and life and career skills are essential for learners and teachers both in their academic and work lives, in order to be effective leaders, individuals and citizens, therefore, these skills should be placed in the curriculum and the syllabus and the MoNE (Ministry of National Education) should support teachers and students in terms of this topic.

Professional development sessions and training programs are required in order to develop and encourage enlightened eclectic in-service and pre-service teachers of the 21st – century, with this way it is possible to develop well-qualified individuals for the future and improve teachers' practices, awareness, knowledge and beliefs of the 21st – century skills. The results of this study have revealed that teachers are open to change and they are willing to adapt themselves to the requirements of the 21st – century skills, for this reason they need to be guided by the administrators and the MoNE for professional development. It is obvious that teachers' awareness and implementations of the 21st – century skills and professional development activities are closely interrelated.

This study has some suggestions for this field in terms of exploring and investigating the perceptions of learners about 21st – century learning and innovation skills and their points of view about their teachers' implementations of them. As this current study was designed as a mixed-method exploratory case study, the same situation of this context might be analysed deeply within various and different research designs.

Apart from these, the number of participants was limited for the qualitative part of this study which may lead to different results in a wider context.

Additional studies might focus more on the effects of professional development sessions in order to improve teachers' awareness, knowledge and implementations of the 21st – century learning and innovation skills. Furthermore, various and different data collection tools can be used when conducting future research.

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Ethic statement: In this study, we declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that we do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, we declare that there is no conflict of interest between the authors, that all authors contribute to the study and that all the responsibility belongs to the article authors in case of all ethical violations.

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More than 'thanks': Responding to compliments in a second language

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Abstract

This study aims at investigating the macro and micro strategies used to respond to compliments in a second language. For this aim, advanced-level Turkish learners of English as a foreign language were given a written discourse completion task (24 items) and were asked to rate the metapragmatic appropriateness of their responses on a scale from 1 to 5, where 1 meant not appropriate at all and 5 meant highly appropriate. The study specifically addresses the role of gender on (i) the strategies used to respond to compliments in a foreign language and (ii) metapragmatic judgments of the appropriateness of these responses. The utilized response strategies to the compliments were coded in terms of the categories proposed by Boori (1994). Overall, the findings showed that the female participants tended to accept the compliments whereas the males preferred to reject them as macro-level strategies. Both groups of learners relied heavily on micro-level response strategies such as an appreciation token, a comment, and returning the given compliment. The findings revealed similar tendencies for both genders across items; however, females statistically significantly differed from males on two items which elicited responses to the compliments received on possession and looks. What is more, the perceived pragmatic appropriateness on two items eliciting responses to a compliment on a skill and a personality trait was statistically significantly higher for females than for males. The findings suggest that gender may play a slight role in compliment responses and their perceived appropriateness.

K**eywords:** Pragmatic competence, EFL, compliment responses, gender, metapragmatic awareness

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Introduction

Pragmatic competence refers to the ability to use language forms in a range of environments, hosting relationships between the speakers and the social and cultural circumstances (Gass & Selinker, 2008). It is of the essence for effective communication and conflict resolution. Speech acts constitute a major part of pragmatic competence since they are the means for individuals to achieve pragmatic goals such as making requests and promises and giving and responding to compliments. Within the speech act theory (Austin, 1962), compliments, and compliment responses (CRs) can be defined as 'phatic speech acts that grease social wheels' (Wolfson, 1983:89). The recipients of a compliment are often left in a dilemma since regardless of how small compliment phrases are, they could be very complicated to respond to. Within the pragmatic framework, Leech's (1983; 2014) politeness model suggests that social equilibrium and friendly relations are maintained thanks to the certain sacrifices we make in a conversation. For instance, the recipient of a compliment on cooking skills can return it by being generous and inviting the speaker for dinner. Here *the generosity maxim* is violated by putting the other ahead of yourself. *The modesty maxim* is put in effect when the recipient of the compliment returns it with minimal praise and maximum dispraise as in 'I am dumb at cooking, I just follow online recipes'. *The agreement maxim* is in place when the recipient of the compliment returns it by maximizing the agreement between the self and the other as in 'Yes, I think I did a good job with that sauce!'. As a result of these maxims, the strategies utilized in responses to compliments would most of the time be to accept, evade or reject the compliments depending on the favored social values of the culture. These three so-called macro strategies to CRs have been linked to our desire to look modest and humble (Gu, 1990), to avoid self-praise (Pomerantz, 1978), to deny that the recipient of the compliment is superior to the speaker (Winch, 2013) or to doubt about the sincerity and honesty of the compliment (Herbert & Straight, 1989).

In addition to socio-cultural norms, responding to compliments is subject to age, race, gender, and ethnicity (Talbot, 2010). For instance, most English-speaking cultures welcome compliments; yet a number of English speakers feel that a simple 'thank you' is not a sufficient compliment response (Cheng, 2003: 26). While Spanish speakers welcome the compliment with a meaningful comment and try to play it down, American speakers regard a simple 'thank you' as a pragmatically appropriate response (Mir & Cots, 2017). New Zealanders show a tendency to accept compliments (Holmes, 1990). Indians may directly reject or disagree with compliments whereas Caucasians try to soften the disagreement and avoid the compliment (Chick, 1996: 335). Japanese speakers avoid self-praise (Daikuhara, 1986) or may resort to different sources of justification such as checking for its accuracy, denying, or downplaying the compliment, or saying nothing with a smile (Barnlund & Araki, 1985:14). The recipients of compliments under the age of 30 welcome compliments on their appearance whereas those older than 30 value compliments on their skills (Cordella, Large & Pardo, 1995).

Compliment response strategies have been explored among Turkish speakers. Ruhi (2006) reports that Turkish speakers were likely to welcome the compliment with an appreciation token, a smile, or praise upgrade most of the time. Although the pattern was not much favored, they would reject the compliments by showing disagreement, keeping silent, or downgrading the compliment. Such responses are taken as indicators of impoliteness where the recipient of the compliment overtly confronts and challenges the compliment. Gender-related variations in the compliment responses of Turkish speakers were observed in the sense that females were more likely to accept the compliments whereas males were most likely to reject them (Baş, 2021).

Studies have also investigated inter-language transfer effects on the CRs of Turkish speakers in a second language (L2). Karagöz-Dilek (2020) reports CRs of six undergraduate students in Turkey who took part in a role-play task. The participants tended to show positive pragmatic transfer from first language (L1) Turkish to L2 English by evading the compliment in both languages and resorting to explanation as one of the main CR strategies. İstifçi (2017) implemented a written discourse completion task on Turkish and Chinese L2 learners of English. Both groups of non-native speakers diverged from native speaker norms in that they resorted to cliches, jokes, and expressions used in their native language. Varol (2015) studied CRs by Turkish, English, and Turkish learners of English as a foreign language (EFL). Both groups of native speakers differed in their CRs, but the EFL group

was more inclined to evade the compliments abiding by the native speaker norms. Korkmaz (2020) found that Turkish speakers relied on accepting the compliment as the dominant CR strategy and female speakers used fewer CRs than males. Turhan & Tuncer (2022) report that both male and female Turkish EFL pre-service teachers resorted to appreciation while responding to compliments. Yet, males preferred to receive praise upgrades more often than females who preferred to shift the credit to a third party.

Although inter-language pragmatic transfer has been widely studied in the literature (e.g., Bu, 2010; Cheng, 2011; Karimnia & Afghari, 2011), the role of gender is a relatively understudied area in responding to compliments in a second language. The effect of gender on compliment responses in an L2 was studied in the Iranian context (Heidari, Rezazadeh, & Rasekh, 2009). Female Iranian speakers were found to be evading and rejecting compliments in English when compared to males who opted to give explicit CRs. Female Iranian learners of English as an L2 with varying levels of proficiency resorted to implicit remarks such as returns, questions, and offers when compared to males who were more direct in their CRs (Allami & Montezori, 2012). Speakers are cited to be influenced by their culture-specific norms and speakers of a second language could resort to the pragmatic norms of their mother tongue especially when they lack pragmatic knowledge in the L2 (p. 477). Heidari-Shahreza, Dastjerdi, and Marvi (2011) investigated the compliment responses of Persian EFL learners on a written discourse completion task. The female participants evaded compliments on possession whereas the males accepted the compliments regardless of being praised on possession, ability, character, or appearance. Jalilzadeh-Mohammadi and Sarkhosh (2016) offered evidence for the role of exposure and acculturation in the CRs of female and male English teachers when compared to male and female non-English teachers in the Iranian context. EFL learners across genders could meet the culturally appropriate norms in responding to compliments in English and those in Persian (Sharifian, Chalak, & Dehkordi, 2019). Male Persian EFL speakers are found to use more CR strategies when compared to females who were inclined to accept the compliments to build solidarity and rapport with the interlocutor (Tamimi, 2015).

Morales (2012) investigated the role of gender in the CRs of Filipino EFL learners of high-schoolers. Both genders were inclined to accept the compliments and very few tended to reject them. Females mostly resorted to an appreciation token and returned the compliments. Both genders used implicit CR strategies. Yet, males were more likely to give a comment history whereas females opted to shift the credit while responding to compliments in L2 English. Yousefvand (2010) explored the role of gender in CRs of Persian-English bilinguals through a discourse completion task. The general tendency was to agree and show modesty when complimented. The male speakers were inclined to reject the compliment whereas the females accepted the compliment sometimes with a surprise. Suteerapongsit (2020) studied the CRs of Thai EFL learners on a role-play task and concluded that micro-level CRs were shaped by gender-based values. In the Moroccan context, Masmoudi and Jarrar (2022) found that university EFL learners of both genders accepted the compliment the most, but the two groups differed with respect to their CRs at the micro level. That is, the females made use of praise upgrade and return strategies whereas the males tended to welcome compliments with an appreciation token in all areas of praise except for those about the character.

One dimension that contributes to pragmatic competence in a second language is metapragmatic awareness which depends on the judgments made on the appropriateness of the given responses. Metapragmatics can be defined as the study of the metalinguistic dimension of language (Silverstein, 1979). Metapragmatic awareness relates to the knowledge of *what* is considered (in)appropriate language use in a given socio-pragmatic context. Studying metapragmatic awareness of second language speakers may help one gain insight into a more complex set of advanced-level abilities of sociolinguistic differences and conflicting pragmatic requirements that are far beyond advanced levels of proficiency (Kinginger, & Farrell, 2004). Research thus far focused on the effect of the pedagogical intervention on complimenting and compliment responses. One commonly reported finding is that pragmatic instruction on the speech act of giving and responding to compliments results in increased metapragmatic awareness in the target language (Saadati & Musayeva Vefalı, 2021; Rose & Kwai-Fong, 2001). The role of metapragmatic judgments to CRs on the development of pragmatic competence was limited to judgments after the pedagogical intervention. What differentiates this paper

from the previous work in the literature is the exploration of the role of gender in CRs without the effect of pragmatic instruction. Following the line of gender-based research in second language pragmatic competence and metapragmatic awareness, the purpose of this paper is to investigate the type and frequency of responses to compliments by advanced-level Turkish EFL learners. Categories of compliment responses were constructed under the classifications proposed by Boori (1994). These categories range from providing a comment or appreciation token to denying the compliment or providing no response at all. In addition, the recipients of compliments were asked to rate the pragmatic appropriateness of their responses on a scale from 1 to 5, where 1 meant 'very poor' and 5 meant 'very appropriate'.

Method

This study adopted a descriptive case study design that aimed at describing which compliment response strategies were used by male and female advanced-level Turkish EFL learners in given situations. Convenience sampling was used in participant recruitment. The research questions addressed were the following:

(i) What are the macro and micro-level compliment response strategies used by advanced-level Turkish EFL learners?
(ii) To what extent do these learners perceive their compliment response strategies as pragmatically appropriate?
(iii) Does gender play a role in the compliment response strategies and self-rated assessment of the appropriateness of these strategies?

Procedure

Approval for this study was obtained from the university board of ethics of a state university in Turkey. The data was collected from first-year college students. The participants were asked to complete a 24-item written discourse completion task (WDCT; Allami & Maontazeri, 2012) and a self-assessment rating task. The items included praises received on personality, skills, possessions, and appearance. Here are some of the representative items from each category:

(1) You are trying to deal with one of the problems you have encountered as the person in charge of a particular department. While you are working in your office, one of the colleagues comes up to you and says, 'You have so much patience to work like this. I wish I could be like you.' (Item 6, character/personality focused)
Your response:
Rating:

(2) After having finished the lunch you had prepared, one of your family members tells you, 'You're such a great cook!' (Item 9, skills/ability focused)
Your response:
Rating:

(3) You have recently purchased a new car. On seeing it, your colleague's son tells you, 'What an awesome car!'
Your response:
Rating: (Item 13, possession focused)

(4) You have an important meeting and for that reason, you wear something good to look really professional. On seeing you, your boss tells you, 'You look chic today!'
Your response:
Rating: (Item 16, physical appearance/looks focused)

These four categories were not distributed evenly across the task. The participants were also asked to self-rate the pragmatic appropriateness of each of their compliment responses on a scale from 1 to 5, where 1 meant 'not appropriate at all', 2 meant 'not appropriate', 3 meant 'not sure', 4 meant 'appropriate' and 5 meant 'highly appropriate'. Both tasks were conducted in English without any adjustments. Such afterthoughts are claimed to raise self-awareness (Cohen, 1996). The aim of integrating a metalinguistic judgment task is to have insight into how the participant evaluates the intention and response given to the compliment by considering the social context. The participants

were given the liberty to go back and forth on the written discourse completion task to modify their responses. Following Allami and Montazeri (2012), the coding scheme was adapted from Boori (1994) based on the categories suggested by Chiang and Pochtrager (1993) and Herbert (1990). The data was entered anonymously into Excel sheets and the types of compliment strategies used were coded under three macro-level and twelve micro-level compliment response strategies. 20% of the data was re-coded by two other coders (a male and a female) to ensure sex-based confounding factors. The average inter-coder reliability was .86. The self-rating scale had high internal reliability (.88). Descriptive statistics in the form of frequencies and percentages were used to report the data. Mann-Whitney U tests were conducted to explore the effect of gender on compliment responses and their perceived self-rating using SPSS (IBM, 2017). The Mann-Whitney U test is a non-parametric measure of variance that compares the rank order of observations between two groups.

Participants

A total of 35 advanced-level Turkish EFL learners, pursuing their first-year undergraduate studies at the English Language Teaching Program of a state university in Turkey, took part in the study. Among the 35 participants, 19 of them were males. The females had a mean age of 18.56 (SD=.63, range= 18-20) and the males had a mean age of 18.74 (SD=1.05, range= 18-21). The two groups were not statistically significantly different age-wise, t (33) =.58, *p*=.55. The participants were screened to be advanced-level learners of English as a result of the institutionalized test of proficiency given by the school of foreign languages.

Findings

First, compliment response strategies at the macro and micro levels were presented. Next, differences between genders were investigated based on the responses given to the written discourse completion and self-rating tasks. Figure 1 below gives a summary of the macro strategies used in CRs.

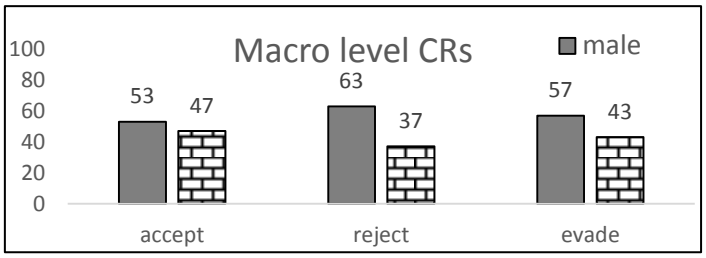

Figure 1. Macro CR strategies across genders

As illustrated in Figure 1, males and females opted for different macro-level CR strategies. Females were more inclined to accept, evade or reject the compliments, whereas the male participants in this study preferred to reject, evade, or accept the compliments in a second language. Table 1 exemplifies the type of compliment response strategies and their frequency of use across genders.

Table 1.
Compliment response categories across genders

Macro level CRs	Micro level CRs	Example	gender	F (%)
Accept	Appreciation token	Thank you very much indeed!	Male Female	56 (44) 71 (56)
	Return	You are successful, too!	Male Female	84 (56) 66 (44)
	Comment	I myself have chosen it!	Male Female	73 (56) 57 (44)
	Comment acceptance	I myself like it too!	Male Female	78 (64) 44 (36)
	Praise upgrade	I have always been sympathetic!	Male Female	46 (48) 50 (52)
	Politeness	Bon appetite!	Male Female	6 (75) 2 (25)
	Offer	You can take it!	Male Female	25 (42) 34 (58)

Table 1 continuing

Reject	Ignore (denial)	No, not at all!	Male Female	25 (63) 15 (38)
	Question	Do you really mean it?	Male Female	20 (65) 11 (35)
Evade/Deflect	No response	The addressee either keeps quiet or gives no response	Male Female	5 (71) 2 (29)
	Comment history (informative comment)	Oh, they brought it to me from Brazil.	Male Female	21 (57) 16 (43)
	Reassignment (shift credit)	I took after mum!	Male Female	19 (54) 16 (46)

As given in the table above, three macro-level strategies yielded twelve categories of micro-level strategies (see Table 1 for examples). The most frequently used compliment responses were appreciation tokens, returning the compliment, making a comment, and accepting the compliment. Praise upgrade was the other most often used response type to the compliments. The females used three strategies more frequently than males when responding to compliments. They appreciated the compliment more, sought further remarks of praise, and offered something in return when complimented. Yet, the use of compliment response strategies was not statistically meaningful across genders (U=57, *p*=.39). When the overall responses were examined, the effect of gender was observed on an item that required a response to a compliment on a possession (U=73, *p*=.008) and on one other item that addressed a compliment to be given on good looks (U=351, *p*=.032). Table 2 presents an item-by-item breakdown and self-perceived pragmatic appropriateness of CRs with respect to gender differences.

Table 2.

The category example and distribution of compliment responses across genders

Items	Gender	Situational setting	Frequent response	N (%)	Appropriacy Median (SD)	Range
Item 1	male	Skills/ability focused	Return	8 (42)	4(.71)	3-5
	female		Appreciation token	6 (38)	4(.96)	2-5
Item 2	male	Character/personality focused	Return	14 (74)	4(1.18)	1-5
	female		Return	13 (81)	4(.81)	3-5
Item 3	male	Skills/ability focused	Comment acceptance	5 (26)	4(1.06)	1-5
	female		Appreciation token	7 (44)	4(.82)	3-5
Item 4	male	Character/personality focused	Appreciation token	4 (26)	4(.93)	2-5
			Comment history	4 (26)		
			Praise upgrade	4 (26)		
	female		Comment acceptance Praise upgrade	4 (25) 4 (25)	4(.89)	2-5
Item 5	male	Skills/ability focused	Comment acceptance	4 (21)	4(1.01)	1-5
	female		Comment	6 (38)	4(1.03)	2-5
***Item 6**	male	Character/personality focused	Comment	5 (26)	3(1.08)	1-5
	female		Comment	7 (44)	4(1.38)	1-5
Item 7	male	Skills/ability focused	Appreciation token	4 (21)	4(1.12)	1-5
			Comment	4 (21)		
	female		Comment	4 (25)	5(1.13)	1-5
Item 8	male	Skills/ability focused	Praise upgrade	4 (21)	3(1.41)	1-5
	female		Denial	4 (25)	4(1.36)	1-5
***Item 9**	male	Skills/ability focused	Politeness	6 (32)	4(1.25)	1-5
	female		Return	4 (25)	5(1.03)	2-5
Item 10	male	Character/personality focused	Comment	5 (23)	4(1.16)	1-5
	female		Offer	5 (31)	5(1.01)	2-5

Table 2 continuing

	male		Praise upgrade	5 (26)	4(.95)	2-5
Item 11	female	Skills/ability focused	Return	5 (31)	4(.97)	2-5
	male		Return	12 (63)	4(.99)	1-5
Item 12	female	Character/personality	Return	4 (25)		
		focused	Comment	4 (25)	4(1.38)	1-5
	male		Offer	6 (32)	5(1.29)	1-5
Item 13	female	Possession focused	Offer	6 (38)	4(.75)	3-5
	male	Physical	Praise upgrade	7 (37)	4(1.10)	1-5
Item 14	female	appearance/looks	Praise upgrade	4 (25)	4(.83)	2-5
		focused				
	male		Comment	7 (37)	4(1.22)	1-5
Item 15	female	Possession focused	Appreciation token	6 (38)	3(1.03)	2-5
	male	Physical	Return	5 (26)	4(.93)	2-5
Item 16	female	appearance/looks	Appreciation token	4 (25)		
		focused	Return	4 (25)	4(.96)	2-5
	male		Comment	4 (21)		
Item 17			Comment history	4 (21)		
		Possession focused	Comment	4 (21)	3(.91)	2-5
			acceptance			
	female		Return	6 (38)	3(1.38)	1-5
	male	Physical	Comment	8 (42)	4(.89)	2-5
Item 18		appearance/looks	acceptance			
	female	focused	Appreciation token	5 (31)	4(.77)	2-5
	male	Physical	Comment	6 (32)	4(.87)	2-5
Item 19	female	appearance/looks	Comment	6 (38)	5(.95)	2-5
		focused	acceptance			
	male	Physical	Comment	7 (37)	4(1.30)	1-5
Item 20		appearance/looks	acceptance			
	female	focused	Appreciation token	4 (25)	4(1.03)	2-5
	male		Offer	8 (44)	4(1.38)	1-5
Item 21	female	Possession focused	Offer	13 (81)	5(.89)	2-5
	male	Physical	Appreciation token	7 (37)	4(1.21)	1-5
Item 22	female	appearance/looks	Praise upgrade	4 (25)	5(1.18)	2-5
		focused				
	male		Appreciation token	4 (21)		
Item 23			Comment	4 (21)	4(1.26)	1-5
		Possession focused	acceptance			
	female		Offer	5 (31)	4(.86)	3-5
	male	Physical	Comment	7 (37)	5(1.30)	1-5
Item 24	female	appearance/looks	Appreciation token	4 (25)		
		focused	Return	4 (25)	5(.73)	3-5

**p<.05*

The responses to the self-assessment rating task, in other words, the metapragmatic judgments are reported with respect to median appropriacy, standard deviations, and range. As shown in Table 2, in general, both groups of students rated their CRs as pragmatically appropriate. None of the participants held the opinion that their responses were inappropriate. The items with unsure responses included responses given to compliments on character, ability, and possession. However, neither of the groups was sure about the CRs they gave to a compliment on a possession. A Mann-Whitney U test indicated that the perceived pragmatic appropriateness was higher for females than males on Item 6 (U=190, p=.03) and Item 9 (U=199, p=.02).These two items asked for a response to a compliment on a skill and a personality character, both of which were inherent to the individual. This may suggest that females view it pragmatically more appropriate than males to respond to compliments related to traits and skills rather than those on possessions. With the remaining items, there was no determining effect of gender on perceived pragmatic appropriateness.

Discussion, Conclusion, and Suggestions

This study explored the type of macro and micro strategies used in CRs and the role of gender in these response strategies along with their self-perceived pragmatic appropriateness. One main finding is that both groups differed in the macro strategies they used to respond to compliments. That is, females tended to accept compliments more often when compared to males who tended to reject them[1]. This finding supports previous work in the L2 literature (e.g., Cheng, 2011; Yousefvand, 2010; Tamimi, 2015). This implies that females could probably be submitting to *the agreement maxim* whereas males might be sacrificing *the modesty maxim*. Cheng (2011) suggests that Chinese ESL and Chinese EFL groups tended to reject or evade the compliments when compared to the American speakers who tended to accept the compliment and agree with it. This was linked to the activation of the Chinese cultural schema of modesty rather than the Western cultural schema of agreement in which the widespread tendency is to avoid disagreement by expressing regret, pretending to agree, displacing disagreement, telling white lies, or hedging opinions (Brown & Levinson, 1987: 117–122). That is, while acceptance of a compliment is mostly adopted by native English speakers (e.g., Chen, 1993; Herbert, 1986), downgrading and rejection were the common tendencies among non-native speakers of English (e.g., Shahsavaria, Alimohammadib, & Rasekh, 2014; Yu, 2004). Like the Iranian EFL speakers, native Turkish speakers would reject or downplay the compliment by adhering to *the modesty maxim* (Ruhi & Doğan, 2001; İstifçi, 1998). Even though this study did not have a control group of native Turkish or native English speakers, it would be safe to conclude that the female L2 speakers were more likely to activate the Western cultural schema of agreement when compared to the male speakers who were limited to the Turkish cultural schema of modesty.

The second main finding relates to the use of micro-level strategies to compliment responses across genders. When the compliment was welcome, female speakers used an appreciation token, an offer, and a praise upgrade more often than the males who returned the compliment and justified it with a comment. Males tended to reject the compliments through denying and questioning more often than females did. This is in line with some of the other studies conducted in the Arabic (Almallah, 2017) and Persian contexts (Khaneshan & Bonyadi, 2016). Moreover, the male participants were most likely to return the compliment as an acceptance strategy and to question it as a rejection strategy. This finding contradicts the findings of Allami and Montazeri (2012) which reported a similar tendency with the female speakers in the Persian context.

Lastly, the distinctive feature of the present study in comparison to previous research in the same field is that it reports the self-assessed pragmatic appropriateness of the CRs through the metapragmatic judgements of the compliment recipients. Asking the participants to self-assess the pragmatic appropriateness of their CRs would allow learners to evaluate how effectively cultural differences are incorporated into their performance (Cohen, 2020). Even though the inappropriateness of judgements is easy to recognize, constructing items on a metapragmatic scale, and deciding on their pragmatic appropriateness can be quite challenging even for native speakers (Ellis & Roever, 2021). The females in this study found their responses pragmatically more appropriate than the males on two items which included praise on skills and looks. The reason for this meaningful difference could be linked to the mismatch between the English and Turkish cultural norms. More specifically, females can express their CRs to skills and looks as pragmatically highly appropriate since female responses are more tolerated and perceived to be sincere. Males, on the other hand, perceived returning the compliment with a comment not as appropriate as females did. The prevalent tendency to respond to the compliment with an offer among the male participants could be attributed to the patriarchal nature of the Turkish society. In addition, the participants in both groups were unsure about the pragmatic appropriateness of their CRs to a possession. Just like the Hebrew speakers (Danziger, 2018), Turkish-

[1] I would like to thank the anonymous reviewer for pointing out one of the limitations of this study. It needs to be noted that that the finding 'females tended to accept the compliments more often when compared to males who tended to reject them' needs to be treated with caution since the number of participants in this study is not equally distributed across genders. For future work, balancing the number of participants across genders could yield statistically more reliable results.

English speakers in this study may welcome internal compliments such as those given on personality more positively than external compliments such as those given on a possession.

The study has a number of implications for second language teaching and learning environments. First, explicit instruction in the second language is helpful for the development of metapragmatic awareness (Eslami-Rasekh, Eslami-Rasekh, & Fatahi, 2004; Gokgoz-Kurt, 2023). Speech acts such as complimenting and responding to compliments could be improved thanks to metalinguistic awareness, which refers to the ability to understand and reflect upon ways to accomplish social and communicative goals in interaction. Taguchi and Roever (2017), for instance, report that Japanese learners who received explicit instruction on speech acts and metalinguistic awareness in foreign language classrooms showed greater improvement in the ability to recognize and produce appropriate linguistic forms for making requests than those who did not receive explicit instruction. Bardovi-Harling (2001) suggested that native speakers differ from non-native speakers in their choice, content, and form of speech acts and semantic formulas. Thus, learners should be provided with the necessary pragmatic encounters such as acting out scripted and spontaneous roles and introducing socially appropriate constructions in response to compliments such as 'That is very kind of you, thank you' in a second language classroom setting (Kasper, 2001). Second, coursebook writers and curriculum designers need to emphasize pragmatic-oriented activities that lend to the use of authentic, communicative skills-based tasks in classrooms and teacher training curricula which would assist learners to attend to both the relevant linguistic forms of utterances and social and contextual features with which these utterances are associated (Schmidt, 2001).

For further work, a larger sample with varying levels of proficiency could be used by integrating different data collection methods including questionnaires, oral interviews, recall protocols, recordings, observations, role plays, and natural speech corpora in addition to the written discourse completion tasks (see Derakhshan, Eslami, & Chalak, 2021, for an overview of methodology). While studying CRs, it should also be kept in mind that not all data collection tools may always speak to the addressed research questions (Golato, 2003). Moreover, the interaction of gender with differences in age, status, power, and social distance between the giver and the recipient of compliment could be explored with native speaker control groups.

Acknowledgment

Ethics statement
I declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that we do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, I declare that there is no conflict of interest between the authors, that all authors contribute to the study, and that all the responsibility belongs to the article authors in case of all ethical violations.
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The Relationship between Perceived Self-Efficacy and Attitudes Towards Supervision in Physical Education Teaching Majors

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Abstract

This study aims to examine whether physical education teacher candidates' self-efficacy perceptions and attitudes toward supervision differ according to gender and grade level (1st, 2nd, 3rd, and 4th grades) and whether there is a relationship between self-efficacy perceptions and attitudes toward supervision. A total of 147 teacher candidates—72 women and 75 men—participated in the research. The mean age of female teacher candidates was 21.51, while it was 21.65 for males. The Demographic Information Form, Teacher Sense of Self-Efficacy Scale-Short Form, and Attitudes Toward Supervision Scale were used to collect data in the study. The findings obtained in the study revealed that the physical education teacher candidates' self-efficacy perceptions and attitudes toward supervision did not differ according to the variables of gender and grade levels, while the scores of perceived self-efficacy and attitudes toward supervision were high. In addition, it was revealed that there was a positive and low-significant correlation between physical education teacher candidates' self-efficacy perceptions and their attitudes toward supervision. As a result of the research, it was observed that the self-efficacy perceptions and attitudes of the physical education teacher candidates toward supervision were high, and the attitudes toward supervision increased as the perceived self-efficacy level increased.

Keywords: Physical education, teacher candidate, supervision, self-efficacy, attitude.

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Introduction

Teacher effectiveness is one of the most important variables that ensure maximum student learning, emphasizing that teacher behaviors in the interaction with students in the classroom are the main determinants of what students learn, how well they learn, and how their attitudes toward content and achievements are shaped (Engelmann, 1988). From this perspective, teachers encourage students' interaction through course content to provide maximum learning and provide students with various opportunities for high-quality education by designing appropriate learning environments for the development of student's potential and abilities and their performance in the educational process (Cranston, 2000; Lieberman & Miller, 2005). It is also widely acknowledged that teachers' formal and informal roles and responsibilities support the school and student success in an educational process where it is critical to establish maximum student learning (Hart, 1982; Koopmans, 2020; Sherrill, 1999; Valli & Buese, 2007). One of the main aspects of the teaching-learning process is teachers' determination to take the appropriate measures to optimize student learning by overcoming these tasks and duties (Bandura, 1977). According to Bandura (1999; 2002), the main driving force behind people's actions in such situations is their efficacy beliefs that they can either achieve the desired outcome or avoid unintended effects. In the field of education, the belief of teachers in their ability to plan and carry out the steps necessary to complete a particular teaching activity in a given situation is known as teacher effectiveness. In addition, it is emphasized that a teacher's self-efficacy beliefs depend on the extent to which they perceive their capacity to influence student performance, including students that are unmotivated or experiencing difficulties (Tschannen-Moran et al., 1998). In other words, teacher self-efficacy is a teacher's judgment of student engagement and ability to achieve desired outcomes for student learning (Bandura, 1977). Tschannen-Moran et al. (1998) assert that teachers' perceptions of their efficacy have an impact on student outcomes, motivation, and classroom behavior. Teachers' motivation and behavior in the classroom are reportedly influenced by their self-efficacy beliefs, just like students' are, according to a study on teacher self-efficacy. Zee and Koomen (2016) noted that in the classrooms of teachers who feel self-efficacious, the likelihood of children demonstrating desired behaviors, improved involvement in the lesson, and more positive attitudes and enthusiasm towards learning and school are higher.

Teachers require information and feedback on their performance and efficacy in fulfilling their roles and responsibilities in the educational setting. The process, called supervision, includes all efforts to provide leadership to teachers and other education professionals in the improvement of teaching; promoting teachers' professional growth and development; selecting and reviewing educational objectives, teaching materials, and teaching methods; and evaluating teaching. While supervision is considered to involve teachers in instructional dialogue to improve teaching and increase student achievement, it builds on teachers' existing strengths, knowledge, and practices and supports their development (Nolan & Hoover, 2005). Furthermore, teachers must be monitored and assessed by supervisors in their contact with students, as these interactions play a critical role in fulfilling teaching goals (Engelmann, 1988). This supervision process not only allows teachers to provide instructional feedback and effect teacher growth, but also positively affects teachers' attitudes about the quality of their work, instructional competence, and self-confidence as teachers (Mireles-Rios & Becchio, 2018). Research on the subject found that teachers' self-confidence increased when they were observed by administrators and given feedback on their areas of strength and weakness after the observation (Mireles-Rios & Becchio, 2018). As a result of the study, it was recommended that supervision and evaluation be used to increase teacher self-efficacy. One national study discovered problems with the supervision process, and it was highlighted that the teacher's cognitive and emotional development was disregarded during supervision (Usta & Özyurt, 2021). Memduhoğlu (2012) consulted teachers' perspectives on supervision in his study and reported that the process of supervising teachers by education inspectors was mostly control-oriented, error-seeking, and evaluation; the audit mostly includes formal processes such as document control; and the function of guiding and improving the process is not adequately fulfilled. It was also noted in a meta-analysis by Klassen and Tze (2014) that teachers' self-efficacy is closely correlated with how well they are judged by their students, principals, or supervisors.

Teachers are expected to gain knowledge and skills in "content knowledge," "pedagogical knowledge," and "pedagogical content knowledge" as part of the Turkish physical education teacher training curriculum. In terms of content knowledge, the teacher must be familiar with the subjects to be taught,

comprehend the underlying principles of the subject to be taught, and be able to arrange them by the content. The teacher is supposed to know the general principles and methods of education and training in terms of pedagogical knowledge. There is a bridge between content knowledge and pedagogical knowledge in pedagogical content knowledge, and it is expected that he will be able to combine these two pieces of knowledge. To achieve these objectives, courses in teacher education programs were created by combining "teaching profession knowledge", "field education,", and "general culture" courses (Council of Higher Education [CoHE], 2018). Through physical education lessons, physical education teachers are expected to assist students in developing basic movement skills, active and healthy living strategies, movement-related life skills, self-management skills, thinking skills, and values that they use throughout their lives in and out of school (Ministry of National Education [MoNE], 2018a; 2018b; 2018c). It is critical to ensure and supervise teachers' abilities to meet the needs of this extensive and complicated structure of both teacher training and school physical education programs in the field of physical education. Teachers' perceptions of self-efficacy and their views on supervision affect physical education teachers' ability to effectively reflect the comprehensive knowledge and skills they have acquired in the teacher training program in school physical education lessons. Researchers in the field of physical education who emphasized that self-efficacy is the primary factor influencing human behavior (Bandura, 1997) provided evidence to support this claim and reported that teachers who feel self-efficacious create programs that assist their students in promoting physical activity and health and subsequently increase their level of physical activity and are more likely to do so than teachers who feel less self-efficacious (Martin et al., 2001; Martin & Kulinna, 2004). In addition, research on teacher self-efficacy and supervision revealed that teacher self-efficacy is strongly associated with the evaluation of teachers' effectiveness during the supervision process by their colleagues, supervisors, or administrators (Klassen ve Tze 2014; McDonnough & Matkins, 2010). A limited number of studies in the field of physical education have also revealed that the knowledge and skills acquired by pre-service teachers, especially during the controlled supervision process in authentic school practice, contribute positively to their self-efficacy perception level (Costa Filho & Iaochite, 2018; Gurvitch & Metzler, 2009). In the case of physical education teacher candidates, revealing their self-efficacy beliefs and views on supervision at an early stage of career development may help with learning about future teaching behaviors and taking preventative measures against potential negative outcomes (Schnitzius et al., 2021). Although the studies on teachers' self-efficacy perceptions and attitudes towards supervision have dealt with these two variables separately, they are limited in number. In addition to this, it was noticed as a result of the examination of the relevant literature that there are almost no studies on these two variables in the field of physical education teaching. Studies on pre-service physical education teachers' self-efficacy levels found no differences based on gender (Eroglu & Unlu, 2015; Mirzeoglu et al., 2007) or grade level (Doğru, 2017; Mirzeoglu et al., 2007). Additional research shows that male physical education teacher candidates have a high level of self-efficacy (Kafkas et al., 2010; Ünver, 2016). On the other hand, studies on supervision consisted of studies that descriptively showed the challenges encountered in the course and teacher supervision (Demirhan et al., 2014). Based on the reviewed literature, it was discovered that there are almost no studies that deal with the relationship between self-efficacy and attitude toward supervision, and it is unclear in which direction self-efficacy and attitude toward supervision change according to gender and grade level variables. Based on the lack of literature on studies dealing with teachers' self-efficacy perceptions and their attitudes towards supervision together, this study aimed to compare the self-efficacy perceptions of physical education teacher candidates and their attitudes towards supervision to the variables of gender and grade level and to examine the relationship between their self-efficacy perceptions and attitude towards supervision. More specifically, the research questions for this study were whether perceived self-efficacy and attitudes toward supervision among those majoring in physical education differed by gender and grade level and whether their perceived self-efficacy and attitudes toward supervision were correlated.

Method

Research Design

Descriptive research design, which describes the population, situation, or event as it is, and more specifically, the correlational research design, was used in the study. Although correlational studies are studies that examine the relationships between two or more variables without intervening in any way,

these studies can give an idea that there may be a cause-and-effect relationship, but they are not interpreted as such (Fraenkel et al., 2012).

Participants

Participants of the study were selected from students who were actively studying in the physical education and sports department in the 2021–2022 academic year. A convenience sampling technique was used for participant recruitment. There were 75 men and 72 women, respectively. 26.5% of the 147 participants were in the first grade, followed by 23.8% in the second, 23.8% in the third, and 25.9% in the fourth. The mean ages of the participants were 21.51 (*SD* = 1.21) for the females and 21.65 (*SD* = 1.91) for the males.

Data Collection Instruments

The data collection instruments were the "Demographic Information Form", the "Teacher's Sense of Self-Efficacy Scale", and the "Attitudes Toward Supervision Scale".

Researchers developed a Demographic Information Form that was utilized in the study to gather information on the participants' gender, age, and grade level.

The Teacher's Sense of Efficacy Scale-Short Form (TSES-SF) was used to determine the instructional self-efficacy level of physical education majors. The scale was developed by Tschannen-Moran and Hoy (2001) and translated into Turkish by Karaoğlu (2019). The scale consists of 12 items and three subscales (Self-Efficacy for Instructional Strategies, Self-Efficacy for Classroom Management, and Self-Efficacy for Student Engagement). Within the scope of this study, the scores from subscales were not used; instead, the self-efficacy total perception scores were used in all study analyses. The scale was prepared in a 9-point Likert type, and the minimum and maximum scores to be obtained from the scale range from 1 to 9. Higher scores obtained from the scale indicate that the perception of instructional self-efficacy is high, and lower scores indicate that the perception of instructional self-efficacy is low. The internal consistency of the original scale as measured by Cronbach's alpha coefficient was found to be .94, the values of Cronbach's alpha coefficient for the Turkish version of the scale were found to be .88, and Cronbach's alpha for this scale in the present sample was .87.

The Attitudes Towards Supervision Scale (ATSS) was used to assess the attitudes of physical education majors toward supervision. The scale was developed by Gündüz et al. (2018). The scale consists of 29 items and 3 sub-scales (Effect of Supervision on the Organization; Effect of Supervision on Employees, and Effect of Supervision on Relationships). The responses of the participants were scored in a 5-point Likert-type scale format, ranging from "none" to "many", and given a score ranging from 1 to 5. The minimum and maximum mean obtained from the scale varied between 1 and 5, and higher scores indicated that the attitudes of the supervisees towards supervision are high in the positive direction and lower scores indicate the negative direction. The original scale's Cronbach's alpha reliability coefficient was .95 (Gündüz et al., 2018), while the reliability value found in this investigation was .94.

Data Collection Procedures

Before starting the research, official ethical approval was obtained from the Social and Human Sciences Ethics Committee of the university where the data were collected (29/03/2022-124). The Demographic Information Form, TSES-SF, and ATSS were used to collect data from 1st, 2nd, 3rd, and 4th-grade female and male teacher candidates studying at the Faculty of Sport Sciences, Physical Education and Sports Department in the Fall Semester of the 2021-2022 academic year. In this regard, the courses that the pre-service teachers are enrolled in were determined, the instructors of the determined courses were informed about the study and permission was obtained, and the scales were applied to those who volunteered to participate by informing the students before the classes started. It took approximately 7 minutes for the participants to fill out the data collection tools.

Data Analysis

The Kolmogorov-Smirnov test for normality revealed that the TSES-SF and ATSS measures were not normally distributed. As a result, the Mann-Whitney U test was used to determine whether the participants' TSES-SF and ATSS scores differed by gender; the Kruskal-Wallis test was used to determine whether there was a difference between the TSES-SF and ATSS scores based on their grade level; and the Spearman's Correlation analysis was used to determine whether there was a significant

relationship between the participants' TSES-SF and ATSS scores. The Statistical Package for the Social Sciences (SPSS) version 21.0 for Windows was used to analyze the data.

Findings

The Mann-Whitney U test was used to compare differences in the TSES-SF scores between female and male teacher candidates. The analysis showed a statistically nonsignificant difference between the TSES-SF scores for female and male physical education teacher candidates, U= 2316.50, p= .14 (Table 1). From this analysis, it can be concluded that the TSES-SF scores were similar in females (*Med.*= 7.67) and males (*Med.*= 7.17) (Figure 1). Similarly, the Mann-Whitney U test was used to compare the difference in ATSS scores between female and male participants, and statistical analysis of the data showed that there was not any significant difference between females and males in their scores of ATSS, U= 2275.50, p= .10 (Table 1). The ATSS scores of female physical education teacher candidates (*Med.*= 4.24) were similar to those of males (*Med.*= 3.97) (Figure 1).

Table 1.
TSES-SF and ATSS Scores Physical Education Teacher Candidates by Gender

	Gender	*n*	$\bar{x}$	*SD*	*Med.*
TSES-SF scores	Female	72	7.58	.82	7.67
	Male	75	7.30	1.04	7.17
	Total	147	7.44	.95	
ATSS scores	Female	72	4.16	.56	4.24
	Male	75	4.01	.55	3.97
	Total	147	4.08	.56	

The Kruskal-Wallis test was used to investigate the differences in TSES-SF scores between the four grade levels. The results of the analysis revealed that there was no statistically significant difference between the TSES-SF scores of the 1st, 2nd, 3rd, and 4th-grade teacher candidates, $\chi^2(3)$= 4.26, p= .24 (Table 2). These findings showed that the TSES-SF scores of the 1st (*Mean rank.*= 84.78), 2nd (*Mean rank*= 66.89), 3rd (*Mean rank*= 67.81), and 4th-grade teacher candidates (*Mean rank*= 75.18) were similar (Figure 1). Whether there was a difference between the ATSS scores of the pre-service teachers in terms of the grade level was also examined within the scope of the research, and the results showed that there was not any statistically significant difference between the 1st, 2nd, 3rd, and 4th grades, $\chi^2(3)$= 7.33, p= .06 (Table 2). According to these results, the ATSS scores of the 1st (*Mean rank*= 89.42), 2nd (*Mean rank*= 66.94), 3rd (*Mean rank*= 66.31), and 4th grades (*Mean rank*= 71.75) were similar (Figure 1).

Table 2.
TSES-SF and ATSS Scores of Physical Education Teacher Candidates by Grade Level

	Grade Level	*n*	$\bar{x}$	*SD*	*Mean of Ranks*
TSES-SF scores	1st grade	39	7.70	.82	84.78
	2nd grade	35	7.25	1.07	66.89
	3rd grade	35	7.36	.78	67.81
	4th grade	38	7.41	1.06	75.18
	Total	147	7.44	.95	
ATSS scores	1st grade	39	4.28	.50	89.42
	2nd grade	35	3.99	.55	66.94
	3rd grade	35	3.99	.51	66.31
	4th grade	38	4.05	.64	71.75
	Total	147	4.08	.56	

A Spearman correlation coefficient was used to determine whether a statistically significant relationship existed between the TSES-SF and ATSS scores of the physical education teacher candidates participating in the research. The results of the analysis revealed that there was a statistically positive and weak significant correlation between the TSES-SF and ATSS scores of the teachers, r_s= .45, n= 147, p= .001.

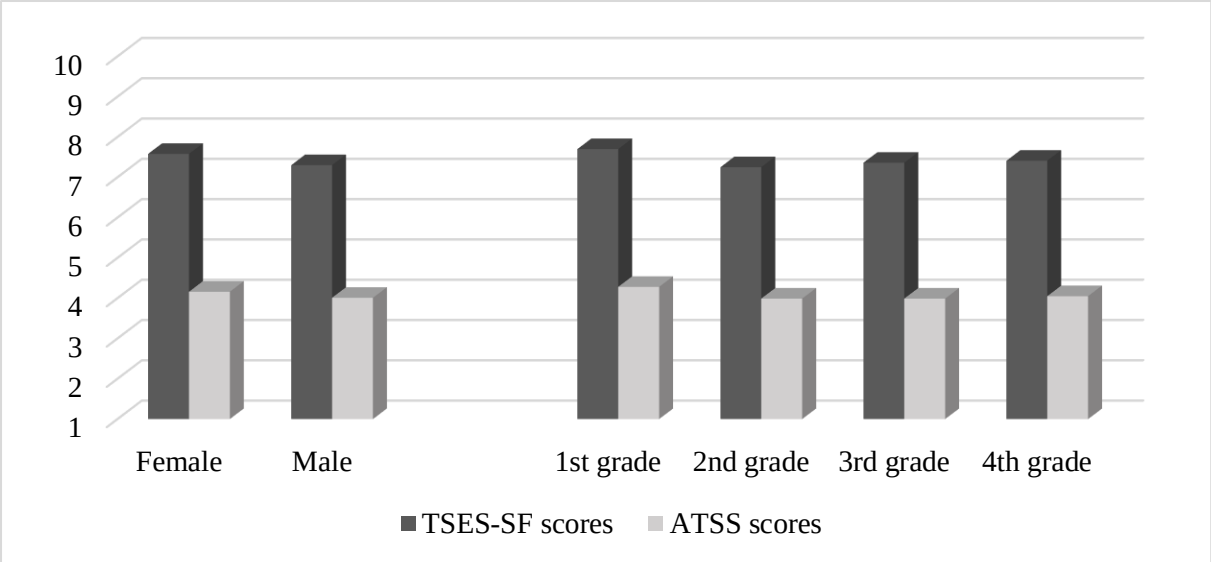

Figure 1. TSES-SF and ATSS Scores of Physical Education Teacher Candidates by Gender and Grade Level

Discussion

The study aimed to identify whether the self-efficacy perceptions of physical education teacher candidates and their attitudes toward supervision differ according to their gender and grade levels and whether there is a relationship between their self-efficacy perceptions and attitudes toward supervision. Consistent with previous research findings, the teachers involved in the current study scored highly in self-efficacy perceptions (Akçöltekin et al., 2018; Eski et al., 2018; Özdemir & Özkan, 2018). The current study's findings also showed no gender differences in self-efficacy. These findings both support and contradict previous studies in the literature. In support of this research, there are studies conducted with the participation of physical education teacher candidates and revealing that the self-efficacy perceptions of female and male teacher candidates are similar (Erbaş & Ünlü, 2020; Eroglu & Unlu, 2015; Eski et al., 2018; Koparan et al., 2010; Ozkan et al., 2014; Özdemir & Özkan, 2018). Some studies show no gender differences and high levels of perception in terms of self-efficacy in studies conducted with the participation of male and female physical education teachers (Gencay, 2015; Öncü, 2019). In addition to the studies that show no difference between the self-efficacy perception levels of female and male physical education teacher candidates and teachers, some studies report differences between the two genders. In one of these studies, Kafkas et al. (2010) revealed that there was a difference between pre-service teachers' perceived self-efficacy levels and those of male pre-service teachers, with self-efficacy levels higher than those of female pre-service teachers. In another study, the perceived self-efficacy levels of physical education teachers were examined, and a difference was found between the two genders; and the perceived self-efficacy levels of female physical education teachers were higher than those of male teachers (Turan et al., 2015). In addition to national studies, international studies have also shown that the perceived self-efficacy levels of physical education teacher candidates and teachers are high (Silva et al., 2010). Different findings have been reached in studies examining the effect of gender in the international arena. In a study conducted in a Brazilian sample, it was revealed that there was no gender difference in pre-service teachers' perceived self-efficacy levels (Iaochite & Souza Neto, 2014). Another study revealing that there was no difference between men and women in terms of perceived self-efficacy was conducted in Belgium with the participation of physical education teachers, and it was reported that teachers perceived self-efficacy levels were high (Mouton et al., 2013). In a Chinese sample, physical education teachers' perceived self-efficacy levels were found to be high, and male teachers' perceived self-efficacy levels were found to be higher than female teachers (Xiong et al., 2020). Another study that found high self-efficacy levels in physical education teacher candidates was conducted in Poland, and in the study, male physical education teacher candidates' perceived self-efficacy levels were found to be higher than females (Ogrodnik et al., 2018). Since the literature findings on physical education teacher candidates and teachers' self-efficacy perceptions and the results obtained from this research do not reveal the gender effect on self-efficacy, it is clear that more research is needed. However, the reason why there was no gender difference in perceived self-efficacy in this study may be

that they were subject to a standard teacher training program and had similar levels of educational knowledge and skills (CoHE, 2018). In addition, contrary to what was discovered in this study, other studies' conclusions that male teachers or teacher candidates had higher levels of self-efficacy than females may have been influenced by the scales' sub-dimensions used in these studies. Men and women are reported to view themselves as equally competent in the literature regarding self-efficacy perceptions toward ensuring student engagement and effective use of general education instructional strategies; however, men are reported to view themselves as more competent than women in the "classroom management" dimension (Klassen & Chiu, 2010; Lesha, 2017). Similarly, the main reason why studies that found female teachers' or teacher candidates' self-efficacy beliefs about teaching to be high did not exhibit resemblance with the findings of this study could be the education level at which the teacher or teacher candidates will or are working. Participants in this study will eventually teach in secondary or high schools. Female teachers' self-efficacy beliefs toward teaching were greater than males' in research evaluating primary school teachers' or pre-service teachers' self-efficacy beliefs (Cheung, 2008; Duru & Arslan, 2021; Manzar-Abbas & Lu, 2015). The assumption that primary education is a woman's work or associated with the role of a mother is suggested to be another cause for these conflicting findings. Society accepts the notion that female teachers have personalities more suited to parenting and teaching as a reflection of gender roles. These results may also be the result of perceptions that women's occupations are compatible with their domestic duties and that women are best suited for careers as elementary school teachers (Drudy, 2008). According to a national study, teachers viewed male teachers as "a figure of authority and security" and "a leading one," whereas they defined female teachers as "a devoted mother" and "a diligent one undertaking many tasks" (Sarı & Başarır, 2016). According to teachers in a different study employing a US sample, male and female primary school teachers exhibit different traits, with female primary school teachers claiming to be more maternal and attentive to their pupils' needs than their male counterparts (Wood, 2012).

Within the scope of this research, it was revealed that the perceived self-efficacy levels of physical education teacher candidates did not differ according to the grade levels of the prospective teachers. Some studies support the findings of this study and reveal that the perceived self-efficacy levels of physical education teacher candidates do not differ according to their grade level (Erbaş et al., 2014; Erbaş & Ünlü, 2020; Eski et al., 2018). Furthermore, studies that are not in line with the findings of this research and that reveal that the self-efficacy perceptions of physical education teacher candidates differ according to the grade level were also encountered (Özdemir & Özkan, 2018). In a study examining the perceived self-efficacy levels of physical education teacher candidates, it was found that the self-efficacy perceptions of the participants differed according to the grade levels, and the perceived self-efficacy levels of the students studying in the 3rd grade were found to be higher than the students in the 1st and 2nd grades, and the perceived self-efficacy levels of the students studying in the 4th grade were found to be higher than the students who were in the 1st grade (Cihan, 2014). Considering the studies in which the grade level variable reveals or does not differentiate between perceived self-efficacy and the gender variable, more research is needed to clarify this finding. It is useful to interpret that the self-efficacy perceptions of pre-service teachers do not differ according to grade level, taking into account that their self-efficacy levels are already high. In addition, these findings can be interpreted as indicating that pre-service teachers' self-efficacy perceptions are not only dependent on the teacher training program (Eroglu & Unlu, 2015).

The findings obtained in this study revealed that physical education teacher candidates' attitudes towards supervision were high and did not differ according to the variables of gender and grade levels. When the literature is examined, studies covering all teaching fields are included in the discussion, since it is striking that the research on this subject focuses on teachers, and the studies in the field of physical education teaching are especially limited. While some of the studies discussed here support the current findings, others do not. In one of these studies, Gündüz (2010) examined primary school teachers' attitudes towards supervisors and found that teachers' attitude scores were moderate and there was no difference between female and male teachers' attitude levels. Although the findings of this study are similar to those of this study in terms of not revealing a difference according to gender, they differ in that the attitude scores are at a moderate level. Examining the attitudes of primary school teachers in the Turkish Republic of Northern Cyprus towards supervisors, Tankı (2016) revealed that teachers' views on supervisors are negative and that these views do not differ between male and female teachers. In

another study, the attitudes toward supervision in primary and secondary schools were examined, and no difference was found between the attitudes of female and male teachers toward supervision (Hasar, 2014). Although teachers' opinions were neutral (neither positive nor negative) in a study examining teachers' attitudes toward supervision, a difference was found according to the gender variable, and it was determined that male teachers' attitude levels were more positive than female teachers' (Uslu, 2021). Sallabaş (2021) also examined teachers' attitudes towards supervision and reported that both female and male teachers had more positive attitudes, while female teachers' attitude scores were higher than male teachers. Another study conducted by Eskibağ (2014) revealed a difference between male and female teachers in terms of attitudes toward supervision, and it was determined that male teachers' perceptions of supervision were higher than female teachers. In a study conducted in a sample of Nigeria, the attitudes of secondary school teachers towards supervision were examined, and it was concluded that the attitude scores of both female and male teachers were at an average level, and no gender difference was found in the findings (Amaefule & Udoji, 2021). According to a study conducted in Ethiopia, it was emphasized that teachers' attitudes toward supervision were negative and they were not satisfied with the practices related to supervision (Kurka & Berhanu, 2019). A similar finding was found among teachers in the Malaysian sample, and it was revealed that teachers' attitudes toward supervision were low (Hoque et al., 2020). Examining the attitudes of English teachers towards supervision in the Iranian sample, Rahmany et al. (2014) reported that a large percentage of the teachers were neutral about supervision; half of them thought that supervision was necessary and the other half thought it was unnecessary. In one of the limited number of studies conducted in the field of physical education teaching, it has been revealed that physical education teachers agree with the necessity of supervision, but they are confused about what is expected of them through supervision (Norris et al., 2017). In another study conducted in the sample of Jordan, the views of physical education teachers on supervisors were examined, and it was reported that physical education teachers perceived the supervisors' equipment for supervision at a moderate level (Oudat, 2021). It is thought that the reason why there is no difference in the attitudes of physical education teacher candidates towards supervision according to gender and grade level in the findings obtained in this study is that the prospective teachers have not yet undergone an inspection process and their attitudes are only dependent on the standard teacher training program (CoHE, 2018). In contrast to the findings of this study, Shakeshaft et al. (1991) claimed that the gender characteristics of men and women play a role in whether women or men have positive attitudes toward supervision. While for female teachers, supervision-related issues are seen as affecting the well-being of the students, for male teachers, they can be seen as administrative issues. It was emphasized as a result that the same words said by the male supervisor have different meanings for male and female teachers and that interactions between a female supervisor and a male teacher are different from those between a female supervisor and a female teacher (Shakeshaft, 1989). According to studies on gender and supervision, the supervisor's attitude toward supervision may change with teaching experience, and it may be uncomfortable for both the teacher and the supervisor to be of different genders at the same time while supervision is taking place (Lee et al., 1993; Range et al., 2014; Shakeshaft et al., 1991). Based on previous research, it is clear that the lack of instructional supervision they have yet to experience in their teacher preparation program may be the key factor explaining why female and male teacher candidates in this study did not differ in their attitudes toward supervision, because in most studies, the attitudes of female and male teachers towards supervision vary depending on their teaching experience (Bada et al., 2020; Deniz & Erdener, 2020; Esen & Albez, 2022). The fact that the pre-service teachers in this study are not yet teachers and have only had school observations and practices may not have resulted in a gender difference in their attitudes.

The findings obtained in this study showed that there is a relationship between the perceived self-efficacy levels of pre-service physical education teachers and their attitudes towards supervision, and as the self-efficacy perception levels increase, the attitude towards supervision also increases. In support of the outcomes of this study, a study of English teachers' self-efficacy found that Iranian teachers with less than 5 years of experience had positive attitudes regarding supervision. It has been claimed that teachers with greater teaching experience have negative attitudes regarding supervision and regard it as a "box-ticking" procedure (Rahmany et al., 2014). In a meta-analysis examining the psychological state of teachers, Klassen and Tze (2014) discovered a high correlation between teachers' self-efficacy and how well they were seen by administrators and colleagues. As a result, it has been emphasized that the

teacher evaluation process is critical not only for receiving feedback from teachers at the end of the evaluation but also for the formation of self-efficacy beliefs that will enable them to be successful in the long run and to demonstrate superior performance throughout their careers. Additionally, it was mentioned that the teacher assessment procedure presents a special chance for administrators and teachers to collaborate in a way that raises teacher effectiveness and, consequently, student accomplishment. The findings of this study also suggest that the relationship between pre-service teachers' high self-efficacy perceptions and their attitudes toward supervision is due to pre-service teachers' awareness of the positive contribution of supervision to the teacher training process. In other words, because they are aware of the positive effect of supervision on their self-efficacy, a relationship may have emerged between their self-efficacy perceptions and their positive attitudes toward supervision. In a recent study, researchers examining the self-efficacy and attitudes of teachers working in public schools in a sample of Nigeria revealed that the perceptions of self-efficacy affect the attitude towards supervision. It has been reported that teachers with high self-efficacy perceptions have higher attitude scores toward supervision than teachers with low self-efficacy (Amaefule & Udoji, 2021). Additionally, pre-service teachers' perceptions of their degree of knowledge and skill for the teaching profession have an impact on how they perceive their self-efficacy, and pre-service teachers who perceive a low level of knowledge and skill have low self-efficacy perceptions. This situation may have negatively affected the views of pre-service teachers who feel inadequate about being supervised by others and witnessing these inadequacies by others (Phan & Locke, 2015).

Conclusion

These research findings have contributed to the literature in various aspects. The first of these is to reveal the self-efficacy perceptions of physical education teacher candidates and make comparisons by gender and grade level. Another contribution is to reveal the attitude towards supervision in the sample of education, more specifically physical education and pre-service teachers, and whether this attitude differs according to the variables of gender and grade of education. The limited number of studies examining attitudes toward supervision and the scarcity of physical education in the field of physical education make the findings of this study valuable. Revealing the relationship between pre-service physical education teachers' self-efficacy level and attitude towards supervision also provides important information for the relevant literature in the field. To summarize, the self-efficacy perceptions and attitudes toward the supervision of physical education teacher candidates in this study were high and did not differ by gender or grade level. A significant relationship was found between pre-service physical education teachers' self-efficacy perceptions and their attitudes toward supervision. As the pre-service teachers' self-efficacy perceptions increase, their attitudes toward supervision also increase.

Recommendations

The current study has several limitations that must be acknowledged. The physical education teacher candidates were recruited using a convenience sampling method from a single physical education teacher education institution. So, the results may not be generalizable to Turkey's intended population of physical education teacher candidates. There is also a small sample size, which may not be large enough to generalize the results and may make the findings inaccurate. This study was cross-sectional and assessed physical education teacher candidates perceived self-efficacy and attitudes toward supervision at a specific time. In addition to these limitations, various suggestions can be made for future studies based on the findings obtained. It is recommended that this research be carried out with the participation of in-service teachers and teachers who have been subjected to supervision. Future studies on a sample of audited pre-service teachers (within the scope of courses such as school experience, teaching practice, and so on) may contribute to the literature. Increasing the sample size is recommended by researchers for future studies. Future research can also compare the attitudes of physical education teacher candidates who have taken and passed the school experience course to those who have not yet done it in terms of self-efficacy levels and attitudes toward supervision. Qualitative and mixed-design research should also be performed to see whether pre-service teachers' high levels of self-efficacy perceptions and attitudes toward supervision are reflected in their physical education classroom practices. Within the scope of practical suggestions, necessary precautions should be taken in teacher training programs regarding the examination and maintenance of the source of positive self-efficacy beliefs and attitudes toward the supervision of physical education teacher candidates, and in this regard,

various courses and seminars should be provided to teacher candidates in teacher training programs and to teachers in in-service training programs.

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Ethics statement: In this study, we declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that we do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, we declare that there is no conflict of interest between the authors, which all authors contribute to the study, and that all the responsibility belongs to the article authors in case of all ethical violations.

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The examination of the variables affecting the print awareness skills of six-year-old children attending kindergarten[1]

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Abstract

This study aimed to investigate the relationships between child gender, maternal education, writing readiness skills, and print awareness skills. A total of three hundred and sixteen six-year-old children, comprising one hundred and eighty-three girls and one hundred and thirty-three boys, were assessed for their writing readiness skills and print awareness skills. Spearman correlation coefficients were calculated to examine the potential relationships among child gender, maternal education, writing readiness skills, and print awareness skills. Additionally, a regression analysis was conducted to assess the predictive strength of these variables on print awareness skills, with child gender and maternal education treated as dummy variables. The results of the regression analysis revealed that these three variables accounted for approximately nine percent of the variance in print awareness skills. The implications of these findings were discussed in terms of understanding the interconnectedness of child gender, maternal education, writing readiness skills, and print awareness skills in promoting emergent literacy development. These findings hold significance for practitioners as they aim to determine the predictive power of writing readiness skills and provide appropriate support for children in relation to these skills.

Keywords: Emergent literacy skills, writing readiness skills, print awareness skills, preschoolers

[1] This study was presented as an oral presentation in 6th International Scientific Research Congress

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Introduction

Emergent literacy skills, including print awareness, oral language, print knowledge, alphabet knowledge, phonological sensitivity, and writing, play a crucial role in children's social and academic success (Hammill, 2004; Justice & Pullen, 2003; Lonigan, Burgess, & Anthony, 2000; Whitehurst & Lonigan, 1998). Key areas in emergent literacy development include exploring environmental print, understanding the role of print, understanding the relationship between speech and print, recognizing the sounds in spoken words, and developing vocabulary. Print awareness and emergent writing skills, defined as early skills, are crucial in supporting children's reading abilities and reducing individual differences in future reading success (Storch & Whitehurst, 2002; Whitehurst & Lonigan, 1998).

Print awareness is a crucial literacy skill that encompasses children's ability to understand the function and form of print, as well as the relationship between spoken and written language (Hiebert, 1981). This skill involves recognizing that writing follows a linear flow, words are separated by spaces, print follows specific rules, and that letters and numbers have distinct characteristics (Puranik, Lonigan, & Kim, 2011). Print awareness skills, which include knowledge of print structure and rules, as well as book conventions, provide children with a conceptual framework for interpreting written information (Van Kleeck, 2003). Differentiating between print and pictures is one of the initial concepts that children learn about literacy (Lovelace & Stewart, 2007). Scholars have emphasized the significance of children understanding the distinction between print and pictures as it facilitates their learning of both the structure and function of print (Christie, Enz, & Vukelich, 2003).

Environmental print, particularly print awareness, is considered a significant predictor of emergent literacy development (Neumann, 2016). Environmental print refers to the print that surrounds individuals in their everyday environment, taking various forms such as different fonts, shapes, and sizes, and commonly appearing in capital letters (Horner, 2005; Neumann, Hood, & Ford, 2013). Children worldwide encounter numerous print stimuli, including signs, food packaging, traffic signs, newspapers, shopping lists, and billboards. Even at the age of two to three, children begin to recognize that people use print for various purposes, such as reading and writing, leading to the natural development of print awareness (Neuman, Coople, & Bredekamp, 2000). The positive impact of the early development of print awareness on children's literacy skills has been well-established (Lovelace & Stewart, 2007), as literacy skills in early childhood serve as a strong predictor for future literacy success (Hammill, 2004).

Print is defined as a visual coding tool used for representing verbal language. The process of handwriting involves the completion of several tasks, including maintaining a proper sitting position, adopting correct body posture, paying visual attention, writing within the boundaries of the paper, holding the pencil correctly, using the non-writing hand to secure the paper on the desk, and finally, placing the feet on the floor and resting the arms on the table (Havens, 2002). It has been observed that children with low writing skills often struggle with holding the pencil and paper correctly, as well as maintaining proper posture (Rosenblum, Goldstand, & Parush, 2006). The development of writing skills is a multifaceted process that involves various abilities, including fine motor control, visual perception, visual-motor coordination, motor planning, palm manipulation, attention, and sensory awareness in the fingers. If handwriting competency is not achieved at school, it can have significant negative effects on both children's academic success and self-esteem. This complex and essential ability includes a number of skills that may affect handwriting skills such as motor control skills, bilateral and visual–motor integration, motor planning, in-hand manipulation, proprioception, visual perception, continuous attention, and sensory awareness of the fingers. Poor handwriting capabilities may be associated with both intrinsic factors (a child’s handwriting capabilities) and extrinsic factors (either environmental or biomechanical components) (Asher, 2006; Denton, Cope, & Moser, 2006; Feder & Majnemer, 2007). In short, requirements for children’s writing readiness include correct use of writing tools, hand-eye coordination, understanding the direction of writing, and recognition of the rules of print.

According to Clay (2001, as cited in Diamond et al., 2008), writing plays a critical role in learning to read as it directs children's attention to print. When children engage in letter writing, they develop the ability to closely observe the distinguishing features of each letter. By directing their attention to the letter forms during writing, children can enhance their knowledge of letter names (Mayer, 2007).

Dinehart (2014) emphasized that regular opportunities for children to express themselves on paper can aid in their understanding of the purposes of print. Similarly, Cabell, Tortorelli, and Gerde (2013) stated that children demonstrate their knowledge of print through writing activities. Furthermore, educational programs designed to enhance children's writing readiness skills have also been found to be effective in improving their reading readiness skills (Jones, Reutzel, & Fargo, 2010; Lust & Donica, 2011; Puranik et al., 2011). In a study conducted by Hand, Lonigan, and Puranik (2022), it was found that early writing skills uniquely contributed to later reading outcomes. Results indicated that preschool children's invented spelling contributed unique variance to later reading outcomes beyond the contributions of early literacy skills

Numerous studies highlight the positive contributions of reading and writing skills to each other. For instance, Kim et al. (2011) discovered a correlation between reading skills, such as spelling, letter writing, and verbal language, and children's writing skills. Molfese et al. (2006) identified a connection between alphabet knowledge, including letter copying, spelling, and writing names, and writing skills. Additionally, Ritchey (2006) established a relationship between letter-writing skills and spelling abilities. In a longitudinal study conducted by Shatil, Share, and Levin (2000), it was found that preschool writing skills are associated with spelling, decoding, and reading comprehension in first grade. Wealer et al. (2022) found that phonological awareness demonstrated a unique predictive value for reading and spelling skills in Grade 1.

Some studies have reported that writing skills developed during the preschool period have a positive impact on children's literacy skills in later stages of education (Longcamp et al., 2005; Longcamp et al., 2008). On the other hand, insufficient writing skills can have negative effects on academic success and self-esteem (Marr & Cermak, 2003; Ratzon, Efraim, & Bart, 2007). Stevenson and Just (2012) have also highlighted that a child's proficiency or inadequacy in writing skills influences their ability to meet academic demands. Therefore, it is crucial to focus on writing skills starting from the early stages of preschool education. Failure to make accurate determinations during this period may make it more challenging to identify writing difficulties in the future (McMaster & Espin, 2007). Additionally, early assessments can offer teachers opportunities to support children and take appropriate measures for enhanced literacy development (Van Hartingsveldt et al., 2010). Educators and researchers should conduct valid and reliable assessments of children's writing skills as they aid in identifying students who may be falling behind their peers and implementing targeted interventions (Coker & Ritchey, 2014).

The theoretical information and previous research findings mentioned above suggest that various skills related to writing and reading, such as print awareness and writing readiness, are interconnected in children. Furthermore, several reports highlight the positive influence of writing and reading skills on children's academic success in the long run. Therefore, it can be argued that evaluating writing and reading skills is of utmost importance as it allows for early support in preschool education. In this regard, establishing predictive relationships between literacy skills can provide valuable information for educators and parents to effectively support children.

Although writing readiness skills have been recognized as a crucial predictor of reading skills (Hammil, 2004), only a limited number of studies have specifically focused on the predictive effect of writing readiness skills. Conversely, numerous studies have examined the predictive effect of reading skills (Gerde, Bingham, & Wasik, 2012; Hooper et al., 2010; Justi, Henriques, & Justi, 2021; Vadasy, Sanders, & Abbott, 2008). These studies have found that certain skills, such as phonological awareness, alphabet knowledge, print awareness, and vocabulary, are predictors of writing skills. For example, Blair and Savage (2006) discovered that phonological awareness and alphabet knowledge are important predictors of children's writing skills. Similarly, Maki et al. (2001) stated that phonological awareness and visual-motor skills also play a significant role in predicting children's writing skills. Additionally, Hecht and Close (2002) identified alphabet knowledge, oral language knowledge, phonological awareness, and print awareness as predictors of children's writing skills. Gerde et al. (2012) found that capital letter knowledge and motor development are important predictors of children's writing skills. Furthermore, Welsch, Sullivan, and Justice (2003) determined that, in addition to alphabet and print knowledge, the age of the child is also an important predictor for name-writing ability. In all of these studies, it can be observed that the predictive effect of reading skills on

different literacy skills is examined. Based on the fact that there are very few studies determining the predictability of writing skills, it is considered necessary to conduct more research that reveals the predictive power of writing skills.

Maternal education is one of the most extensively studied demographic variables associated with children's literacy. Foster et al. (2005) stated, "Parental demographic background variables such as level of education may serve as proxy variables for home literacy experiences associated with kindergarteners' literacy skills." While many studies have focused on the relationship between maternal education and children's literacy skills (Cottone, 2012; Magnuson et al., 2019; Wu & Sterling-Honig, 2010), only a few papers have examined the predictive power of this variable (Skibbe et al., 2008; Stephenson et al., 2008).

Likewise, while the gender variable has been widely explored as a child characteristic in numerous studies focusing on early literacy, there is a scarcity of research that specifically investigates the predictive role of gender in children's literacy skills (Van Tonder et al., 2019). However, the number of studies examining child gender is comparatively lower than those examining maternal education (Dynia et al., 2020; Myrtil, Justice, & Jiang, 2019).

Therefore, conducting an investigation on the relationship between child gender, maternal education, writing skills, and print awareness, as well as identifying the predictive role of writing readiness skills, child gender, and maternal education in print awareness skills, can make a valuable contribution to early childhood literacy. Additionally, the present study will offer much-needed information on the relationship between these variables in the Turkish context.

Therefore, the purpose of this paper is to investigate the predictive strength of child gender, maternal education, and writing readiness skills on print awareness skills of six-year-old children and the relationships between these skills and child gender and maternal education. Therefore, this study answered the following questions:

(1) Is there a significant relationship between child gender, maternal education, writing readiness skills, and print awareness skills?

(2) Is child gender, maternal education, and writing readiness skills in six-year-old children a significant predictor of print awareness skills?

Methods

The study is in the relational screening model in terms of revealing the extent to which the variables affect each other. Relational screening models are research models that aim to determine the presence and/or degree of co-variation among two or more variables. Correlation is a type of analysis used in the relational analysis, and it aims to determine whether variables co-vary together and, if so, how they co-vary in searches of different types of correlations (Karasar, 2009). The study has been designed using a relational screening model to reveal the relationships between variables of child gender, maternal education, writing readiness skills, and print awareness skills. The dependent variable of the study is the skill of print awareness skills, while the independent variables are child gender, maternal education, and writing readiness skills.

Participants

In the correlational survey study, the target population comprised six-year-old children enrolled in independent kindergartens affiliated with the Kilis Provincial Directorate of National Education. The sample for the study consisted of three hundred and sixteen children, selected through the criterion sampling method from among the children attending these independent kindergartens. The inclusion criteria for the sample selection in this study involved children who are six-year-old and attend independent kindergartens. The sample included more girls (57.9%, n=183) than boys (42.1%, n=133). The educational backgrounds of the mothers varied, with years of education ranging from 5 to 16. The educational level of mothers was as follows: 36 mothers (11%) were literate 68 mothers (22%) had completed primary school; 154 mothers (49%) had completed high school; 42 mothers (13%) had completed a college degree; and 16 mothers (5%) had completed a graduate degree.

Study tools

The control list for the evaluation of the print awareness of pre-school children (CLPAP)

"The Control List for the Evaluation of the Print Awareness of Pre-school Children" was developed by Şimşek and Alisinanoğlu (2013a) to measure print awareness levels in preschool children. The scale consists of 17 items with two dimensions, 9 items of the first dimension are about "Book Concepts" and the second dimension consists of 8 items related to "Print Concepts". "The Control List for the Evaluation of the Print Awareness of Pre-school Children", which was administered during classroom visits, asked children to perform tasks (e.g., "Show me the title of this book", "Show me which way I go to read the page") that were posed by the investigator while examining a storybook together. Participants received a point for each acceptable response, for a possible total score of 17. The control list includes the target concept, concept type, instructions for the investigator, and acceptable responses.

For the construct validity, exploratory factor analysis (EFA) was conducted with two hundred children and CFA was performed with another two hundred children. The result of EFA revealed that CLPAP was composed of two factors with core values of 7.69 and 4.84. The variance explained by the first factor was 45.26% while 28.45% was explained by the second factor. The total variance explained by the factors was 73.71%. According to the CFA, construct reliability for the first factor was .92 and the explained variance was .62. However, for the second factor, they were computed as .97 and .84, respectively. The first subscale of the control list was denominated "Book Concepts" and the other was termed "Print Concepts". The Kuder Richardson-20 (KR-20) formula was used to measure the reliability of the control list. The KR-20 reliability coefficient was calculated to be 0.64 for the first factor (Book Concepts), 0.51 for the second factor (Print Concepts), and 0.72 for the total scale (Şimşek & Alisinanoğlu, 2013a).

The control list for the evaluation of the writing readiness skills of pre-school children (CLWRP)

"The Control List for the Evaluation of the Writing Readiness Skills of Pre-school Children" developed by Şimşek and Alisinanoğlu (2013b) measures children's writing readiness skills such as correct sitting position for writing, holding a pencil, securing paper on the surface, keeping a proper distance between eyes and writing material, knowing the print direction, and drawing in accordance with the instructions. The validity and reliability of the scale were examined by Şimşek and Alisinanoğlu (2013b) using test-retest reliability and agreement between independent raters. The test-retest reliability coefficient was calculated as 0.90 indicating the control list had high construct stability. Regarding the agreement between raters, the lowest and highest agreement between experts were calculated as they were 0.32 and 1.00, respectively. All correlations were statistically significant.

Procedures for data collection

Ethics clearance and approval for this study were obtained from the Institutional Review Board of Kilis 7 Aralık University, Turkey. The basic plan was to identify a group of preschool-age children, compare their writing readiness, and print awareness skills with those of a group of same-age, typically developing children. Accordingly, six-year-old children were selected as the focus group. All data were collected in the autumn of the 2019-2020 preschool year. During that time, children were assessed on two developed literacy skills: print awareness and writing readiness skills. Two control lists "The Control List for the Evaluation of the Print Awareness of Pre-school Children" and "The Control List for the Evaluation of the Writing Readiness Skills of Pre-school Children" were used to collect data. Trained undergraduate research assistants administered direct assessments of literacy skills in two to three 20-minute sessions at the child's preschool in a quiet space. Children were assessed within 2 months period in the autumn of the school year.

Data analysis

The data in this study were analyzed using SPSS 17.0 statistical analysis software. Correlational analysis and regression analysis were conducted to examine the relationships between child gender, maternal education, print awareness skills, and writing readiness skills. Missing data were excluded from the analyses, resulting in a varying sample size for different analyses. Pearson correlation coefficient was used to assess the relationships between these skills, while regression analysis was employed to determine the predictive strength of the variables.

In this study, non-continuous variables, namely, gender and maternal education, were coded as dummy variables and included in the regression analysis. Four dummy variables were created for the mother's education level corresponding to five intervals, namely, literate, primary, high school, undergraduate, graduate, and above. To create the dummy variable for child gender, girls were coded as "0". According to Büyüköztürk (2009), in certain cases, it might be appropriate to thoroughly examine the impact of non-continuous variables on the dependent variable. To perform such an analysis, one level of the interval-scale variable is left out and a "dummy" variable is created that contains one less interval (G-1) than the number of total intervals.

Findings and Discussion

Correlational analyses

Correlation analyses were conducted to examine the relationship between child gender, maternal education, print awareness skills, and writing readiness skills. The results showed that there were no significant correlations between gender and maternal education with print awareness skills. However, a low significant correlation ($r=.29$, $p<.01$) was found between print awareness skills and writing readiness skills.

Table 1.
Correlations among variables for print awareness skills

Variables	(1)	(2)	(3)	(4)
Child gender	-	-	-	-
Maternal education	.014	-	-	-
Print awareness skills	-.020	.039	-	-
Writing readiness skills	-.030	.029	.29**	-

**p<.01 (2-tailed)

As seen in Table 1, no significant correlation exists between child gender and print awareness skills ($r=-.020$, $N=316$, $p>.01$). These findings are consistent with the study conducted by Brown et al. (2013), which also reported no associations between gender and printed word skills, such as differentiating between letters, numbers, and shapes, as well as spacing between words. These results suggest that boys and girls demonstrate similar levels of proficiency in understanding the rules and structure of print. Numerous studies have emphasized the significance of children's interest in literacy activities as a crucial factor influencing their literacy skills (Kaderavek & Pakulski, 2007; Martini & Senechal, 2012; Puranik & Lonigan, 2012). Therefore, our findings may be attributed to the fact that both boys and girls exhibit similar interests in engaging in literacy activities.

Additionally, the analysis presented in Table 1 indicates that there is no significant correlation between gender-related differences in writing readiness skills ($r=.030$, $N=316$, $p>.01$). However, Dynia et al. (2020) found a positive association between name writing and both child age and gender. They observed slightly higher name-writing proficiency in girls compared to boys, suggesting that this result may be attributed to the superior grasping and flexibility exhibited by young girls. Other studies have highlighted the significance of fine motor skills in the development of writing abilities in children (Dinehart & Manfra, 2013; Grissmer et al., 2010). In the present study, children were assessed based on their understanding of print rules, and no significant gender-related differences were observed in their writing readiness skill scores. Hence, it can be argued that girls and boys display comparable levels of writing readiness skills, such as maintaining a proper sitting position for writing, holding a pencil, securing paper on the surface, maintaining an appropriate distance between their eyes and writing material, understanding print direction, and following instructions for drawing. Furthermore, it can be concluded that children possess similar skills, knowledge, and experiences regardless of their gender.

Based on Table 1, there is no significant correlation between maternal education and print awareness skills ($r=.039$, $N=316$, $p>.01$). However, contrary to our findings, some studies have reported a correlation between children's print awareness and the educational level of their mothers (Norman, 2007; Skibbe et al., 2008). This discrepancy can be explained by the fact that mothers, regardless of their educational background, provide similar home literacy environments for their children.

Numerous studies have also emphasized the significant correlations between children's literacy skills and the underlying factors of the home literacy environment (Farver et al., 2013; Xu, Farver, & Krieg, 2017). Therefore, the findings of this study suggest that factors such as the home literacy environment may have a greater influence and may overshadow the impact of maternal education.

Furthermore, no significant correlations were found between maternal education and writing readiness skills (r=.029, N=316, p>.01). However, in contrast to our findings, some studies have reported a positive effect of maternal education level on their children's literacy readiness skills (Hofslundsengen, Gustafsson, & Eriksen-Hagtvet, 2019; Hooper et al., 2010). For instance, Dynia and Solari (2021) found that children with autism, whose mothers had higher education levels, exhibited better print awareness, word awareness, and name-writing skills. However, in the case of the Kilis city province examined in the present study, no significant correlation was found between both print awareness and writing readiness scores and maternal education. Compared to the major provinces in Turkey where most studies have been conducted, Kilis city is a relatively small province with fewer social opportunities and activities. The social life and socio-demographic characteristics of Kilis city differ significantly from those of developed and larger cities in Turkey. In this regard, both highly educated and less educated mothers in Kilis city likely have ample time to spend with their children. These unique social characteristics of Kilis city may have contributed to our findings, which show significant differences from previous studies. Therefore, it can be argued that mothers in our sample implemented similar literacy activities or provided similar support for their children's literacy education. Many studies have presented that parenting literacy practices have positive effects on children's literacy skills (Puranik et al., 2018; Skibbe et al., 2008; Van Bergen et al., 2017).

Furthermore, it is worth noting that specific parental habits, such as engaging in book reading and asking questions during shared reading, can significantly contribute to children's literacy development, irrespective of the parent's education level. Therefore, it is suggested that certain home-related variables may have influenced the results obtained in our study. This argument aligns with the findings of previous studies that have emphasized the positive influence of the home early literacy environment and related literacy practices (Evans & Shaw, 2008; Hood, Conlon, & Andrews, 2008).

Correlations between print awareness skills and writing readiness skills

Table 1 reveals a significant but low correlation (r=.29, N=316, p<.01) between children's print awareness skills and writing readiness skills This finding is consistent with previous studies that have examined the relationship between writing and reading skills. For instance, Puranik et al. (2011) found that print awareness and letter-writing skills contribute to name-writing skills, while alphabet knowledge, print awareness, and letter-writing skills support letter-writing skills. Additionally, Welsch et al. (2003) emphasized the impact of age and name-writing skills on print knowledge. The results obtained from this study suggest that as children's writing readiness skills improve, their print awareness abilities also increase. The association between writing readiness skills and print awareness indicates that both skills encompass the structure and rules of print.

Regression analyses

Regression analyses were conducted to examine the relationships between child gender, maternal education, writing readiness skills, and print awareness skills. The results of the regression analysis are presented in Table 2, which shows the contributions of the three variables (child gender, maternal education, and writing readiness skills) to the prediction of print awareness skills.

Table 2.
Regression analysis of child gender, maternal education, writing readiness skills on children's print awareness

Variables	Print awareness skills				
	B	SE B	β	t	p
Child gender	.09	.42	.012	.23	.83
Maternal education	-.41	.61	-.037	-.68	.49
Writing readiness skills	.44	.08	.29*	5.42	.000

*p <.05; R=.297 R^2 = .088.; F= 10.058 p <.01

A multiple regression analysis was conducted to examine the relationship between print awareness skills, child gender, maternal education, and writing readiness skills. In this analysis, child gender, maternal education, and writing readiness skills were considered independent variables, while print awareness skills were the dependent variable. The results of the analysis revealed a significant overall effect of the model, $F(3, 312)=.297$, $p<.001$, $R^2=.088$. Child gender, maternal education, and writing readiness skills accounted for 9% of the total variance in print awareness. The standardized regression coefficients (β) indicated the relative importance of the predictor variables on print awareness as follows: writing readiness skills (β=.29, p<.05), maternal education (β=-.037, p>.05), and child gender (β=.012, p>.05). The t-test results for the significance of the regression coefficients indicated that only writing readiness skills significantly predicted print awareness skills.

Based on the findings of the present study, it can be argued that writing readiness skills are predictive of print awareness. The emphasis placed by teachers on the rules, function, and structure of print during writing activities may have contributed to this result. While there is substantial theoretical knowledge regarding the potential of writing to enhance a child's reading ability, and the importance of the reading-writing relationship is widely acknowledged, further research is needed to gain a deeper understanding of this relationship and the predictive role of writing skills on reading skills.

Conclusions

In this study, the relationship between child gender, maternal education, writing readiness skills, and print awareness skills of six-year-old children attending kindergarten was examined. In addition, this article aimed to examine the predictive powers of child gender, maternal education, and writing readiness skills on print awareness skills.

Relations between gender with writing readiness and print awareness skills

Correlation analyses revealed that child gender did not show a significant relationship with print awareness and writing readiness skills. This finding is consistent with previous studies. A review of the literature indicated that studies investigating the gender variable in relation to emergent literacy skills of preschool children consistently found no significant differences based on gender (Kelman, 2006; Son, Lee, & Song, 2013). Similarly, Hammer, Farkas, and Maczuga (2010) found that gender had no impact on the reading skills of preschool children, and exploring the effect of this variable on reading readiness skills in primary school children contributes to the field. Bayraktar (2018) also reported no significant difference between children's print awareness skills and the gender variable in their study. Additionally, in a separate study by Campbell et al. (2019), it was concluded that name-writing ability (assessed at school entry) had a greater influence on writing skills compared to variables such as gender, age, and years in the program.

Relations between maternal education with writing readiness and print awareness skills

One of the interesting findings of the study is the lack of a significant relationship between maternal education and print awareness and writing readiness skills. However, previous research has reported significant associations between maternal education and children's print awareness and writing readiness skills (Brooks-Gunn, Han, & Waldfogel, 2002; Hammer et al., 2010; Hartas, 2011). In this study, the lack of an increase in children's print awareness and writing readiness skills with the increase in maternal education level suggests that mothers have not acquired knowledge on supporting their children's literacy skills throughout their education. The reason for this finding in the current study may be attributed to the fact that mothers in the sample shared similar home literacy environments with their children due to the unique characteristics of the Kilis city province, as mentioned earlier. Therefore, it is recommended to explore different variables related to the home literacy environment to determine which specific factors are more/less influential on children's print awareness and writing skills. Consistent with this, home literacy environment aspects are found to differentially relate to children’s oral abilities, phonological sensitivity, and print awareness (Xu et al., 2017). In addition to maternal education, further studies may examine some different variables such as mothers’ literacy habits, home activities implemented by mothers with their children, and the duration of these activities on children’s print awareness and writing readiness skills. Based on the results obtained, it is suggested that the effect of more variables such as appropriate role modeling for children and building a social interaction on literacy skills can be examined. Because the main factor

in the development of literacy skills including writing skills is a child's observation of parents or other adults and social interaction with them (Aram & Levin, 2001). Moreover, children's knowledge of print and writing skills develop in environments where adults are good role models for them (Bloodgood, 1999).

Relations between writing readiness skills and print awareness skills

According to the correlation analysis, there is a low but positive correlation between children's writing readiness skills and print awareness. Given the finding from this study that print and writing skills are related, it is important to provide support for both skills both at school and at home. In line with this, Zhang and Bingham (2019) suggested that writing instruction delivered by teachers not only enhances children's writing skills but also improves their reading skills. Before starting school, it should be noted that children often have difficulty distinguishing non-alphabetic symbols from letters (Schmitterer & Schroeder, 2018). Children's awareness of this issue can be enhanced by providing them with opportunities to engage in activities that promote these skills from an early age.

According to Gerde et al. (2012), writing is considered an important activity that should be integrated into children's learning environment. Furthermore, these activities are more beneficial when supported and accompanied by an adult or parent (DeBaryshe, Binder, & Buell, 2000). Makin and Whitehead (2004) suggest several daily literacy activities that can be carried out with children, such as collecting print materials, visiting places where children can encounter written text, preparing shopping lists and greeting cards, and creating a message board for reminder notes. Therefore, it is essential to inform both teachers and parents about these daily literacy activities with children. Training programs can be implemented to provide guidance and support for parents and teachers, encouraging their active participation. For example, in the study conducted by Hannon, Nutbrown, and Morgan (2020), mothers were encouraged to participate in a program aimed at supporting their children's literacy skills. The study findings indicated that children whose mothers had a lower education level exhibited greater advancements in literacy skills compared to children whose mothers had a higher education level.

Writing readiness skills as a predictor of print awareness

Based on the results of the regression analysis aiming to assess the predictive power of writing readiness skills on print awareness in six-year-old children, it was observed that writing readiness skills significantly predict print awareness. However, although this study suggested a potential correlation between the two skills due to the inclusion of similar terms like print rules and print structure, further research is required to assert that writing skills serve as a crucial predictor of reading skills.

Taking into consideration the reciprocal predictive nature of both skills and their shared elements, it can be argued that emphasizing the development of print awareness skills should be prioritized during writing activities. In line with this, it has been emphasized that preschool teachers should not perceive children as incapable of engaging in writing before reaching a certain level of maturity, and instead, should actively support the cultivation of these skills (Dennis & Votteler, 2013). Therefore, teachers must encourage children from an early age to scribble from left to right and create letter-like shapes (Perlmutter et al., 2009).

Therefore, in light of the significant impact of reading and writing skills on children's future academic success, it is crucial to implement appropriate and effective literacy activities from the preschool period onwards. In this regard, Bengocheaa, Justice, and Hijlkemac (2017) recommended that assessing these skills can contribute to understanding children's development and identifying the types of support (such as book reading, literacy environment, etc.) provided to children. Future studies can further investigate parental behaviors and activities that promote children's literacy skills.

Implications

Based on the findings of the study, the following recommendations can be made to researchers:

When children participate in writing-related activities, their attention should be drawn to the rules, functions, and structure of print. Children should be included in writing activities from an early age by

creating writing activities appropriate for their age. Mothers should be informed about literacy activities that can be done at home with their children. The relationship between the frequency of reading and writing activities conducted at home and school and children's literacy skills can be examined. It can be determined which types of literacy preparation activities children are included at home and school. The influence of different reading and writing skills on each other can be investigated. The predictive effect of different demographic variables related to the family, teacher, and child on children's reading and writing skills can be examined. Future studies can be included larger sample sizes from different regions or provinces to enhance the generalizability of the results. In addition to focusing on six-year-old children, it may be that beneficial to investigate the predictive strength of writing skills in other age groups, such as four- and five-year-old children, to gain a more comprehensive understanding. By considering these recommendations, researchers can further contribute to the understanding and promotion of children's print awareness and writing readiness skills in early childhood literacy.

Limitations

This study had several limitations. Firstly, it was restricted to a sample of three hundred and sixteen children attending independent kindergartens in Kilis city. Conducting further studies with larger sample sizes from different provinces would enhance the generalizability of the findings. Secondly, the focus of this study was solely on six-year-old children, and exploring the predictive power of writing readiness skills across other age groups, such as four- and five-year-olds, would provide a more comprehensive understanding. Lastly, it should be noted that the results of this study are based on the psychometric properties of the two checklists used in Turkey: "The Control List for the Evaluation of the Writing Readiness Skills of Pre-school Children" and "The Control List for the Evaluation of the Print Awareness of Pre-school Children." While these scales have demonstrated high internal consistency reliability and good test-retest reliability, further research is required to examine additional psychometric properties, such as specificity and sensitivity.

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Ethic Statement: In this study, I declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that I do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, I declare that author contributes to the study and that all the responsibility belongs to the article author in case of all ethical violations.

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Science Learning in Playful Learning Environments: A Study from US Early Childhood Classrooms

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Abstract

Science may be a particularly vital subject in early life, serving not just to provide the foundation for future scientific understanding, but to expand understanding and recognition of the value of young children's thinking and learning. therefore, designing learning environment to support children's playful science learning is getting important. For this purpose, the current study was conducted to instigate how playful learning environments support children's science learning. The data of this study was collected from four different US early childhood learning environments. The analysis of the data showed that children's playful discoveries promote their scientific skills and science learning. In these learning environments, children are encouraged to play more and explore a variety of situations in these learning environments thanks to the materials chosen and the design of the learning centers that encourage interaction between children. The findings of the current study suggest that exemplary practices should be developed in order to move away from traditional learning environments and to support learning through play, and to raise awareness on this issue, starting with teacher candidates.

Keywords: Playful learning, science learning, playful learning environments

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Introduction

Piaget (1964) believes that play gives children numerous opportunity to engage with environmental components and construct their own knowledge. In recent years, there is a growing effort to bring back play into children's learning at school (Smith & Pellegrini, 2008). The related literature supports the idea that play and learning are mutually support one another (Buldu, 2022; Fisher et al., 2011; Kangas, 2010; Nicolopoulou et al., 2015; Zosh et al., 2018). What is meant by the term "playful learning" is that children can acquire knowledge while playing in their own free time while being guided by an adult or within the limits of a carefully designed game (NEAYC, 2022). Based on a review of the research literature, it can be suggested that learning through play is a learning pedagogy that includes developmentally appropriate practices. Research provides a strong support for our belief that children learn by means of the natural inquiry process of play (Whitebread et al., 2012).

To increase children's chances of developing their abilities on lifelong learners, they should be involved in meaningful discoveries through play (Zosh et al., 2017). For children's later success in math, science, language, and even social skills, it is important to meaningfully connect them to their needs, interests, and wonders. Through playful learning practices, children can try out their ideas, test their hypothesis, better understand social relations, and take meaningful risk for learning (Mardell et al., 2023). Providing learning process based on children's everyday life situations, and designing it through playful learning will help children to increase their ability of agency. Agency is basically the ability of children to consciously engage in their own learning. One of the main purpose of playful learning is to help learners on supporting their agency, creativity, and inquiry skills. It should not be forgotten that not all play is playful learning, and it is not something where anything goes. In playful learning, the content of the course is shaped around the learners' interests and wonders. Playful learning also does not mean that it is chaotic; rather, it has a purpose to bring about meaningful engagement in learning.

As to playful learning environment, it captures children's attention and maintains their interest, making even scientific concepts more accessible and enjoyable. When students are engaged, they are more likely to actively participate in the learning process and retain information better. In addition to the few studies on children's learning processes in well-designed environment, there are almost no studies that will reveal the relationship of playful learning environment with science learning in early childhood education. Therefore, the contribution of the study to the field will be great.

Playful Learning Environment

Children can explore their surroundings creatively while engaging in play. While playing they feel the pleasure of wonder and discover without limitations or outside interruptions. Play and learning studies conducted over the years show that open-ended and self-directed play and play environments are crucial for children's cognitive, social, and emotional development (Nicolopoulou et al., 2015). Thanks to playful interactions, it is possible to explore some of the most fundamental scientific problems through play. A playful learning environment is a place where children can deeply through their exploration, wonder, and, choices (PoP, 2022). One of the best aspects of playful learning environments is that children can lead their own learning in line with their interests and curiosity. In order to do so, to the extent that the literature leads us for creating a playful learning environment, designing semi-structured playful activities can help children to make spontaneous inquiries and discoveries (Kangas, 2010). Although there is no single way or understanding for the design of playful learning environments, an environment where children are supported to learn based on developmentally appropriate practices, and the learning process is fed with the information obtained from assessment results can be defined as a playful learning environment. A playful learning approach involves much more than just providing fun activities in the classroom. Children's feelings and mood for learning are key but not the only factor to implement it.

While designing the physical learning space, choices for material selection is one of the crucial elements that support children's learning. Open-ended, natural, aesthetic, novel materials are highly suggested for incorporating children's agency in their learning. Furthermore, creating a playful space in the classroom like a dramatic play area. Another important aspect to design a playful learning environment is to view the environment through the eyes of the children. Such questions like "Is the environment interesting? Inspiring?", and "Do they have the chance to cultivate their physical, cognitive, imaginal, and creative

abilities?" can help us to design playful learning environments (East Lothian Council, 2019). To think about how playful learning environments can be created within early childhood classrooms, the PoP team (2022) suggested four different lenses to create such environments; community, values, environment, and structure. Based on the "environment" aspect, it can be suggested that such learning environments provide a visible connection between children's lives and learning objectives. Allowing children for much flexibility in the use of classroom space and materials is quite suggested while constructing their knowledge throughout their learning process (Chaille & Britain, 2003). Movable and transformable materials can support your classrooms and children's changing needs.

Science Learning in Playful Learning Environments

Children naturally desire to learn about what is happening around them from the time they are born. Children are experts on play and also are scientists from birth (Chaille & Britain, 2003). It is critical to engage young children in hands-on playful learning (Hirsh-Pasek et al., 2022). Fostering their curiosity for deep science learning. For this reason, beginning in infancy, it is essential to provide children with an environment where they can discover and investigate as a part of their learning. such playful science learning environments require both inside and outside spaces for more inquiry and wonder. Science learning environments should be filled with the materials that children need for exploration (Bullard, 2010). It is well-recognized that children learn about things when they engage through their senses, and act out their interests (Berk, 2006). For instance, a child cannot learn about fragrances from a book. They become familiar with and learn about the smells of flowers, the voices of animals, and the textures of leaves by touching, smelling, and hearing them. By exposing children to experience things like seeing insects, establishing a setting where they can witness the seasons changing, and forcing them to feel the heat and cold, they will learn more quickly and effectively.

First of all, it is necessary to look at what the playful learning environment, where components are located indoors and outdoors, offers for learning. In the related literature, playful learning environments are defined as a place that offers a high amount of interaction and playful discoveries (Broadhead et al., 2010). For assessing the quality of physical learning environments, there are some checklists and scales that provide a deep understanding of how the environment can be designed around playful considerations and how teachers can support children's learning (Bjørnestad & Os, 2018). ITERS-R is one of the checklists that is used for rating environments. This scale suggests some quality indicators for classroom environments to support playful discoveries. Parallel with this understanding, this study investigated the four different early childhood classroom environments in the US to better understand how playful learning environments can be designed and support playful learning. Based on the purpose of the study, the research question of the current study is "*How does the design of a playful learning environment support children's science learning?"*

Method

The major purpose of the study is to reveal how playful learning environments support children's science learning skills. To investigate this research problem, the qualitative research method was chosen by the researcher. Basic qualitative research method was used for getting rich information about the learning settings. According to Creswell and Plano Clark (2011), one of the most effective part of qualitative study is to gather in-depth insight about the research problem. The data of the current study was collected through observations. To make systematic observation for the environments, the researcher developed an environment observation form that is specific to the research context.

Data Collection Contexts

The purpose of the current study is to get deeper information about how playful learning environments support children's science learning skills. For this purpose, a purposeful sample strategy was employed in the current study. To obtain information-rich cases for in-depth information, the teachers were selected from playful schools purposefully (Yıldırım & Şimşek, 2016). To this end, four different early childhood schools from toddler, preschool and kindergarten levels were taken part in the current study. All of the classroom environments included in the study were selected from Cambridge, MA.

The participant teachers in the selected schools work as partners in the same classroom. The toddler classroom environment was selected from one of the private school in the city. The kindergarten and

preschool classes were also selected from three different public schools. In the classrooms, the teachers work with their partners. The number of children in the class varies between 7 and 13. There are different learning centers in the classrooms and these centers are designed by the teacher. The size of the classes is designed in such a way that the children can move freely and the size is suitable for the class size. The schools are located in the center of the city and there are no big socio-economic differences among the children enrolled to these classrooms.

Data Collection Process and Tools

The researcher made observations after meeting with the schools to collect the data and determining the appropriate day and time interval. Before the observations, school principals and teachers were informed about the content of the study and ethical permission was shared. Observations were carried out in the spring term of 2021-2022. One day was allocated for each class observation and the observations continued until sufficient information was obtained for the observation tool. Each observation lasted an average of 2-3 hours.

The researcher developed an environment observation tool for observing each of the learning environment. The environment observation tool basically composed of three main parts; (1) Learning centers and materials, (2) Physical appearance of the classrooms, and (3) Integration of centers with learning.

The Environment Observation Tool was used ones at a time for each of the schools. The researcher took some notes about each of the categories. Each school was observed one time until reaching enough information about the learning environment. The purpose was not investigation of the interaction or teachers' practices, that's why one observation for each learning environment provided enough information. At the initial phase of the analysis, two theme developed; (1) learning environments and materials and (2) list of materials used on science teaching. However, it didn't seem like these two themes were different enough to be regarded as two separate themes. As is seen in the Table 1, there were four main factors to consider when using the observation tool.

Table 1.
An Environment Observation Tool

Dates/ The name of School	Organization of the learning environment	Physical appearance of the classrooms	Integration of the centers with learning
List of materials used on Science learning			

After the initial version of the observation tool was developed, the researcher asked two experts in the field for getting feedback about the items in the tool. Both of the experts suggested to include separate place for list of materials used during science learning. After receiving all revisions, the researcher designed the observation tool from general appearance of the learning environment to integrating environment to learning process.

Before starting to the environment observation, the researcher contacted with the school administrators to observe physical appearance of the playful learning environments. Together with the administrators, the researcher visited the classrooms and filled the form. During the observation, the researcher did not focus on the teaching science. Instead of this, the researcher focused on how the environment support science teaching and learning in playful learning environments. The first observed learning environment was the toddler class. This classroom belongs to the one of the private school in the city center. The second classroom environment observed by the researcher was preschool classroom which belongs to

the public school. The other two kindergarten classroom environments were also belonging to the two different public school in the city center.

Data Analysis Process

To analyze how playful learning environments support children's science learning, the data of the current study collected through observations of different playful learning early childhood classroom. The collected data were analyzed through thematic analysis method as suggested by Braun & Clarke (2006).

Because thematic analysis enabled the researcher to more clearly identify common themes among the environments, thematic analysis was chosen to be the best possible analytical technique. As themes and codes were developed, this process was guided by the relevant literature (Bjørnestad & Os, 2018; Broadhead et al., 2010). At the initial phase of the analysis, two theme developed; (1) learning environments and materials and (2) list of materials used on science teaching. However, it didn't seem like these two themes were different enough to be regarded as two separate themes. After taking expert opinion for the data analysis, three major themes were developed: (1) Aesthetics of the space, (2) preferences for the learning materials, and (3) arrangement of the learning centers. As is seen in the Table 2, the analysis revealed that there are three major themes on the design of the playful science learning environments.

Table 2.
Major themes developed from the analysis

Aesthetics of the space	Preferences for the learning materials	Arrangement of the learning centers
- Wide and open windows - Bringing more green into the classroom - Less color, more function - Child-related displays	- Open-ended, natural, messy materials - Independent use of centers - Tools for connecting to the nature - Space for privacy	- Less segmentation btw areas - Encourage interaction btw children - Provocations to support scientific inquiry

Findings

The current study aimed to investigate playful learning environments to understand how these environments support children's science learning. For this purpose, four different learning environments were included in the study from toddler, preschool, and kindergarten levels. The analysis of the data showed that there are three major theme to uncover the support of playful learning environment for children's science learning. These major theme are (1) aesthetics of the space, (2) preferences for the learning materials, and (3) arrangement of the learning centers.

Aesthetics of the space

The first major theme developed for the current study is aesthetic appearance of the learning environment. Under this major theme, there are four categories;

- Wide and open windows
- Bringing more green into the classroom
- Less color, more function
- Child-related displays

For the first category of wide and open window is common for four different learning environments included in the current study. The lightening of the classrooms mostly provided through natural day lights. The classrooms have wide windows and doors to reach school backyards which are belonging to each class. Depending on the activity they are engaged with, children can easily reach out of the classroom or are not disconnected from the outside world with the help of wide windows. The other category showed that each of the classroom environment has plenty of green. The Reggio-inspired classrooms pay more attention to promote respect for both the natural and artificial environments. Therefore, children can both explore the growth of the plants and how to care them.

Another striking point in the classrooms is that the furniture is not very colourful and mostly wooden. These Reggio-inspired playful learning environment is a nontraditional place, and there are no seats for each of the children. Children can easily access to educational materials; thus they can take charge of their own learning responsibility. Keeping in mind that learning environments provides children with unique learning experiences, the environments were designed by considering to provoke children's learning.

The last category is related to how children's learning displayed in the classroom environment. For each of the classroom environments, displaying children's learning stories through documentations is crucial part of their learning process. The creative work of children is displayed all over the classroom and school, and it gives the strong impression that the learning environment was made specifically to foster children's imagination and curiosity. The walls of the classroom are filled with children's photos and quotations that belong to their learning process. In the Reggio-Inspired classrooms, the documentation emphasizes children's playful discoveries. Teachers carefully examine and record the content and aesthetics of the children's work as they observe and record it.

Preferences for the learning materials

The other major theme developed for the current study is preferences for the learning materials. Under this major theme, there are four categories;

- Open-ended, natural, messy materials
- Independent use of centers,
- Tools for connecting to the nature
- Space for privacy

For the playful learning environments, materials are decided based on children's interest and attention. Because the learning process is designed parallel with the project-based learning and the topic is selected based on children's desire and attention, open-ended natural materials are most commonly used materials in these environments. This is also connected with the other category of independent use of learning centers. As the learning materials are arranged in a way that attracts the attention of the children, the children can go to the centers individually and determine their own learning processes. Since the materials are open to exploration and do not usually have a single use, children spontaneously include the materials in their play. Materials like mud, piece of woods, shovels, pipes, sponges, pinecones, lights, leaves, sea shells are helpful for children to free play and playful discoveries. In these classes, children can use different type of materials for different purposes. For instance, the classrooms filled with letter visuals and literacy elements, so children can integrate them while even playing dramatic play.

The other attention grabbing features of the playful learning environments is the selection of tools for conducting learning activities. Unlike traditional learning environments where art materials —like crayons, papers, scissors, and sticks— are predominantly used, vagoons, tents, fireplace, light table, piece of woods are commonly used in the playful learning environments. the schools, which have not playground, can use some vagoons to take children to the natural environments. Therefore, the teachers can include different places into their learning process. The other benefits of using these tools is to create content through various modes. The teachers can design an activity for acting out the weather conditions, outside art, and free discoveries at the nature.

The current study showed that the playful learning enrolments in this study have some private spaces for children. These spaces can be designed in the book reading areas through cushion, dramatic play areas through cozy seats. Thanks to these spaces, children can spend some time for imaginative thinking.

Arrangement of the learning centers

The last theme of the current study is arrangement of the learning centers. Under this theme there are three categories as follows;

- Less segmentation between areas
- Encourage interaction between children
- Provocations to support scientific inquiry

Under the category of lees segmentation between areas showed that children can easily manage their own learning process and design their playful discoveries. In these classrooms, there is no specific learning centers like science, math or music as in the traditional classrooms. All areas are organized around the topic determined that day for the project, and anyone who wants can play in the area they want, specific to that topic. In relation to this category, the interaction between children engaging in different areas does not decrease. While a group is playing in one area, they can combine their play with other group, or one of the children can go to another area and continue his or her playing. Even though the space designated for each area is small, the intersection of the areas has an adequate amount of space where every child can play together. Children were allowed to choose what they want to do for play.

It is a part of environmental design to make the learning environment feel comfortable by arranging the materials on the tables and shelves in a way that will attract the attention of the children for playful learning environments. The children's environment was designed as being open and encourage play, discovery, learning, and creativity. Thanks to the design of the classroom, children can easily expand their knowledge by integrating different learning areas (for example, by adding writing or art to the science area). At each area and center, children can find some provocation questions to support their scientific inquiries.

Discussion, Conclusion, and Suggestions

The current study was aimed to investigate how playful learning environments support children's science learning. The analysis of the environments showed that each of the classroom have similar features and they are all designed by considering Reggio Emilia Approach. Based on the analysis of the data three major themes showed us how environment support children's scientific inquiry skills. The theme can be listed as; (1) aesthetics of the space, (2) preferences for the learning materials, and (3) arrangement of the learning centers.

The theme for aesthetics of the space showed that the aesthetic design of the classrooms is supported through Reggio Emilia Approach. According to Rinaldi (2005), Reggio approach takes into account three main factors that affect a child's learning process, also known as "*environment is the third teacher*". This is because it encourages children to pursue their interests, work together freely with other children, and acquire information from both inside- and outside-the-classroom activities (Cadwell, 2011; Fraser, 2006; Gandini, 2004). Parallel with the finding of the study, the related literature suggest that Reggio-inspired classrooms aims to provide a sensory learning environment to children thanks to its aesthetic design (Bullard, 2010). As it is presented in the current study, providing plenty of greens, easy access to the nature and the use of calmer and monochromatic furniture is common within these classrooms. According to Haworth et al. (2013), an effective science learning environment is one that fosters children's curiosity. For creating an effective playful science learning environment, thinking critically, and being deliberate while constructing an effective atmosphere in your future classroom are all necessary.

The other theme preferences for the learning materials showed that the classroom environments in the current study are different from the traditional ones. Instead of using art materials often for each of the activity, the materials for multi-purpose use are always preferred. These Reggio-inspired classes provide children with material support and the opportunity for long-term research projects. According to Rutter et al., 2001, the design of the science learning environment is profoundly important to enhance children's scientific inquiry skills. furthermore, studies frequently show that the classroom has an impact on student achievement (Haworth et al., 2013). To improve the quality or relevance of children's learning, there have been numerous attempts at changing the way science is taught (Aikenhead, 2006). One of the ways to achieve this is to change the materials offered to children. In this concern, it can be claimed that open-ended and natural materials will help children discover more, be curious and gain more experience. Children can use objects that are open-ended in a variety of ways. According to Worth (2010), Close investigation of materials is the foundation of inquiry-based science. Moreover, play is actively interacting with the materials we came across (Bogost, 2016). Parallel with these suggestions, it can be claimed that open-ended materials encourage creativity because they are about the investigating process. While children use unrestricted materials to make a certain kind of product, these products would reflect

the children's own discovery and ideas. Sand, water, blocks, play dough, paint, and other materials are some examples of open-ended materials. Through these materials children will learn a variety of topics through the discovery of materials. Parallel with the finding of the current study, Raven & Wenner (2022) also found similar findings. In their study, the researchers conducted single case study which focused on the activities and experiences of one constructivist-oriented preschool teacher who employed science-based guided play. The result of the study showed that arranging science learning centers and classroom environment is one of the important aspects of preschool science learning. similarly, the current study showed that arranging learning centers to support children's discovery, and inquiry is one of the elements that support children's science learning. The current study also showed that arrangement of the learning environment one of the effective ways of supporting children's scientific skills. According to finding of the Head Start study, as children spend much less time learning science than other subjects, they had poorer scores in scientific readiness than in every other subject (Greenfield et al., 2009). Children who are not given the opportunity to investigate science may develop knowledge and ability gaps that are rarely able to be filled (Morgan et al., 2016).

It is suggested that exemplary practices be developed to enhance learning through play and move away from traditional learning spaces. This awareness-raising effort should begin with teacher candidates. It is believed that in order for the concept of learning via play to be implemented into the educational system, it is crucial to prepare teachers with a playful mindset, beginning with teacher training programs. As suggested by Jorgensen, Schroder and Skovbjerg (2022), playful learning in higher education is an emergent field of research. The educator in Turkey may focus on how they can design more playful course content in higher education.

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Ethics statement: In this study, I declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that I do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, I declare that all the responsibility belongs to the article author in case of all ethical violations.

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Examination of Metaphorical Perceptions of Fathers with 0-6 Years Old Children about the Experience of Being a Father

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Abstract

The current study aims to determine the metaphors expressed by fathers regarding their "becoming a father" experiences and to explore the underlying elements of these metaphors. Thus, the study was carried out using the phenomenological method, one of the qualitative research methods. The study group for the research consisted of 82 fathers with children aged between 2 and 72 months. The data for the research were collected both online and face-to-face. The data on the experience of "becoming a father" was "becoming a father …. like/similar; Because…" were obtained by filling in the blanks of the expression. The content analysis method, frequently used in qualitative research methods, was utilized, and the data were analyzed via the MAXQDA (20.2.2) program. For the data's reliability, the encoders' mean reliability index was checked, and the reliability index in this study was 81%. Fathers stated a total of 96 metaphors, and the metaphors they expressed the most were listed as "being a superhero," "great plane tree," "good news," "school," "rainbow," "being a cloud," "rebirth" and "gift." These metaphors were emphasized as positive expressions. According to the analysis of the generated metaphors, three themes (Interaction with the Child, Contributing to the Well-Being of the Fathers, and Perceived Fatherhood Duties) were determined. A total of two categories were analyzed in the theme of Interaction with the Child: The learning-teaching process and gamification. There are three categories in the theme of contributing to the father's well-being: Relaxing metaphors, metaphors about positive life events, and metaphors indicating a basic need. Two categories were analyzed in the theme of perceived paternity duties: "Responsibility and Accessibility" and "Being a Role Model."

Keywords: Fathers, fatherhood, metaphor, fathering, father involvement.

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Introduction

While it is the beginning of a significant and impressive process for a baby to join the family system, it is a critical turning point, especially for the family. It indicates that essential experiences can be experienced. Venning et al. (2020) also state that an exciting but at the same time frightening process has begun for families. It is emphasized in the literature that it has a side defined as the "new normal" (Vidaurreta et al., 2021). With this new normal process, there is a severe change in dads' lives (Volling & Palkovitz, 2021). Fatherhood stands out as a concept with many dimensions and is explained in terms of family systems based on many theories (Attachment Theory, Ecological Approach, Essential Father Theory) (Pleck, 2007). In Bronfenbrenner's ecological approach, the child's relationship with their parents can be seen as the first system that the child encounters in their life, which starts with their own family of origin and progresses in a context that affects the whole culture. Therefore, the father's presence at an essential point in the system is critical (Pleck, 2007). Attachment theory and essential father theory also emphasize the importance of the presence of fathers through their effects on childhood and subsequent personality/identity development. The psychological dimensions of father involvement are a more complex and contextualized structure (Petss & Knoester, 2018). Emotional interaction, accessibility, and responsibility dimensions have been proposed (Lamb et al., 1985). The accessibility and responsibility dimensions in this model were re-examined, and the importance of warmth, support, control/monitoring, other cognitive aspects, and emotional effects in fathering tasks were emphasized (Pleck & Stueve, 2001). Another contextual model of father involvement suggests that gender-related variables, family policies regarding childcare culture, and work culture affect the concept of fatherhood, affecting fathers' father involvement (Adler & Lenz, 2017). Kuzucu (2011), while emphasizing the changing roles of fatherhood, also emphasizes the child's development. It is already seen that paternity (father involvement) plays a vital role in the positive outcomes of the child's developmental processes, the harmony of the family, and the well-being of the parents (Blanco Castro et al., 2022; Diniz et al., 2021; Wilson & Prior, 2011). When father involvement is seen as positive and healthy, it is not difficult to say that it benefits both parents (Cummings et al., 2010). Healthy father involvement in a child's growth improves a mother's well-being and marital satisfaction (Tikotzky et al., 2015; Cummings et al., 2010).

Furthermore, fathers' self-confidence and self-image are positively impacted (Allport et al., 2018). However, the birth process of a baby can bring with it compelling and wearing thoughts (Huang et al., 2018). Michelic et al. (2018) explained these difficulties as being able to adapt to the changes in the couple's relationship with being a parent and incompatibilities that can be experienced in the transition to parenthood. From this point of view, we can define being a father as a phenomenon that affects the developmental trajectory of the baby, can change the family dynamics (Pilkington et al., 2015), and enters another normal process (Vidauretta et al., 2021). Thus, in Freud's theory, the father's role in the individual's development is significant and fundamental. It is known that the role and function of the father are especially crucial in the provision of impulse control, the development of the superego in the child, and the transition to the social and symbolic order, such as the sense of conscience (Erdem, 2014). In the literature, fathers' relationships with their children have a significant relationship with children's cognitive and academic abilities (Diniz et al., 2021; Grossman et al., 2002; Jeynes, 2007; McBride et al., 2013; Rollè et al., 2019; Varghese & Wachen, 2016). It is also essential to consider fathers' views on fatherhood and father involvement, the most important stakeholders with a significant share in children's development.

Fatherhood and Father Involvement

When studies on fatherhood are examined, it is helpful to read them regarding masculinity and gender roles (Cherry & Gerstein, 2021; Hauari & Hollingworth, 2009; Johnson, 2022; Shafer et al., 2021; Williams, 2009). In addition, when the studies conducted in the last quarter century are examined, changes in paternal attitude and paternal involvement may also be the reason for the scientific interest in fathers (Schoppe-Sullivan & Fagan, 2020). Although there are improvements in paternity leave and fathers in many countries (Huerta et al., 2014), it is clear that there is a need for studies that will increase father involvement and reduce the obstacles to father involvement (Shafer et al., 2021).

Although there has been an increase in studies on fathers, a desired level of father involvement has not been reached.

Considering the studies examining the variables that may affect father involvement, the literature generally focus on the father's education level (Yeung et al., 2001; Uzun & Baran, 2019), father's age (Baxter & Smart, 2011; Maume, 2011; Uzun & Baran, 2019), whether the father is married or not (Baxter & Smart, 2011; Wiik et al., 2009), and the child's age (Baxter & Smart, 2011; Lamb, 2010; Uzun & Baran, 2019). Huerta et al. (2014) also stated in their study that fathers who take leave from their work during childbirth show higher father involvement than those who do not. In addition, in all OECD countries except Denmark, there is a significant socio-economic difference between fathers who take leave and those who do not. When studies on fatherhood are examined, it is seen that fathers with high masculine representation also show higher father involvement (Schoppe-Sullivan et al., 2021; Shafer et al., 2021). Here, too, the responsibility associated with masculinity and the behaviors of caring for the child and home may have been exhibited in the experiences of fatherhood. In fact, the paternal role also presents a complexity of beliefs and behaviors. Therefore, obtaining latent beliefs and information about the paternity experience through metaphor may lead to a richer pattern.

At this point, the concept of metaphor is seen as a way of obtaining the opinions and beliefs of people about their experiences (Lakoff & Johnson, 2005; Moser, 2000). Metaphor plays a functional exploratory role, especially in reaching latent meanings and obtaining socially and culturally meaningful information (Moser, 2000). Since fatherhood and father involvement are also part of a social and social construction process (Coltrane, 2020; Lamb, 1997), it is possible to make an exploratory definition through metaphors regarding fathers' experiences of fatherhood.

The literature shows that fathers have little information on fatherhood and involvement (Lemay et al., 2010). Barlett (2004) makes a similar statement and states the ambiguity of fathers' experiences and views. Especially in Turkey, studies on fathers are also increasing. Scoping review (Kuzucu, 2011; Mercan & Tezel Şahin, 2017) and descriptive studies (Uzun & Baran, 2019), scale adaptation (Kuzucu & Özdemir, 2013; Uzun, 2020), and developmental studies (Sımsıkı & Şendil, 2014; Uzun & Baran, 2015), and experimental studies (Uzun & Baran, 2022) stand out. On the other hand, it is significant that fathers' views on their fathering role and engagement are examined and addressed in a contextual framework. Thus, it is crucial to examine the views of fathers living in Turkey on the experience of fatherhood. It is also essential that "being a father" occur as a cultural and social process, and fatherhood experiences result in the construction of this process (Coltrane, 2010). The perspectives and beliefs of fathers, the subjects of this structured process, are also critical. Therefore, this study aims to obtain the views of fathers living in Turkey on fatherhood experience and father involvement by asking them to describe them metaphorically. For this purpose, answers to the following questions were sought:

1. What are the metaphors expressed by fathers regarding their “fatherhood” experiences?

2. Under which conceptual categories are the metaphors developed by fathers regarding their fatherhood experiences?

Method

Research Model

In this study, the meanings that fathers attribute to their views on their fatherhood experiences were examined in depth and phenomenological design, one of the qualitative research methods, was used. Phenomenology research is the in-depth exploration and emergence of individuals' experiences, perceptions, attitudes, and meanings regarding a phenomenon (Yıldırım & Şimşek, 2013). To discover the common meanings underlying the phenomenon, it tries to describe the experiences experienced by people and explain the essence of these experiences (Rose et al., 1995). How they attribute meaning to the phenomenon they have experienced, what they describe and remember, and the language they use while sharing their experiences about this phenomenon with others is also fundamental (Patton, 2014). The language in which fathers who have experienced fatherhood describe their own experiences has also been examined metaphorically. A mental framework of the phenomenon is presented by trying to reveal hidden knowledge through metaphors (Shuell, 1990). In this study, too, to reveal hidden

information (Lakoff & Johnson, 1980), metaphorical perceptions of fathers were made using content analysis, one of the qualitative data analysis methods.

Study Group

The study group of this research was formed with the maximum variation sampling technique, one of the purposive sampling methods. For this purpose, it is aimed to understand the shared experiences of fathers as much as possible (Yıldırım & Şimşek, 2013). While forming the working group, inclusion-exclusion criteria were determined. These criteria are stated below:

- At least 2 months of experience as a father

- The child will be at most 72 months old

- Being currently married

- Living in the same house with your child (as resident fathers)

Data were obtained from 82 fathers who met these criteria, both face-to-face and online. Detailed information about the children of fathers in the study group is presented in Table 1.

Table 1. Demographic information about the children of the participants

Variables	f
Child's Age	82
2 – 12 months	9
13 – 36 months	18
37 – 48 months	19
49 – 72 months	36
Child's gender	82
Boy	36
Girl	46
Child's Birth Order	82
First child	43
Not first child	39

The mean age of the fathers was analyzed as 36.41 (*SD*= 6.16). In addition, 32 of the participants work in the private sector and 50 in government institutions.

Data Collection

Before beginning the data collection, the researchers applied to Hacettepe University Ethics Committee to start the study and obtained permission no. E-51944218-300-00001900116. Afterward, the data of the study were obtained by giving both online and face-to-face forms to the participants. While thinking about their metaphors, it was assumed that they would have richer data by thinking on their own and writing them down. Opinions of fathers with children between the ages of 0-6 on the experiences of "fatherhood" and "father involvement" were obtained through metaphor. It is aimed to reach the experiences, views, beliefs, and values in the background of the phenomenon through metaphor (see Lakoff & Johnson, 1980; Moser, 2000; Shuell, 1990). In line with this purpose, fathers are told "Being a father is like …; because…" and were asked to complete the statement. It was stated to the fathers that they needed as much time as they wanted in order to make this metaphorical definition. The relationship between the metaphor topic and the source of the metaphor of the metaphors produced by fathers on fatherhood experience and father participation was revealed with the preposition "like", and the meaning and context attributed to the metaphors with the conjunction "because" (e.g., Akgün, 2016). With the word "because", it was possible to obtain the explanation of the metaphor, that is, the source of the metaphor. Yıldırım and Şimşek (2013) also suggest that after the participants convey the metaphor, they reach its source by asking "why" or "how".

Data Analysis

Initially, the steps of the metaphor analysis methods suggested by Saban (2008) and Armstrong, Davis, and Paulson (2011) below were followed for the analysis of the data:

1- Taking the statements produced by the participants as metaphors into the text

2- Examining the statements that were converted into text and eliminating the answers that were not expressed as metaphors

3- Researchers review the eliminated and preserved responses

4- Meaning and coding of metaphors according to the source of the metaphor

5- Categorizing metaphors

6- Thematization of categories

7- Carrying out validity and reliability studies of the analysis.

Therefore, the answer sheets were numbered from 1 to 82. In this study, content analysis, one of the data evaluation methods used in qualitative research in social sciences, was used (Krippendorff, 2018). Content analysis is a scientific approach that allows verbal, written, and other materials to be examined in an objective and systematic way and organized according to certain categories (Bogdan & Biklen, 2007). In short, content analysis is to gather similar data within the framework of certain concepts and categories and to interpret them in a way that the reader can understand (Yıldırım & Şimşek, 2013). The metaphors stated by the fathers in a total of 82 papers filled by the research were analyzed with the metaphor source. Firstly, the expressions are codes; codes are divided into categories and categories into themes. Afterward, the validity and reliability studies of the analyzes were started and information was given about this part below.

Trustworthiness

During the data collection process, the first researcher was prepared and aimed to enable the participant to provide information efficiently and in-depth. The independent status of the researchers is a factor that the researchers pay attention to. In addition, the participants' demographic information was hidden from the data analysis to prevent any possible bias. To ensure accurate data analysis and transferability of the results, the researchers explained the research process to the participants in detail from the beginning with the informed consent form (Moretti et al., 2011). In this way, the concept of credibility was tried to be achieved by ensuring that the participants' metaphors about their experiences were conveyed more accurately and understandably (Guba, 1981; Thomas & Magilvy, 2011). Thus, each statement in each answer given to the question trying to reveal the metaphorical perception formed the analysis unit of the research. After this coding, the codes and themes created to ensure consistency were evaluated separately by both researchers and then evaluated over the codes and themes that were agreed upon. Creswell (2003) also recommends getting an expert opinion on the codes and themes determined as one of the credibility measures. This research was carried out in light of this information. Miles and Huberman (1994) suggested that the reliability ratio between coders should be calculated by dividing the number of agreed codes by the total number of agreed and non-agreed codes, and this ratio should be close to 80%. In this regard, their suggested formula [Confidence coefficient = Number of cases on which consensus was reached/ (Number of cases on which consensus was reached + Number of cases on which no consensus was reached) X 100] was used. The reliability coefficient of this study was calculated as 81% [(75/93) * 100] and it was concluded that the categories determined in line with the opinions of the experts were highly consistent. The intercoder confidence ratio is also within the recommended range. By using the MAXQDA package program for reliability analysis of the data, it is aimed at preventing being lost in the analysis over time and ensuring consistency.

Findings

In this section, the metaphors that fathers stated about the experience of “being a father” were presented in the form of evaluating these metaphors under the relevant categories and arranging the explanations specified for the related metaphors.

Table 2.
Metaphors developed by fathers for the experience of “being a father”

Metaphors	f	Metaphors	f
Gate	1	Play	1
Growing the tree	1	Playing in the amusement park	1
Book (Immersive)	1	Being a student	1
Patience stone	1	Kitchen	1
Childhood	1	House	2
School	4	Blessing	2
Laboratory	1	Bread and water	1
The blue of the sky	2	To be like cotton	1
Being a cloud	3	Traveling along the coastline	1
Rainbow	3	Listening to music	1
Rain	1	Rebirth	3
Sun which is a shadow	1	Waterfall of emotions	1
A bright star	1	Bottomless pit	1
Water	1	Tranquility	1
Sea	1	Source	2
Owning the 3 most important things	1	Color that gives meaning to life	1
Spring	2	Gospel	4
Shore (calm)	1	Opportunity	2
Heaven ticket	2	Gift	3
Reward	1	Starting a new life	1
Space infinity	1	Turtle	1
Camellia	1	Cloudy weather	1
Mountain	2	Great plane tree	5
Tree	1	Being a rock star	1
Hiking	1	Kingdom	1
Piggy bank	1	Being a pilot	1
Being a roof	1	Basket	1
Life itself	1	Building a world	1
Endless road	1	Being a soldier	1
Running a marathon	1	Candle	1
The test of life	1	Being a stove	1
Being a superhero	5	Compass	1
Windows (opening to the outside World)	1	Being a role model	1
Total			96

According to Table 1, fathers produced a total of 66 types of metaphors for the experiences of "being a father" and expressed 96 opinions for this. The metaphors that fathers stated the most in the top ten about the concept of fatherhood; are "being a superhero", "great plane tree", "good news", "school", "rainbow", "being a cloud", "rebirth" and "gift". Metaphors were generally created to emphasize the father and child relationship, the contribution of fatherhood to their well-being, and the fatherhood process. While it was determined that a total of eight metaphors were repeated 3 to 5 times, it was determined that a total of 53 metaphors were expressed once. It has been determined that fathers mostly produce the metaphors of "being a superhero" and "great plane tree" for fatherhood. Tables 2, 3, and 4 show the themes that the fathers differ from in terms of the common features of the metaphors they stated about the concept of “being a father”, and the distribution of the themes according to the categories. The first theme, interaction with the child, and its categories are presented in Table 3.

Table 3.

Distribution of the metaphors developed by fathers for the concept of fatherhood according to the categories related to the theme of interaction with the child

Categories	f
1. Metaphors Related to the Learning–Teaching Process	11
Gate	1
Growing the tree	1
Book (immersive)	1
Patience stone	1
Childhood	1
School	4
Laboratory	1
Building a world	1
2. Metaphors Related to the Gamification	3
Play	1
Playing in the amusement park	1
Being a student	1

According to Table 3, the metaphors developed by fathers for the experience of "being a father" are grouped under two categories regarding their interactions with their children. These categories are listed as "Metaphors related to the learning-teaching process" and "Metaphors related to gamification" in terms of their metaphor coverage. Different numbers of metaphors are specified in each of these categories. The category in which the most metaphors appear is in the category of "Metaphors related to the learning-teaching process". Examples of each of the metaphors in these categories are given below, with the expressions of the participants.

1. Metaphors in the category of "Metaphors related to the learning-teaching process" and examples given by fathers of their explanations [metaphors' sources]

A total of eight metaphors were stated in this category by the fathers. The explanations of these metaphors are given below in Table 4.

Table 4.
The respondents' metaphors and metaphors sources about the category of "Metaphors related to the learning-teaching process"

Metaphors	Fathers' Statements
Gate	I should be a door that can see what's coming in and out of their life, not a locked door to check in. (K2)
Growing the tree	Being a father is like growing a tree for me. It takes care and watering. Protect from the cold when appropriate (K70)
Book (immersive)	It's like a gripping book. Because my child has an inquisitive personality that likes to explore, and I like it. (K145)
Patience stone	Being a father is like a stone of patience to me. Because normally, if my brother did it, I would shout and get angry, I try to be patient and not react to his behavior. (K19)
Childhood	It's like going back to my childhood… I see myself in it, trying to turn things wrong into right. (K27)
School	It's like school because I learn something new every day (K31)
Laboratory	Being a father is like a laboratory for me. Because it allows for new learning through trial and error. (K37)
Building a world	Being a father is like building a whole new world for me. Because I have a child who is hungry for all kinds of information, wants to learn, researches, and asks. I am constantly trying to improve myself for his development. And I create a whole new world with my child. (K15)

2. Metaphors in the category of "Metaphors related to gamification" and its examples given by fathers of their explanations

A total of three metaphors were stated by the fathers in this category. The explanations of these metaphors are given below in Table 5.

Table 5.
The respondents' metaphors and sources of metaphors about the category of "Metaphors related to gamification"

Metaphors	Fathers' Statements
Play	Being a father is "like a game" for me. Because as my child gets older, I seem to level up in the game, and the difficulty increases. (K156)
Playing in the amusement park	Being a dad is "like playing in an amusement park" for me. Because being a father is risky and dangerous, but it's fun and happy, nonetheless. (K148)
Being a student	Being a father is like "being a student again" for me. Because I re-learn, discover, and interpret my own childhood by reading my own child. I am tasting the real value of the concept of mother, father, and family in all the flavors of life. (K166)

The metaphors that fathers developed for the experiences of fatherhood were grouped under three categories of the second theme "Contributing to the well-being of the fathers". These categories are listed as "Relaxing metaphors", "Metaphors about positive life events", and "Metaphors indicating a basic need" in terms of their metaphor coverage. The information about the theme is presented in Table 6.

Table 6.
Distribution of the metaphors developed by fathers for the concept of fatherhood according to the categories related to the theme of "contributing to the wellbeing of the fathers"

Categories	f
1. Relaxing Metaphors	30
The blue of the sky	2
Rainbow	3
Rain	1
Sun which is a shadow	1
A bright star	1
Water	1
Being a cloud	3
Sea	1
Owning the 3 most important things	1
Spring	2
Shore (calm)	1
To be like cotton	1
Traveling along the coastline	1
Listening to music	1
Rebirth	3
Waterfall of emotions	1
Bottomless pit	1
Tranquility	1
Source	2
Endless road	1
Running a marathon	1
2. Metaphors about positive life events	14
Color that gives meaning the life	1
Gospel	4
Opportunity	2
Heaven ticket	2
Gift	3
Reward	1

Table 6 continuing

Starting a new	1
3. Metaphors indicating a basic need	6
Kitchen	1
House	2
Blessing	2
Bread and water	1
Total	50

According to Table 3, different numbers of metaphors are specified in each of these categories. The category in which the most metaphors appear is in the category of "Relaxing metaphors". Examples of each of the metaphors in these categories are given below, with the expressions of the participants. The category with the highest number of metaphors is "Relaxing metaphors". Below, examples of each of the metaphors in these categories are given with the participants' statements and explanations.

1. Examples of the metaphors in the category "Relaxing metaphors" and their explanations provided by the fathers

A total of twenty-one metaphors were mentioned by the fathers in this category. Explanations of these metaphors are given beneath in Table 7.

Table 7.
The respondents' metaphors and sources of metaphors about the category of "Relaxing metaphors"

Metaphors	Fathers' Statements
The blue of the sky	For me, being a father is "like the blue sky", because I feel that I am living with an infinite peace of mind. (K160)
Rainbow	Being a father is like a rainbow for me. Every moment with my son is colorful; yellow when he laughs, blue when he cries, red when he is sick, pink when I miss him, and purple when he misbehaves... (K188)
Rain	It is like rain because it brings life to barren lands… (K30)
Sun which is a shadow	For me, being a father means "being a shadow and a sun for my children". Because being a father means giving up on yourself for the sake of your children's happiness and peace of mind... (K117)
A bright star	Being a father is "like a bright star" for me. Because fatherhood is like a miracle, having a child made me a little emotional, to be honest, nothing is as beautiful as a child, he is the joy of my home, and I am glad I became a father. (K124)
Water	For me, being a father is "like water" because it is the purest form of love and without it, I think there is no life. (K118)
Being a cloud	Being a father is for me "like clouds" because when I see them, I am light and relaxed like clouds ... (K90)
Sea	For me, a sea... It relaxes you; it teaches you different things, it is very beautiful, it is pure and clean, and its feeling is clear and real. (K205)
Owning the 3 most important things	Being a father to me is like being in a deserted forest with 3 things I love. Because it is a phenomenon that I am happy with its existence, that I love unconditionally, and that I would do anything for it. (K66)
Spring	Being a father is "like spring" for me because I love spring very much, I love green very much, and when I see my children, it fills me with peace, just like spring, it fills me with peace, and I love my children very much, and I am very happy to be a father. (K164)
Shore (calm)	A serene beach, because I can escape from the stress and hustle and bustle of life with my son's smile and find peace. (K73)
To be like cotton	Being a father means being like cotton wool for me. Because every time I hold my daughter, I forget everything. She calms me, her smile gives me strength. (K191)
Traveling along the coastline	For me, being a father is like going on a long car journey along the coastline, because on such a journey you feel a sense of peace, and happiness, on the one hand... (K43)

Table 7 continuing

Listening to music	Being a father is like listening to music for me. Because I want to hear your laughter over and over again, just like the music I love. (K190)
Rebirth	Being a father is like being born again for me, to grow up with a new life in my hands... (K18)
Waterfall of emotions	A waterfall of emotions because I experience each emotion much more intensely ... (K71)
Bottomless pit	Being a father is a bottomless pit for me because my son is my constant source of happiness. (K49)
Tranquility	... a peaceful time, because when I am with my children I forget my stresses, and I ignore my troubles in their laughter. (K7)
Source	Being a father is a "source of pride" for me because it is a very beautiful feeling, a source of happiness. (K136)
Endless road	For me, being a father is "like a road with no end". Because I feel happy on that road, because I feel safe, I never want that road to end. For me, that road is the line of peace, happiness, and life. (K111)
Running a marathon	It's like running a marathon because the running time is hard and tiring and the happiness of winning at the finish ... (K39)

2. Examples of the metaphors in the category "Metaphors related to positive life events" and their explanations provided by the fathers

A total of seven metaphors were mentioned by the fathers in this category. Explanations of these metaphors are given in Table 8.

Table 8.
The respondents' metaphors and sources of metaphors about the category of "Metaphors related to positive life events"

Metaphors	Fathers' Statements
Color that gives meaning the life	Because, of having children, I felt that my perspective changed, and my responsibility and fear increased more. (K112)
Gospel	Being a father is a "gift or a miracle" for me because I see my child as a source of peace for my wife and myself. (K107)
Opportunity	Being a father means a world of responsibility for me, an opportunity to improve myself. Because there is a brand new, fresh sprout that follows and imitates me and shapes its personality by looking at me. (K6)
Heaven ticket	It looks like heaven on earth. It's like a phenomenon that encompasses all concepts such as compassion, conscience, peace, and happiness. (K24)
Gift	The greatest gift and happiness in the world. Because I don't feel the love that my children make me feel in anything. I believe that they are the miracle of the world. (K208)
Reward	Because I am happy when I love children ... (K103)
Starting a new	Being a father is "starting a new life" for me. Because… You are starting a new life, every smile of your child... (K116)

3. Metaphors in the category of "Metaphors indicating a basic need" and examples of fathers regarding their explanations

A total of four metaphors were stated in this category by the fathers. The explanations of these metaphors are given in Table 9.

Table 9.
The respondents' metaphors and sources of metaphors about the category of "Metaphors indicating a basic need"

Metaphors	Fathers' Statements
Kitchen	... a kitchen where she can have a snack when she's hungry... (K2)
House	Being a father is like being a house. First, I have to make sure that the ground you put your child on is solid... (K2)

Table 9 continuing

Blessing	It's a blessing. My child is my most valuable asset ever and, in the future... (K196)
Bread and water	Being a father is for me "a basic need like bread and water" because you can't live without them. You need them every moment. You must always be there for me. (K108)

As a result of the content analysis, "perceived fatherhood duties" were determined as the last theme of the metaphors produced by the participants. Below, the results regarding the theme and the categories and codes of the theme are presented in Table 10.

Table 10.
Distribution of metaphors developed by fathers for the concept of “being a father” according to categories related to the theme of "Perceived fatherhood duties"

Categories	f
1. Metaphors related to “Accessibility and responsibility”	32
Space infinity	1
Turtle	1
Camellia	1
Mountain	2
Cloudy weather	1
Great plane tree	5
Tree	1
Hiking	1
Kingdom	1
Being a pilot	1
Basket	1
Being a roof	1
Candle	1
Being a superhero	5
2. Metaphors related to the “Role model”	9
Being a stove	1
Piggy bank	1
Being a bright star	1
Compass	1
Windows (opening to the outside world)	1
Being a role model	1
Life itself	1
Being a soldier	1
The test of life	1
Total	32

According to Table 4, the metaphors developed by the fathers for the experience of “being a father” were grouped under two categories related to their interactions with the child. These categories in the theme of “Perceived fatherhood duties” are listed as "Metaphors related to accessibility and responsibility" and "Metaphors related to being a role model" in terms of including the most metaphors. Different numbers of metaphors were mentioned in each of these categories. The category with the highest number of metaphors is "Metaphors related to accessibility". Below, examples of each of the metaphors in these categories are given with the statements of the participants with explanations.

1. Examples of the metaphors in the category "Metaphors related to Accessibility and Responsibility" and their explanations provided by the fathers

A total of fourteen metaphors were mentioned by the fathers in this category. Explanations of these metaphors are given beneath in Table 11.

Table 11.
The respondents' metaphors and sources of metaphors about the category of "Metaphors related to Accessibility and Responsibility"

Metaphors	Fathers' Statements
Space infinity	For me, being a father is "like the infinity of space". Because I feel an endless love for my children. (K101)
Turtle	Being a father is like being a turtle for me. I want to carry it all on my back. I'm aware of the responsibility but don't take it as a burden. (K67)
Camellia	It's like a camellia because even in the best of weather you strive to make it better... (K82)
Mountain	Being a father for me is like being a mountain, a hill because I want to protect my child, love him, and be safe. I want to be with him in difficult moments. (K157)
Cloudy weather	Cloudy because sometimes mercy is eerie but also easy to reach when they want to... (K68)
Great plane tree	... looks like a mighty sycamore. Because my son shades in my shadow. (K59)
Tree	I feel my tree/arms expanding and a sapling growing in the shade ... (K48)
Hiking	It looks like a nature walk. The path is sometimes flat and bumpy... but always close to my child... a very beautiful and unstable experience for such a feeling... (K174)
Kingdom	It's like a kingdom because I have a lot of responsibilities and I have to be with my children all the time, I have to support them. (K203)
Being a pilot	For me, being a father is similar to being an airplane pilot, both very enjoyable and stimulating, but also a heavy responsibility... (K35)
Basket	It looks like a basket because it brought the burden of responsibility... (K12,)
Being a roof	Being a father for me is "like being a roof" because I am there for him against all outside influences and prevent him from being harmed. (K158)
Candle	Being a father is a candle for me. Because as I melt, my children light up. (K38,)
Being a superhero	It's like being a superhero because I'm there for my child whenever they need me. (K10)

2. Examples of the metaphors in the category "Metaphors related to being a role model" and their explanations provided by the fathers

A total of nine metaphors were mentioned by the fathers in this category. Explanations of these metaphors are given in Table 12.

Table 12.
The respondents' metaphors and sources of metaphors about the category of "Metaphors related to the Role Model"

Metaphors	Fathers' Statements
Being a stove	"It's like being a stove" because, while my insides are on fire to protect him, my behavior towards him and what I teach him about life is so that he learns everything without the slightest harm. To make him stronger. (K51)
Piggy bank	It is like a piggy bank. Because a person fills the piggy bank by taking it as a debt to tell the right and wrong, the good and the bad, the homeland, the past, what he expects from himself in the future, his faith, his temple, and his ancestors. (K248)
Being a bright star	For me, being a father is "being a rock star". Because I feel the responsibility and excitement of being a role model... (K142)
Compass	A compass because it is the host that tells the truth about the good and the right in an unknown world... (K3)
Windows (opening to the outside world)	... I have to be her window to the outside world, a window through which she can open the curtains herself, turn her arm, and breathe when she opens it so that I can show her the world outside her... (K2)
Being a role model	To be a role model. Because raising quality people ... (K9)

Table 12 continuing

Life itself	Being a father means life itself for me. Because from the moment you start shaping another human being, you realize that you are alive. (K11)
Being a soldier	Being a father is like being a soldier. Because it gives me unique feelings. I consider it my duty to protect him from everything and raise him in the best way. (K41)
The test of life	"The test of my life" If I prepare him for life in a happy and good way, I will consider that I have passed this test… (K65)

Considering the metaphors coded in the categories belonging to the themes, fathers generally expressed the experience of being a father with positive characteristics. In this respect, figure 1 shows a diagram of the metaphors explained by the fathers according to the frequency of emphasis. As can be understood from this figure, the fathers' concepts of their responsibilities and being a phenomenon that is good for them were explained primarily with the metaphors of being a superhero, great plane tree, good news, rainbow, school, and cloud, it is noteworthy that a total of 53 metaphors expressed with equal font size were the metaphors expressed once. It is noteworthy that other high-frequency metaphors such as superhero, great-sycamore, good news, rainbow, school, being a cloud, rebirth, gift, resource, etc. are also included in the diagram in different size fonts according to their frequency values.

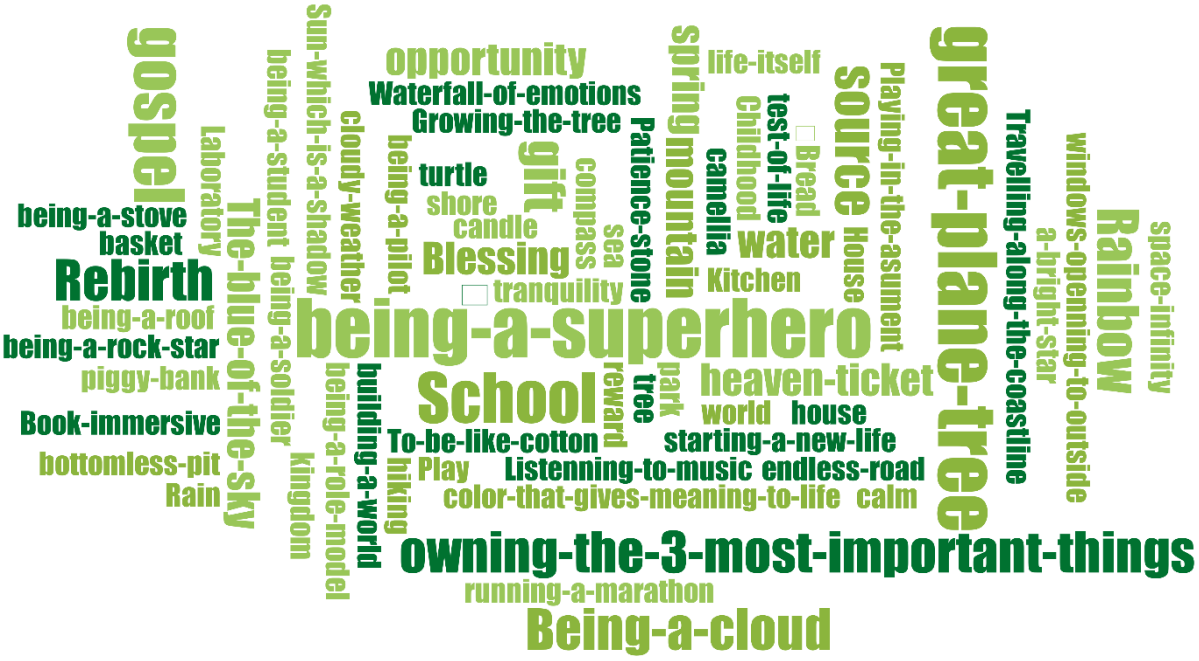

Figure 1. Word cloud of the fathers' metaphors about the experience of “being a father”

Categories and themes related to metaphors are seen above. Regarding the source of the metaphor, the participants provided 128 different coded explanations (metaphors’ source). As a result of analyzing these explanations, three different categories emerged, and are shown in Figure 2.

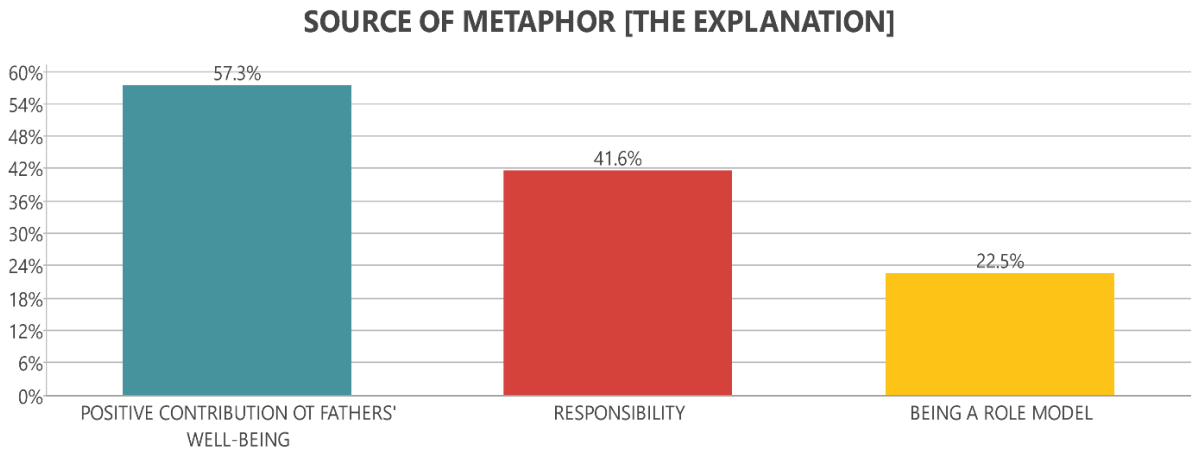

Figure 2. The father's source of metaphor about the experience of "being a father"

When the explanations regarding the source of the metaphors were analyzed, the most frequently expressed category was fatherhood's "positive contribution to fathers' well-being": 57 views, representing 57.30% of all views, and the participant views on these expressions are exemplified below. When the source of the metaphor is examined, K191's statement "... Because every time I hold my daughter, I forget everything, she calms me, her smile gives me strength." and K111's statement "... Because I feel happy on that road because I feel safe, I never want that road to the end. For me, that road is the line of peace, happiness, and life." show the contribution of fatherhood to the life energy of individuals. Furthermore, according to the source of the metaphor, the other most frequently expressed category was "responsibility" with 46 statements, representing 41.60% of all statements. The explanations of the fathers regarding the statements in this category are exemplified below. K10's statement "... because I am with my children whenever they need me ..." and K24's statement "... The answer to the question of what responsibility means and how it should be, I can express it as being a father ..." indicate that fathers were willing to take responsibility and understood the importance of taking responsibility along with having children. Lastly, according to the source of the metaphor, the least expressed category was "being a role model," with 25 statements, 19.50% of all statements. The explanations of the fathers regarding the statements in this category are exemplified below. K10's statement "… because there is a brand new, fresh sprout that follows and imitates me and shapes its personality by looking at me..." and K142's "... because I feel the responsibility and excitement of being a role model..." state that fathers know that they were role models and realized their importance.

Discussion

Within the scope of this study, 82 fathers with children aged between 2 and 72 months were asked to produce metaphors about their experiences of "being a father" and in this regard, 96 different opinions were expressed, and 66 different metaphors emerged. Regarding the source of these metaphors, 128 different opinions were expressed. When the metaphors were analyzed, the fathers stated a total of 96 metaphors, and the most frequently expressed metaphors were listed as "being a superhero", "great plane tree", "gospel", "school", "rainbow", "being a cloud", "rebirth", and "gift". It is seen that these metaphors point to the positive aspects of the fatherhood experience. The literature also emphasizes the positive aspects of the fatherhood experience (Blanco Castro et al., 2022). In the analysis of the metaphors generated, codes, categories, and themes were determined in terms of the source of the metaphor [the explanation made for the metaphor]. According to the results of the analysis of the metaphors produced, a total of three themes were analyzed: Interaction with Children, Contributing to Fathers' Well-Being, and Perceived Fatherhood Duties. A total of two categories were analyzed in the theme of Interaction with Children: Learning-teaching process and gamification. Since the 0-6 age period is a critical period for the child, it is crucial that the father interacts with the child and wants to contribute to the child's well-being during this period (Cabrera, 2010; Diniz et al., 2021; Rolle et al., 2019). Paquette (2004), and Volling and Palkovitz (2021) also emphasize the importance of the role of fathers, especially in early childhood. Especially father engagement's contribution to the child's emotional regulation is essential in this process (Cabrera et al., 2017). The fact that the fathers who

participated in the study tried to both learn fatherhood with their children and contribute to their lives may be an indication of how fathers have become as important as mothers in childcare in recent years. Moreover, the fact that fathers expressed their experiences of being a father with metaphors related to gamification is in line with the literature (Robinson et al., 2021; Stgeorge & Freeman, 2017). It is stated that fathers spend most of their time playing games with their children and especially playing rolling games that develop gross motor skills. In particular, it is also known that early childhood and the period until the start of school is seen as the period with the highest frequency of fathers' play (Amodia -Bidakowska et al., 2020). Fathers can interact with their children most easily through play, and this is also seen in the metaphors produced within the scope of this study. As a matter of fact, fathers tend to learn and teach from the fatherhood experience (Masciadrelli et al., 2006). Furthermore, it is perspicuous that there is a process in which fathers both learn and teach by playing games in their interaction with their children.

In the other finding of the study, the theme of "Contributing to the well-being of the Fathers", there are three categories: "Relaxing metaphors", "Metaphors about positive life events" and "Metaphors indicating a basic need". It is seen that the fathers described an experience that positively affected their well-being. The metaphors they produced for the state of being a basic need can be seen as a reflection of this. In particular, it is seen that fathers associate with traditional gender roles and that there is a positive relationship between being a man and a father (Baldwin et al., 2018). It can be said that men with this tendency attribute a positive meaning to fatherhood and perhaps see it as a status to be attained. As researchers, it is seen that the belief that fatherhood should be an indispensable and must-have experience may also cause stress. It can be said that fathers with traditional gender beliefs, who see fatherhood as a fundamental duty, care about being a father and try to be a good example (Schoppe-Sullivan et al., 2021; Shafer et al., 2021). Fathers also take ownership and responsibility for tasks such as providing preparation for the child's developmental achievements (Ashton-James et al., 2013). From this point of view, the ability of individuals to fulfill the duties defined as roles and responsibilities may have an effect that will increase their well-being. Especially interacting with children is likely to have the same effect.

In the theme of "Perceived Fatherhood Duties", two categories were analyzed: "Responsibility and Accessibility" and "Being a Role Model": they expressed the meaning that participant fathers attributed to fatherhood and how they saw the fathering experience for themselves. Thus, their views and experiences regarding the tasks and responsibilities of fathering were expressed in this way. This result is also in line with the literature (Schoppe-Sullivan et al., 2021; Shafer et al., 2021; Wray, 2020). Baldwin et al. (2018) who addressed the concept of fatherhood experience for the first time, stated that dads think a lot about their fatherhood identity and their changing roles, how it affects the fatherhood experience, and fathers' own father involvement dimensions before and after. It is seen in the literature that fathers especially attach significance to their responsibilities and role modeling. In terms of father involvement, fathers believe that they should be role models in the process of teaching values to their children (Masciadrelli et al., 2006). In addition, recent fatherhood models indicate that fathers tend to be more active, responsible, involved, engaged, and connected (Huttunen & Eerola, 2017). The fact that fathers express that they do their best to take care of their children's needs, to be accessible, and to be role models in life is a situation that other studies have also expressed. The dads do their best to fulfill their roles and responsibilities and take an active role in meeting the needs of the family is also quite understandable in terms of the definition of "working and responsible fathers" (Ranson, 2012).

Consequently, it is seen that fathers' perception of "fatherhood" also includes the dimension of responsibility, which society attaches great importance to. They might be very willing to compromise, especially when they consider the future of their children, their current conditions, and the financial and moral investment to be made in their future. In fact, despite the responsibility and care burden of fatherhood, many people in the world are motivated to become fathers even if they are caught unprepared (Spiteri et al., 2022). Therefore, it can be concluded that fathers are motivated toward father involvement. Thus, it is understandable that many metaphors produced in the study and their sources have positive content.

Conclusion and Recommendation

When the study findings are examined, it is understood from the metaphors produced that the participants' perception of "being a father" is positive. Significantly when the sources of the metaphors are examined, being a father contributes positively to the well-being of dads, even though there are expressions related to difficulties and care burdens. This finding aligns with the literature (Allport et al., 2018; Wilson & Prior, 2011). Although fathers have positive feelings about the presence of their children, the fact that they also stated challenging aspects such as responsibility and care burden might emphasize that stress might be experienced in fatherhood duties. Therefore, the concept of paternal stress can be studied in the literature just like that of maternal stress. As a matter of fact, although it is stated in the literature that fathers contribute a lot to the development of children, it can be said that fathers also contribute positively to their well-being. In addition to the researchers' studies on the effects of father involvement on children, it might also contribute to examining the relationship between fathers and their own well-being. Furthermore, fathers' interaction with their children and high levels of father involvement contribute positively to fathers as well as children. The most crucial suggestion regarding the study results is that it is vital to investigate in detail the variable of father involvement in fathers' well-being. The most critical issue is that it would be meaningful to create models for fathers' relationships with their spouses and the effect of this relationship on the child. In the components of psycho-education programs such as the Father Support Program of the Mother Child Education Foundation [*AÇEV*], it would be effective to inform fathers about other dimensions of the concept of father involvement. For policymakers, it would be necessary for the Ministry of Family and Social Services to organize a series of integrated programs in cooperation with the Ministry of National Education to increase father involvement. The concept of fatherhood should be conveyed to fathers and their partners through psycho-educational programs with healthier and more prosperous content. Since the perception of fatherhood and fathering has many cultural components, it can also be reinforced with unhealthy and false truths. As a result, an inaccurate father figure might emerge. It is valuable for policymakers and non-governmental organizations to carry out programs, activities, and studies in this context.

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Validity and Reliability of the Future Decent Work Scale with Turkish Vocational and Technical High School Students[1]

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Abstract

The working conditions of individuals in their workplaces must have human conditions. The characteristics that should be in a decent job are listed as safe working conditions, sufficient free time and rest hours, organizational values that complement family and social values, adequate compensation, and access to health services. The aim of this research is to study the validity and reliability of the Future Decent Work Scale on Vocational and Technical Anatolian High School students which measures individuals' perceptions of decent work that they can obtain in the future. Within the scope of the validity and reliability studies of the scale, data were collected from 545 Vocational and Technical Anatolian High School students. In order to test the construct validity of the scale, Confirmatory Factor Analysis (CFA) was used and criterion-related validity was examined. Cronbach Alpha and McDonald's Omega coefficients were calculated for reliability evidences. CFA results revealed that, the goodness of fit indices of the scale indicated good (GFI=.93, AGFI=.90) and acceptable ($\chi 2/df$=3.943, RMSEA=.074, SRMR=.069, CFI=.85) level of fit indices. The Cronbach Alpha internal consistency coefficient was calculated as .77 for the scale. These results show that the scale is a valid and reliable measurement tool on Vocational and Technical Anatolian High School students.

Keywords: Decent work, Decent work perceptions, Psychology of Working Theory, Vocational education, High school students.

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Introduction

The concepts of job and work are concepts that have existed in people's lives for centuries and are inevitable to continue their existence. One of the reasons for this is that these concepts have the potential to meet the three basic needs of the individual such as survival, social connection and self-determination needs (Blustein, 2013). Similarly, Duffy et al. (2016) emphasized that job and work have a basic function and that this function is the contribution of individuals to protect their physiological and psychological health, meet their needs and get satisfaction from their life. In this direction, it has been pointed out that a job must meet certain conditions to meet these needs of individuals (Blustein, 2008). Jobs that meet these conditions are defined as "decent work" (International Labor Organization [ILO], 1999). The ILO (1999, 2017) states that as the characteristics of decent work are fair wages, safe work environment, social protection for employees and their families and better opportunities in terms of personal and social aspects, a free work environment, equal opportunities for women and men. From this point of view, the Psychology of Working Theory (PWT, Duffy et al., 2016), which is based on the Psychology of Working Framework (Blustein, 2001; 2002; 2006; 2008; 2013), revealed five factors as following; safe working conditions, adequate free time and rest, organizational values that complement family and social values, adequate compensation, and permit access to health services. Accordingly, it is seen that decent work is a multidimensional structure that fulfills all these qualities and conditions, and the offering a definition for decent work, as well as making decent work possible for all people, becomes an important issue.

PWT (Duffy et al., 2016) focused on decent work and examined the processes of individuals to reach decent work in depth and presented a model that included these components. In this model, economic constraints, and marginalization (due to race, ethnic identity, social class, gender, etc.) that can be considered as contextual inputs are included as determinants of decent work. In addition, there are career adaptability and work volition, which can mediate the role of contextual inputs on accessing decent work, can be evaluated as psychological variables. The model points out to the role of four additional variables whose moderating role is emphasized, which have a potential to either strengthen or weaken the relationships between contextual variables (economic constraints and marginalization), psychological variables (career adaptability and work volition) and decent work. According to the model proposed, moderator variables were remarked as critical consciousness, proactive personality, social support, and economic conditions. Within the scope of the model, decent work can be treated as both a predictor and an outcome variable. In this regard, the model's outcome variables, in other words, the variables predicted by decent work are work fulfillment and well-being (Duffy et al., 2016). Individuals will meet their three basic needs (survival, social connection, self-determination) through decent work, and the ability to meet their needs will affect their work fulfillment and well-being (Buyukgoze-Kavas & Autin, 2019; Duffy et al., 2016; Kozan et al., 2019). As can be seen, this model, created within the framework of the theory, emphasizes the variables that can be effective in reaching and maintaining a job that offers decent conditions, and that reaching a decent job will contribute to general well-being.

In this theory, the predictors and outcome variables of decent work are briefly explained above. It is also emphasized that social class, privilege, and freedom of choice play a direct role in career choice (Duffy et al., 2016). For this reason, individuals who are members of a disadvantaged group based on their socioeconomic status, could not have sufficient access to financial and social capital (e.g., in terms of factors such as race, ethnic identity, social class, gender), and who are forced to make work-based transitions reluctantly may have problems in finding a job with decent conditions again. Considering the effects of decent work on important components of mental health such as well-being and life satisfaction (Blustein, 2013), it becomes an utmost importance to support disadvantaged individuals who may encounter many individual and environmental barriers in accessing decent work. International research reveals that especially in countries with low welfare levels and heavy working conditions, the well-being levels are low (Diener et al., 2015; Marks et al., 2006). In a study conducted by the American Psychological Association (APA, 2020) with 3500 working adults, it was stated that 78% of the participants regularly felt stressed due to factors such as high workload and lack of job security, and 20% of them had worse psychological health compared to the previous year. In addition, there are also studies concluded about the critical role of work experience in society, especially people

who are poor and in working class (Ali, 2013; Blustein et al., 2002; Noonan et al., 2007). Morever, studies have determined that experiences of discrimination and marginalization negatively affect the career development process (Flores et al., 2011; Eggerth et al., 2012), and high barriers and work volition have negative effects on fulfilling the requirements of the career decision-making process (Blustein, 2008; Duffy et al., 2012; Duffy et al., 2015).

On the other hand, research on decent work within the framework of theory usually focuses on working adults and university students. In the study conducted by Kim et al. (2019), university students' perceptions of securing and maintaining decent work have significant relationships with economic resources, work volition, and career adaptability. In studies conducted in Turkey on decent work, it has been observed that there are positive associations between decent work and job and life satisfaction, and negative associations between decent work and attempting to quit work (Buyukgoze-Kavas & Autin, 2019; Işık et al., 2019; Kozan et al., 2019). As a result of the findings, it is seen that the relationships between the predictors of decent work (economic constraints and marginalization) and outcome variables (work fulfillment and well-being) suggested in the PWT (Duffy et al., 2016) are significant. However, it is suggested that the results of research on the model put forward by the theory should be investigated in different age groups and different cultures (Duffy et al., 2016). At this point, it is important to introduce a valid and reliable measurement tool to the relevant literature in investigating the perceptions of students in vocational and technical education, who may be considered disadvantaged in various aspects in the context of Turkey, which are explained in more detail below, regarding their future decent work experiences.

Technical and vocational education and training (TVET) institutions are institutions established to meet the need for qualified intermediate staff (Sarkees-Wircenski et al., 1995) who have practical knowledge and skills in various fields (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2012). Individuals attending TVET institutions receive training to develop their practical knowledge and skills related to the field they have chosen, in line with these purposes. The purpose of TVET was emphasized by the Turkish Ministry of National Education (MoNE, 2018) as providing individuals with the knowledge and skills in certain business areas and providing them with the skills, abilities, and competencies required their profession in line with the goals of the economy and the demands of the business world. As seen in the purpose, the main objective of TVET is to prepare students for the business and working world by providing them with the knowledge and skills in line with the economic goals and demands of the business world. In addition, TVET graduates are expected to have some skills such as teamwork, communication, ethical/social responsibility, analytical thinking, professionalism, technical knowledge, reading comprehension, critical thinking, problem solving, creativity and innovation (American Management Association [AMA], 2019; National Association of Colleges and Employers [NACE], 2017). As it is seen, students who continue their education in TVET institutions, learn the knowledge and skills required by their profession, on the other hand, they must improve themselves in terms of other skills expected by the business world in the 21st century. At this point, TVET plays an important role in preparing young people for work, improving their skills, and responding to the needs of the economy and labor market (Gelişli et al., 2016).

Vocational and Technical Anatolian High Schools (VTAHS) are the most common TVET institutions in Turkey. There are currently more than four thousand VTAHS in Turkey and more than one million students continuing their formal education in these institutions (MoNE, 2022). Students who start their education in VTAHS choose one of 54 different fields and branches in the 9th or 10th grade and get training that includes knowledge and skills specific to that field until they graduate. A general secondary education program is applied to all students in the 9th grade. From the 10th grade until graduation, students continue their education which they can gain knowledge and skills specific to the field they have chosen (MoNE, 2018). Students in the 9th, 10th and 11th grades receive theoretical and practical training in the general program and the field. In the 12th grade, students receive theoretical training at school once or twice a week; three or four days of on-the-job skills training and internship (MoNE, 2018). In this way, students have the opportunity to meet business life, use the knowledge and skills they have acquired in their fields, and acquire new knowledge and skills while doing their internship. Although one of the aims of TVET and VTAHS is to equip students with

knowledge and skills in a field of their choice, to prepare them for business life and to meet the need for skilled manpower (Strategy and Budget Presidency, 2019), there are many problems experienced by students in the TVET.

In the related literature, there are many studies on the problems experienced by TVET students. For example, Günbayı and Tokel (2014) listed the problems experienced in these high schools as lack of materials, inadequacy of workshops, incompatibility between theory and practice, excess number of students in practice, and financial inadequacies. Ergün (2018) stated that in VTAHS, functionality (e.g., graduate students do not want to do their jobs), insecurity (e.g., not getting a job because the student who comes to the institution for internship is not trusted), inadequacy (e.g., lack of trained staff, lack of students) and indifference (for example, the lack of sensitivity of the people involved in the upbringing of students). Çelebi and Deliktaş (2017) emphasized that there are many problem areas such as low economic opportunities of students, low industry-school cooperation, low job opportunities for graduate students. In their study, Ayaz and Karacan-Özdemir (2021) reported that the problems related to students are lack of interest and motivation, low self-efficacy belief, low academic achievement, and sociocultural structure (for example, the disadvantaged conditions of the region where students live, low expectations for the future of the students from their environment). Similarly, in their study, Yeşil and Tunç (2020) showed that low academic achievement, limited options, and disadvantaged conditions were among the problems of students. In addition to these problems, there are studies showing that there are several biases held by society such as only problematic students go to VTAHS or academic success in these schools is insignificant and it is easy to graduate from these schools (e.g., Kennedy et al., 2017; Lamb, 2011). Moreover, it has been stated that families believe VTAHS do not provide a future for their children (İsmail & Abiddin, 2014), and the society perceives these schools as schools attended by socioeconomically disadvantaged students (Oketch, 2007) or students with the potential to harm society (Buthelezi, 2018).

Based on these research findings related to TVET, considering the one of the main points of PWT in disadvantaged groups (for example, low socioeconomic level, minority groups, working class, disabled individuals, immigrations, women, etc.) and recommendation of examining decent work in different age groups and in different cultures (Duffy et al., 2016), it can be said that the evaluation of the future decent work perception of the students in TVET is extremely important in terms of taking precautions and carrying out the necessary studies. At this point, the necessity and need to adapt a measurement tool to evaluate this perception for TVET students, who have a unique context within the framework of the education they receive, and the problems pointed out in the relevant literature, come to the forefront. Accordingly, the aim of this study is to test the validity and reliability of the Future Decent Work Scale (Kim et al., 2019) on TVET students, which was developed on university students according to the PWT and adapted to Turkish by Keser and Büyükgöze-Kavas (2022). The criterion-related validity of the scale will be tested with the life satisfaction variable, which was stated to be the outcome variable of decent work in the PWT (Duffy et al., 2019) and which was shown to have a significant relationship between decent work (Büyükgöze-Kavas & Autin, 2019; Işık et al., 2019; Kozan et al., 2019).

Method

In this study, it was aimed to test the validity and reliability of the Future Decent Work Scale (Kim et al., 2019; Keser & Büyükgöze-Kavas, 2022) on vocational and technical high school students. Information about the participants, data collection tools, data collection process and data analysis are given in this section.

Participants

The participants of the research consist of 545 students who continue their education at the 9th, 10th, 11th, and 12th grade levels from different Vocational and Technical Anatolian High Schools in Ankara districts. It is emphasized that around 300 participants would be sufficient to conduct factor analysis studies of the scale (Guadagnoli & Velicer, 1988; Nunnaly, 1978). Comrey and Lee (1992) considered the number of participants between 500 and 1000 as very good for validity and reliability studies. Based on the literature, it can be said that the number of participants is sufficient to conduct validity and reliability studies of the scale. Participants in the study were reached by convenience

sampling method (Fraenkel et al., 2006). Demographic information about the participants is provided in Table 1.

Table 1.
Demographic Information of Students

Variables		n	%
Gender	Female	276	50.6
	Male	269	49.4
Grade	9	151	27.7
	10	155	28.4
	11	114	20.9
	12	125	22.9
Mother's educational level	Elementary School and Below	183	33.6
	Middle School-High School	310	56.9
	Associate degree and above	52	9.6
Father's educational level	Elementary School and Below	124	22.8
	Middle School-High School	358	65.7
	Associate degree and above	63	11.5
Socioeconomic status	Low	50	9.2
	Medium	443	81.3
	High	52	9.5
	Total	545	100

In Table 1 above, information about the gender, class, education levels mother and father and their perceived socioeconomic levels are given. Of the participants in the study, 50.6% were female (n=276) and 49.4% were male (n=269). In addition, it is seen that the rates of participants are close to each other according to grade levels, and the highest number of participants are 10th grade students. Below in Table 2, the distribution of students with regards to their field was provided.

Table 2.
Distribution of Students by Fields

Field	Female	Male	Total	%
Information Technologies	40	57	97	17.8
Biomedical	7	26	33	6.1
Office Management	34	3	37	6.8
Child Development	79	-	79	14.5
Electric-Electronics	1	26	27	5
Graphic Design	46	2	48	8.8
Machine Design Technology	6	97	103	18.9
Food and Beverage Services	47	41	88	16.1
Accommodation and Travel Services	4	16	20	3.7
Beautician	12	1	13	2.4
Total	276	269	545	100

In Table 2 above, information about the fields of students is given. Looking at the distribution according to the fields, it is seen that most of the participants in the research are from machine design technologies and the least number of participants are from beautician.

Instruments

Demographic Information Form. The form was created by the researchers and the participants were asked about the variables of gender, grade, parental education level, socioeconomic status, and field.

Future Decent Work Scale (FDWS). The scale was adapted to the Decent Work Scale developed by Kim et al. (2019) by Duffy et al. (2017) by arranging the time expressions of the scale items to be used by university students. The scale was adapted to measure students' perceptions of access to decent work in the future (Kim et al., 2019). The scale is scored in a 7-point Likert type (1- Strongly disagree, 7- Strongly agree) and consists of 15 items and 5 sub-dimensions in total. There are 3 items in each sub-dimension of the scale. The sub-dimensions in the scale are "Safe working conditions", "Access to adequate healthcare", "Adequate compensation", "Free time and rest" and "Complementary values" (Kim et al., 2019). There are four reverse items in the scale. Two of these items are in the "Adequate compensation" dimension and the other two in the "Free time and Rest" dimension. To test the construct validity of the scale, a confirmatory factor analysis (CFA) was utilized and fit indices were found to be satisfactory (TLI= .96, CFI= .97, SRMR= .04 and RMSEA= .05). To investigate reliability evidence, an internal consistency method was used through calculating the Cronbach Alpha and it was reported as .91 for the total scale (Kim et al., 2019). According to these results, the scale is a valid and reliable scale for university students.

The scale was adapted into Turkish by Keser and Büyükgöze Kavas (2022) on university students. CFA was performed to prove the construct validity of the scale. According to CFA results, TLI was calculated as .94, CFI .95, SRMR .05 and RMSEA .06. The Cronbach Alpha internal consistency coefficient for the entire scale was calculated as .86. When looking at the sub-dimensions, the Cronbach Alpha internal consistency coefficient is .82 for the Safe working conditions sub-dimension, .86 for the Access to adequate healthcare sub-dimension, .87 for the Adequate compensation sub-dimension, .84 for the Free time and rest sub-dimension, and .85 for the Complementary values sub-dimension. These results show that the scale is a valid and reliable measurement tool on university students in Turkey.

Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS). The BMSLSS was developed by Seligson et al. (2003) as the short form of the Multidimensional Student Life Satisfaction Scale (Huebner, 1994). The scale was developed to measure the level of life satisfaction perceived by children and adolescents regarding their family, friends, school, self and life environment. The scale consists of a total of 5 items in a 7-point Likert type (1-Terrible, 7-Delighted) and gives a total score. Explanatory factor analysis (EFA) was performed for the construct validity of the scale and a structure consisting of a single factor emerged. In addition, in the study conducted for criterion-related validity, it was stated that there were positive and significant relationships with positive affect, inverse and significant relationships with negative affect. The Cronbach Alpha internal consistency coefficient of the scale was calculated as .75 (Seligson et al., 2003).

BMSLSS was adapted into Turkish by Siyez and Kaya (2008). The validity and reliability studies of the scale were conducted with students aged between 9-16. For the validity evidence of the scale, an EFA was performed, and it was revealed that the scale had a similar structure with the original form. In addition, the criterion-related validity of the scale was ensured by negative relationships with depression and positive relationships with personality (Siyez & Kaya, 2008). The Cronbach Alpha internal consistency coefficient of the Turkish version of the scale was calculated as .89 and the test-retest reliability coefficient as .82. Within the scope of this study, this scale was used to test the criterion-related validity of FDWS.

Data Collection Process

First up, ethical approval was obtained from the ethics commission of a state university to ensure the protection of the rights of the participants. Then, official permission was obtained from the Education Research and Development Department of the Ministry of National Education (MoNE) for the scales

to be applied in schools. After obtaining the necessary permissions, the researchers contacted school administrators and school psychological counseling and guidance services. Data were collected from students who continue their education in vocational and technical high schools in the fall semester of 2022-2023. All scales were applied in the classrooms with the permission of the teachers. It took approximately 20 minutes for the participants to answer the scale set. The data of the study were collected by the researcher.

Data Analysis

In this study, validity, and reliability studies of the FDWS were conducted with students attending vocational and technical high schools. Before conducting the analyses, missing data screening and normality assumption checks (Kurtosis-skewness values, histogram graphs, extreme data, and Normal Q-Q Plot graphs) were performed, and descriptive information regarding participants were also reported in the findings.

For the construct validity evidence, a CFA was performed, and criterion-related validity was tested via calculating the correlation between FDWS and life satisfaction. In order to test the reliability of the scale, the Cronbach Alpha internal consistency value for the total score and sub-dimensions were calculated. Values related to validity and reliability are given below Table 3, Figure 1, Table 4 and Table 5. SPSS 24 was used while analyzing the data. In addition, AMOS 22 (Arbuckle, 2013) was used in the CFA examinations of the scale.

Findings

Results of Confirmatory Factor Analysis

CFA was applied to test the construct validity of the scale. The goodness of fit values taken as criteria during the analyses and the goodness of fit indices obtained as a result of the CFA applied on the data obtained from the VTAHS students regarding the scale are given in Table 3.

Table 3.
Criterion values for CFA and goodness of fit indices of FDWS

Fit Indices	Good fit	Acceptable fit	Estimated model
$\chi 2/df$	≤ 2	2-5	3.943
RMSEA	$\leq .05$	$\leq .08$	.074
SRMR	$\leq .05$	$\leq .08$	.069
GFI	$\geq .90$	$\geq .85$	.93
AGFI	$\geq .90$	$\geq .85$	.90
CFI	$\geq .90$	$\geq .85$	.85

(Source: Hu & Bentler, 1999; Jöreskog & Sörbom, 1993; Marsh et al., 1988; Schreiber et al., 2006)

As can be seen in Table 3 above, the goodness-of-fit indices of FDWS are $\chi 2/df$ ($\chi 2=311.496$, $df=79$, $p=.00$)=3.943, RMSEA=.074, SRMR=.069, GFI=.93, AGFI=.90 and CFI=.85. When the goodness of fit indices were examined, it was seen that the $\chi 2/df$, RMSEA, SRMR, and CFI values were at an acceptable level of fit (Marsh et al., 1988; Schreiber et al., 2006), while the GFI and AGFI values had a good fit level (Hu & Bentler, 1999; Jöreskog & Sörbom, 1993). The model obtained as a result of the CFA is given in Figure 1 below.

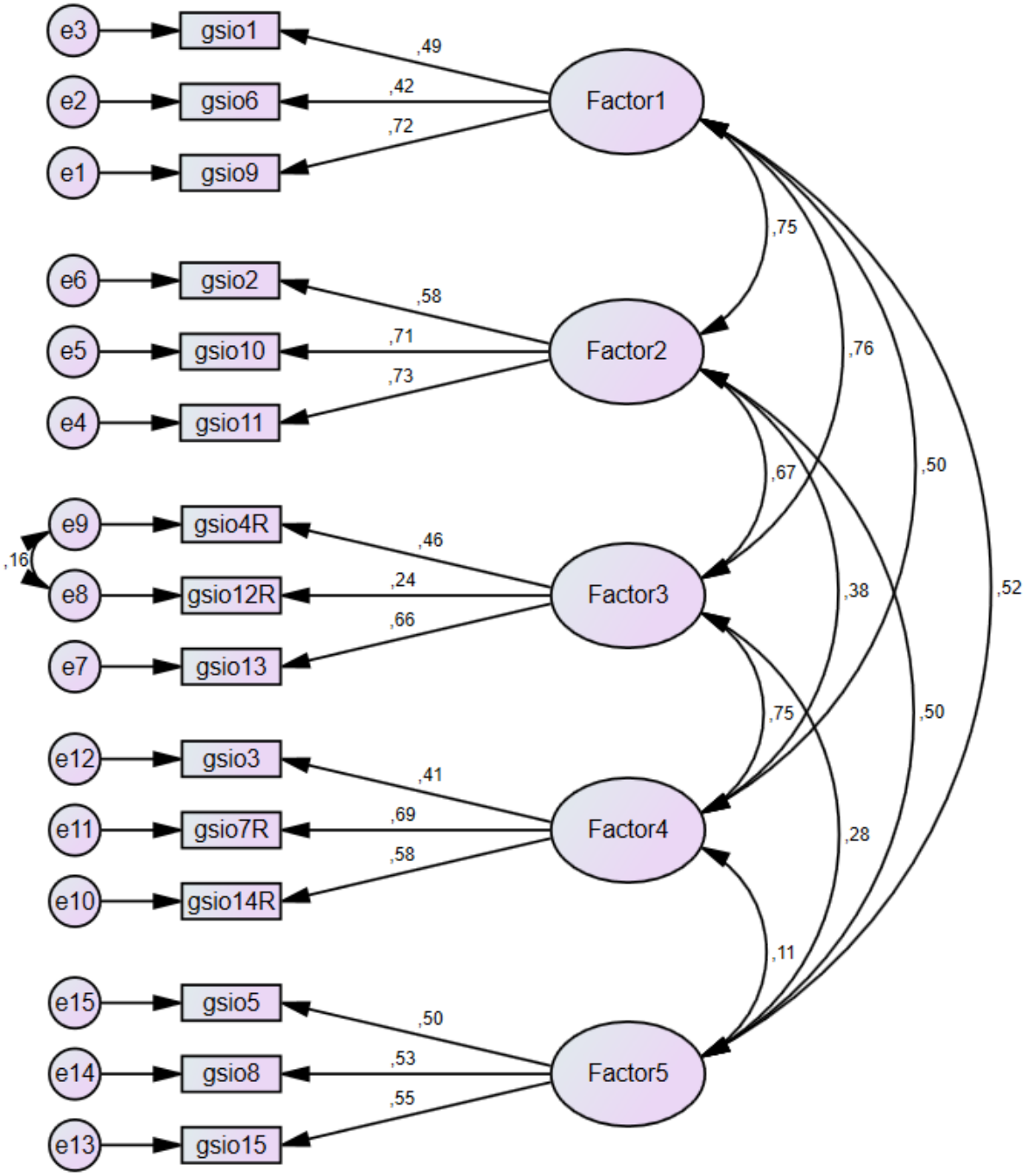

Figure 1. CFA Model of FDWS

As seen in Figure-1 above, item factor loadings obtained as a result of CFA are above .40 except one item (12th item under the third factor) (Hu & Bentler, 1999; Jöreskog & Sorbom, 1993; Schreiber et al., 2006). The 12th item below the critical value of .40 was not removed from the scale in order to preserve the original structure of the scale and as there should be at least three items in one factor (Büyüköztürk, 2013; Harrington, 2009). However, in order to improve the goodness of fit indices, a modification process was performed between e8 and e9, which have high error coefficients (Tabachnick & Fidell, 2014, p. 776).

Results of Criterion-Related Validity Analysis

The criterion-related validity of the FDWS was tested with the life satisfaction variable, which is one of the related concepts according to the PWT (Duffy et al., 2016). The results of criterion-related validity are given in Table 4.

Table 4.
Correlations of the FDWS and its sub-dimensions with the BMSLSS

FDWS	BMSLSS
Total score	.34**
Safe working conditions	.25**
Access to adequate healthcare	.22**
Adequate compensation	.28**
Free time and rest	.22**
Complementary values	.16**

*p<.05, **p<.01

As seen in Table 4, the correlations between criterion variables and FDWS were positive and statistically significant (p<.01), which can be considered as validity evidence for the FDWS.

Results of Reliability Analysis

Cronbach Alpha and McDonald's Omega coefficients were calculated for the total scale regarding the reliability of the FDWS. McDonald's Omega coefficient is one of the recommended reliability methods for the multidimensional scales (Hayes & Coutts, 2020). The reliability coefficients for the scale and its sub-dimensions are given in Table 5 below.

Table 5.
Cronbach Alfa and McDonald's Omega coefficients of FDWS and sub-dimensions

Scale and sub-dimensions	Cronbach Alfa (α) coefficients	McDonald's Omega (ω) coefficients
FDWS	.77**	.78
Safe working conditions	.52**	.54
Access to adequate healthcare	.70**	.71
Adequate compensation	.50**	.51
Free time and rest	.55**	.61
Complementary values	.54**	.55

**p<.01

As seen in the table, the Cronbach Alpha coefficient for the total score is .77 and the McDonald's Omega coefficient is .78, for the Safe working conditions sub-dimension is .52 and the .54, for the Access to adequate healthcare sub-dimension is .70 and .71, Adequate compensation sub-dimension is .50 and .51, for the Free time and rest sub-dimension is .55 and .61, Complementary values sub-dimension is .54 and the .65. The Cronbach Alpha coefficient for the total score and the "Access to Adequate Healthcare" sub-dimension was found to be above the critical value of .70, while the reliability coefficients of the other sub-dimensions were below the critical value (Nunnally & Berstein, 1994).

Discussion, Conclusion, and Suggestions

Duffy et al. (2017) developed the Decent Work Scale to measure the concept of decent work according to the PWT (Duffy et al., 2016). Kim et al. (2019) adapted the Decent Work Scale (Duffy et al., 2017) as the Future Decent Work Scale to university students and to measure university students' perceptions of future decent work. This scale was adapted to Turkish through utilizing a sample of university

students in Turkey by Keser and Büyükgöze-Kavas (2022). In the PWT (Duffy et al., 2016), it is emphasized that the work-based experiences of individuals who take part in world of work and are planned to be involved should be examined. Considering that vocational and technical high school students choose an area to gain certain knowledge and skills in a working field (MoNE, 2018) and receive education, it can be said that these students are potential candidates for business life and world of work after graduation. At this point, to researchers' knowledge, there is no available measurement tool in the related literature to measure the work-based experiences and future decent work perceptions of vocational and technical high school students based on PWT (Duffy et al., 2016). Accordingly, in this study, the validity and reliability of the Future Decent Work Scale (Kim et al., 2019; Keser & Büyükgöze-Kavas, 2022) adapted to the Turkish sample to measure the future decent work perceptions of university students was tested on vocational and technical high school students.

Within the scope of this study, considering the certain demographic variables included such as gender, class, field, and the district where the school is located in the sample group it can be concluded that a relatively heterogeneous group was reached to use the scale in TVET students. With the aim of validating to use the scale for TVET students, a CFA was conducted and the findings pointed out a conceptually existing structure (McArdle, 1996) and the proposed model showed acceptable fit indices (x2/df, RMSEA, SRMR, GFI, AGFI, CFI) (Hu & Bentler, 1999; Jörekog & Sorbom, 1999; Marsh et al., 1988; Schreiber et al., 2006). As a result of CFA to test the construct validity of the scale, the five-factor structures consisting of its sub-dimensions "Safe working conditions", "Access to adequate healthcare", "Adequate compensation", "Free time and rest" and "Complementary values" were also confirmed for TVET students. However, the fact that an item in the "Adequate compensation" dimension had a loading below .30 (Büyüköztürk, 2013; Harrington, 2009) indicates that it does not work for the sample group used in this study. This item is "I will feel I am not paid enough based on my qualifications and experience" and a reverse item. This statement indicates that students do not believe that they will earn an adequate compensation in the future, even if they have high qualifications and experience, while evaluating their perceptions of accessing a decent job in the future. It can be said that there are several possible reasons why this item has a low load in the data obtained from TVET students. First explanation is that the students may not have understood it correctly as it was a reverse item. In addition, since the students are still in the education process, it can be listed as the fact that students at 9, 10 and 11th grades have little or no work-based experience and their perceptions of wage expectations from their future jobs may not be fully formed. Another reason can be the fact that students are in adolescence and their feelings and thoughts about the future tend to change irregularly as the self and identity development of individuals in adolescence process (Steinberg, 2007). On the other hand, it can be said that the intelligibility of this item in its Turkish translation is difficult. This item can be considered as "I will feel I am paid enough based on my qualifications and experience" a statement and this item can be revised in future research. However, as stated before, the relevant item was not removed from the scale in order not to deteriorate the structure intended to be measured in the original scale and the fact that number of items that should be included in a factor was at least three (Büyüköztürk, 2013).

The criterion-related validity of the scale is tested with the life satisfaction variable as alleged to be closely related to the concept of decent work in PWT framework (Duffy et al., 2016) and a pile of studies have supported this relationship as well (Büyükgöze-Kavas & Autin, 2019; Işık et al., 2019; Kozan et al., 2019). The results of the present study indicated that there are significant and positive relationships between life satisfaction and the whole scale as well as its sub-dimensions. This result confirms the relationship between decent work and life satisfaction as hypothesized in the PWT (Duffy et al., 2016). In addition, previous research on the theory (Büyükgöze-Kavas & Autin, 2019; Işık et al., 2019; Kozan et al., 2019) also have supported the significant relationship between life satisfaction and decent work. Based on the theory and research findings, it is seen that the criterion-related validity results are both supported by the studies and show similar results with the results of previous studies. This result showed that the criterion-related validity of the scale is ensured for TVET students. In addition, to researchers' knowledge, this study is one of the first attempts to examine the relationship between decent work perception and life satisfaction of vocational and technical high school students in the context of PWT in Turkey (Duffy et al., 2016) and therefore, hopefully, the results of the study will provide a substantial contribution to the literature.

The reliability of the scale was tested with the Cronbach Alpha reliability coefficient in terms of internal consistency. The reliability coefficient for the scale was found to be above the acceptable value of .70 (Nunnally & Berstein, 1994). At this point, it can be said that the scale is a reliable measurement tool for TVET students in line with the internal consistency value of the scale. On the other hand, when the reliability coefficients of the sub-dimensions in the scale are examined, it is seen that the "Access to Healthcare" sub-dimension has an acceptable value. It was concluded that the reliability coefficients of the other sub-dimensions, "Safe Working Conditions", "Adequate compensation", "Free Time and Rest" and "Complementary values" were below .70. As Tavakol and Dennick (2011) cited, the low number of items are one of the reasons for the low Cronbach's alpha values. There are 3 items in each sub-dimension in the scale (Kim et al., 2019). The low number of items in the sub-dimensions (Tavakol & Dennick, 2011) can be treated as one of the reasons why the reliability coefficients are below the critical value. In addition, considering the developmental characteristics of the students, the presence of reverse items in the scale may have negatively affected the answers of the students and, thus in return, the reliability of the scale. Another reason may be the developmental characteristics of adolescents, since the study group was adolescents. Since it is thought that the self and identity development of individuals continue during adolescence, their feelings and thoughts about the future may change irregularly (Steinberg, 2007). In addition, lack of interest and motivation and low academic achievement (Ayaz & Karacan-Özdemir, 2021) are among the problems experienced by TVET students. These problems can lead to situations such as students' random answers to items due to loss of interest and motivation (responding to one item at the highest level while giving the lowest response to the other and repeating it for all scales), answering without understanding what they have read, giving quick answers to finish quickly, which will reduce reliability.

Looking at the studies on decent work, it is seen that in the context of PWT (Duffy et al., 2016), individuals use the scale as a total score to measure perceptions of decent work and evaluate the results over a total score (see Buyukgoze-Kavas & Autin, 2019; Duffy et al., 2020; Işık et al., 2019; Kim et al., 2022; Kozan et al., 2019; Wan & Duffy, 2022). Based on the research, the fact that the reliability values of the scale for the total score for the TVET students in this study are above the acceptable level indicates that the scale is a reliable tool in measuring the future decent work perceptions of the TVET students. On the other hand, McDonald's Omega coefficient was calculated to test the reliability of the scale and its sub-dimensions (Hayes & Coutts, 2020). For a scale to be accepted as a reliable scale, it is stated that the omega critical value is minimum .50 (Reise et al., 2013). When the Omega coefficients related to the scale and sub-dimensions are examined, it is seen that the scale and sub-dimensions are at acceptable values. As a result, CFA, criterion-related validity, Cronbach's alpha, and McDonald's Omega coefficients analyzed to test the psychometric properties of the scale showed that the scale is a valid and reliable measurement tool for to be used on vocational and technical high school students.

This study bears some limitations. Firstly, it can be shown that the data of the study does not cover VTAHS students from all regions of Turkey. The data were collected from VTAHSs located in different regions of Ankara. From this point of view, the psychometric properties of the scale can be re-tested with a dataset that includes VTAHS students from other regions of Turkey. Another limitation is that the reliability evidences were provided only through Cronbach alpha and McDonald's Omega methods. In future studies, in addition to these methods, different reliability calculation methods such as test-retest can be included in the analyses.

In addition to these limitations, the study has some strengths in terms of its contributions to the related literature. Duffy et al (2016) suggested examining the experiences of decent work of each group that is involved or wants to take part in the world of work. Testing the psychometric properties of the scale to investigate the future decent work perceptions of students continuing TVET in Turkey based on the Psychology of Working Framework (Blustein, 2008; 2013) and Theory (Duffy et al., 2016) can be considered as a strong aspect of the research. In addition, within the framework of the theory, it is suggested that the decent work model be tested in cultures different from the American culture (Duffy et al., 2016). At this point, testing the study in Turkish culture contributes to the relevant literature. Considering all these strengths and limitations, new studies can be designed with variables such as

economic constraints, marginalization, career adaptability and work volition in the model proposed by the theory about the expectations of decent work of TVET students based on PWT.

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Ethic statement: In this study, we declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that we do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, we declare that there is no conflict of interest between the authors, which all authors contribute to the study and that all the responsibility belongs to the article authors in case of all ethical violations.

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The Relationship between University Students' Foreign Language Learning Motivation and Anxiety

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Abstract

Generally, when motivation is high, the anxiety of a person is reduced and success is increasing. One of the subjects related to learning in general, and language learning in particular, is related to "anxiety". The aim of this research is to determine the relationships between foreign language learning motivation and student anxiety. 305 students were involved in the relational survey model of the research. The participants of the research are students of B1 level who study in language preparation of A University. Data of the study were collected with the Motivation in Learning Turkish as a Foreign Language Scale and, Anxiety in Learning Turkish as a Foreign Language Scale. We used the descriptive statistics, t-test, ANOVA, and Pearson correlation coefficient for data analysis. The participants have the highest degree of motivation in the dimension of instrumental motivation and the lowest degree of motivation in the dimension of cultural motivation. Views of the participants on the internal motivation, instrumental motivation, and motivation to learn Turkish as a foreign language differ from each other according to their gender and views on instrumental motivation and their mother tongue as well. The participants feel the highest degree of anxiety in listening and having the lowest degree of motivation in writing. The participants' internal motivation to learn Turkish as a foreign language, as well as their anxiety about speaking, writing, and studying Turkish as a foreign language, have negative and significant relationships.

Keywords: Foreign language learning motivation, foreign language learning anxiety, Turkish, Turkish as a foreign language.

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Introduction

There are numerous studies devoted to the role of motivation in the learning process. Those studies revealed that students who are sufficiently motivated can shape their behaviors according to their purposes, demonstrate behaviors suitable for the learning process they are successful at improving their skills, and are determined to learn (Sevim, 2019). Motivated students process information in depth, insistently manage difficult tasks, have a positive attitude towards school, and find school satisfactory. These students do not create problems at school (Akbaba, 2006).

Motivation also plays a crucial role in students' foreign language learning achievement in a classroom environment and it is in a centric position along with language ability (Acat & Demiral, 2002). It is an indisputable fact that motivation is one of the most important dimensions that bring success in language teaching (Lightbown & Spada, 2013) and that increase one's determination in using a foreign language (Ahmed, 1989 cited in: Sevim, 2019). Gardner and Lambert (1959) divided motivation sources into instrumental and integrative. Instrumental motivation focuses on language learning for more immediate and practical goals, while integrative motivation focuses on language learning for personal development and cultural enrichment. Studies have shown that these types of motivation are associated with success in second language learning. In this study, motivation is classified into three types "internal, instrumental, and cultural" (Acat & Demiral, 2002; Sevim, 2019):

Internal Motivation. Internal motivation is related to the intrinsic driving force. The reasons for these intrinsic driving forces are the desire to learn a foreign language to improve oneself, to visit the country that learner is interested in, and think that by speaking a foreign language one will gain respect. People with internal motivation demonstrate behaviors such as using opportunities properly, enjoying learning a language, and expressing a desire to speak the language as their mother tongue.

Instrumental Motivation. Instrumental motivation focuses on the external benefits of individuals during the learning process. The sources of motivation are to be able to work in a country using that language, to live comfortably in that country, to continue educational life, to climb the career ladder, to please employers/teachers, and to be more successful at work/study. There are practical reasons behind language learning motivation in this dimension.

Cultural Motivation. This dimension focuses on culture-oriented issues. The dimension is based on reasons such as being interested in the civilization and culture of that language, being respected by the society in which that language is spoken, and considering that society as friendly. People with this motivation are people who have accepted society using the language they have learned.

One of the subjects related to learning in general, and language learning in particular, is related to "anxiety". In general, anxiety is feeling an unpleasant emotional state accompanied by physiological symptoms (Feist, 1990) and is an emotional reaction to psychological events and changes in human nature. In this sense, anxiety is defined as "sadness, disturbing thought, worry, and sorrow" (Turkish Language Association, 2022). A worried person tends to exaggerate everything. They can even accept daily routine problems as if the world has come to an end (Cokluk-Bökeoglu & Yilmaz, 2005). In addition to its constructive and positive features, anxiety also has destructive and disruptive elements that arise when it reaches pathological dimensions (Canbaz et al., 2007).

Research has shown that people learning a foreign language experience a certain level of anxiety (Altunkaya, 2017). According to Teimouri et al. (2019) large-scale meta-analytic study, there is a strong significant relationship between language anxiety and second language achievement. Language learning anxiety can be defined as a "learned emotional response" developed in the language learning process (Kilic, 2017). Polatcan (2018) defined anxiety in learning a foreign language as "retreating into one's shell due to the feeling of failure". Anxiety in learning a new foreign language can be classified in the four dimensions of basic language skills such as "listening, writing, speaking, and reading" (Genc-Koylu & Isik, 2020).

Listening Anxiety. Listening anxiety generally can be referred to as worrying about not being able to understand listening text while listening for the first time; worrying while listening to unknown topics, while being interviewed in the learned language; worrying that the learned language will not be

understood when it is spoken too quickly; feeling anxious about not being able to understand what is being said.

Writing Anxiety. This type of anxiety can be defined as worrying to write in the learned language, having difficulty in writing; worrying about writing exams and concerning about writing practices for which the learner is unprepared, feeling anxious about writing assignments; feeling uneasy when organizing one's thoughts in writing activities; concerns about not being able to get one's thoughts together or not being able to convey one's thoughts fully in writing form.

Speech Anxiety. It is related to worrying when answering questions, making presentations in class, or participating in a dialogue in front of group mates. People with speech anxiety are worried about expressing their opinion on a subject in the speaking class, about speaking with native speakers of the learned language, or feeling anxious when they need to speak unprepared.

Reading Anxiety. This dimension is related to the increase of anxiety when one starts to read a long text in the learned language and encounters an unknown word or grammar rule while reading or when a learner is worried about making a mistake in pronunciation while reading the text.

Generally, when motivation is high, the anxiety of a person is reduced and success is increasing (Kirova et al., 2012; Yan & Horwitz, 2008). In this regard, we tried to determine the relationship between anxiety and motivation of students who are learning Turkish as a foreign language. In order to achieve this common general purpose, we tried to find the answers to the following questions:

1. What are the motivations of students who learn Turkish as a foreign language?
2. Do the motivations of students who learn Turkish as a foreign language differ according to gender, field, and mother tongue?
3. What are the anxieties of students who are learning Turkish as a foreign language?
4. Do the anxieties of students who learn Turkish as a foreign language differ according to gender, field, and mother tongue?
5. Is there a relationship between the motivation and anxiety of students learning Turkish as a foreign language?

Method

In this study, we used a relational survey model. The relational survey model is designed to assess whether or not there is a change between variables and, if so, to specify the nature of change. In this study, the relational survey model was used since it tried to determine the relationships between foreign language learning motivation and student anxiety.

Population and Sample

The population of the study includes 1050 students enrolled in language preparation at A University's High School of Foreign Languages. In determining the sample size, Cochran's (1962) sample size determination formula was used (Balci, 2021) and it was determined that the sample of the study should consist of 281 people at 95% confidence level. Considering the fact there can be losses and unusable measurement scales, scales were applied to 320 people. 305 scales were returned. Participants of the research are students of B1 level language preparation of A University. The language levels in the language preparation of A University are “A1, A2, B1, B2, and C1”. Students at B1 level are able to read and understand text in Turkish easily. Therefore, the scales were used in Turkish.

201 of the participants (n=305) were women (65,9%), 104 were men (34,1%); 271 were native speakers of Kyrgyz (88,9%), 34 native speakers of other languages (11,1%); 141 students came from villages (46,2%), 33 of them from towns (10,8%), 131 of them from cities (43,0%). 167 of the participants were students in the field of social sciences (54,8%), 88 from the fields of science/mathematics, and 50 from the fields of language education.

Data Collection Tools

The research data were collected with the Motivation to Learn Turkish as a Foreign Language Scale (Sevim, 2019) and with the Anxiety in Learning Turkish as a Foreign Language Scale (Genc-Koylu & Isik, 2020).

Motivation to Learn Turkish as a Foreign Language Scale. The scale was developed, and by Sevim (2019). The scale consists of 3 sub-dimensions [internal motivation-9 items; instrumental motivation-8 items; cultural motivation-5 items] with 22 items. In Sevim's (2019) study, Cronbach's Alpha reliability coefficients were determined as .63 for the internal motivation sub-dimension, .79 for the instrumental motivation sub-dimension, .72 for the cultural motivation sub-dimension, and 84 for the scale. The Likert-type scale was used in the research consisting of answers such as "1-strongly disagree, 2-slightly agree, 3-undecided, 4-mostly agree, 5-completely agree". An increase of points obtained from the scale indicates an increase in motivation in that dimension.

Anxiety in Learning Turkish as a Foreign Language Scale. The scale was developed by Genc-Koylu and Isik (2020). The scale consists of 4 sub-dimensions [listening anxiety-15 items; writing anxiety-10 items; speaking anxiety-8 items; reading anxiety-6 items] with 39 items. According to Genc-Koylu and Isik's (2020) study, Cronbach's Alpha reliability coefficients were determined as .72 for the listening anxiety sub-dimension, .83 for the writing anxiety sub-dimension, .82 for the speaking anxiety sub-dimension, and .78 for the reading anxiety sub-dimension, and .90 for the scale. The Likert-type scale was used in the research consisting of answers such as "1-strongly disagree, 2-disagree, 3-partially agree, 4-agree, 5-completely agree. An increase of points obtained from the scale indicates an increase in anxiety in that dimension.

Data-Analysis

In order to determine the personal data in the research and to evaluate the answers related to the scale, descriptive statistics were used. For the comparison of the participants' views, a t-test, one-way variance analysis (ANOVA) were applied. In order to decide which statistics to use in the analysis of the data, it was first examined whether the data showed a normal distribution. For this purpose, Kolmogorov-Smirnov Test was used. The results of the Kolmogorov-Smirnov Test were .21 ($p>.05$) for Motivation to Learn Turkish as a Foreign Language, and .24 ($p>.05$) for Anxiety in Learning Turkish as a Foreign Language.

For the determination of relations Pearson correlation coefficient was used. The Sidak test, one of the post hoc multiple comparison tests, was used for the significant F values to determine the source of the difference. In the dimensions where differences have been found, η^2 (eta-squared) type of statistics was used to determine the degree of effect of the difference. η^2 value is a measure in which η^2 between 0.01-0.05 indicates a small effect; between 0.06-0.13 indicates a medium effect; η^2 greater than 0.14 indicates a large effect. The correlation coefficient between 0.70-1.00 in absolute value is high; between 0.69-0.30 is moderate. The value between 0.29-0.00 is defined as a low-level relationship.

Findings

In this section, the participants' motivations for learning Turkish as a foreign language, as well as their concerns about learning Turkish, were presented and compared based on several variables. The tables used in the analysis for the purpose of comparison consist of only the data in the dimensions in which statistical difference is determined. Afterwards, the relationships between the motivation and anxiety of the participants to learn Turkish were determined. The general situation regarding the motivation of the participants to learn Turkish is given in Table 1.

Table 1.

The Participants' Motivation to Learn Turkish as a Foreign Language (n=305)

Points	Mean (M)	Standard Deviation (S)	Answer Scale
Instrumental Motivation	3.90	0.51	Mostly agree
Internal Motivation	3.79	0.73	Mostly agree
Cultural Motivation	3.35	0.84	Undecided
Total	3.74	0.53	Mostly agree

As shown in Table 1, the participants have the highest motivation in the dimension of instrumental motivation (M=3.90-mostly agree), and the lowest motivation in the dimension of cultural motivation (M=3.35-undecided). In general, the motivation of the participants to learn Turkish as a foreign language is quite high.

Table 2 presents the results of the t-test analysis conducted to compare the motivation of the participants to learn Turkish as a foreign language according to gender.

Table 2.

Comparison of Participants' Motivation to Learn Turkish as a Foreign Language According to Gender (n=305)

Points	Gender	n	Mean (M)	Standard Deviation (S)	sd	t	η^2
Internal Motivation	1) Female	201	3.97	0.51	303	3.30*	.03
	2) Male	104	3.77	0.51			
Instrumental Motivation	1) Female	201	3.88	0.71	303	2.93*	.03
	2) Male	104	3.62	0.75			
Cultural Motivation	1) Female	201	3.40	0.85	303	1.66	--
	2) Male	104	3.23	0.81			
Total	1) Female	201	3,81	0,51	303	3,40*	.04
	2) Male	104	3,59	0,54			

*p<.05

As shown in Table 2, the cultural motivations of the participants [$t_{[303]}$=1.45; p>.05] do not statistically differ according to gender. The participants' internal motivations [$t_{[303]}$=3.30; p<.05], instrumental motivations [$t_{[303]}$=2.93; p<.05] and their motivation to learn Turkish as a foreign language [$t_{[303]}$=1.45; p<.05] statistically differs according to gender. In terms of internal motivation, instrumental motivation, and motivation to learn Turkish as a foreign language, female participants have a higher level of motivation than male participants.

The η^2 statistic was used to determine the degree of effect of the detected differences. Accordingly, participants' views differ at a "low level" in internal motivation, instrumental motivation, and motivation to learn Turkish as a foreign language.

There is no statistically significant difference according to the field of education in the participants' internal motivation [$F_{[2-304]}$=2.61; p>.05], instrumental motivation [$F_{[2-304]}$=1.04; p>.05], cultural motivation [$F_{[2-304]}$=1.77; p>.05] and their motivation to learn Turkish as a foreign language [$F_{[2-304]}$=2.69; p>.05].

Table 3 presents the results of the t-test analysis conducted to compare the motivation of the participants to learn Turkish as a foreign language according to the mother tongue.

Table 3.

Comparison of the participants' motivation to learn Turkish as a foreign language according to mother tongue (n=305)

Points	Mother Tongue	n	Mean (M)	Standard Deviation (S)	sd	t	η^2
Internal Motivation	1) Kyrgyz	271	3.92	0.52	303	1.91	--
	2) Other languages	34	3.74	0.51			

Table 3 continuing

Instrumental Motivation	1) Kyrgyz	271	3.76	0.73	303	2,14*	.02
	2) Other languages	34	4.04	0.70			
Cultural Motivation	1) Kyrgyz	271	3.31	0.83	303	1.68	--
	2) Other languages	34	3.57	0.86			
Total	1) Kyrgyz	271	3.72	0.53	303	0.90	--
	2) Other languages	34	3.81	0.51			

*p<.05

As indicated in Table 3, internal motivation [$t_{[303]}$=1.91; p>.05], cultural motivation [$t_{[303]}$=1.68; p>.05]of the participants and their motivation to learn Turkish as a foreign language [$t_{[303]}$=0.90; p>.05] do not statistically differ according to mother tongue. However, there is a statistically significant difference in the instrumental motivation of the participants according to the mother tongue [$t_{[303]}$=2,14; p<.05]. Participants whose mother tongue is not Kyrgyz (M=4.04) have higher instrumental motivation than participants whose mother tongue is Kyrgyz (M=3.76). The η^2 statistic was used to determine the degree of effect of the detected difference. Accordingly, the views of the participants change at a "low" level in instrumental motivation.

Table 4 demonstrates the general situation of the participants' anxiety in learning Turkish as a foreign language.

Table 4.

Participants' of anxieties in learning Turkish as a foreign language

Points	**Mean (M)**	**Standard Deviation (S)**	**Answer Scale**
Listening Anxiety	2.94	0.48	Partially agree
Reading Anxiety	2.41	0.72	Disagree
Speaking Anxiety	2.31	0.68	Disagree
Writing Anxiety	2.29	0.68	Disagree
Total	2.56	0.47	Disagree

As can be seen in Table 4, the participants experience the highest level of anxiety in listening (M=2.94-partially agree). The participants experience relatively a lower level of anxiety in reading (M=2.41-disagree), speaking (M=2.31-disagree), and writing (M=2.29-disagree). Even though the participants have a certain level of anxiety in all sub-dimensions and generally in learning Turkish as a foreign language, these anxieties are at a low level.

Table 5 provides the results of the t-test analysis conducted to compare the participants' anxiety in learning Turkish as a foreign language according to gender.

Table 5.

Comparison of the participants' anxiety in learning Turkish as a foreign language according to gender (n=305)

Points	**Gender**	**n**	**Mean (M)**	**Standard Deviation (S)**	**sd**	**t**	**η^2**
Speaking Anxiety	1) Woman	201	2.35	0.67	303	1.49	--
	2) Man	104	2.22	0.69			

Table 5 continuing

Writing Anxiety	1) Woman	201	2.25	0.66	303	1.18	--
	2) Man	104	2.35	0.72			
Reading Anxiety	1) Woman	201	2.43	0.71	303	0.91	--
	2) Man	104	2.36	0.74			
Listening Anxiety	1) Woman	201	3.02	0.46	303	4.26*	.06
	2) Man	104	2.78	0.48			
Total	1) Woman	201	2.59	0.45	303	1.84	--
	2) Man	104	2.49	0.50			

*p<.05

As seen in Table 5, there is no significant difference according to gender in speaking anxiety of the participants [$t_{[303]}$=1.49; p>.05], writing anxiety [$t_{[303]}$=1.18; p>.05], reading anxiety [$t_{[303]}$=1.91; p>.05] and anxiety in learning Turkish as a foreign language [$t_{[303]}$=1.84; p>.05]. Nevertheless, there is a statistically significant difference in listening anxieties [$t_{[303]}$=1.49; p<.05] of the participants according to gender. Female participants (M=3.02) have a higher level of anxiety in listening than male participants (M=2.78). The η^2 statistic was used to determine the degree of effect of the detected difference. Accordingly, the views of the participants change at a "moderate" level in listening anxiety.

Table 6 presents the results of the ANOVA analysis conducted to compare the participants' anxieties in learning Turkish as a foreign language according to the field of education.

Table 6.

Comparison of participants' anxiety in learning Turkish as a foreign language according to the field of education (n=305)

Points	**Field of Education**	**n**	**Mean (M)**	**Standard Deviation (S)**	**sd**	**F**	**η^2**	**Significant Difference [Sidak]**
Speaking Anxiety	1) Social sciences	167	2.25	0,60	2-304	1,64	--	--
	2) Science/ Mathematics	88	2.41	0.77				
	3) Language education	50	2.29	0.74				
Writing Anxiety	1) Social sciences	167	2.21	0.65	2-304	3.95*	.03	1-2
	2) Science/ Mathematics	88	2.45	0.74				
	3) Language education	50	2.24	0.64				
Reading Anxiety	1) Social sciences	167	2.34	0.68	2-304	1.51	--	--
	2) Science/ Mathematics	88	2.49	0.77				
	3) Language education	50	2.49	0.75				
Listening Anxiety	1) Social sciences	167	2.94	0.46	2-304	0.36	--	--
	2) Science/ Mathematics	88	2.95	0.49				
	3) Language education	50	2.88	0.53				
Total	1) Social sciences	167	2.52	0.43	2-304	1.97	--	--
	2) Science/ Mathematics	88	2.64	0.53				
	3) Language education	50	2.54	0.49				

*p<.05

As shown in Table 6, speaking anxiety [$F_{[2-304]}$=1.64; p>.05], reading anxiety [$F_{[2-304]}$=1.51; p>.05], listening anxiety [$F_{[2-304]}$=0.36; p>.05] of the participants and anxiety in learning Turkish as a foreign

language [$F_{[2-304]}$=1.97; p>.05] do not differ statistically according to the field of education. However, there is a statistically significant difference in writing anxiety [$F_{[2-304]}$=3,95; p<.05] according to the field of education. Students of science/mathematics (M=2.45) feel more anxious in writing than students of social sciences (M=2.21). According to the η^2 statistics, to determine the degree of effect of the detected difference, the views of the participants change at a "low" level in writing anxiety.

Statistically there is no significant difference in total points of the sub-dimensions such as speaking anxiety [$t_{[303]}$=1.45; p>.05], writing anxiety [$t_{[303]}$=1.55; p>.05], reading anxiety [$t_{[303]}$=0.59; p>.05], listening anxiety [$t_{[303]}$=0.58; p>.05] of the participants and anxiety in learning Turkish as a foreign language [$t_{[303]}$=0.63; p>.05] according to mother tongue.

The results of the Pearson correlation analysis conducted to determine the relationship between the motivations of the participants to learn Turkish as a foreign language and their anxiety in learning Turkish are given in Table 7.

Table 7.

The Relationship between Motivation and Anxiety of the Participants to Learn Turkish as a Foreign Language (n=305)

		Anxiety in learning Turkish as a foreign language				
		Speaking anxiety	Writing anxiety	Reading anxiety	Listening anxiety	Total Point
Motivation to learn Turkish as a foreign language	Internal motivation	-.43**	-.41**	-.27**	-.07	-.37**
	Instrumental motivation	.07	-.09	-.01	.14	.00
	Cultural motivation	-.09	-.04	-.02	.08	-.02
	Total	-.24**	-.22**	-.12*	.07	-.15**

**p<.01

As seen in Table 7, there is a statistically significant, moderate level and negative relationship between internal motivation and speaking anxiety [r=-.43; p<.01] of the participants. As the participants' internal motivation increases, their speaking anxiety decreases. Internal motivation explains 18.49% of the variability in speaking anxiety.

There is a statistically significant, moderate level, and negative relationship between internal motivation and writing anxiety [r=-.41; p<.01]. As the participants' internal motivation increases, their writing anxiety decreases. Internal motivation explains 16.81% of the variability in writing anxiety.

Statistically significant, low level and negative relationship are between internal motivation and reading anxiety [r=-.27; p<.01]. As the participants' internal motivation increases, their reading anxiety decreases. Internal motivation explains 7.29% of the variability in reading anxiety.

There is a statistically significant, moderate level and negative relationship between internal motivation and anxiety in learning Turkish as a foreign language [r=-.37; p<.01]. As the participants' internal motivation increases, their anxiety about learning Turkish as a foreign language decreases. Internal motivation explains 13.69% of the variability of anxiety in learning Turkish as a foreign language.

Statistically significant, low level and negative relationship are between the motivation of the participants to learn Turkish as a foreign language and their speaking anxiety [r=-.24; p<.01]. As the participants' motivation to learn Turkish as a foreign language increases, their speaking anxiety decreases. Motivation to learn Turkish as a foreign language explains 5.76% of the variability in speaking anxiety.

There is a statistically significant, low level, and negative relationship between motivation to learn Turkish as a foreign language and writing anxiety [r=-.22; p<.01]. As the participants' motivation to learn Turkish as a foreign language increases, their writing anxiety decreases. Motivation to learn Turkish as a foreign language explains 4.84% of the variability in writing anxiety.

There is statistically significant low level and negative relationship between the motivation of the participants to learn Turkish as a foreign language and reading anxiety [r=-.12; p<.05]. As the participants' motivation to learn Turkish as a foreign language increases, their reading anxiety decreases. Motivation to learn Turkish as a foreign language explains only 1.44% of the variability in reading anxiety.

There is a statistically significant, low level, and inverse direction between motivation to learn Turkish as a foreign language and anxiety to learn Turkish as a foreign language [r=-.15; p<.01]. As the motivation of the participants to learn Turkish as a foreign language increases, their anxiety about learning Turkish as a foreign language decreases. Motivation to learn Turkish as a foreign language explains only 2.25% of the variability in the anxiety of learning Turkish as a foreign language.

Discussion, Conclusion, and Suggestions

The motivation and anxiety of university students learning Turkish as a foreign language are thoroughly examined. In the beginning, the participants' motivation and anxiety concerning learning Turkish were determined and compared using a number of variables. Afterwards, the relationships between these two variables and their sub-dimensions were determined. According to the findings, the participants' motivation to learn Turkish as a foreign language is relatively high. The participants have the highest level of motivation in the instrumental dimension and then in the internal and cultural motivation dimensions respectively. According to the works on foreign language motivation, the instrumental motivation of university students is higher (Al-Tamimi & Shuib, 2009). It was determined that in previous studies done in Turkey, the instrumental motivations of people who learn Turkish as a foreign language (Tok & Yigin, 2013) and those who learn another foreign language (Uludag, 2001) are generally higher than other types of motivation. According to the research of Tok and Yigin (2013), foreign students who came to Turkey have instrumental motivation sources (academic, economic, touristic, political, and, marriage etc.) the most in learning Turkish.

There is a considerable gender difference in the participants' internal, instrumental motivation to learn Turkish. Although the level of the effect of the detected differences is low, this difference is in favor of female students. Some studies conducted in Turkey (Ertan, 2008; Pulat, 2010) and other countries (Chang, 2005; Demir, 2022; Mori & Gobel, 2006; Nikitina & Furuoka, 2005; Peacock, 1997; Varisoglu, 2018) have found that female students are more motivated in comparison to male students.

There is no difference according to the field of education in general dimensions and sub-dimensions of motivations of the participants to learn Turkish as a foreign language. Accordingly, it can be said that the motivation to learn Turkish as a foreign language is not influenced by the field of education.

There is a difference in the instrumental motivation according to the mother tongue. Students whose mother tongue is not Kyrgyz have higher instrumental motivation than students whose mother tongue is the Kyrgyz language. Despite the fact that the level of effect of the detected difference is low, it can be said that the motivations of students whose mother tongue are languages other than Kyrgyz are more instrumental in learning Turkish. Although the difference is not statistically significant, the fact that the internal motivation of students whose mother tongue is Kyrgyz is higher than students whose mother tongue is not Kyrgyz confirms this view.

The students who have participated in the research have a low level of anxiety about learning Turkish as a foreign language. The language skills, in which participants feel anxiety the most, are listening, reading, speaking, and writing skills respectively. Genc-Koylu (2020) also found in his research that people who learn Turkish as a foreign language experience "listening, reading, speaking and writing" anxiety at an intermediate level. In another study (Sevim, 2014), it was determined that foreign students had a low level of anxiety in speaking Turkish. Although speaking and listening skills are seen as the skills that cause anxiety the most (Horwiz et al., 1986), it has been revealed that anxiety can occur not only in speaking but in all four basic language skills that form the basis of foreign language teaching such as reading, listening and writing (Iscan, 2016). MacIntyre (1995) stated that anxiety also affects second-level activities in language learning, such as listening, learning, and understanding, and that anxious students are worried about misunderstanding or misinterpreting grammatical rules. Iscan (2016) in his research with Turkish learners in Jordan determined that

students' foreign language anxiety levels are high and that it causes a lack of motivation in students. The fact that the participants have low anxiety about learning Turkish as a foreign language is crucial in terms of learning the language and making this learning permanent.

The participants' speaking, writing, and reading anxieties, as well as their anxiety in learning Turkish as a foreign language, do not differ by gender. In some studies, it was determined that foreign language learning anxiety does not differ according to gender (Batumlu & Erden, 2007; Demir, 2022; Sarigul, 2000).

The listening anxiety of the participants differs according to gender. Female participants feel more anxious in listening than male participants. However, the effect of the detected difference is at a moderate level. Nevertheless, along with studies that found that women feel a high level of anxiety in listening (Abu-Rabia, 2004; Cheng, 2002; Elkhafaifi, 2005), there are also studies that found the opposite (Kitano, 2001). Although it is not related to foreign language anxiety, Ucgun (2016) found that in secondary schools, girls are more anxious than boys in listening and reading according to the gender variable.

There is no significant difference according to gender in speaking, writing, and reading anxiety of the participants. In some previous studies on speaking (Boylu & Cangal, 2015; Sallabas, 2012; Sen & Boylu, 2015; Sevim, 2014), reading (Altunkaya, 2015, 2017; Capan & Karaca, 2013), and listening (Altunkaya, 2017; Capan & Karaca, 2013; Elkhafaifi, 2005) no significant difference was determined according to gender. According to the obtained results and the inconsistent research results included here, gender is not an important determinant of students' foreign language learning anxiety.

The views of the students on the dimension of writing anxiety differ according to the field of education. Students of science/mathematics feel a higher level of anxiety than students of social sciences. Although the effect of the detected difference is low, it may be a feature of the field that students of science/mathematics are anxious in writing. Because writing studies in science/mathematics fields are less than social sciences and these fields are generally based on numerical operations.

The views of the participants on the anxiety of learning Turkish as a foreign language and its sub-dimensions do not differ according to the mother tongue. Accordingly, for this study, it can be said that the anxiety of learning Turkish is not influenced by the mother tongue.

There are significant, moderate level and negative relationships between motivation and anxiety. As students' internal motivation increases, their anxiety in speaking, writing, reading, and anxiety in learning Turkish decreases. According to relevant studies, motivation and anxiety are negatively correlated (Alico, 2016; Gomari, 2013; Liu & Chen, 2015; Liu & Huang, 2011; Luo et al., 2020; Tahernezhad et al., 2014; Wariyo, 2020).

There is no significant relationship between instrumental, cultural motivations, and anxiety in learning Turkish as a foreign language and its dimensions. As the motivation of the participants to learn Turkish as a foreign language increases, their anxiety in speaking, writing, and reading and anxiety in learning Turkish as a foreign language decreases. Accordingly, it can be said that the main determinant source of motivation in learning Turkish as a foreign language is internal motivation.

There are some limitations to this study. The investigation was only conducted at one university. Similar investigations in diverse samples will improve the generalizability of the results. Furthermore, qualitative research methods should be applied to gain more comprehensive conclusions on the subject.

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Ethic statement: In this study, we declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that we do not take any of the actions based on "Actions against Scientific Research and Publication Ethics". At the same time,

we declare that there is no conflict of interest between the authors, which all authors contribute to the study and that all the responsibility belongs to the article authors in case of all ethical violations.

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Developing a Scale to Measure Teacher's Reward and Praise Behaviors for Classroom Management

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Abstract

Classroom management is a crucial factor in creating an effective learning environment. In a classroom with poor management, students cannot engage in the learning process and may experience anxiety. Therefore, equipping teachers with effective classroom management skills is among the responsibilities of school leaders. However, prior to offering professional development programmes, school leaders should first explore how teachers are managing their classrooms. Two of the most important tools teachers use for effective classroom management are rewards and praise. However, according to the Self-Determination Theory, although rewards and praise are effective in establishing discipline, they may not significantly enhance students' motivation. Therefore, it is imperative to measure how often rewards and praise teachers employ in their classrooms in a valid and reliable manner. To the best of our knowledge, no scale currently exists in the literature that measures this aspect. This research will be the first study to measure teachers' reward and praise behaviors. The research is conducted as a quantitative study using a descriptive survey model. In the initial round, a 25-item pilot form was administered to 465 teachers. The results of Exploratory Factor Analysis revealed a 13-item, 2-factor structure, explaining 76% of the total variance, named as "teacher praise behaviors" and "teacher reward behaviors," respectively. The reliability levels of the factor scores were found to be .87 and .92. In the second round, data were collected from 271 teachers using the 13-item form. Confirmatory Factor Analysis confirmed the 2-factor structure. To test concurrent validity, two scales were administered, and their relationships were presented as evidence of concurrent validity. In conclusion, the Teacher Reward and Praise Scale has been presented as a valid and reliable instrument for measuring teachers' behaviors in classroom management, available for researchers and practitioners' use.

Keywords: Classroom management, reward, praise, educational leadership, scale development

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Introduction

Teacher's classroom management skill is widely acknowledged as the most effective way to create a conducive learning environment. In fact, without effective classroom management, it is nearly impossible for a teacher to establish an effective learning environment (Marzano, Marzano, & Pickering, 2003). In a poorly managed classroom, both effective teaching and learning processes fail (Jones & Jones, 2012). Research has demonstrated that classroom management plays a crucial role in enhancing the overall quality of education (Akgün, Yarar, & Dinçer, 2011; Korpershoek, Harms, de Boer, van Kuijk, & Doolaard, 2016) and significantly influences student outcomes (see Manley, Tu, Reardon, & Creswell, 2023). A meta-analysis conducted by Korpershoek et al. (2016) clearly revealed a positive relationship between classroom management and student outcomes. However, regrettably, classroom management remains one of the most challenging aspects of education for teachers (Pigge & Marso, 1997; Lewis, Romi, Katz & Qui, 2008). According to the study conducted by Dağlı and Han (2017), the most prevalent issue that teachers encounter in classrooms concerns students' problematic behavior. Due to the challenges faced in classroom management, teachers often experience stress (Freiberg, Oviatt & Naveira, 2020) and burnout (Brouwers & Tomic, 2000; Friedman & Farber, 1992). Consequently, research on classroom management has seen a significant increase in recent times. Bozkuş (2021) examined studies on classroom management conducted between 1980 and 2019 and found that 38% of these studies were conducted within the last five years. In summary, classroom management stands as one of the most crucial determinants of educational quality and deserves considerable attention and emphasis.

Despite the existence of various definitions of classroom management (Oliver, Wehby & Reschly, 2011), leading figures in the field, Evertson and Weinstein (2006) define it as any teacher action that supports and facilitates academic and social learning. Effective classroom management, in essence, serves two primary purposes. The first is to establish order in the classroom and prevent disruptive student behaviors. The second is to foster the development of students (e.g., social, emotional, moral, cognitive development) (Brophy, 2006; Doyle, 1986; Öztürk & Gangal, 2016; Wubbels, 2011). Brophy (2006) also refers to these two purposes as "discipline" and "socialization" processes. Being aware of this distinction is essential. A method employed by the teacher to ensure discipline may indeed maintain order, but it may not enhance and even thwarts student's development and socialization.

There are different approaches to classroom management. Among the six approaches proposed by Evertson and Weinstein (2006), two are particularly significant (Wubbels, 2011) and have received more research attention: "behavioral" and "internal control". Erdoğan (2003) recommends two approaches among others: reactive and preventive. The reactive approach reflects a behavioral approach and the preventive approach reflects a cognitive approach. Within the internal control approach, teacher aims to develop students' self-regulation so that students manage themselves. The reactive approach, as the name suggests, teacher reacts to student (mis)behaviour and tries to control them in order to create a quite environment. The behavioral approach uses conditioning to increase desired behavior or extinguish undesirable behavior. For instance, methods such as rewards, praise, point systems, or credit systems can be used to increase desired behaviors, while techniques like punishment or extinguishes undesired behaviors (Arın, Tunçer & Demir, 2016; Brophy, 2006). The internal control approach aims to support students to internalize values (Elias & Schwab, 2006). In recent years, particularly thanks to studies drawing "Self-Determination Theory" (Ryan & Deci, 2017), there has been a transition from the behavioral approach to the internal approach (Wubbels, 2011).

Two different approaches mentioned above ("behavioral" and "internal control") have distinct perspectives on rewards and praise. The behavioral approach advocates for the use of rewards and praise, whereas the internal control approach views them as controlling mechanisms. According to the behavioral approach, behavior is clearly defined, taught to students, and when they display the desired behavior, they are rewarded (Horner & Sugai, 2015). Of course, in some cases, if a student does not exhibit the desired behavior, they may receive punishment. Kazdin (2017) argues that a reward-based system in the classroom is an effective classroom management strategy. Similarly, praise, especially behavior-specific praise, is recommended as an effective classroom management technique with empirical evidence to support its effectiveness (Royer, Lane, Dunlap, & Ennis, 2019). In fact, many researchers who advocate for the behavioral approach have developed different school programs that incorporate praise systems into the classroom management process. However, a methodologically robust analysis has found no evidence to support the effectiveness of reward-based programs (Maggin, Chafouleas, Goddard & Johnson, 2011). Maggin et al. (2011) attribute the previous studies' findings of the effectiveness of reward systems to the use of insufficiently robust statistical methods in those studies.

According to the internal control-focused approach, rewards may be effective, but their impact is often short-lived, and sometimes they have no effect at all (Han & Altunhan, 2022; Yaman & Güven, 2014). Various meta-analysis studies have shown that internal control-focused, social, and emotional learning development programs help reduce student problems, enhance social skills, and improve academic achievement (Taylor, Oberle, Durlak & Weissberg, 2017). These classes are student-centered, allowing students to share responsibility and control, which fosters internal discipline (Freiberg & Lamb, 2009).

The internal control-focused approach is advocated by the "Self-Determination Theory" (Ryan & Deci, 2017). According to the "Self-Determination Theory," rewards and praise are considered a control system based on external motivation rather than internal motivation (Kowalski & Froiland, 2020). Rewards and praise are considered part of a controlling teacher style (Su & Reeve, 2011). A teacher with a controlling style tries to shape students' behavior and emotions as they desire, giving them little choice and wanting everything in the classroom to be as they wish, asserting their authority. According to Ryan and Deci (2017), rewards and praise have negative effects on students let along being effective. In fact, their meta-analysis found that rewards decrease internal motivation (Deci, Koestner & Ryan, 1999) because students perceive them as the reason for desired behavior. Furthermore, students fail to internalize the behavior (Ryan & Deci, 2017), leading to a decrease in internal motivation (Brophy, 2014). While rewards and praise may achieve the first goal of classroom management (discipline), they may not fulfill the second goal (development). Due to this, teachers may mistakenly believe that rewards and praise are effective. In the context of Turkey, rewards are frequently used (Güzelyurt, Fidan, Tümas & Şuhade, 2019). Furthermore, when examining the views of preschool teachers regarding the use of rewards and punishments, the majority of teachers stated that rewards and punishments can be used (Güzelyurt et al., 2019). In summary, rewards and praise are common classroom management approaches.

In order to conduct studies in the field of classroom management, the first step is to examine teachers' views and the frequency of teacher behavior in relation with rewards and praise. Classroom management development programs should be shaped based on these findings. However, upon reviewing the literature, no scale measuring teachers' reward and praise behaviors has been found. This scale development study, to the best of my knowledge, will be the first of its kind and will be used to measure teachers' reward and praise behaviors. The purpose of this research is to develop a reliable and value scale that measures teachers' reward and praise behaviors accurately.

Methodology

The current research is a scale development study, which employs a descriptive, quantitative research model. The purpose of this study is to develop a valid and reliable measurement tool to assess teachers' reward and praise behaviors in classroom management.

Participants

The data used in the research were collected from two different groups of teachers. The first group consists of 465 teachers working at the K-12 level, while the second group includes 271 teachers also working at the K-12 level. A convenience sampling strategy was used because of its practicality and accessibility (Bryman, 2016). An online link was created and posted on a social media account. According to the scale development process, it is recommended to reach five times the number of items in the trial form for the sample size (Yurdabakan & Çüm, 2017). Therefore, the sample size was considered adequate for scale development. This study received ethical approval from the International Final University Scientific Research and Publication Ethics Board with a reference no of 100/050/REK.001 on the date of 16.07.2023. The demographics are presented in Table 1.

Table 1.
Demographic Characteristics of the Study Groups

	First Group		Second Group	
	n (465)	%	n (271)	%
Gender				
Female	323	70.6	239	95.6
Male	134	29.4	11	4.4
Grade				
Preschool	66	14.4	30	12.0
Primary School	139	30.3	62	24.8
Middle School	153	33.3	73	29.2
High School	101	22.0	85	34.0
	Avg.	Sd.	Avg.	Sd.
Age	25.9	9.1	28.4	5.5

Notes: Eight participants from the first group and twenty-one participants from the second group did not share their demographic information.

Data Collection

In this scale development study, two constructs, reward and praise, were measured. A comprehensive literature review was conducted on these two constructs. The author has previously written a book on the concept of rewards. The literature review was mostly based on the extensive material of that book (Bolat, 2016). There was no similar scale in the literature that could be read. Based on the literature review, 32 items were written by the author. Subsequently, these items were presented to a lecturer and an associate professor. The lecturer was an expert in evaluation and measurement. He was easily able to spot duplicate items and recommended to include as few items as possible. The associate professor was an expert in the field of educational sciences. Duplicate items were eliminated through a discussion. Two items were added on the recommendation of the associate professor. The new form consisted of 25 items. To ensure face validity and construct validity, four factors were predicted theoretically: praise as control, praise as motivation, reward as control and reward as motivation. As discussed below, only three factors emerged from analysis. Praise scale yielded only one factor unlike our prediction. The

scale was scored using a 5-point Likert-type scale. Participants were asked about the frequency of their reward/praise behaviors in the classroom, and the options were none (1), sometimes (2), occasionally (3), often (4), and always (5).

Findings and Analysis

Data for testing the psychometric properties of the scale was collected in two rounds, and various analyses were conducted. Mplus versiyon 8.7 (Muthen & Muthen, 1998; Muthen & Muthen, 2017) was used to analyze the data. Validity evidence is provided through a series of exploratory and confirmatory factor analysis, reliability evidence is provided through an evaluation of Cronbach's alpha. Before conducting the traditional exploratory factor analysis (EFA), 12 out of 25 items were excluded using the parallel analysis approach after repeated EFA series with data from the first study group. Kaiser-Mayer-Olkin (KMO) test is performed to see if EFA can be applied to the data. KMO value was .934 that is above the common cutoff of .70 indicating that sample is adequate for EFA. Since response options are in ordinal nature, Weighted Least Square Mean and Variance Adjusted (WLSMV) estimator is employed in all of the factor analyses. WLSMV estimator is a robust estimator with non-normally distributed ordinal responses (Suh, 2015) Ultimately, EFA was performed using the geomin technique for oblique rotation to determine the factors (latent structure) over 13 items and to test the relationships among the items within the latent structure. To decide on the number of factors emerging from the EFA, the Kaiser-Guttman rule (Guttman, 1954; Kaiser, 1960) was used, which identified 2 factors with eigenvalues greater than 1 and aligned with the researcher's theoretical expectations. Matsunaga's (2010) criterion of an absolute value greater than .40 was used to determine the relationship between an item and its factor. When examining the model-data fit for solutions up to the 2-factor solution, it was found that the 2-factor solution provided a good model-data fit with an RMSEA of .076, CFI of .992, TLI of .988, and SRMR of .026, and adequately represented the data. An RMSEA value below .08 indicates an acceptable level of model-data fit (MacCallum, Browne & Sugawara, 1996). Additionally, CFI and TLI above .95 and SRMR below .08 are considered indicators of good model-data fit (Hu and Bentler, 1999). Furthermore, the 2-factor solution aligns with our theoretical expectations. The statistics for model-data fit resulting from the EFA conducted with data from the first study group are presented in Table 2.

Table 2.
Exploratory Factor Analysis Model-Data Fit Indices

Model	estimated free parameters	X^2	Free parameters	P	RMSEA	RMSEA %90 confidence level	CFI	TLI	SRMR
One factor analysis	13	1488.2	65	<.001	.217	[.208, .227]	.919	.903	.140
Two factor analysis	25	194.9	53	<.001	.076	[.065, .087]	.992	.989	.026

*The results of the 2-factor exploratory factor analysis (EFA) conducted with data from the first study group and the reliability evidence for the factors are summarized in Table 3.

According to the findings presented in Table 3, the eigenvalues of the two factors are above 1, with the first factor having an eigenvalue of 7.454 and the second factor having an eigenvalue of 1.914. Six items are associated with the first factor, and seven items are associated with the second factor. The factor loadings for the items range from .564 to .933 for the first factor and from .556 to .931 for the second factor. The total explained variance is 76%. Based on the theoretical framework, the first factor is labeled as "praise," and the second factor is labeled as "reward."

Table 3.
Exploratory Factor Analysis Results and Reliability of the Teacher Reward and Praise Behavior Scale (2-factor solution)

Factor	Items	Factor Weight	
		1	2
(1) Praise	M1- I praise my students when they achieve success.	.660	.078
	M2- I use praise in the classroom to motivate my students.	.820	.004
	M3- I use praise to appreciate my students' efforts.	.933	-.142
	M5- I use praise to motivate my students.	.874	.040
	M8- I praise my student when they exhibit appropriate behaviors.	.836	-.013
	M13- I praise my student when they behave as I desire.	.564	.170
(2) Reward	M1- I give rewards to my students to encourage them to make more effort.	.002	.765
	M4- By rewarding successful work, I motivate my students.	.229	.556
	M5- I use rewards to motivate my students.	.145	.853
	M6- I use rewards while educating my students.	.104	.901
	M10- I utilize a reward system to prevent undesirable behaviors.	-.009	.839
	M11- I promise rewards to my students to encourage them to work harder.	-.005	.745
	M12- I use rewards to instill correct behaviors in my students.	-.049	.911

The eigenvalue for the first factor is 7.454, and for the second factor, it is 1.914. In the 2-factor solution, the total variance explained is 76%. $r_{f_1,f_2} = .576$, N= 465, ∝praise=.92, ∝reward=.87

Additionally, to estimate the reliability level of each factor score, the items related to each factor were considered together, and Cronbach's alpha (Cronbach, 1951) was calculated. A Cronbach's alpha greater than .70 is considered acceptable reliability, greater than .80 indicates good reliability, and greater than .90 indicates very good reliability. As a result of the reliability analysis, Cronbach's alpha was calculated as .92 for the "praise" factor and .87 for the "reward" factor. It was concluded that each factor score is both acceptable and has good reliability.

To provide additional evidence for the construct validity of the measurement tool with the factor structure established through exploratory factor analysis, confirmatory factor analysis (CFA) was conducted using the data obtained from the second study group, consisting of 271 teachers. The purpose here was to determine how well the data from another sample within the same population fit the established factor structure (model) and to assess the adequacy of the factors in explaining the structure (DeVellis, 2017). The findings of the conducted CFA are presented in Table 4.

Table 4.
Summary of Confirmatory Factor Analysis Model-Data Fit Indices

Model	Estimated free parameters	X^2	Free parameters	P	RMSEA	RMSEA %90 confidence level	CFI	TLI	SRMR
Two factor model	66	173.3	64	<.001	.079	[.065, .094]	.991	.989	.038

When examining the goodness-of-fit statistics in Table 4, it can be observed that the fit indices are as follows: RMSEA = .079, CFI = .991, TLI = .989, and SRMR = .038. These fit indices fall within the range of good-acceptable threshold values. In the final stage, the two-factor structure discovered from the data of the first study group was confirmed through confirmatory factor analysis (CFA) without further modification. The results of the Confirmatory Factor Analysis for the Teacher Reward and Praise Behavior Scale are presented in Table 5.

Table 5.
Confirmatory Factor Analysis Results for the Teacher Reward and Praise Behavior Scale

Factor	Item	Standardized Factor Weight	Standardized Error	t	p
(1) Praise	M1	.883	.016	55.45	<.001
	M2	.954	.009	104.42	<.001
	M3	.836	.017	49.55	<.001
	M4	.884	.017	52.24	<.001
	M5	.827	.019	42.52	<.001
	M6	.718	.030	23.91	<.001
(2) Reward	M7	.901	.013	70.85	<.001
	M8	.768	.027	28.19	<.001
	M9	.957	.008	120.49	<.001
	M10	.917	.011	80.67	<.001
	M11	.662	.035	18.88	<.001
	M12	.798	.021	37.26	<.001
	M13	.846	.019	45.73	<.001

According to the data presented in Table 5, the factor loadings for the first factor (praise) range from .71 to .95, and for the second factor (reward), they range from .66 to .95. Furthermore, Cronbach's alpha values for the first factor (praise) and the second factor (reward) are found to be .91 each. Each factor can be considered to have very good reliability. The relationship between the two factors is positive, and the correlation is 0.42. Thus, through the analysis of the data obtained from the second study group, both validity and reliability evidence have been provided.

Finally, the criterion-related validity of the Teacher Reward and Praise Behavior Scale, for which validity and reliability evidence was obtained through both EFA and CFA, was tested using correlation analysis with other variables based on the data from the second study group. In this study, to examine the concurrent validity of the scale, the relationships between its sub-dimensions (reward and praise) and conceptually related constructs were analyzed using correlation analysis with two other scales (Christensen, Johnson & Turner 2020; DeVellis, 2017). To test concurrent validity, two scales conceptually related to the sub-dimensions of the Teacher Reward and Praise Behavior Scale were used in correlation analysis.

In the second study group, participants were administered two additional scales concurrently with the Teacher Reward and Praise Behavior Scale. The Subscale of Verbal Emotional Punishment from the Parent Reward and Punishment Scale developed by Atli, Sad & Ozer (2022) was used. Although the items in this scale were originally written for parents, they were adapted for the classroom environment in this research. The 4-item scale has a Cronbach's Alpha value of .60. The reason for using this scale is that teachers who use rewards also tend to use punishments (Newby, 1991) because both are control mechanisms. The second additional scale was the High Parental Expectation subscale from the

Perfectionism Scale developed by Frost, Marten, Lahart & Rosenblate (1990), which is commonly used in the literature. The items in this scale were originally written for students but were adapted for the classroom environment in this research. The 5-item scale has a Cronbach's Alpha value of .77. The reason for using this scale is the presence of a relationship between control and high expectations (see Leung & Shek, 2017). The findings of the concurrent validity analysis based on the data obtained from the second study group, as well as the results of the reliability analysis for the scales, are presented in Table 6.

Table 6.
Findings on the Concurrent Validity of the Teacher Reward and Praise Behavior Scale

	Emotional Punishment Scale	High Expectations Scale	
Factor 1 – Praise	0.273*	0.288*	
Factor 2 - Reward	0.279*	0.282*	
	Avg.	Sd.	∝
Praise Factor	3.8	0.81	0.91
Reward Factor	2.5	0.81	0.91
Verbal Emotional Punishment Subscale	1.6	0.38	0.60
High Expectation Subscale	1.6	0.65	0.77

Note: N=271; *p<.05; Avg.= Average, Sd.= Standard deviation, ∝= Cronbach's Alpha

Based on the results of the correlation analysis conducted to obtain evidence of concurrent validity, positive correlations were found between the praise subscale and the "verbal emotional punishment scale" (r=0.27) and the "high expectation scale" (r=0.28). Similarly, the reward subscale showed positive correlations with the "verbal emotional punishment scale" (r=0.28) and the "high expectation scale" (r=0.28). In the final stage, through the analyses conducted with data from two different study groups, a 2-dimensional scale consisting of 13 items, named the "Teacher Reward and Praise Behavior Scale," was developed, and evidence of its validity and reliability was presented.

Discussion, Conclusion, and Suggestions

The purpose of this study was to develop a valid and reliable scale for measuring teachers' reward and praise behaviors in classroom management. Surprisingly, there is no scale available in the literature that specifically measures teachers' praise and reward behaviors for classroom management. Only one study focuses on measuring parental reward behaviors (Atli et al., 2022). There are robust studies related to the use of rewards and praise in educational processes, but most of them are qualitative research involving interviews with teachers (Cumhur, Kartal, Karademir & Erdinç, 2019; Güzelyurt et al., 2019; Han and Altunhan, 2022; İlgar & Örs, 2021) or review articles (Gündüz & Balyer, 2011; Köçer & Çınar, 2021). These studies contribute to the field by proposing strong alternatives to rewards. However, in studies related to classroom management with teachers, their behavioral dimensions should first be measured reliably. This research will be pioneering in the field by ensuring the reliable and valid measurement of rewards and praise, thus making valuable contributions to future studies in the field. To the best of my knowledge, this research is the first scale study that measures teachers' reward and praise behaviors, which adds to the significance of its contribution to the field.

In this research, the developed scale demonstrates adequate construct validity, concurrent validity, and internal consistency reliability, reflecting its validity and reliability characteristics. According to the results of exploratory factor analysis and reliability analysis, teachers' reward and praise behaviors are measured with two factors. The first factor is praise, and the second factor is reward behaviors.

Subsequently, the confirmatory factor analysis confirmed the two-factor structure and provided sufficient evidence of reliability.

The research's most significant feature is the use of concurrent validity measures. Reward and praise are generally considered essential elements of positive classroom management. Especially in the field of education, it is recommended to use rewards and specific praise more frequently (Alter & Haydon, 2017). According to this approach, rewards promote the increase of desired behaviors (Kazdin, 2017). Royer et al. (2019) propose behavior-specific praise as an effective classroom management strategy. However, the Verbal Emotional Punishment scale used for concurrent validity has shown a positive relationship between reward/praise and verbal emotional punishment ($\propto = 0.29$). According to the behavioral approach, this relationship should be negative. The positive correlation suggests that teachers who use rewards and praise also tend to apply more verbal emotional punishment. This is in line with the pioneering and influential study by Newby (1991). These findings support an internal control approach. Verbal emotional punishment behaviors include sulking, yelling, and using insulting language. There is also a positive correlation with the High Expectancy scale ($\propto = 0.27$). This finding indicates that rewards and praise serve more as control mechanisms rather than motivators. It is consistent with the "Self-Determination Theory" in literature. Controlling parents impose their own thoughts and expectations on their children (Barber, 1996). Similarly, controlling teachers allow students less room for self-expression and tend to transmit their own thoughts to the students (Reeve & Jang, 2006). The positive correlation between the two scales suggests that rewards and praise are more frequently used as control mechanisms. Contrary to the behavioral approach, this relationship should be negative. A review conducted by Bartholomew, Ntoumanis & Thogersen-Ntoumani (2009) indicates that both rewards and high expectations represent controlling behaviors. These findings provide empirical support for the "Self-Determination Theory." Especially in Turkey, where teachers often use and believe in the necessity of rewards (Güzelyurt et al., 2019), this research can contribute to changing thought patterns and fostering an internal control in classroom practices.

The scale can be used by school administrators and researchers as a single scale or as two separate sub-scales to measure teachers' reward and praise behaviors for classroom management. School administrators can design classroom management improvement programs based on the results obtained from this scale. Teachers may not be fully aware of how much they use rewards and praise in their classroom management practices. This scale can help increase their awareness in this regard and provide valuable insights for their professional development.

The research has several limitations. One limitation is that it measures reward and praise behaviors, which largely reflect teachers' attitudes, but there might be a discrepancy between attitudes and actual behaviors. For example, a teacher who does not believe in the motivating power of rewards and praise might still use them in classroom management to compensate for feeling inadequate in discipline. Therefore, a scale should be developed that measures teachers' attitudes towards rewards and praise separately. The research relies on self-report measures based on teachers' statements. Teachers may provide responses that are socially desirable or unknowingly misrepresent their own behaviors (Junco, 2013). To address this, the scale's predictive validity should be tested by comparing teachers' self-reported behaviors with actual observations of their classroom practices. Furthermore, the data for this research was collected online, and a separate sample should be collected in a face-to-face setting to conduct independent reliability and validity studies. Additionally, the second group of participants

consists mainly of females, which might introduce gender bias. Future studies should aim to include more male participants to ensure gender balance in the research findings.

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Data Availability Statement: Data generated or analyzed during this study is available from the authors on request.
Conflict of Interest: There is no conflict of interest among authors.
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Permission: There is no need to get a written permission from the author to use the scale. The Teacher Reward and Praise Behavior Scale can be used by researchers and practitioners as long as it is for research purposes.

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Appendix: Scale Items in Turkish

Öğretmen Ödül ve Övgü Davranış Ölçeği

M1-Öğrencim bir başarı gösterdiğinde, onu överim.
M2-Öğrencilerimi motive etmek için sınıfta övgüyü kullanırım.
M3-Öğrencilerimin çabalarını takdir etmek için övgü kullanırım.
M4-Öğrencilerimi motive etmek için övgüyü kullanırım.
M5-Öğrencim doğru davranışları sergilediğinde onu överim.
M6-Öğrencim istediğim gibi davrandığında, onu överim.
M1-Öğrencilerimin daha çok çaba göstermeleri için, onlara ödül veririm.
M2-Başarılı çalışmaları ödüllendirerek, öğrencilerimi teşvik ederim.
M3-Öğrencilerimi motive etmek için ödül kullanırım.
M4-Öğrencilerimi yetiştirirken ödül kullanırım.
M5-İstenmeyen davranışları önlemek için ödül sistemini kullanırım.
M6-Öğrencilerim daha çok çalışsın diye ödül vaat ederim.
M7-Öğrencilerime doğru davranışları kazandırmak için, ödül kullanırım.

e-Kafkas Journal of Educational Research e-KJER Research Article

The Effect of an Online Decision-Making Skills Psychoeducation Programme on University Students' Decision-Making Styles: A Mixed Method Study[1]

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Abstract

This study examines the effect on university students' decision-making styles of an online decision-making skills psychoeducation programme focused on cognitive behavioural therapy. A nested design, which is one of the mixed method designs, was used in the study. In the quantitative part of the study, a quasi-experimental design was used to test the effect of the programme, while in the qualitative part, a phenomenological design was used. The quantitative data were obtained through the "Melbourne Decision Making Questionnaire", while the qualitative data were obtained through a "Semi-Structured Interview Form", "Session Evaluation Form" and "Psychoeducation Programme Evaluation Form". The quantitative data were collected from 22 participants, of whom 11 were in the experimental group and 11 were in the control group, and the qualitative data were collected from the 11 participants in the experimental group. Descriptive statistics, exploratory and confirmatory factor analysis, reliability analysis, the Friedman rank test, the Wilcoxon signed-rank test and the Mann-Whitney U test for independent samples were used for the analysis of the quantitative data. Content analysis was performed on the qualitative data. The study determined that the psychoeducation programme caused a partially significant increase in the decision-making self-esteem and vigilant decision-making style, a partially significant decrease in the avoidant decision-making style, and a significant decrease in the procrastinating decision-making style of the participants in the experimental group. However the psychoeducation programme did not have a significant effect on the hypervigilant decision-making style of the students in the experimental group. When the views of the participants were examined, the main views were that the content of the programme was considered satisfactory, that the programme was evaluated as an awareness-raising process, that it aroused positive and motivating emotions, and that it was a beneficial study that provided practical and tangible gains.

Keywords: Online decision-making skills psychoeducation programme, cognitive behavioural therapy, decision-making styles, university students, mixed method

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Introduction

When one considers that every moment of life involves a decision-making process, the idea of decision making may at first seem rather ordinary. However, studies show that most people are much weaker in terms of their decision-making skills than they think (Commendador, 2011). This brings to mind the question of how individuals can make healthier decisions for themselves (Scott & Bruce, 1995). This issue occupies an important place in the field of psychological counselling and guidance services, since one of the ultimate goals of these services is to enable individuals to make healthy decisions in areas where they have problems or wish to improve themselves (Egan, 2013). In addition, it is thought that being able to make healthy decisions is a harbinger of a decrease in existing psychological disorders (Bavolar & Orosova, 2015). Studies show that healthy decision-making behavior is associated with individuals' self-esteem, problem-solving skills and coping skills and is one of the important criteria of mental health (Avşaroğlu & Üre, 2007; Deniz, 2006; Palamarchuk & Vaillancourt, 2021). Healthy decision-making processes gain importance especially in the early stages of life. Since individuals face important responsibilities and developmental tasks during adolescence and young adulthood, decision-making behaviours are of critical importance (Nota & Soresi, 2004). University life, which begins at the end of adolescence and in the early stages of young adulthood, is a period when individuals, who generally move away from their families, take on all their life responsibilities and when their independent decision-making behaviours become even more important. During this period, students are faced with critical decision-making situations related to their careers, emotional and social processes, and personal development. Therefore, their acquisition of healthy decision-making behaviour directly impacts their future lives and life satisfaction (Wasarhelyi et al., 2019).

The fact that decision-making is an important pattern of behaviour in individuals' lives makes it important to analyse and monitor the decision-making processes correctly (Wolff & Crockett, 2011). The decision-making process consists of successive stages, in which each stage forms the basis for the next. The way each individual perceives and implements these stages differs from childhood onwards. These differences are examined under the name of decision-making styles. Decision-making styles determine individuals' preferences related to an event or situation (Deniz, 2004). Individuals need to acquire appropriate and effective decision-making skills so that they can develop themselves by obtaining satisfaction from their lives. Decision-making styles play a critical role in the acquisition of these skills (Thunholm, 2004). When the literature is examined, it can be seen that different decision-making styles are emphasised. Harren (1979) divided decision-making styles into three groups, namely rational, intuitive and dependent decision-making styles. Arroba (1977) examined decision-making styles under six categories: no thought, compliant, logical, emotional, intuitive and hesitant. Scott and Bruce (1995) on the other hand, separated decision-making styles into five groups as rational, intuitive, dependent, avoidant and spontaneous. One of these classifications is vigilant, procrastinating, avoidant and hypervigilant decision-making styles, which were shaped by the study conducted by Mann et al. (1998) on university students from different cultures (Deniz, 2004).

Healthy decision making is of critical importance for individuals' mental health (Avşaroğlu & Üre, 2007; Deniz, 2006; Palamarchuk & Vaillancourt, 2021), especially during the university period when decision-making behavior is more intense (Wasarhelyi et al., 2019). It is known that the behavior of the individual deeply affects the rest of the life and mental health of the individual. It is thought that decision-making styles play a key role in decision-making behaviors, therefore, dysfunctional decision-making styles should be changed in order to gain healthy decision-making behavior.In previous studies on the development of individuals' decision-making skills, it can be observed that decision-making styles were also emphasised (Çolakkadıoğlu & Güçray, 2012; Çolakkadıoğlu & Çelik, 2016; Ercengiz & Şar, 2018; Mann et al., 1988). However, it can be seen that in previous studies, determinants such as thoughts, core beliefs, assumptions, concerns, fears and priorities that shape decision-making styles were not emphasised. These elements are considered to be the key elements that shape decision-making styles (Bavolar & Bacikova-Sleskova, 2020; Gambetti & Giusberti, 2019), since while making decisions, individuals are affected by the attitudes, beliefs and values that develop within themselves. These elements are important factors in evaluating options, making final decisions and shaping the decision-making style used by the individual (Thunholm, 2004). In this regard, it is considered possible to enable the individual to make more careful and effective decisions by identifying and changing his/her irrational

thoughts and beliefs (Alwood & Salo, 2012; Van Dongen et al., 2005). In the field of psychological counselling, numerous therapeutic approaches for assisting individuals have emerged. Cognitive behavioural therapy (CBT), which is one of these approaches, asserts that the thoughts and beliefs of the individual are the basic elements that affect and determine their emotions and behaviours (Beck, 2020; Wenzel et al., 2016). In this respect, CBT is regarded as a correct approach that can be applied to individuals who require psychological support on the subject, as it focuses on the main elements that affect individuals' decision-making processes. One of the strengths of CBT is that it is an educational, preventive and developmental approach. Due to this characteristic, CBT has become a key approach used in preventive and developmental psychological support programmes (Brown, 2011; Gerrity & DeLucia-Waack 2007).

It can be seen that preventive and developmental psychological support services have been adopted more and become more widespread in recent years. Psychological counselling and guidance services provided at different school levels are grounded on an educational, preventive and developmental basis. The main purpose of all preventive and developmental approaches is for individuals to correctly analyse and gain awareness of the reasons and factors behind their own psychological processes (Conyne, 2000). In this regard, the practices carried out have revealed that psychoeducation programmes provide satisfactory answers to the educational, preventive and developmental aspects of the psychological counselling process (Gerrity & DeLucia-Waack, 2007). In Turkey, however, it can be seen that the physical infrastructure required for the expansion of psychoeducation programmes at all school levels and in universities is insufficient. It is considered important to seek easy and practical ways to overcome this deficiency and contribute to the expansion of psychoeducation programmes. Accordingly, within the framework of the opportunities offered by technology, conducting the programmes online is also a strong alternative (Coudray, et al., 2019; Visvalingam, et al., 2022). Globally and in Turkey, the use of online psychoeducation programmes was limited prior to the COVID-19 pandemic. As reasons for this, the fact that online psychoeducational practices would not be as effective as face-to-face programmes, that participants would experience trust problems, and that body language could not be understood were among the views put forward. However, the obligations during the pandemic process were instrumental in the spread of online psychoeducational practices. It can be said that as a result of the visible positive effects of these programmes, negative attitudes towards online psychoeducational practices declined (Yüksel-Şahin, 2021). This situation also shows that online psychoeducational practices can be easily chosen when the COVID-19 pandemic conditions decline and social distancing rules are no longer needed. Moreover, cognitive behavioural therapy consists of evidence-based processes and activities. In this respect, CBT is thought to provide a functional and effective infrastructure for online psychoeducational practices (Andersson & Cuijpers, 2008).

Based on the reasons mentioned above, the aim of this study was to determine the effect of a CBT-oriented online decision-making skills psychoeducation programme prepared by the researcher on university students' decision-making styles and to evaluate the participants' views on all stages of the programme. In line with this main purpose, the following hypotheses were tested and answers were sought to the questions below.

1. The posttest scores obtained from the decision-making questionnaire by the participants in the experimental group participating in the online decision-making skills psychoeducation programme are significantly higher than their pretest scores.

2. The follow-up test scores obtained from the decision-making questionnaire by the participants in the experimental group participating in the online decision-making skills psychoeducation programme are significantly higher than their pretest scores.

3. There is no significant difference between the pretest, posttest and follow-up test mean scores of the participants in the control group.

4. The decision-making questionnaire posttest scores of the participants in the experimental group participating in the online decision-making skills psychoeducation programme differ significantly from those of the participants in the control group.

5. What are the targeted learning outcomes of the participants in the experimental group regarding the programme?

6. What are the evaluations of the participants in the experimental group regarding the programme sessions and the effects of the programme?

Method

Research Model

This research was conducted with a nested design, one of the mixed method research models. This design is used to answer the purpose and find answers to different questions of the research with different data types, to support the elements of an experimental design, to test the intervention process, and to ensure the clarity of the results (Creswell & Clark, 2018). In this context, a 2 (experimental and control groups) x 3 (pretest-posttest-follow-up) quasi-experimental design was used to test the effect of the Online Decision-Making Skills Psychoeducation Programme. The quasi-experimental design is one of the experimental designs frequently used in the fields of psychology and education (Wallen & Fraenkel, 2013). Quasi-experimental designs involve the manipulation of independent variables like real experimental designs, but unlike these, do not involve the random assignment of participants to groups. Different from studies conducted in laboratory environments, studies in the field of psychological counselling are mostly carried out in natural environments. This makes random assignment to conditions difficult (Heppner et al., 2015). In the qualitative part of the study, data were collected for a different purpose at each stage. The qualitative data were collected in order to determine the learning outcomes of the programme before the experiment, to test the implementation from the perspective of the participants during the experimental procedure, and to make sense of the quantitative findings after the experiment. The collected qualitative data were analysed according to a phenomenological approach. In the phenomenological approach, the aim is to reveal the themes and patterns related to the subject in line with individuals' perceptions and evaluations (Creswell & Poth, 2016; Patton, 1990). The flow diagram of the study process is shown in Figure 1.

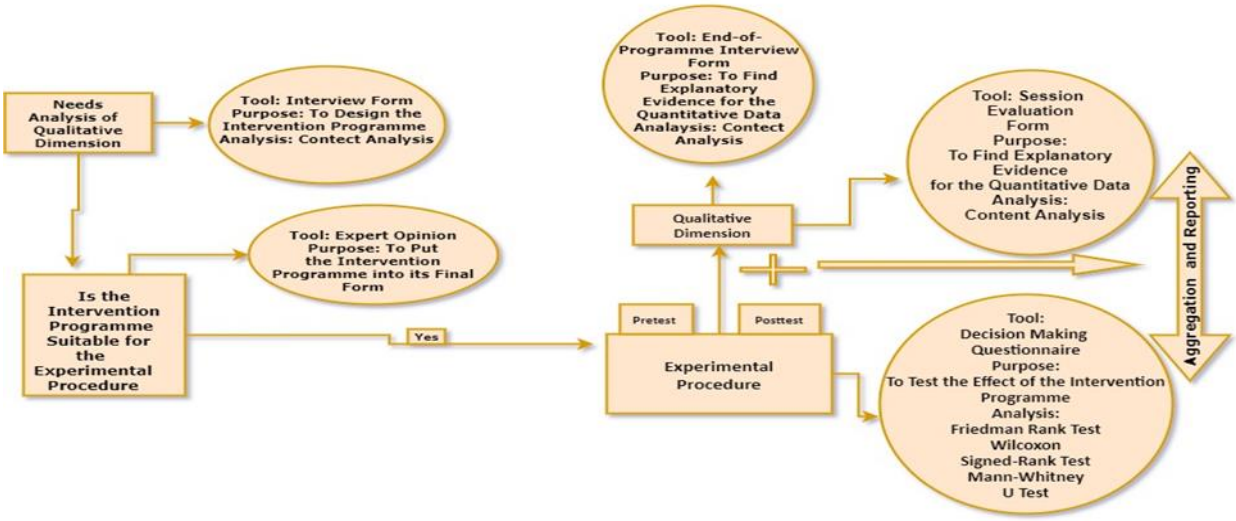

Figure 1. Research Process (Flow Diagram).

Study Group

The study group of the research consists of 22 university students (11 in the experimental group and 11 in the control group) continuing their education at different universities. Within the scope of the research, the Melbourne Decision Making Questionnaire and a personal information form prepared by the researcher were administered to 534 students via Google Forms through convenience sampling, which is one of the non-random sampling methods. In addition, in the questionnaire form, the necessary information about the psychoeducation programme was provided, and a section was added requesting

the contact information of students wishing to participate. The criterion sampling method, which is a type of purposive sampling, was used to determine the experimental and control groups (Patton, 1990). During the evaluation of the data obtained using the decision-making questionnaire, the arithmetic mean values for each sub-dimension of the scale were first calculated for the group from which the data were collected. Within this scope, it was assumed that individuals whose decision-making self-esteem and vigilant decision-making style scores were below the average, and whose avoidant, procrastinating and hypervigilant decision-making style scores were above the average, were at risk in terms of their decision-making behaviours. From among students who were included in any of the criteria specified in these sub-dimensions, the experimental group was formed by conducting pre-interviews with 11 students who volunteered, while the control group was also formed with 11 students who volunteered. While determining the participants in the experimental and control groups in the study, not only the mean scores, but also the interview data, the voluntariness of the participants, and their declarations about attending the sessions regularly were taken into account (Brown, 2020; Walsh, 2013). It was observed that 81.8% of the participants in the experimental and control groups were female students and that 18.2% were male students. Among the participants, 9.1% continued their education in the 1st grade, 27.3% in the 2nd grade, 54.5% in the 3rd grade, 4.5% in the 4th grade, and 4.5% in the 5th grade. Since participation in the study was based on voluntariness, no intervention was made to the ratio of female and male students.

Data Collection Tools and Process

In the study, the "Melbourne Decision Making Questionnaire I-II (MDMQ I-II)" was administered within the scope of the pretest, posttest and follow-up test to determine the decision-making styles of the university students. In addition, a "personal information form" prepared by the researchers was used to determine the students' socio-demographic characteristics. Within the scope of the research, interviews were conducted using a "semi-structured interview form", "session evaluation form" and "psychoeducation programme evaluation form" prepared by the researchers. The necessary permission was obtained for the decision-making questionnaire and for the compliance of the study with scientific research and publication ethics. Expert opinion was sought for the interview forms prepared for the qualitative interviews, and then the interviews were conducted in their final version. Due to the restrictions created by the COVID-19 process, the decision-making questionnaire was administered within the scope of the pretest, posttest and follow-up test online via Google Forms to students who continued their education at different universities in Turkey during the 2021-2022 academic year. Before the implementation of the programme, qualitative interviews were conducted using the "semi-structured interview form" in the online ZOOM platform, the other qualitative data collection tools were sent to the participants online via e-mail after each programme session and at the end of the programme, and the filled forms were also sent to the researchers online via e-mail. Information on the data collection tools used within the scope of the research is presented below.

Melbourne Decision Making Questionnaire I-II (MDMQ I-II)

The Melbourne Decision Making Questionnaire was developed by Mann et al. (1998) to measure self-esteem and decision-making styles in decision making. The adaptation of the questionnaire to Turkish culture was made by Deniz (2004). The scale consists of two parts. The first part aims to determine the level of self-esteem in decision making. This part of the questionnaire consists of 6 three-point Likert-type items under a single factor. The highest score that can be obtained from this part of the questionnaire is 12. The second part of the questionnaire measures decision-making styles. This section consists of 22 three-point Likert-type items under a single factor. In this part of the questionnaire, there are four sub-dimensions: vigilant, avoidant, procrastinating and hypervigilant decision-making styles. In all sub-dimensions of the questionnaire, the internal consistency coefficient varied between .65 and .85 (Deniz, 2004). Following the reliability analyses conducted within the scope of the current study, the Cronbach alpha internal consistency coefficients were calculated as .68 for decision-making self-esteem, .73 for the vigilant decision-making style, .70 for the hypervigilant decision-making style, .70 for the procrastinating decision-making style, and .71 for the avoidant decision-making style. Following the exploratory factor analysis (EFA) performed to test the validity of the questionnaire in the study, the Bartlett sphericity test result of the questionnaire was found to be significant, the KMO value was calculated as .87, and the total explained variance was determined as 37%. Confirmatory factor analysis

was performed to confirm the 5-factor structure of the questionnaire. The fit indices (X2/df=2.64, CFI=.86, GFI=.89, AGFI=.87, RMSEA=.05) obtained as a result of the first-stage confirmatory factor analysis were found to be at an acceptable level of fit (Kline, 2011). .

Semi-Structured İnterview Form

This is a form created in the study by the researchers to obtain the opinions of the students who participated in the experimental group regarding the aims and content of the Online Decision-Making Skills Psychoeducation Programme.

Session Evaluation Form

This is a form prepared by the researchers and administered at the end of each session to determine the functions and effectiveness of the sessions in the Online Decision-Making Skills Psychoeducation Programme.

Psychoeducation Programme Evaluation Form

This is a form prepared by the researchers and administered at the end of the programme to determine the general effects of the Online Decision-Making Skills Psychoeducation Programme and the participants' suggestions regarding the programme.

Personal Information Form

This is an information form that includes questions aimed at determining the students' gender and grade levels.

Online Decision-Making Skills Psychoeducation Programme

Psycho-education is applications based on knowledge and skills offered to individuals to cope with their problems (Çivitçi, 2020). The main purpose of these practices is to enable the individual to cope with both his current problems and the problems he may encounter in his future life (Corey, 2015). Psycho-educational programs are carried out on a certain subject, within the framework of determined objectives. The content of these programs, the methods and techniques to be used, and the functioning of the program are predetermined. In this framework, practitioners should also be experts in the subject (Brown, 2020). Prior to the development of the Online Decision-Making Skills Psychoeducation Programme based on CBT, the researcher received 52 hours of cognitive behavioural therapy training. Moreover, the researcher examined many studies on the theoretical foundations and practices of CBT. At this stage, theoretical and practical scientific studies and resources related to CBT (Beck, 1993; Beck, 2020; Greenberger & Padesky, 2015; Salkovskis, 1997; Wenzel et al., 2016) were utilised. Furthermore, studies and resources on the theoretical foundations and practices of psychoeducation (Brown, 2020; Corey, 2015; Walsh, 2013) were also made use of. During the research process, some of the intervention studies on decision-making styles (Çolakkadıoğlu & Güçray, 2012; Çolakkadıoğlu & Çelik, 2016; Ercengiz & Şar, 2018; Mann et al., 1988) were also utilised while preparing the theoretical basis, principles and practices of the programme. Afterwards, the content was shaped in line with the objectives determined as a result of the interviews with the participants, and the psychoeducation programme was finalised (see Appendix Table 1). The psychoeducation programme was implemented in 10 sessions, each lasting 80 minutes, via the online ZOOM application. Since the psychoeducation programme was implemented online, mostly visual and auditory activities were included. It is considered sufficient for psychoeducational practices prepared for university students and adults to last from 8-12 sessions, with a period of 60-90 minutes for each session (Brown, 2020; Walsh, 2013).

Data Analysis

The SPSS 24.0 and AMOS 24.0 software programs were used for the analysis of the quantitative data in the study. First of all, exploratory factor analysis, confirmatory factor analysis and reliability analysis were performed to test the validity and reliability of the Melbourne Decision Making Questionnaire. The fact that the skewness and kurtosis coefficients of scale scores in a data set are within the limits of ±1.5 indicates that the scores are normally distributed. In addition, the homogeneity of variance results should be taken into account in determining the analysis methods to be used for within-group and between-group comparisons (Tabachnick & Fidell, 2013). As a result of the descriptive analysis made

within this framework, it was observed that the skewness and kurtosis coefficients of some of the sub-dimensions of the questionnaire were not within the value range determined for normal distribution, and when the results of Levene's test were examined, it was observed that the groups did not show a homogeneous distribution in some sub-dimensions of the questionnaire. Therefore, it was decided to use non-parametric tests to seek answers to the hypotheses. In this context, the Friedman rank test, which is a non-parametric test, was used for within-group comparisons, that is, to determine whether there was a significant difference between the pretest, posttest and follow-up test measurements of the groups, while the Wilcoxon signed-rank test for related samples was used to determine the source of the difference in cases where a significant difference was detected. The Mann-Whitney U test for independent samples, which is a non-parametric test, was used to determine the difference between the posttest measurements of the groups. In the study, statistical analyses of the findings were carried out based on a .05 level of significance. In the qualitative phase of the research, the qualitative data collected online from the participants prior to the programme, after each session and at the end of the programme were subjected to thematic analysis by both the researcher and an expert experienced in qualitative data analysis (Braun & Clarke, 2006; Patton, 1990). The results of both analyses were compared and the necessary revisions were made. Afterwards, the codes and themes obtained from the analyses and agreed upon were reported using a fluent language and supported by direct quotations.

Findings

Quantitative Findings

This part of the study includes the results of the analysis of the collected data. Firstly, Table 1 shows the descriptive statistical values of the pretest, posttest and follow-up test scores of the experimental and control groups in the Melbourne Decision Making Questionnaire (MSDS I-II).

Table 1.
Descriptive Statistics for Pretest, Posttest and Follow-Up Test Scores of Experimental and Control Groups

Decision-Making Styles	Experimental Group						Control Group					
	Pretest		Posttest		Follow-up test		Pretest		Posttest		Follow-up test	
	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD
Decision-making self-esteem	1.04	.15	1.04	.25	1.45	.15	.98	.32	1.09	.17	1.19	.31
Hypervigilant decision-making style	1.29	.18	1.20	.40	1.21	.34	1.29	.36	1.25	.36	1.18	.34
Vigilant decision-making style	1.45	.34	1.63	.32	1.75	.38	1.45	.16	1.48	.27	1.21	.35
Avoidant decision-making style	1.34	.26	.80	.41	.75	.36	1.05	.23	1.00	.22	.92	.33
Procrastinating decision-making style	1.41	.37	.83	.43	.54	.41	1.30	.28	1.32	.41	1.14	.32

As can be seen in Table 1, there are differences between the results of the pretest, posttest and follow-up test regarding the experimental and control groups' scores in the sub-dimensions of the decision-making questionnaire. Furthermore, it can be seen that there are differences between the experimental and control groups' posttest scores in the sub-dimensions of the decision-making questionnaire. To examine whether these observed differences are statistically significant, the experimental and control groups' pretest, posttest and follow-up test scores in the sub-dimensions of the decision-making questionnaire were compared within themselves (within-group comparisons). Afterwards, the posttest scores of the experimental and control groups in the sub-dimensions of the decision-making questionnaire were compared with each other (between-group comparisons). These statistical

procedures are listed below by considering the hypotheses.

Within-Group Comparisons

The Friedman rank test was used to test the hypotheses for the in-group comparisons set out below. The Wilcoxon signed-rank test was also performed for the hypotheses in which a significant difference was detected within the group.

1. The posttest scores obtained from the decision-making questionnaire by the participants in the experimental group participating in the online decision-making skills psychoeducation programme are significantly higher than their pretest scores.

2. The follow-up test scores obtained from the decision-making questionnaire by the participants in the experimental group participating in the online decision-making skills psychoeducation programme are significantly higher than their pretest scores.

3. There is no significant difference between the pretest, posttest and follow-up test mean scores of the participants in the control group.

In order to test hypotheses 1, 2 and 3, the scores obtained in the questionnaire by the students in the experimental and control groups from the pretest, posttest and follow-up test measurements were compared using the Friedman rank test for related samples, and the findings are presented in Table 2.

Table 2.
Results of Friedman Rank Test for Pretest, Posttest and Follow-Up Test Measurements of Experimental and Control Groups ın Decision-Making Questionnaire

Variables	Groups	Measurements	*N*	*MR*	*Sd*	X^2	*p*
Decision-making self-esteem	Experimental	Pretest	11	1.64	2	9.135	0.010*
		Posttest	11	1.68			
		Follow-up test	11	2.68			
	Control	Pretest	11	1.55	2	4.200	0.122
		Posttest	11	2.09			
		Follow-up test	11	2.36			
Vigilant decision-making style	Experimental	Pretest	11	1.45	2	9.172	0.010*
		Posttest	11	2.05			
		Follow-up test	11	2.50			
	Control	Pretest	11	2.23	2	3.846	0.146
		Posttest	11	2.23			
		Follow-up test	11	1.55			
Procrastinating decision-making style	Experimental	Pretest	11	2.82	2	14.976	0.001*
		Posttest	11	1.95			
		Follow-up test	11	1.23			
	Control	Pretest	11	2.18	2	2.313	0.315
		Posttest	11	2.14			
		Follow-up test	11	1.68			
Avoidant decision-making style	Experimental	Pretest	11	2.86	2	14.333	0.001*
		Posttest	11	1.82			
		Follow-up test	11	1.32			
	Control	Pretest	11	2.36	2	3.765	0.152
		Posttest	11	2.00			
		Follow-up test	11	1.64			

Table 2 continuing

Hypervigilant decision-making style	Experimental	Pretest	11	2.41	2	4.357	0.113
		Posttest	11	1.77			
		Follow-up test	11	1.82			
	Control	Pretest	11	2.14	2	0.500	0.779
		Posttest	11	1.95			
		Follow-up test	11	1.91			

MR: Mean Rank **p<.05*

As can be seen in Table 2, there is a significant difference between the pretest, posttest and follow-up test scores of the experimental group regarding decision-making self-esteem and the vigilant, procrastinating and avoidant decision-making styles (p<.05). However, it can be seen that there is no significant difference between the pretest, posttest and follow-up test results of the experimental group regarding the hypervigilant decision-making style (p>.05). Moreover, no significant difference was found between the pretest, posttest and follow-up test measurements of the control group in the sub-dimensions of the decision-making questionnaire (p>.05). Regarding the significant differences observed between the experimental group's pretest, posttest and follow-up test scores for decision-making self-esteem and the vigilant, procrastinating and avoidant decision-making styles, in order to determine the measurement or measurements to which the differences were related, the measurements were compared using the Wilcoxon signed-rank test for paired groups, and the obtained results are shown in Table 3.

Table 3.
Results of Wilcoxon Signed-Rank Test for Paired Groups Regarding Pretest, Posttest and Follow-Up Test Masurements of Experimental Group

Variables	Paired comparisons	Group	*N*	*MR*	*SR*	*z*	*p*
Decision-making self-esteem	Pretest-posttest	Negative ranks	4	4.50	18.00	.000	1.000
		Positive ranks	4	4.50	18.00		
		Ties	3				
	Pretest-follow-up	Negative ranks	1	2.50	2.50	-2.572	.010*
		Positive ranks	9	5.83	52.50		
		Ties	1				
	Posttest-follow-up	Negative ranks	1	1.50	1.50	-2.501	.012*
		Positive ranks	8	5.44	43.50		
		Ties	2				
Vigilant decision-making style	Pretest-posttest	Negative ranks	0	.00	.00	-2.032	.042*
		Positive ranks	5	3.00	15.00		
		Ties	6				
	Pretest-follow-up	Negative ranks	1	6.00	6.00	-1.974	.048*

**p<.05*

Table 3 continuing

		Positive ranks	8	4.88	39.00		
		Ties	2				
	Posttest-follow-up	Negative ranks	1	5.00	5.00		
		Positive ranks	5	3.20	3.20	-1.166	.244
		Ties	5				
Procrastinating decision-making style	Pretest-posttest	Negative ranks	8	5.31	42.50		
		Positive ranks	1	2.50	2.50	-2.382	.017*
		Ties	2				
	Pretest-follow-up	Negative ranks	11	6.00	66.00		
		Positive ranks	0	.00	.00	-2.947	.003*
		Ties	0				
	Posttest-follow-up	Negative ranks	8	5.88	47.00		
		Positive ranks	2	4.00	8.00	-2.005	.045*
		Ties	1				
Avoidant decision-making style	Pretest-posttest	Negative ranks	9	5.61	50.50		
		Positive ranks	1	4.50	4.50	-2.350	.019*
		Ties	1				
	Pretest-follow-up	Negative ranks	11	6.00	66.00		
		Positive ranks	0	.00	.00	-2.940	.003*
		Ties	0				
	Posttest-follow-up	Negative ranks	7	6.36	44.50		
		Positive ranks	3	3.50	10.50	-1.741	.082
		Ties	1				

MR: Mean Rank, **SR:** Sum of Ranks **p<.05*

Examination of Table 3 reveals a significant difference between the decision-making self-esteem follow-up test scores of the experimental group and their pretest scores (z=-2.572; p<.05), but no significant difference between their decision-making self-esteem posttest and pretest scores (z=.000; p>.05). Based on these findings, it can be said that there was no difference in the decision-making self-esteem levels of the students in the experimental group as a result of the experimental procedure, but that there was a significant increase in the follow-up test measurements compared to the pretest. A significant difference can be seen between the vigilant decision-making style pretest scores of the experimental group and their posttest scores in favour of the posttest scores (z=-2.032; p<.05). This significant increase was also maintained in the follow-up test, and there was a difference between the pretest scores and the follow-

up test scores in favour of the follow-up test (z=-1.974; p<.05). In line with these findings, it can be said that there was an increase in the vigilant decision-making style scores of the students in the experimental group as a result of the experimental procedure, and that this increase was also maintained in the follow-up test. The procrastinating decision-making style posttest scores of the experimental group decreased significantly compared to their pretest scores (z=-2.382; p<.05). It is observed that their follow-up test scores also decreased significantly compared to the pretest scores (z=-2.947; p<.05). Based on these findings, it can be said that there was a significant decrease in the procrastination decision-making style scores of the students in the experimental group as a result of the experimental procedure, and that this significant decrease continued in the follow-up test measurement. Considering the avoidant decision-making style posttest scores of the experimental group, it can be said that their pretest scores decreased significantly as a result of the intervention programme (z=-2.350; p<.05). This significant decrease continued in the follow-up test measurements (z=-2.940; p<.05). In line with these findings, it can be said that there was a significant decrease in the avoidant decision-making style scores of the students in the experimental group as a result of the experimental procedure, and that this significant decrease was also maintained in the follow-up test measurement.

Between-Group Comparisons

In the study, the Mann-Whitney U test was used to test the hypothesis that *"The decision-making questionnaire posttest scores of the participants in the experimental group participating in the online decision-making skills psychoeducation programme differ significantly from those of the participants in the control group"*. To test this hypothesis, the mean scores obtained by the experimental and control groups from the posttest measurement were compared. The findings regarding this procedure are presented in Table 4.

Table 4.
Mann-Whitney U Test Results Regarding Posttest Scores of Experimental and Control Groups ın Sub-Dimensions of Decision-Making Questionnaire

Variables	Group	*N*	*MR*	*SR*	*U*	*z*	*p*
Decision-making self-esteem	Experimental	11	10.86	119.50			
	Control				53.500	-.473	.636
		11	12.14	133.50			
Vigilant decision-making style	Experimental	11	13.18	145.00			
	Control				42.000	-1.244	.214
		11	9.82	108.00			
Procrastinating decision-making style	Experimental	11	8.36	92.00			
	Control				26.000	-2.301	.021*
		11	14.64	161.00			
Avoidant decision-making style	Experimental	11	9.77	107.50			
	Control				41.500	-1.263	.207
		11	13.23	145.50			
Hypervigilant decision-making style	Experimental	11	10.73	118.00			
	Control				52.000	-.589	.556
		11	12.27	135.00			

MR: Mean Rank, **SR:** Sum of Ranks **p<.05*

When Table 4 is examined, no significant difference can be seen between the posttest scores of the experimental and control groups for decision-making self-esteem or the vigilant, avoidant and hypervigilant decision-making styles (p>.05). As shown in Table 4, it was determined that only the procrastinating decision-making style posttest scores of the experimental group are significantly lower than the procrastinating decision-making style posttest scores of the control group (U=26.000; p<.05).

Qualitative Findings

In the study, to find an answer to the question "*What are the targeted learning outcomes of the participants in the experimental group regarding the programme?*", the participants were interviewed using the "Semi-Structured Interview Form" via the online ZOOM platform before the experimental study. Following the analysis of the obtained data, the programme was shaped and the main themes of

the Online Decision-Making Skills Psychoeducation Programme were created (see Appendix Table 1). With regard to the implementation process and the effects of the programme, to find an answer to the question "*What are the evaluations of the participants in the experimental group regarding the programme sessions and the effects of the programme?*", the "Session Evaluation Form" and "Psychoeducation Programme Evaluation Form" were used. When the participants' evaluations of the psychoeducation programme sessions are examined, it can be seen that they regarded the sessions as an awareness-raising, instructive and beneficial process and that they found the content productive. The participants stated that the programme created many different emotions in them throughout the process, and it was observed that these expressed emotions were generally positive ones (see Appendix Table 2). When the general evaluations of the participants at the end of the psychoeducation programme are examined, they stated that the programme made a positive impression on them, created awareness in them, and increased their decision-making skills. In addition, the participants made suggestions for making the subjects more concrete, increasing the number of activities, conveying the topics through case studies, and conducting the programme face-to-face (see Appendix Table 3).

Discussion

As a result of the study, it can be said that the online decision-making skills psychoeducation programme conducted with a focus on CBT led to a partial increase in the decision-making self-esteem and vigilant decision-making style, and a partial decrease in the avoidant decision-making style of the participants in the experimental group. It can be seen that the psychoeducation programme resulted in a significant decrease in the procrastinating decision-making style of the participants in the experimental group. It was also observed that the programme did not have any effect on the participants' hypervigilant decision-making style. In the qualitative data collected at the point of better understanding of these quantitative results, the participants stated that the program is an awareness-raising, instructive and beneficial process in general, leaving positive effects on them and increasing their decision-making skills. In this respect, the positive changes that the program brought about in the decision-making styles of the participants can be better understood. The inability of the program to create the expected positive changes on some decision-making styles can be explained in the context of the deficiencies highlighted in the qualitative data, by making the subjects more concrete, increasing the number of activities, transferring the subjects through case studies, and making the program face-to-face. It can be stated that these results show some similarities to the findings of previous studies in the literature. In the study by Mann et al. (1988), in which they tested the effects of a conflict theory-based decision-making skills training programme, they observed an increase in the participants' cautious-selective decision-making style and decision-making self-esteem. The cautious-selective decision-making style describes a decision-making process similar to the vigilant decision-making style used in this study. In this respect, it can be said that the partial increase in the participants' vigilant decision-making style and levels of decision-making self-esteem in the study show parallelism with the results obtained in the study conducted by Mann et al. (1988).

In other studies (Çolakkadıoğlu & Güçray, 2012; Çolakkadıoğlu & Çelik, 2016), in which the effect on decision-making styles of a conflict theory-based decision-making skills psychoeducation programme developed was examined, it was found that the psychoeducation programme increased participants' decision-making self-esteem and cautious-selective decision-making style, while it reduced the complacent, panic and cop-out decision-making styles. In the literature, decision-making styles are generally examined in two groups as positive and negative decision-making styles. Positive decision-making styles describe healthy ways of decision-making in which individuals determine options according to a purpose, gather information about the options, calculate the advantages and disadvantages, and make their decisions accordingly (Klaczynski et al., 2001). In this respect, it can be said that the partial increase in decision-making self-esteem and the vigilant decision-making style in this study bears similarities to the results of previous studies (Mann et al., 1988; Çolakkadıoğlu & Güçray, 2012; Çolakkadıoğlu & Çelik, 2016). In a study examining the effect on decision-making styles of a psychoeducation programme based on Acceptance and Commitment Therapy (Ercengiz & Şar, 2018), it was found that the programme resulted in a significant reduction in the participants' dependent and avoidant decision-making styles, but that it did not have a significant effect on their instant, intuitive and rational decision-making styles. In this study, too, it can be said that similar results were obtained

for the procrastinating and avoidant decision-making styles, which describe a similar decision-making process to the dependent and avoidant decision-making styles discussed in the abovementioned study. In addition, it can be seen that similar results were obtained for the instant decision-making style, which describes a similar decision-making process to the hypervigilant decision-making style. However, although there was a partial increase in the vigilant decision-making style of the participants in this study, there was no significant increase in the rational decision-making style, which describes a similar decision-making process, in the study conducted by Ercengiz and Şar (2018).

An individual's decision-making self-esteem is shaped by his/her perceptions, thoughts, assumptions and core beliefs about him/herself (Filippello et al., 2013). The implemented programme included activities focusing on individuals' automatic thoughts, assumptions and core beliefs. It is thought that such activities created awareness in the participants and enabled them to take bold, individual steps in their decision-making processes. In addition, it can be said that focusing on the decision-making processes in the implemented programme and carrying out activities in this direction created an awareness of the decision-making processes in the participants, which in turn led to a positive change in the vigilant decision-making style. The procrastinating decision-making style is a negative decision-making style. Individuals who use negative decision-making styles take false steps in their decision-making processes and shift the responsibility for their decisions to others (Deniz, 2004). It can be said that within the scope of the programme, focusing on both the decision-making processes and the responsibilities in decision-making, and carrying out related activities created awareness in the participants, and this awareness effectively reduced their procrastinating decision-making style. Furthermore, it is thought that especially the topics related to decision-making responsibility and anxiety and the implementation of activities in this direction in the programme led to a decrease in the participants' avoidant decision-making styles. In the study, there was no significant programme-related change in the participants' hypervigilant decision-making style. The CBT approach emphasises that reducing individuals' avoidance and safety behaviours is important in the struggle against anxiety (Salkovskis, 1997). The intervention study was carried out via the online ZOOM programme for ten sessions. In this respect, the anxiety experienced by the participants in the decision-making process and the limited effect in reducing the hypervigilant decision-making style is seen as a consistent result. In fact, in the interviews held during the implementation process and after the implementation, the participants considered the fact that the programme was online and allowed only a weak interaction as a limitation. It can be seen that the qualitative findings collected before, during and after the experiment in the programme are functional in explaining and making sense of the quantitative results, and in revealing the contributions of the participants regarding the deficiencies in the programme. Since no randomness is sought for participation in groups in quasi-experimental designs, problems with internal validity are experienced (Heppner et al., 2015). These internal validity problems can be reduced by holistic interpretation of data obtained from different data sources through data triangulation (Patton, 1990). In this regard, it is thought that in the study, determining the learning outcomes and accordingly, the content of the programme following the qualitative interviews made before the intervention programme, and the fact that in the qualitative data collected during and after the programme, the participants regarded the programme as a satisfactory and beneficial intervention, enabled a better understanding of the quantitative results. Visvalingam et al. (2022) and Çolakkadıoğlu and Çelik (2016) stated that the qualitative data they collected in their studies made the quantitative results more understandable. Moreover, the participants' opinions and suggestions on the weaknesses of the programme in both the session evaluation forms and the programme evaluation forms provide a strong source of information about the issues that need to be emphasised and corrected in order to make the intervention programme more effective.

Recommendations

It was observed that the implemented intervention programme had an impact on the participants' decision-making self-esteem and decision-making styles. For this reason, it is recommended that within the scope of preventive and developmental guidance by psychological counselling and guidance services in universities, the programme be revised and implemented with regard to the decision-making skill, which is a very important part of life. In addition, the results show that decision-making behavior can change. In this respect, it is recommended that different programs should be prepared and implemented

by psychological counseling and guidance services in universities for decision-making skills on vocational and career, emotional and social processes and personal development in order for students to make sound decisions during the university period when critical decisions are taken. It is recommended that researchers prepare different training programmes aimed at contributing to psychological counselling and guidance practices related to decision-making processes, and that they apply them especially to participants in the adolescent and young adulthood periods, which are critical periods for decision-making processes. In addition, it is seen that qualitative studies in the literature on decision making are limited, so it is recommended to consult the opinions of individuals.

Limitations

In addition to the contributions stated above, this research also has some limitations. In this study, the experimental and control groups were formed on a voluntary basis. Therefore, there was an imbalance in the groups, especially in terms of gender. The fact that the study was conducted with a quasi-experimental design also constitutes a limitation in terms of internal validity. Moreover, the fact that the participants in the study were university students constitutes a limitation in terms of generalising the findings to other segments of society. Finally, it is thought that conducting the study via the online ZOOM platform weakened interaction for both the implementer and the participants, which constitutes a limitation in terms of the study findings.

Conclusion

In this study, despite a number of limitations that emerged due to the pandemic conditions, it can be seen that results emerged that reveal the effectiveness of the online psychoeducation programme for decision-making processes and decision-making styles. It can be stated that these results also provide supportive findings in terms of the practicability and effectiveness of online psychoeducation programmes in the field of psychological counselling and guidance.

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Ethics statement: In this study, we declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that we do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, we declare that there is no conflict of interest between the authors, which all authors contribute to the study, and that all the responsibility belongs to the article authors in case of all ethical violations.

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Appendices

Appendix Table 1.

Main Themes of Cbt-Based Online Decision-Making Skills Psychoeducation Programme

Sessions	Themes	Duration
Session 1	Introduction to online decision-making skills psychoeducation programme, getting acquainted and determining goals	80 minutes
Session 2	Decision-making process and decision-making styles	80 minutes
Session 3	Recognising emotions and distinguishing emotions from	80 minutes
Session 4	Automatic thoughts and their effects on decision-making	80 minutes
Session 5	Personal assumptions and their effects on decision-making	80 minutes
Session 6	Core beliefs of individuals and their effects on decision-making processes	80 minutes
Session 7	Obstacles to decision-making ability (fears and anxieties)	80 minutes
Session 8	Overcoming obstacles (coping with fears and anxieties)	80 minutes
Session 9	Priorities and responsibilities in decision making	80 minutes
Session 10	Evaluation and completion of psychoeducation programme	80 minutes

Appendix Table 2.
Participants' Views on Programme Process

Themes	Participant Statements
Function **(What are the participants' views on the functionality of the program?)**	E5: "Especially sharing others' experiences increased my own awareness of many issues." E1: "I had a lot of emotions that I thought I felt but didn't actually feel as such. I learned to stop after experiencing something and really think about how I was feeling at that moment, as I used to have automatic feelings and thoughts in the face of events and did not actually focus on what I was feeling." E6: "In fact, I learned that in the decision-making process, in my opinion, our automatic thoughts have a huge impact on us." E7: "Even though I could not associate the styles I learned with myself, I came to question my own style and my own attitude in this way." E2: "It was beneficial for us to understand what style we should have in order to make healthy decisions." E3: "It allowed me to observe what I learned in my life. For example, when I had to decide on something, it allowed me to examine what kind of path I might be following."
Content **(What are the evaluations of the participants regarding the content of the program?)**	E5: "The content was excellent, and the information about the topics and the activities were very clear." E6: "This implementation was very productive and effective. The topics in its content were exactly what I needed." E1: "The content was clear and interconnected." E8: "The content was conveyed simply and clearly enough. It was a concrete content." E3: "The implementation process exceeded my expectations. The programme content was well organised." E9: "The implementation process of the session was an adequate and good process for me."
Emotional Impact **(What are the effects of the program process on the emotions of the participants?)**	E2: "It honestly saddened me to realise how much anxiety affects my decisions, but as a result, becoming aware of this and wanting to change something excites me." E3: "In general, the process made me think about myself, which was tiring but also pleasing." E10: "The fact that there are positive differences in my priorities between the old me and the new me has had a positive effect on my feelings, because these positive changes make me happy." E5: "Ever since I made feeling good my priority, I have felt happier and better." E1: "I was surprised because I noticed and thought about some things for the first time." E9: "I am curious about the aspects of myself that I will discover as the sessions progress." E6: "Observing that I learned something from everyone who shared their opinion there motivated me more."

Appendix Table 3.
Participants' End-of-Programme Evaluations

Themes	Participant Statements
Effect **(What are the effects of the implemented program on the participants?)**	E8: "First of all, I realised the factors that are effective in making decisions and my own decision-making style, and made sense of the decision-making processes of the people around me. The sharing of ideas by the group members gave me a different perspective. The process created awareness in me." E2: "I had supposed that I was the only one with the problems I was experiencing, but I realised that I was not alone in this. Frankly, it made me happy to see others who have dealt with these problems. One of the situations I liked to see was that we understood each other even if we didn't meet face to face." E9: "It was very valuable that we were able to express ourselves comfortably and open up while feeling safe in a group environment." E7: "I think it is a nice and satisfying process to encounter new perspectives all the time and to reinterpret the concepts we know together with our advisor." E6: "When I joined this programme, I had a lot of confusion in my head and this confusion had a great impact on both the things I did in my daily life and my decision-making processes. I can say that thanks to this programme I participated in, the confusion has decreased and I can look at my life from a healthier perspective."
Learning Outcome **(What did the implemented program bring to the participants?)**	E1: "Thanks to this training, I learned what my automatic thoughts were. In addition, in this training, we often talked about the reasons for our behaviours and our feelings while exhibiting these behaviours. As someone who had unconsciously avoided this before, it confronted me with many things and taught me to question myself." E6: "In terms of making healthy decisions, it enabled me to become aware of my automatic thoughts, core beliefs, assumptions, and safe behaviours that I acquired while avoiding my anxieties, which used to affect my decisions." E2: "I can say that the programme made a lot of difference for me. First of all, I began to spend more time with myself. It helped me to place myself and my happiness at the top of my priorities in decision making. This enabled me to easily say no to people. I gradually began to let go of the safe behaviours that I used to hide behind when I was anxious. Instead of running away from my anxiety, I started to confront it." E9: "By the end of the programme, I learned where I had made mistakes while making decisions and what I should do. Now I will try to make thoughtful decisions."
Suggestion (What are the suggestions of the participants regarding the implemented program?)	E1: "There were topics related to education that were sometimes too abstract for me and that I could not get into my head. I would like those to be a little clearer." E8: "I would have expected the assignments to be action-oriented. I would like us to have real experiences and share and evaluate them in the group." E9: "It would be good if there was more emphasis on personal experiences and more concrete examples in the programme." E2: "I think it would be more productive if the programme was conducted face-to-face, because we could not see the faces of many friends online and an environment of trust could not be fully established; not everyone opened up. "

e-Kafkas Journal of Educational Research e-KAJER Research Article

The Self-Awareness Scale for Anti-Bias Education: A Reliability and Validity Study[1]

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Abstract

As a result of the diversity of preschool education environments day by day, it has become inevitable for teachers to make some sensitive arrangements to meet the needs of children based on their differences. For this reason, it is important to determine the awareness of teachers about anti-bias education.This study aims to investigate the psychometric properties of the scale called The Self-Awareness Scale toward Anti-Bias Education and to assess preschool teachers' self-awareness towards anti-bias education in Turkey. Before collecting data for first study, items were determined by benefiting from literature and getting opinions of field experts. 270 preschool teachers participated this study to test validity and reliability of the draft scale. Firstly, Exploratory Factor Analysis was applied and the KMO value of .840 and the Bartlett Test of Homogeneity (x^2= 794,814, p = 0.000) were found to be significant. The factor loadings of the items ranged from .75 to .48. The model fit indices were found as acceptable with Confirmatory Factor Analysis. As a result, 11 items were included in the created test scale. It was also decided that the scale would be in a 5-point Likert type. 120 preschool teachers participated to the second study and it was found that preschool teachers' self-awareness for anti-bias education was high. In addition, their professional experiences had an effect on their awareness. Teachers who have more professional experience had more positive self-awareness for anti-bias than teachers who have fewer professional experiences.

Keywords: anti-bias education, early childhood education, preschool education, self-awareness

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Introduction

Children are egocentric at the pre-functional stage and, therefore, not able to understand others' perspectives (Piaget, 1924; as cited in Kohler, 2008). This lack of understanding also causes children to not be able to focus on the multiple features of people in order to categorize them. It is thought that prejudices are mostly formed after age 5 (Aboud, 2003). However, additional research has shown that children become aware of diversities and differences among people at early ages and that they have some biases about them (Aboud, 2008; Bigler and Wright, 2014; Hirschfeld, 2008; Patterson and Bigler, 2006). According to Ramsey (1992), attitudes towards race and social context are shaped during the preschool years. In addition, Derman-Sparks and Edwards (2010) stated that children recognize the differences among gender and race from birth to age 3. The authors also emphasized that differences do not create bias in children; rather, children learn bias from the adults around them. Anti-bias education is an inclusive and integrated curriculum that aims to question and prevent these biases and misunderstandings (Derman-Sparks and Edwards, 2010).

Anti-bias education teaches children to care about differences and to respect all people. Besides, it not only helps children but also parents and teachers in building a positive self and group identity (Wolpert, 2002). Children are aware of adults' behaviors and understand which behaviors are accepted by adults. Therefore, children's interaction with teachers and adults is at the heart of anti-bias education (Derman-Sparks and Edwards, 2010). Research shows that practices based on anti-bias education help both teachers and children to realize their identity, develop cultural awareness, and work on other personal features; in addition, it allows children to show positive attitudes towards differences (Simangan, 2012; Polat and Özkabak-Yıldız, 2018; Üner, 2011).

The ever-changing formations of preschool classrooms push teachers to be more sensitive to the various needs of children. Therefore, it is emphasized that it is imperative to implement a culturally sensitive and inclusive curriculum in meeting the needs of younger learners (Gay, 2001; Hein, 2004). Early childhood teachers can improve adequate and appropriate support and care for all children if they see the differences and diversities as a way to teach respect and advocacy (Han and Thomas, 2010). On the contrary, if teachers are silent to diversities and differences, children may think that these issues are not important to discuss and that biases and inequalities are normal and acceptable. At the same time, this type of silence can trivialize the voices of marginalized groups and make minority students feel worthless (Vittrup, 2016). Anti-bias education enables teachers to question their existing teaching practices and planned experiences; it can also make them consider their teaching styles, their own and their student's cultural traits, race, ethnic differences, family features, and educational priorities and problems by being aware of their unbiased behaviors (Derman-Sparks and Ramsey, 2000). Therefore, teachers' careful self-reflection is key in anti-bias education (LeeKeenan and Nimmo, 2016). Similarly, Derman-Sparks and Edwards (2010) emphasized that the first thing teachers should do when considering anti-bias education is to realize the effects of their own personal, cultural, and occupational experiences on their views about social identities like race, gender, culture, socio-economic status, family structure, and different abilities/disabilities. Their experiences regarding these social identities are important in order to realize the beliefs and biases affecting what they choose to ignore or act on (Marshall, 2011). LeeKeenan and Allen (2017) noted that if adults are aware of their self-identities and how these influence their work, they can help children feel good about their own. Teachers should develop a strong understanding of their own biases, identity, and cultural beliefs to create learning environments in which children from both dominant and non-dominant groups feel confident (Barrera and Corso, 2003; Ladson-Billings, 1994; Sanchez, 1995). They should abandon racism, classism, and all other inequitable behaviors to develop best practices for children (Gayle-Evans and Michael, 2006) and realize their advocate roles about being unbiased (Derman-Sparks and Edwards, 2010). If teachers do not realize that other identities exist, they might wrongly assume that everyone has a similar history and background (LeeKeenan and Nimmo, 2021), and this could cause a neglect of different needs and abilities of children with diversities.

While it is very important to realize the effects of social identities on teachers' practices, LeeKeenan and Nimmo (2021) noted that most teachers do not even consider who they themselves are or how social identities shape their role as teachers and their relationships with children and families. As today, there has been no research conducted in Turkey measuring and assessing teachers' self-

awareness towards social identities among anti-bias education. Therefore, it is considered necessary and important to develop a measurement tool for early childhood teachers to assess their self-awareness towards anti-bias education. Therefore, this study, firstly, aims to investigate the psychometric properties of the scale called "The Self-Awareness Scale toward Anti-Bias Education" to assess preschool teachers' self-awareness towards anti-bias education in Turkey. Secondly, it is aimed to investigate whether preschool teachers' age, years of professional experiences, working area and their educational level affect their self-awareness towards anti-bias education.

Method

Participants

In line with the first aim of the research, the opinions of 271 preschool teachers working in 7 regions of Turkey were taken to establish a scale that determine their self-awareness towards anti-bias education. Participants were included in this study through the convenience sampling method. The demographic information of the participants is shown in Table 1.

Table 1.
Demographic information of the participants of Study 1

Factor	Category	n	%
Gender	Woman	258	95
	Male	13	5
Age	19-25	34	12
	26-30	86	32
	31-35	52	19
	36-40	64	24
	41-55	35	13
Years of professional experience	1-5	88	33
	6-10	78	29
	11-15	67	25
	16 and over	38	14
Working area	Marmara	80	29
	Central Anatolia	62	23
	Black Sea	37	14
	Aegean	27	10
	Mediterranean	24	9
	Eastern Anatolia	23	8
	S. Eastern Anatolia	18	7
Education level	Bachelor	214	79
	Graduate	36	13
	Associate	21	8

The majority of pre-school teachers participating in first study were female (95%). While the ages of the participants ranged from 19-55, teachers between the ages of 26-30 (32%) participated the most. In this study, which included participants working in 7 regions of Turkey, the highest numbers of participants come from the Marmara (29%) and Central Anatolian (23%) regions. The majority of the participants (79%) have a bachelor's degree.

For second aim, which is determined as investigating the effects of age, educational degree, region, and professional experiences on teachers' self-awareness towards anti-bias education. 114 preschool teachers participated to this study which were included through the convenience sampling method. The demographic information of these participants is shown in Table 2.

Table 2.
Demographic information of the participants of Study 2

Factor	Category	n	%
Gender	Woman	110	97
	Male	4	3
Age	20-25	13	11
	26-30	36	32
	31-35	23	20
	36-40	23	20
	41 and over	19	17
Years of professional experience	1-5	32	28
	6-10	28	25
	11-15	33	29
	16 and over	21	18
Working area	Marmara	23	20
	Central Anatolia	29	26
	Black Sea	21	18
	Aegean	11	10
	Mediterranean	14	12
	Eastern Anatolia	9	8
	S. Eastern Anatolia	7	6
Education level	Bachelor	97	85
	Graduate	17	15

The participants of second study are mostly female (97%) and mostly 26-30 aged (32%). Their years of professional experiences are ranged from 1 to 42, and teachers who have been working 1-5 years are in the majority (28%). There are teachers from all 7 regions of Turkey, but mostly teachers from Central Anatolia attained to the study (26%). Most of them also have a bachelor's degree (85%).

Developing the scale

To examine teachers' self-awareness towards anti-bias education, first of all, the literature was examined in depth. In the literature of the sources for anti-bias education, the checklists of Chen, Nimmo, and Fraser (2009), Rhomberg (2004), and the Anti-Defamation League (2012) were used; then, items from the scale were determined. Firstly, the item pool was formed with 23 items in Turkish. Subsequently, 3 preschool teachers were asked to investigate the intelligibility of the items. After suggested corrections, the draft scale form was presented to 6 experts who were linked to direct or indirect research related to the field of preschool education, and their expert opinions were later obtained. The experts expressed their opinions by marking one of 3 options: *"appropriate", "not suitable",* and *"must be corrected".* They were later given the option to write their own suggestions in the "suggestion" section. The opinions obtained from the experts were collected in a single form, and the content validity was later determined. While determining content validity, the method suggested by Veneziano and Hooper (1997), which takes the ratio of the number of experts who gave a positive response to the total number of experts, was used. Items with a content validity ratio above 0.80 were included in the scale, while those below were excluded from the scale. After content validity study was carried out, the decision was made to keep 12 items on the scale and to discard 11 of them.

Before conducting Study 1, a pilot study with a draft scale was conducted with 423 preschool teachers. Data obtained as a result of the pilot application were tested with Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), and it was observed that there was 1 item that disrupted the scale structure as a result of CFA. It then was decided to collect the data again and repeat the analyses by removing the item that disrupted the scale structure. As a result, 11 items were included in the created test scale, and the decision was made to collect the necessary data. It was also decided that the scale would be in a 5-point Likert type, which included the following: "1-Totally disagree, 2-Disagree, 3-Undecided, 4-Agree, 5-Totally agree".

Ethical Issues

To collect all data, all required permissions were first obtained from the Hacettepe University Senate Ethics Committee. The date for ethical review is 23.02.2021 and the document number is E-35853172-300-00001497623. It was announced to all teachers that participation in the research was voluntary.

Data Collection

After the items of the scale were determined, an online scale form was prepared via Google Form to deliver to the preschool teachers for first study. This created scale form consists of 2 parts. In the first part, there are questions on the demographic background of the teachers such as gender, age, the region where they work, the physical place they work in, and their education level. In the second part, there are questions that determine the self-awareness of the teachers about anti-bias education. A trial scale form was directed to the teachers via online platforms (via e-mail or text message) from May to July, 2021.

After the developing scale, researchers collected new data from preschool teachers to investigate whether preschool teachers' age, years of professional experiences, working area and their educational level affects their self-awareness towards anti-bias education. Another online form was prepared via Google Form. This form also included two parts: Demographic Information Form and The Self-Awareness Scale towards Anti-Bias Education. The form was delivered to preschool teachers from October to December, 2021.

Analysis the data

This quantitative study applied Explatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to test reliability and validity of the scale. In addition, t-test and ANOVA test were used to examine the factors effect on preschool teachers' self awareness

In line with the responses from the 276 teachers who participated in first study through online platforms, validity and reliability studies of the Self-Awareness Scale towards Anti-Bias Education, which were created as equal interval scale, were conducted. Before the factor analysis was performed, the outliers were determined. To do this, firstly, Z-score of total score was obtained. 5 data were found between -6.05 and -3.08 after Z-score. After that, box-plot graphic was examined and it also showed that these 5 data were outliers. In this direction, data obtained from 5 teachers were excluded from the sample, and the data obtained from the 271 teachers were analyzed.

To determine the construct validity of the scale, first, EFA was conducted. After that, CFA were performed. EFA was used for developing a measuring tool while CFA was generally used for adaptation. However, CFA can also be used for confirming the EFA's results (Güngör, 2016). The reason of using CFA was to verify the results of the EFA in this study. At the same time, to determine the reliability of the scale, the Cronbach Alpha value was calculated for the whole scale.

After developing the scale, the second study was conducted. To investigate whether preschool teachers' age, years of professional experiences, working area and their educational level affects their self-awareness towards anti-bias education, independent sample t-test and one-way ANOVA were conducted. Before these, the normalities of variables and homogeneity of variances were tested.

Findings

Findings regarding validity

EFA and CFA were performed to determine the construct validity and item factor loads were obtained after submission of the expert opinions. First of all, the analysis was started with the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett Homogeneity tests to determine whether the assumptions of factor analysis were met. As a result of the analysis, the KMO value of .840 and the Bartlett Test of Homogeneity (x^2 = 797,494, p = 0.000) were found to be significant. It was decided that the data set was suitable for EFA, and then EFA was applied. Principal axis factoring and direct oblimin rotation technique were applied in EFA to determine the construct validity of the scale. As a result of the first

EFA, it was found that the items with a factor load greater than 1 were grouped under 2 factors, and the explained variance rate of these 2 factors was 37,67%. Two factors had eigenvalues greater than one. The first eigenvalue was found 4.001 and the second one was found as 1.272. There was no adjoining item. The results of the first EFA was showed in Table 3.

Table 3.

First EFA results of the Self-Awareness Scale towards Anti-Bias Education

Order	Material	Factor 1	Factor 2
Item 1	M 8	.732	-.218
Item 2	M 7	.707	-.410
Item 3	M 6	.674	-.366
Item 4	M 10	.645	.088
Item 5	M 1	.541	.157
Item 6	M 5	.532	.261
Item 7	M11	.472	-.028
Item 8	M9	.451	.253
Item 9	M 2	.430	.319
Item 10	M 3	.413	.259
Item 11	M4	.412	.170

EFA was repeated by limiting the number of factors to 1 in line with the purpose of the study, considering the literature and also the factor loadings of Factor 2 was lower than .40. Table 4 shows the factor loadings of the items as a result of second EFA.

Table 4.

Item Factor Loadings of the Self-Awareness Scale towards Anti-Bias Education

Order	Material	Factor 1
Item 1	M 8	.728
Item 2	M 7	.668
Item 3	M 10	.655
Item 4	M 6	.646
Item 5	M 1	.544
Item 6	M 5	.529
Item 7	M11	.479
Item 8	M9	.450
Item 9	M2	.423
Item 10	M4	.415
Item 11	M3	.411

According to Table 4, the factor loadings of the scale items ranged from .73 to .41. The explained variance rate of the model obtained for the scale was found to be 30.45%

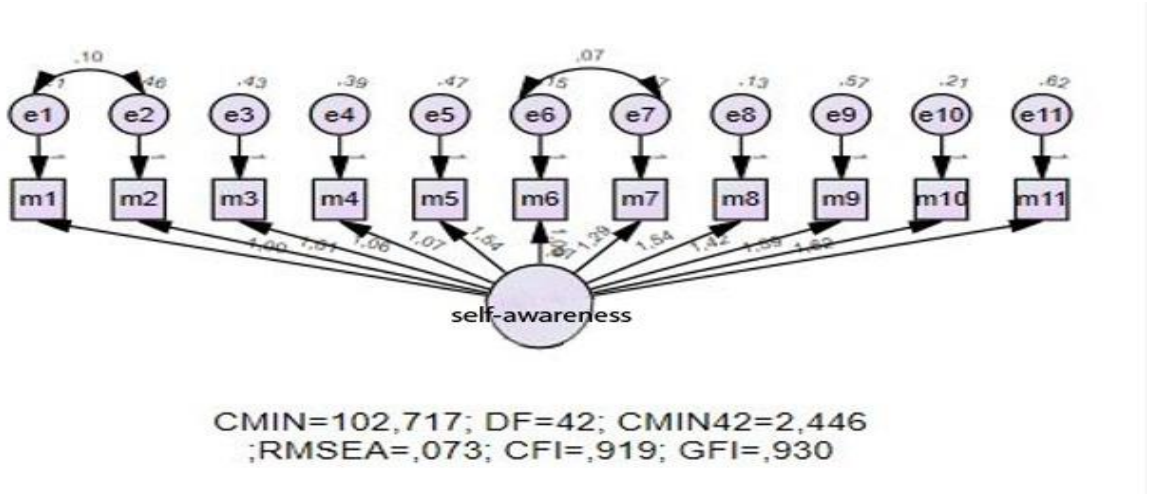

Figure 1. The model fit results from Confirmatory Factor Analysis

In Figure 1, item factor loads, modification indices, and model fit indices obtained as a result of the CFA performed to test the fit of the scale's construct validity are shown. To improve models with inadequate fit, researchers often examine the modification index for each parameter (i.e., each factor loading, factor interrelation, or correlated-error term) that has a fixed value of zero in the hypothesized model, in search of ways to improve model fit (Bryant, Yarnold, and Michelson, 1999). In this research, modification indices were also conducted to improve the model fit because CFI value was firstly found lower than .90. When the fit indices of the model were examined, it was determined that the fit was at an acceptable level ($\chi 2/df = 2.446$, RMSEA = .073, CFI = .919, GFI = .930). The items of the scale were shown at Appendix A.

Findings regarding reliability

To test the reliability of the Self-Awareness Scale towards Anti-Bias Education, Cronbach's alpha was calculated for internal consistency by computing the total score of Study 1's participants. The overall reliability coefficient of the scale was found to be .802. In addition to this, McDonald's Omega reliability analysis was conducted, and it was found to be .791. These values show that the scale is reliable.

After deciding the scale met the criteria of validity and reliability, Study 2 was conducted. Firstly, the reliability of the scale for Study 2 was calculated, and Cronbach's alpha value was found to be .874. Mcdonald's Omega value was also found as .867. Therefore, it was concluded that the scale could be used for Study 2.

Findings regarding factors affected teachers' self-awareness

To investigate whether preschool teachers' age, years of professional experiences, working area and their educational level affected their self-awareness towards anti-bias education, firstly, normality test for total score were examined and it was found that total score meets the criteria for normality ($p>0.05$). Then, teachers' mean score for self-awareness towards anti-bias education was examined.

Table 5.
Mean score of teachers on Self-Awareness Scale

	n	M	SD	Min	Max
Total	114	49.34	5.11	35	55

According to Table 5, mean score was 49.34. The highest possible score on the scale was 55. Therefore, it can be said that pre-school teachers' self-awareness towards anti-bias education was high. After that, normality tests for independent variables (age, educational degree, professional experiences, working area). The descriptive statistics results were shown at Table 6.

Table 6.
Descriptive statistics for score on Self-Awareness Scale

Factors	Groups	n	$\bar{x}$	μ	Sd	Skewness	Kurtosis	p
Educational degree	Bachelor	97	49.16	51.00	5,19	-.519	-779	.00
	Graduate	17	50.35	51.00	4,64	-.999	.716	.03
Age	20-25	13	4.07	46.00	6.41	-.235	-1.188	.47
	26-30	36	49.08	49.00	4.89	-.394	-.977	.01
	31-35	23	49.56	51.00	5.01	-.310	-1.401	.00
	36-40	23	50.08	51.00	5.19	-.738	-.517	.00
	41 and over	19	50.89	51.00	3.95	-.725	-.816	.01
Year of professional experience	1-5	32	47.5	48.00	5.57	-.293	-.783	.12
	6-10	28	48.78	49.02	5.42	-.542	-.929	.01
	11-15	33	50.75	51.00	4.63	-.585	-1.294	.00
	16 and over	21	50.66	51.00	3.85	-.549	-.921	.02
Working area	Marmara	23	50.47	52.00	4.57	-.993	.146	.01
	Central Anatolia	29	49.48	51.00	4.91	-.377	-1.392	.00
	Black Sea	21	47.61	47.00	6.13	-.341	-.866	.08
	Aegean	11	49.81	51.00	5.61	-.689	-.710	.06
	Mediterranean	14	47.85	47.5	4.95	-.139	-.334	.63
	Eastern Anatolia	9	51.22	51.00	2.94	.060	-1.322	.33
	S. Eastern Anatolia	7	50	52.00	5.88	-.734	-1.484	.04

According to Table 6, all factors' means and medians are close to each other. In addition, skewness and kurtosis values are between -1.5 and 1.5. These values show that distributions of all groups met the normality standards. In the Shapiro-Wilk test, p values were found to be less than 0.05; however, scores of mean and median were close to each other, and skewness and kurtosis values were between -1.5 and 1.5. In addition, ANOVA tests are resistant to violations of normality as long as there is no skewness caused by the outlier effect (Tabachnick & Fidell, 2013). After that, factors of which could affect teachers' self-awareness for anti-bias education were examined with t-test and ANOVA tests. Firstly, teachers' educational degrees were assessed. Welch's t-test was used because the number of sub-groups of degree factor was not close each other, and Welch's t-test could make more unbiased predictions. To do this, firstly, homogeneity of variance was controlled, and found that homogeneity of variance was met for educational degree ($p > 0.05$).

Table 7.
Welch's t-test results for score on Self-Awareness Scale in terms of educational degree

Factor	Groups	M	SD	F	η2
Degree	Bachelor	49.16	5.19	.777	.007
	Graduate	50.35	4.64		

Table 7 shows that there is no meaningful differences between teachers who have bachelor and graduate degree ($F=.777$, $p>0.05$).

To examine whether preschool teachers' age, years of professional experiences, and working area affected their self-awareness towards anti-bias education, ANOVA test were conducted. Firstly, normality of variances were observed. It was found that homogeneity of variances were met for age ($p<0.05$), years of professional ($p<0.05$), and working area ($p<0.05$) Therefore, it was determined to conduct one-way ANOVA. The ANOVA results were represented in Table 8.

Table 8.
ANOVA results for score on Self-Awareness Scale

Factors	Groups	M	SD	F	η2
Age	20-25	46.07	6.40	1.982	.06
	26-30	49.08	4.89		
	31-35	49.56	5.01		
	36-40	50.08	5.19		
	41 and over	50.89	3.95		
Year of professional experience	1-5	47.5	5.57	2.945*	.07
	6-10	48.78	5.43		
	11-15	50.75	4.63		
	16 and over	50.66	3.85		
Working area	Marmara	50.47	4.57	1.024	.05
	Central Anatolia	49.48	4.91		
	Black Sea	47.61	6.13		
	Aegean	49.81	5.61		
	Mediterranean	47.85	4.95		
	Eastern Anatolia	51.22	2.94		
	S. Eastern Anatolia	50.00	5.88		

*$p<0.05$

According to Table 8, there is statistically meaningful differences between teachers' years of professional experiences ($F=2.94$, $p<0.05$), while there were no meaningful differences between ages of teachers ($F=1.98$, $p>0.05$) and their working areas ($F=1.02$, $p>0.05$). The effect size of year of professional experiences were found as .074. This shows that year of professional experiences had moderate effect on self-awareness of teachers.

The differences between teachers' years of professional experiences was analyzed with Tukey HSD and the result was shown at Table 9.

Table 9.
Results of the Tukey HSD in terms of year of professional experience

(I) year of professional experience	(J) year of professional experience	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1-5	6-10	1.28	1.29	.75	4.56	2.08
	11-15	3.25*	1.24	.04	6.48	.02
	16 and over	3.16	1.4	.11	6.82	.49
6-10	11-15	1.97	1.28	.41	5.31	1.37
	16 and over	1.88	1.44	.56	5.64	1.87
11-15	16 and over	.09	1.39	1	3.72	3.54

*p < .05

Table 9 shows the meaningful differences between teachers' years of professional experiences. Accordingly, teachers who have 11-15 years of professional experiences has higher self-awareness than teachers who have 0-5 years of professional experiences.

Discussion, Conclusion and Suggestions

Recognizing teachers' awareness of their own social identities before applying practices about anti-bias education is seen as crucial (Derman-Sparks and Edwards, 2010; LeeKeenan and Nimmo, 2016). Learning environment, which cares for and teaches to stand up for all children, including children of nondominant groups, in the face of injustice, requires teachers to realize their own biases, identity and cultural beliefs (Barrera & Corso, 2003; Ladson-Billings, 1994; Sanchez, 1995). Therefore, developing a measurement tool that evaluates teachers' self-awareness towards anti-bias education and analyzing the factors related their self-awareness should be considered. In this study, firstly, the validity and reliability study of the Self-Awareness Scale towards Anti-Bias Education was developed as a Likert-type test to measure the self-awareness of pre-school teachers towards anti-bias education. EFA and CFA were used to test the construct validity of the scale, and Cronbach Alpha analysis was used to test its reliability. As a result, it was found that the validity and reliability of the scale were ensured.

To test the suitability of the sample size and data, first of all, KMO and Bartlett Sphericity tests were performed. As a result of the analysis, the KMO value of .84 and the Bartlett Sphericity test were found to be significant ($p < 0.001$), and it was decided that the data were suitable for performing EFA (Büyüköztürk, 2017). As a result of EFA, it was observed that 11 items loaded in 2 factors and that their factor loadings are above .30. After this, the relevant literature was worth considering, and the decision was made to use a single-factor scale. As Byrne (2012) showed, a determined factor structure with AFA was tested with CFA, and the suitability of the structure was confirmed. According to the CFA result, the CMIN/df value, which is one of the most basic measurements used to test the general suitability of the model, was found to be 2.446, which was evaluated as appropriate (Wheaton, Muthen, Alwin, and Summers, 1977). The value was observed as .73, which is an acceptable level (Browne and Cudeck, 1992). At the same time, the CFI value was found to be .91, and the GFI value was .93; it was concluded that these fit values were at an acceptable level (Baumgartner and Homburg, 1996). Finally, the Cronbach Alpha coefficient value was calculated to evaluate the status of the items in the scale to explain the same structure and form a whole; this was also initiated to determine the internal consistency, and this value was found to be .802. In scale studies, it is generally accepted that $\alpha = 70$ and above indicates that the scale is reliable (Landis and Koch, 1977; Robinson, Shaver, and Wrightsman, 1991).

Teachers' intrinsic motivation and self-perception towards diversity are more effective for their professional development and knowledge rather than getting education (Turnšek, 2013). Therefore, after validity and reliability studies, teachers' self-awareness level and factors which have effects on their self-awaress were considered important for this study. Accordingly, teachers' self-awareness level found as positive. These means teachers have an awareness of anti-bias education. In addition, only teachers' years of professional experience have a meaningful effect on teachers' self-awareness. Teachers who have more professional experience have more positive self-awareness for anti-bias than teachers who have less professional experience. However, teachers' age, education level, and working area did not have an effect on teachers' self-awareness. You (2000) found that preschool teachers' beliefs for anti-bias education was high and their professional experiences also influenced their beliefs. Kintner-Duff (2011) also found that teachers' personal and professional experiences affect teachers' beliefs, knowledge and practices. This shows that the year of teachers' work experience is important for their awareness of anti-bias education.

To conclude, both the EFA and CFA's results show that the Self-Awareness Scale towards Anti-Bias Education was appropriate for validity and reliability. In addition, its internal consistency was attained. Therefore, it can be concluded that this scale can be used to assess preschool teachers' self-awareness towards anti-bias education. While the lowest score taken from the scale was 11, the highest score was determined as 55. Using this scale in future research with different or larger groups will contribute to both the validity and reliability of the scale, as well as adding to the related literature.

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Ethics statement: In this study, we declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that we do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, we declare that there is no conflict of interest between the authors, which all authors contribute to the study, and that all the responsibility belongs to the article authors in case of all ethical violations.

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Conflict of Interest: There is no conflict of interest among authors.

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Appendix A. The Self-Awareness Scale for Anti-Bias Education

1- Totally disagree 2- Disagree 3-Undecided 4-Agree 5-Totally agree

	Items
1.	Farklılıklara (etnik köken, kültür, sosyo ekonomik yapıları, dil, aile stilleri, cinsiyet, kalıp yargısal olmayan cinsiyet rolleri, yeterlilikler) dayalı önyargılar mücadele ederim [I fight prejudices based on differences (ethnicity, culture, socio-economic status, language, family style, gender, non-stereotypical gender roles, competencies)].
2.	Farklılıkları olan çocuklara (etnik köken, kültür, sosyo ekonomik yapıları, dil, aile stilleri, cinsiyet, kalıp yargısal olmayan cinsiyet rolleri, yeterlilikler) sınıfımda yer almasını kolaylaştıran bir tutum sergilerim [I exhibit an attitude that facilitates the participation of children with differences (ethnicity, culture, socio-economic structure, language, family styles, gender, non-stereotypical gender roles, competencies) in my class].
3.	Farklılıklara (etnik köken, kültür, sosyo ekonomik yapıları, dil, aile stilleri, cinsiyet, kalıp yargısal olmayan cinsiyet rolleri, yeterlilikler) dayalı ön yargıların farkına varırım [I become aware of prejudices based on differences (ethnicity, culture, socio-economic structures, language, family styles, gender, non-stereotypical gender roles, competencies)].
4.	Farklılıkları olan çocuklara (etnik köken, kültür, sosyo ekonomik yapıları, dil, aile stilleri, cinsiyet, kalıp yargısal olmayan cinsiyet rolleri, yeterlilikler) saygı gösterme konusunda model olurum [I model to respect children with differences (ethnicity, culture, socio-economic background, language, family styles, gender, non-stereotypical gender roles, competences)].
5.	Kendi kültürel kimliğimin farkındayım [I am aware of my own cultural identity].
6.	Birine karşı önyargılı yorumları duyduğumda onlarla kolaylıkla mücadele edebilirim [When I hear prejudiced comments against someone, I can easily fight them.]
7.	Kişisel değerlerimi başkalarına dayatmamak için her türlü çabayı gösteririm [I make every effort not to impose my personal values on others].
8.	Farklılıkları (etnik köken, kültür, sosyo ekonomik yapıları, dil, aile stilleri, cinsiyet, kalıp yargısal olmayan cinsiyet rolleri, yeterlilikler) olan çocuklarla çalışmada yararlı olacak kaynakları nerede bulacağımı bilirim [I know where to find resources that will be useful in working with children with differences (ethnicity, culture, socio-economic background, language, family styles, gender, non-stereotypical gender roles, competencies)].
9.	Farklılıkları güçlü yanlar olarak görürüm [I notice differences as strengths].
10.	Kendi kültürel kimliğim ile ilgili kendimi rahat hissederim [I feel comfortable about my own cultural identity].
11.	Var olan önyargılarımın farkındayım [I am aware of my existing prejudices].

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A Digital Storytelling Workshop with Mathematics Teachers

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Abstract

This qualitative case study presents reflections from an online Digital Storytelling Workshop conducted with four secondary mathematics teachers studying for a master's degree at a state university in Turkey. Data were collected through online lesson recordings, a semi-structured interview form, participants' reflective diaries, and digital stories prepared during the process. Content analysis was used in the analysis of the data. According to the results of the research, it was determined that the participants had the most difficulty in creating a dramatic question and adding multimedia. It was seen that they paid more attention to the dramatic question, sound, and music elements while evaluating sample digital stories. They mentioned time-saving in terms of the advantages of holding the workshop online, and the fact that interaction was limited regarding the disadvantages. They stated that the workshop mostly benefited them in terms of using technological digital storytelling tools. They reported that due to the disruptions experienced in online education, they used the prepared digital stories limitedly in their own classrooms, and stated they could not receive sufficient feedback. They also stated that in the event that they could use digital stories in mathematics classes, they would benefit students in various ways eg boosting imagination and associating mathematics with daily life. The digital stories prepared at the end of the workshop were examined, and it was seen that there was an improvement in terms of preparing digital stories in accordance with mathematical and rules in all participants.

Keywords: Digital Storytelling, mathematics teachers, online digital storytelling workshop.

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Introduction

Stories give our lives a sense of reality through narrative (Cuppit, 1991). Stories are utilized for establishing communication and developing an understanding of people. Lewis (2011) stated that stories are one of the main ways of understanding the world we live in. Stories provide the reader with a true-life and embodied experience that accompanies the literary experience (Garrett, 2006). Due to its structure, mathematics is a field in which there are mostly abstract concepts. Therefore, there is sometimes a need for concretization in the mathematics education process. Since stories are about concretization and making connection between abstract concepts and real life, one of their usage areas is in mathematics education. It has long been understood that stories can be used to teach mathematical ideas to primary and secondary school students (Balakrishnan, 2008). In mathematics education, stories develop students' cognitive abilities (Toor & Mgombelo, 2015). Moreover, stories also have an effect on increasing academic achievement, reducing mathematics anxiety (Katipoğlu, 2019), and increasing the retention of knowledge (Ulupınar Özkuzukıran & Kayabaşı, 2020).

Storytelling is a traditional approach that is also used in mathematics education and contributes to the process. Due to the rapid development of information technology, the trend in education has changed from traditional classroom teaching to teaching through digital media. One of the reasons for this is the change in students' learning styles as a result of their interest in appropriate technologies and the internet (Tsai et al., 2015). Many teachers integrate multimedia tools into their lessons in order to teach students different skills such as synthesizing, analyzing, evaluating, and presenting the information. When students use technology, they learn to transform data into information. Moreover, using multimedia tools gives students the opportunity to participate in and interact with the lesson. One of these multimedia tools is digital storytelling (DST) (Alismail, 2015). Many educators have recognized the potential of DST, which is used as a tool in subject areas such as history, language arts, social studies, teacher training, etc. (McLennan, 2006).

As in many other fields, DST is also utilized in mathematics education. In order for DST to be used as an effective tool in mathematics education, mathematics teachers and educators should acquire knowledge about DST. Considering the fact that workshops are effective in education (Köse, 2021; Öztürk & Korkut, 2020; Sökezoğlu-Atılgan & Taş, 2020), conducting online workshops is preferred. Due to the COVID-19 epidemic which has affected the world, there has been an online education process in our country, as in many countries. Therefore, the DST workshop was conducted online from the beginning. The primary aim of the research is to introduce DST to mathematics teachers and to have them make designs on how DST can be used in mathematics education. In other words, it is to give mathematics teachers experience in designing DST with the help of an online workshop. For this purpose, it is aimed to reveal the difficulties faced by the teachers in the workshop process, the evaluation criteria of DSTs, and the advantages and disadvantages of conducting the workshop online. In addition, it was aimed to examine the contribution of the workshop to the teachers and their experiences regarding the use of the DSs in the classroom environment. From the teachers' point of view, it is also aimed to determine the contribution of DST to students if it is used in classrooms. Another aim is to determine the progress of the participants in the workshop process. For this reason, the online DST workshop held with mathematics teachers in this study was presented by evaluating from the perspectives of both the participants and the researcher.

DST and mathematics education

In the most general sense, the digital story (DS) is the creation of short films by combining digital images, texts, and sounds with the aim of informing people about various subjects (Robin, 2016). In other words, it is a technique that permits computer users to become creative storytellers through the processes of doing research, writing a scenario, and developing an interesting story on a topic. This material is then combined with various types of multimedia, including computer-based graphics, recorded audio, computer-generated text, video clips, and music so that it can be played on a computer or uploaded to a website (Robin, 2008). In this way, people are able to produce and publish their own stories to be shared with others (Ellum, 2005). The DS is a multimodal form of communication that appeals to different student groups (Sweeder, 2008). It requires limited technological expertise and

enables students to demonstrate what they have learnt through different approaches (Shelton, Archambault & Hale, 2017). Digital stories encourage students to think more deeply about the meaning of a topic or story, to personalize their experiences, and also to clarify what they know about the topic (Sadık, 2008). According to Bran (2010), the DS provides an original way for students to display their knowledge, skills and creativity, and provides increased interest for both the content creator and the viewer by enabling students to go through the process of writing and storytelling in an engaging way. DST is characterized by flexibility, interaction, nonlinearity, user participation and even creating with collaboration (Barber, 2016). While DST encourages literacy development, it also improves reading comprehension (Royer & Richards, 2008). Moreover, it develops 21st-century skills (Robin, 2008), collaboration, and proficiency in technology (McLennan, 2006), and digital literacy (Churchill, 2020; La Rose & Detlor, 2021). Furthermore, it is effective in shaping students' social practices and identities (Istenic et al., 2016). It improves students' motivation, creativity, and connections with others (Kim & Li, 2021). It enables changes in classroom management practices and strengthens teacher-student and peer-to-peer collaboration (Kaminskienė & Khetsuriani, 2019). It also provides benefits such as trust, different perspectives, satisfaction, and impartiality in peer reviews (Tatlı et al., 2018). DST is a suitable platform for developing behavioral, emotional, and cognitive commitment in mathematics education (Marsico et al., 2019). Moreover, it is a tool that helps children to learn basic mathematics and preserve knowledge (Lawson & Olokunde, 2016). It has been observed that DST is effective in eliminating errors and misconceptions (Karaoğlan Yılmaz et al., 2017) and changing students' motivation and attitude toward mathematics in a positive way (Çakıcı, 2018). Furthermore, it contributes to students' ability to see mathematics learning as useful, and benefits their learning (Niemi & Niu, 2021). It also facilitates the association of mathematics with daily life and enables the creation of interesting and entertaining learning environments (Özpinar, Gökçe & Yenmez, 2017). Moreover, it improves students' abilities to be active solvers of real-world problems (Albano & Pierri, 2017). It has been determined that DST is an effective tool for developing children's mathematics and computer literacy skills in the preschool period (Preradovic et al., 2016). At the primary school level, it is an effective tool used in teaching subjects that students have difficulty with (e.g., subtraction) (Bratitsis & Mantellou, 2020). Furthermore, it is used successfully for developing pre-service teachers' pedagogical competencies and mathematical content knowledge (Istenic Starčič et al., 2016) and for introducing mathematical concepts to them (Arora, 2020). It also develops students' computer skills (Tsai et al., 2015) and creative thinking skills (Hill & Grinnel, 2014). By directing students towards active collaborative learning, DST enables students' active knowledge generation and active participation in class (Niemi et al., 2018). DST not only supports teachers in transferring abstract content but also increases students' levels of understanding of concepts (Petrucco et al., 2013).

The DS creation process begins with identifying a topic. It then continues as researching the topic, writing the content, selecting the images, recording the story, placing the images, setting the timing, adding music (optional), recording the project and sharing the DS (Royer & Richards, 2008). Morra (2013), on the other hand, explained that the first stage is to find an idea and then to carry out the research/discovery/learning process related to this idea. In the next stage, the scenario is written and the plan is made with the storyboard. The music, visuals and sound are determined, and the DS is created and shared by combining all of these. The elements of the digital story have been defined by different researchers. One of these is Lambert (2006), who describes these elements as point of view, a dramatic question, emotional content, the gift of your voice, the power of the soundtrack, economy, and pacing. Point of view means the author's point of view and the purpose of the story are included. A dramatic question is the question that gives the purpose of the story, arouses curiosity and will be answered at the end of the story. Emotional content is the bond between the story and the audience. Voice means of the story where necessary in accordance with its purpose. Appropriate music should be chosen to increase the effectiveness of the story. Economy is the element that expresses the use of unnecessary content in accordance with the purpose of the story. Pacing is the element that indicates how fast the story will progress. Also Robin (2008), stated the elements as the overall purpose of the story, the narrator's point of view, a dramatic question or questions, quality of the images, video and other multimedia elements, use of a meaningful audio soundtrack, the choice of content, pacing of the narrative, good grammar and language usage, economy of the story detail, and clarity of voice. When

the definitions of the aforementioned researchers are examined, it is seen that there are similarities and differences. In order to enrich the study, it was planned that teachers would examine both perspectives rather than the perspective of a single researcher. For this reason, the focus was on the digital story elements of both researchers.

DST and the workshop

Workshops are a process in which a group of people comes together to acquire new knowledge, produce creative solutions to problems, or work on innovations related to a field-specific topic. It is seen that workshops are designed according to three different perspectives. These are classified as workshops as a means, workshops as practice, and workshops as a research methodology (Ørngreen & Levinsen, 2017). Workshops are an effective method used in education (Buchbinder et al., 2005; Haghani et al., 2012; Safari & Hosseini, 2016; Salman, 2009). Workshops can be conducted face-to-face and online. Looking at the studies on DST workshops, it has been determined that the DS creation process is handled in different ways, but that these processes are in fact similar (Tekeli, 2018). For example, Şimşek (2013) discussed this process as the stages of creating the story circle, writing the story down, recording the voiceover, preparing the images, putting the DS together, and in-group screening. In the workshop, the DS creation stages are cyclical and encourage participants to be more relaxed due to their non-hierarchical nature. In online DST workshops, however, the situation is different. Here, choosing a suitable tool for simultaneous meetings becomes more important. When designing the DST workshop, everything should be done at the service of the learners. Learners should be given the necessary space for their learning and study in the process. In the online workshop process, the informant should have the role of a learner, a guide, and a teacher (Yee & Stevens, 2019).

Studies on DST workshops in education exist in the literature (Brushwood Rose & Granger, 2013; DeGennaro, 2008; Doğan & Robin, 2008; Hausknecht et al., 2016; Yüksel Arslan et al., 2016). However, these studies appear to be rather limited (Çıralı Sarıca & Koçak Usluel, 2020; Wu & Chen, 2020). It is also seen that online workshops are held for various reasons, for example promoting HPN vaccination (Chen, Kim, Todd & Larkey, 2022), developing digital literacy and social work leadership knowledge (La Rose & Detlor, 2021); but that online workshops are also limited. The DIgital STorytelling COntests (DISTCO) with the participation of teachers and students are one of these (Doğan, 2010). Among the topics studied are the effects of the online workshop on the development of English learners' literacy skills (reading and writing) (Rahimi & Yadollahi, 2017), and on student achievement in science, social presence, and attitude (Nam, 2017). In addition, Oakley et al. (2018) conducted an online DST workshop on the exchange of multimodal digital stories in the Australian-Chinese context.

Due to the COVID-19 pandemic process, lessons have been conducted online in many countries, including Turkey. The inability to hold face-to-face workshops in the online education process and the completely online execution of the education process necessitated conducting an online workshop in the research. In this study, an online DST workshop was designed as a graduate course at a public university. In the research, the workshop process and the prepared products were evaluated.

Research Questions

1. What are the situations in which the participants have difficulties in the DST workshop?
2. What are the elements that the participants pay attention to while evaluating digital stories in the DST workshop evaluation activity?
3. What are the advantages and disadvantages of conducting the DST workshop online?
4. What has been the benefits of the DST workshop for the participants?
5. What are the participants' experiences in using the digital stories they prepared in the workshop in their mathematics classes?
6. What would be the benefits of digital stories for students in the event that they are used in mathematics classes?
7. What is the progress of the participants in the workshop process?

Method

The research was designed as a qualitative case study.

Participants

The participants in the study were four people studying for a master's degree in the field of mathematics education at a public university in the northeast of Turkey. The participants of the research work and live in different cities of the country. The research was carried out within the scope of the Mathematics Teaching Methods and Models II course. Criterion sampling (Patton, 1987) was used for sample selection. The criterion was that the participants taught at public secondary schools and had successfully completed the Mathematics Teaching Methods and Models I course. All of the participants were women. Participants were coded as P1, P2, P3, and P4. P3 had two years of teaching experience, while the other participants had one year of experience. All of the participants stated that they had not heard of the concept of DST before.

Study process

During the research process, an online DST workshop was conducted with the participants. The Yee & Stevens (2019) perspective was used for the online workshop. Accordingly, Microsoft Teams, which is used within the university, was used for simultaneous meetings. The reasons for choosing Microsoft Teams are that it enables online conferences to be conducted easily, it allows the lessons to be recorded and watched later, it is free of charge, it is easy to use, and screen sharing and file-sending operations are performed. The choice of the tool to be used to design the digital stories was made together with the participants. The participants examined and presented a total of eight tools, two for each participant. The aim here was not to oblige the participants to use a single software, but for them to be flexible and to support their own choices in this regard.

In the first week of the process, the participants were met online. The demographic characteristics were determined and the scope of the study was explained. Theoretical information about DST was given and the reasons for using it in mathematics education were explained. The participants were asked to watch samples of digital stories on the topic of mathematics education. A short DS was designed together with the team. In this sample DS design, the subject of mathematics was decided together with the participants and the DS was prepared with one of the DST preparing tools called Storyjumper. Here, the researcher is the person at the computer and actively using the tool. Participants took an active role in the whole process, such as choosing the subject, creating the scenario, creating the characters, adding sound and music, and deciding on the content. Everyone expressed their opinions with their reasons, and a story and digital story were created with the help of discussions. While designing this, care was taken to ensure that the whole team was active and that a common product was produced by evaluating each of their views. For the following week, each participant was asked to select and introduce two DS design tools. While the tools were being introduced, they were asked to make presentations through mini digital stories and in this way, an attempt was made to familiarise the participants with the concept of DST. In the second week, the participants presented the examined tools through the digital stories they had prepared. Participants created two different stories with the two digital story creation tools they chose. Then their advantages and disadvantages were discussed with the team. For the following week, the number of tools investigated was reduced from eight to four, and the participants were asked to choose one tool each and prepare a DS for this tool the following week. In the third week, the digital stories, which each participant had designed for 3-5 minutes on a free topic, concept, or learning outcome in mathematics with the tool they had chosen, were shared and examined. The aim here was to determine the appropriateness of the tool for use in mathematics. In the third week, the number of tools was reduced to four. Unlike the second week, a story was designed and it was aimed to have more ideas in tool selection. The prepared digital stories were examined and the problems and difficulties experienced in the process were determined. With the consensus of all participants, Animaker, which is one of the appropriate tools for the study, was chosen, and it was decided to continue with this tool in the next part of the study. Animaker is a tool that was created in 2014 and has both paid and free options. What

distinguishes it from the other tools examined is that the number of free characters, character movements, visuals, and music tracks is quite high, and there is also the possibility to add your own voice. Moreover, although the tool has no Turkish language option, the participants did not see this as a disadvantage because the interface is extremely simple and practical. The following week, the free mathematics digital stories prepared by the participants in Animaker were examined. The theoretical parts were emphasized in terms of the prepared digital stories. How the digital stories would be evaluated and what needed to be considered were explained on the basis of DS assessment scales. In the fifth and sixth weeks, the theoretical part was reinforced by examining and discussing 20 mathematics digital stories. For the next week, it was stated that digital stories would be prepared again with the aid of Animaker, but first of all, the participants were asked to create their stories. The topic was not restricted so that the participants could move more freely and apply the resulting products in a real classroom setting. Similarly, the choice of grade level was left to the participants. There were cases where the participants got stuck in the story creation process from time to time. Here the researcher has tended to relieve the bottleneck by offering options. In addition, in some stories, the researcher provided guidance in situations such as keeping the dialogues long, throwing the purpose into the background or allocating more limited time to problem solving. In the seventh week, the stories prepared by the participants were examined, discussed, and worked on before being digitalized. In the eighth week, the stories were digitalized and shared with the team. In the ninth and tenth weeks, the digital stories, reflective diaries, and semi-structured interview forms were collected. For the first 8 weeks, the meetings lasted 90 minutes per week.

Data collection tools

Four types of data collection tools were used in the study. The first data collection tool was Microsoft Teams video recordings, which contained recordings of each week's lesson. Secondly, the participants' reflective diaries were utilized. At the end of each week, the participants were asked to create a reflective diary (in Word format) containing their views on that week's lesson, and these were collected at the end of the process. Thirdly, a semi-structured interview form was implemented at the end of the process. The questions in the form are as follows:

- ✓ We conducted the lessons online due to the COVID-19 outbreak. What do you think were the advantages and disadvantages of holding the DST workshop online?
- ✓ What was the impact of the DST design process on you, and what qualities did it foster, develop or negatively affect you?
- ✓ Did you use the digital stories you prepared in your classes? Explain why/why not.
- ✓ Can you explain what the most difficult issue was while creating a DS?
- ✓ In your opinion, how do digital stories affect which skills of students? Please explain.

The fourth data collection tool was the digital stories prepared by the participants throughout the process.

Data analysis

Content analysis (Weber, 1990) was used to analyze the data. The views of two experts were obtained in the analysis of the data. The percentage of agreement was determined as 89%. According to Miles and Huberman (1994), a percentage of agreement of 80% and above is determined to be sufficient for inter-coder reliability. Codes, categories, frequencies and direct quotations have been included in the research.

Research ethics

In this study, the data of the participants were recorded. In addition, the participants were informed in detail about the study. Ethics committee approval was obtained by the Social and Human Sciences Scientific Research and Publication Ethics Committee of the university where the study was conducted. (27.05.2021/20)

Findings

Findings regarding the situations in which participants had difficulty in the DST workshop

By analysing the data, two categories were identified, and these are presented in Table 1.

Table 1.
Categories and Codes for Situations in Which Participants had Difficulty in the DST Workshop

Categories	Codes	*f*
Story writing	Creating a dramatic question	4
	Adjusting the length of the story	2
	Adjusting the mathematical operations	1
	Choosing a topic	1
	Adapting the story to mathematics	1
Digital story creation	Adding multimedia	3
	Using the software	2
	Voiceover	1
	Music	1
	Scene selection	1
	Character selection	1

As can be seen in Table 1, in story writing, the participants had the most difficulty in creating a dramatic question and adjusting the length of the story. While creating a DS, adding multimedia, and using the software were among the situations they found difficult.

> "While I was preparing the DS, I had trouble with the voiceover and music, I couldn't adjust the sound ratios, and besides, I couldn't transfer pictures or photos to the application from outside… In our lesson this week, we shared the story creation drafts we had prepared as homework with each other. After getting feedback on my story draft from the instructor, I learned that I might have a problem with the length, so I learned his advice to reduce the process intensity and how my dramatic question should be revised; my friends also said that they liked it without giving any additional feedback... Here, I had difficulty in the 'writing a dramatic question' part" (P1 / Voiceover / Music / Adding multimedia / Adjusting the mathematical operations / Creating a dramatic question).

> "I had difficulty at the beginning because I was not used to the Animaker program, but over time its layout could be understood. I had a lot of problems in this program when I wanted to add something after finishing the story, as when I added something, it was very difficult to record and adjust the location of all the sound recordings. After watching the videos, I realized that my deficiency was in the dramatic question. The areas where I had the most difficulty while preparing my own DS were choosing a topic and preparing a dramatic question. For this reason, I generally decided by looking at the outcomes, and an idea came into my mind in that way. Moreover, advertisements were a source of inspiration for me while preparing the video" (P2 / Using the software / Adding multimedia / Creating a dramatic question / Choosing the topic).

Findings regarding the elements that the participants paid attention to while evaluating digital stories in the DST workshop evaluation activity

Two categories were obtained from the analysis of the data, and these are presented in Table 2.

Table 2.
Categories and Codes for Elements That Participants Paid Attention to When Evaluating Digital Stories

Categories	Codes	f
Relating to the story	Dramatic question	4
	Purpose of the story	2
	Originality	2
	Daily life-mathematics relationship	1
	Grammar	1
	Length of story	1
	Economy	1

Table 2 continuing

Technological elements	Sound	3
	Music	3
	Multimedia synchronization	2
	Character selection	1
	Scene transition	1
	Sound-scene compatibility	1

It was determined that the participants mostly focused on the dramatic question, the purpose of the story, and originality in their evaluations of the story. In the technological elements, sound and music evaluations were at the forefront.

> "This week, we watched and evaluated digital stories prepared on different topics in mathematics. Most of the stories lacked a dramatic question, and I realized once again how important this part was. In some videos, the music was not suitable or else the music drowned out the character's voice. This issue also needs to be given close attention. Some of the stories were very appropriate for their purpose and covertly embedded mathematics in real life, but some of them were like direct mathematics questions. I realized that it was more correct to use the same characters in the scenes in terms of story integrity. When a real human figure is put in a cartoon character, there is a break in the story, so it is necessary to set the characters correctly. We should also choose music that is appropriate for the scenes" (P2 / Dramatic question / Music/ Daily life-mathematics relationship / Character selection).

> "During the course, in my mind, I always thought, 'What great ideas these are, why don't I think of them?'. However, there were some situations that I saw were lacking, of course, and these were a few more scene transitions, the compatibility of the sound with the scene, and the length of the story. Most of the stories I examined did not have a dramatic question. This was one of the biggest shortcomings. Most of them were original and has not have unnecessary content in accordance with the purpose of the story but some of them had inconsistency between scenes and sounds" (P3/ Scene transition/ Sound-scene compatibility / Length of story / Dramatic question / Originality / Economy).

Findings regarding the advantages and disadvantages of conducting the DST workshop online

The data were analysed and are presented in Table 3:

Table 3.
Categories and Codes for the Advantages and Disadvantages of Conducting the Workshop Online

Categories	Codes	*f*
Advantages	Time saving	3
	Online sharing	1
	Both the stories and the process are online	1
	Opportunity to watch lesson recordings later	1
	Opportunity for screen sharing	1
	Efficiency	1
Disadvantages	Limited interaction with participants	2
	Loss of time	1
	Difficulty of group work	1

As seen in Table 3, the participants mostly stated that conducting the workshop online was advantageous in terms of saving time. The limited interaction with the participants was the code mostly stated as a disadvantage.

> "Our advantages were that we saved time, and the fact that we all had a computer at hand in a lesson that should take place in a technological environment increased the efficiency, and thus, everyone had the opportunity to experience one-to-one the work done and the applications used by each other. Our disadvantages were that since we could not be in the same environment and breathe the same air during the lesson, we may not have been able to fully exchange our thoughts, ideas, and feelings with each other, and had we been able to work

face-to-face, the exchange of ideas in the discussion environments we created might have been better" (P1 / Time saving / Efficiency / Online sharing / Limited interaction with participants).

"As an advantage, it was nice that the lessons were taught in this way since the stories were prepared in an online environment. With screen mirroring, we were able to learn the programs more easily and quickly and put them into practice. I don't think there was a disadvantage. I think the DS design process can be taught online" (P4 / Both the stories and the process are online / Screen sharing).

Findings Regarding the Benefits of the DST Workshop for the Participants

The data on the benefits of the DST workshop for the participants were analyzed, and two categories were obtained and are presented in Table 4.

Table 4.
Categories and Codes for the Benefits of the DST Workshop for the Participants

Categories	Codes	*f*
Technological benefits	Positive attitude towards technology	3
	Acceleration in technology use	1
	Using technology in class	1
	Discovering new programs	1
	Adapting technology to mathematics	1
	Production through technology	1
Other benefits	Learning a method that will draw attention in class	1
	Daily life-mathematics relationship	1
	Writing stories, developing scenarios, and fictionalizing	1

As can be seen in Table 4, the participants mostly state toward they developed a positive attitude towards technology. The frequency of codes in the other category is the same.

"In this process, I discovered programs that I did not know about before and learned how to adapt them to mathematics and to draw attention in class in different ways. This increased my interest in technology" (P2 / Discovering new programs / Adapting technology to mathematics / Positive attitude towards technology).

"There was pleasure and excitement given by producing something with technology. Normally, I don't like technology and avoid it, but I designed the digital stories with love. I am sure that my future connection with technology will be less biased because I realised that I could achieve what I said I could not achieve" (P3 / Production through technology / Positive attitude towards technology).

Findings Regarding the Participants' Experiences in Using the Digital Stories They Prepared in the Workshop in Their Mathematics Classes

While P1 and P3 stated that they could not use the prepared digital stories in their mathematics classes since there was no participation in the relevant course in online education, P2 and P4 stated that they used them.

"Yes, I used them. Since the class size was small, I did not have any difficulties. I used them for the process priority topic and the students watched them carefully and said that they liked them very much. I think it was beneficial" (P2).

"I used the videos we prepared within the scope of the workshop in the online environment during the pandemic process. Due to the low participation in the online classes and the internet connection problems experienced, I only had the chance to show them one story. However, I evaluated the stories in the evaluation stage of the lesson, in terms of repetition of the topic and in order to inform the students about DST. Due to the very low participation, I did not have the chance to get much feedback from the students. When I examined some of the reactions I received, the fact that the digital stories contained stories and examples from daily

life attracted the attention of some students, but they were not liked by other students as well" (P4).

Findings Regarding the Benefits of Digital Stories for Students in the Event That They Are Used in Mathematics Classes

The data were analysed and are presented in Table 5.

Table 5.
Codes Regarding the Benefits of Digital Stories for Students in the Event That They are Used in Mathematics Classrooms

Codes	f
Boosting the imagination	2
Associating mathematics with daily life	2
Improving communication skills	1
Developing creative and critical thinking skills	1
Arousing curiosity	1
Developing problem-solving skills	1
Improving perception skills	1
Grasping the subject	1
Activating different types of intelligence	1
Developing a positive perspective on the subject	1
Improving the use of technology	1

The most repeated codes were boosting students' imagination and associating mathematics with daily life.

> "It improves communication skills because effective listening and effective speaking, which are two important aspects of communication, are used both while watching and commenting on these stories. It develops creative and critical thinking skills because creativity is used to explain one's own different ideas while commenting on a story. It makes the lessons feel close to real life because students can find themselves in any part of the stories. It develops their curiosity and imagination skills because it increases their interest and curiosity thanks to what they watch. It improves students' problem-solving skills because they watch and interpret the problems and solutions exposed in the stories" (P1 / Improving communication skills / Developing creative and critical thinking skills / Associating mathematics with daily life / Arousing curiosity / Boosting the imagination / Developing problem-solving skills).
>
> "I think students' perception levels increase thanks to digital stories. In other words, their ability to perceive what is intended in the story develops. Thus, they can perceive the thing that is intended more easily in new generation questions, which are actually the problems of the present day" (P2 / Improving perception skills).
>
> "There are concrete examples in terms of associating mathematics with daily life, and I think there will be a positive effect in this respect. At the same time, I believe it will have a successful effect in terms of grasping the subject" (P3 / Associating mathematics with daily life / Grasping the subject).

Findings Regarding the Progress of the Participants During the Workshop Process

In order to analyse the progress of the participants during the workshop, the online lesson recordings and the digital stories they designed in the process were analysed.

The case of P1

In the workshop, P1 introduced the Animaker and Biteable programs. While introducing the programs, she made presentations via mini videos. Compared to her other teammates, she prepared a more detailed introductory video and made more detailed explanations. She designed a total of three digital stories in the Animaker program. Her first story about the story of the number pi was 3 minutes and 8 seconds long. In the DS she prepared, the sound of the music drowned out the voice of the character in some places. The images transferred from outside the program were found not to be very compatible

with the story. In addition, it was determined that there were writing and spelling errors in the story. The subject of the second DS made with Animaker was the calculation made by two friends between themselves of the number of flowers using fractions. A dramatic question was not used in the DS. In addition, the music used drowned out the character's voice. It was also determined that there was an error in reading the fractional number. It was seen that there were writing and spelling errors throughout the story. In the last DS, the problem of determining empty seats and rows, on the condition that a group of friends sat side by side at a basketball match, was discussed. Contrary to the stories she prepared before, no errors or deficiencies were found in this DS, which was based on calculating the specified percentage of a quantity.

P1 told the story of the number pi in her first story. There is a speaker in the story and he gives information about the number of pi. He said that throughout history there were people who were interested in circles and that this was a need. He also gave a short formula on how to calculate the number pi. In the second story, there are two characters. The first character told the other character how beautiful the flowers he grew in his house were. The first character asked her to do a calculation and said that if she did the calculation correctly, he could gift him a flower. Accordingly, there are 4 flowers in the room and this number is 2/7 of the total number of flowers. The other character remembers how she learned in school how to find the multiplicity given as a simple fraction, and by calculating he finds that the total number of flowers is 14. Since the result is correct, his friend gives the flower as a gift. Here, P1 chose an example from the subject of fractions and associated it with daily life. In her last story, P1 dealt with the situation of four close friends going to a basketball game and sitting side by side in the stands. Accordingly, the first row of the tribune is 100% full and the number of seats here is 50. There are 4% vacancies in the second row and 8% in the third row. They realized that they could not be in the first row in the dialogues, but they should look at the second and third rows. However, they stated that the number of seats in the second and third rows is not certain. P1 made a presentation with the help of video in her first story. It is observed that only information is given in this presentation. In the second and third stories, mathematical subjects are associated with daily life. Problem solving was done with calculations and explanations by including mathematical operations in line with a problem.

The case of P2

Using the program called Moovly, P2 first discussed the calculations made among themselves by students, who accidentally broke the window of the classroom, to pay for the cost of the glass. It was determined that the prepared DS was very short (1 minute). P2 stated that this was due to the fact that she could not use the program in the way that she wanted and that the feature of adding sound in the program was limited. After choosing Animaker, she designed a 3-minute DS aimed at cooperation that included exchange and ratio-proportion. It was determined that there were problems in sound, writing, and spelling in the DS. Moreover, it was determined that a large part of the story included unnecessary dialogue. In the last DS, it was seen that she created two different scenarios in the same story for calculations of area. It was observed that questions and explanations were frequently used in the story. Unlike the previous one, no problems were encountered regarding sound and music.

In its first story, P2 is about 4 students breaking the classroom window while playing ball. Their teachers reported that they had to pay a total of 60 TL to have the glass made. Everyone has a different amount of money in their pocket. The amount that each of them has to pay is 15 TL. Everyone will calculate how much to give out of their pocket money. Fractions are used here. For example, he stated that a child who has 45 TL in his pocket must give 1/3 of his total money in order to give 15 TL. It includes both four operations and fractional notation and calculation. In the second story, the teacher watched a video. This video is about helping each other. Two friends want to sell orange juice to apply for this cooperation project. They stated that 50 ml of water comes out of an orange and that a glass of orange juice is 200 ml. They calculated that it takes 4 oranges for a glass of orange juice. He then stated that they would sell 100 glasses of orange juice for 5 TL. He calculated that they would earn 500 TL from 100 glasses of orange juice. He calculated that an orange costs 25 cents and 400 oranges are needed, that is, they will spend 100 TL. In the end, he explained that they would earn 400 TL and that they could give it to the project. P2 constructed a shopping problem in this story and calculated the profit by subtracting the expenses from the expenses. Four processes were used extensively. P2

developed a fiction about area calculation in his last story. The girl, sitting with her father, watched a news report about the obligation of parking in houses of 120 m^2 and tried to find out whether their house complied with this obligation. To the girl who knows meter but not m^2, her father explained that m^2 is used in area calculations. She calculated the area of all the rooms in turn and found that the total area was less than $120m^2$. Later, the character, who was talking to his friend on video, liked the wallpaper in his friend's room very much and wanted to buy it. The father of the girl, who could not find the wallpaper she wanted, stated that they could make the wallpaper themselves. She calculated that the wall of her room was $20m^2$. She tried to make the wallpaper she wanted by creating rectangles with side lengths of 25 cm and 20 cm. For this she calculated that she would need 400 rectangles. P2 associated mathematics with daily life in this story. He also made area calculations. She also addressed the issue of converting area measurement units to each other. Looking at the stories of P2, it is seen that she started with four operations and fractions and then formed more complex fictions including these.

The case of P3

P3 introduced the Plotagon and Renderforest programs and, with Renderforest, also reflected her sense of responsibility by creating a fictionalization to determine the amount of money a child should save each day in order to buy the bike he/she wanted. She had a problem while sharing the DS she prepared. In her story, it was seen that contrary to the first stories of the other participants, she successfully created the dramatic question. However, since she voiced all the characters in the story herself, the story was problematic in terms of voiceover. It was determined that as well as problems with the colors used, there were unnecessary dialogues. She also did not use music. The first DS that she prepared with Animaker lasted 3 min 31 sec. The aim of the DS was to introduce integers with the weather forecast. It is not a very understandable story and it was determined that there were typos. In addition, it was found that the images were incompatible and that a dramatic question was not used. The last story, on the other hand, was a four-minute story that aimed to introduce time measurement units, proceeded with questions and answers, and took place in two different locations. No problems with the sound, music and images were encountered in the story.

In its first story, P3 focused on a child's desire to buy a bicycle. Her mother stated that she needed to save money to buy the bike she wanted. She calculated how much money she had to save per day to buy the bike, which was 750 TL. There are 5 months to summer. By calculating a month from 30 days, she realized that there are 150 days in total. She calculated that she could buy the bike she wanted by saving 5 TL every day. P3 utilized four operations here. In the second story of P3, it was the subject of the teacher explaining the subject of integers to the students in the classroom. The teacher first showed the weather video. Accordingly, the expressions below 0, 0 and above 0 are used in the case of weather. After the teacher watched the video, he explained these concepts in turn and explained integers. Then, by asking questions, she explained the concepts of negative, positive and 0 in the class according to the video. It was seen that P2 made use of examples in explaining the definition in this story. In its last story, P3 has built a dialogue between two sisters on vacation at sea. Accordingly, the characters first defined the concepts of seconds, minutes and hours with the examples they gave among themselves. They then talked about the fact that it takes 10 hours for them to arrive at the resort, and it can be confusing to use the concepts of minutes and seconds in long-running situations. With their fathers included in the story, they calculated how long it would take their fathers, who had come to the holiday destination by plane, had come by bus. P3 used time units. It also benefited from four processes. In her stories, it was seen that there was a tendency towards making a definition without calculating and calculating with the definition.

The case of P4

P4 introduced the StoryboardThat and Animoto programs but stated that she was looking for another program to prepare her first DS. She designed her first DS with SuperAnimo. Due to the program feature, she designed two stories. In total, she achieved a three-minute video. She voiced all the characters herself, and therefore, the story was found to be problematic in terms of sound. She had trouble sharing the story. The story contained language and grammatical errors. She stated that she had problems in using Turkish fonts. The pictures added from outside the program were not suitable for

the background. She prepared her second story about percentages in Animaker. The first part of the story was about the implementation of a percentage discount on a camera the character liked. In the second part, she mentioned the subject of buying a gift for her mother on her birthday. The duration of the story was 3 min 21 sec. There was a dramatic question in the story and moreover, there were no spelling mistakes. It was determined that the colors were appropriate and that there was no problem in terms of sound and music. She stated that she was more comfortable with the application, but had difficulty in writing a script. When the second stories were examined, it was determined that P4's story was the best. She stated that she had difficulty writing a dramatic question while composing the final story. P4 created a story about the perimeters of triangles and quadrilaterals. It was determined that in the DS, there was incompatibility in the pictures added from the outside, but there was no problem other than that. The duration of the last story was 4 min 30 sec.

In her first story, P4 dealt with two sisters walking in the forest. These sisters talked about the order of shapes of some animals and plants they saw in nature. When they came home, they shared what they saw with their mothers, and their mothers also explained the concept of the golden ratio. In the second story of P4, father and daughter saw that there was a discount on a shopping site in the advertisement and this was expressed as a percentage. Her father explained to the girl who did not know the percent symbol. Upon this, they saw that there was a discount on the camera that they wanted so much. They calculated how much they could buy a 1000 TL photograph machine with a 20% discount. In the continuation of the story, mother's day is approaching. The girl, who wanted to buy a bag for her mother as a gift, calculated how much she could buy with a 20% discount over 200 TL, and took the gift and gave it to her mother. In the last story of P4, a girl wants to decorate her room. She shared with her sister that she wanted to place a lighted ornament on the edge of the mirrors in her room. The girl, who went shopping with her sister, took ornaments by calculating the perimeter of the isosceles triangle and rectangular mirror in her room. When she came home, she saw that she measured the edges of the rectangular mirror differently and saw that she had some ornaments left in her hands. Upon this, she wanted to evaluate these ornaments by having a new trapezoidal mirror made. For this, she constructed a trapezoidal shape with two different side lengths. It was seen that P4 gave information about the golden ratio in his first story. In the second story, percentages were used by relating it to daily life. Explanations are also included in this story. In the last story, perimeter calculations of polygons are presented by associating them with daily life. Compared to the first story, it was seen that the other stories focused more on problem solving.

It was observed that all participants actively participated in the course, criticized each other, helped each other, supported each other, and sometimes worked in cooperation. The fact that the final digital stories of the participants were good can be interpreted as the fact that the process was efficient.

Discussion, Conclusion, and Suggestions

In this study, an online DST workshop was held with mathematics teachers studying for a master's degree, and the process was examined from various perspectives. Firstly, the situations in which the participants had difficulties in the DST workshop were determined. It was observed that all participants had difficulties in creating a dramatic question and transferring it to their stories. The dramatic question is defined as a question that draws the attention of the audience and is resolved at the end of the story (Bull & Kajder, 2005). The dramatic question is the one that keeps the audience curious throughout the story and is resolved at the end of the story. What is expected of a good dramatic question is that it encourages the listener to pay attention to the end of the story and to think about the end of the story. Similarly, there are studies in the literature that point out the difficulty of creating dramatic questions (Kildan & İncikabı, 2015; Kocaman- Karoğlu, 2016). It was determined from both video recordings and reflective diaries that not all participants initially understood what the dramatic question was. In addition, it was determined that they did not well on the dramatic question in their first stories. During the workshop, discussions were held on the dramatic questions that the participants tried to pose. The participants had an idea by getting feedback from both the researcher and each other. In addition, in the evaluation study of digital stories, they focused more on digital stories and gained knowledge about the dramatic question. However, when the participants' final digital stories were examined, it was seen that there was less problems with the dramatic questions. It can be said that the workshop benefited the participants in this regard. In digital storytelling,

technologies are utilized to support the educational process (Yüksel, Robin & McNeil, 2011). There are numerous technologies that have different features for designing digital stories. It is possible to mention a wide range of paid and free usage options that have different interfaces, characters, scenes, sound, and music alternatives. So as not to restrict the participants in this workshop, the choice of tool to be used was left to them. The participants examined and presented two tools each and determined the appropriate tool. Despite this, most of the participants stated that they had difficulties in adding multimedia. It is considered that the software selected in studies on DST should have many different multimedia content, because otherwise, participants have to make additions from outside. While making additions, the subject of copyright infringement may emerge, while various difficulties may also be experienced in obtaining suitable images for the story. Indeed, a similar situation was experienced in this study. In the study, it was seen that the participants mostly considered the dramatic question item while evaluating the sample digital stories. This situation can be associated with the fact that the participants mostly had difficulty in creating a dramatic question. In the evaluations, an important finding that emerged was that the participants focused not only on the technological elements but also on the story. Lambert (2006) stated that sound and music are important in providing the emotional content of the DS. The fact that the participants paid particular attention to these two elements can be interpreted as the fact that they understood the theoretical framework.

In the process, at first, the participants focused more on the technological part. However, in the later stages of the workshop, it was determined that they associated mathematics with daily life more in creating digital stories. It was determined that they thought about explaining the subject/concept more easily while designing their digital stories in the course recordings. In addition, it was observed that they had ideas such as attracting the attention of the listeners and emphasizing the use of mathematics in daily life. It was also determined that they posed a mathematical problem and made transaction calculations. For example, P1 and P4 gave more information about a concept in their first stories. (pi number and golden ratio). But later, they created stories that required complex mathematical operations and occasionally included explanations and definitions. In these stories, they started with a problem situation and eventually solved that problem.

While stating the advantages of conducting the DST workshop online, the participants mostly mentioned the saving of time. James (2002) also mentioned the benefit of online education in terms of saving time. Efficiency and shorter design time compared to face-to-face education for participants in different geographical areas (Piskurich, 2006) was another finding obtained in the research. The possibility to watch the lessons later (Çıralı-Sarıca & Koçak-Usluel, 2020) was another of the advantages mentioned, while limited interaction (Coman et al., 2020; Dung, 2020) was determined as a disadvantage in this study.

While expressing the benefit of the process for them, the participants frequently mentioned technology. Çetin (2021) also mentioned a similar situation in his study. Technical knowledge, which is one of the 21st-century skills, is expressed as the ability to use devices and applications to perform practical tasks and to recognize specific online environments (Van Laar et al., 2017). Researchers define21st-centuryy tools as critical facilitators of learning. The information age, which emerged with the widespread use of these tools, prepares people for a world in which there are deep information flows, opportunities, and choices. Information and communication technology helps people make sense of this preparation (Salpeter, 2003).

The participants were asked to use the last four digital stories they designed in their classes. However, it was determined that only two of the participants were able to use the stories in the classroom. In our country, which has switched to online education due to the pandemic, a number of problems are being experienced. Demir & Kale (2020) stated that the inadequacy of the internet, the lack of hardware tools, parents' technological knowledge, and students' individual characteristics cause problems in distance education. Erdem & Arı (2021), on the other hand, stated that lack of devices, internet connection problems, psychological, familial, and environmental factors, and health factor was effective on students' absenteeism in online education. Although the reasons for absenteeism were not focused on in the study, it is thought that there were absences due to similar reasons and that therefore, digital stories were not used. It is necessary to increase students' online satisfaction and engagement

by creating opportunities for designing online education in such a way as to better meet students' needs (Henry, 2020).

In their study, Karakoyun and Kuzu (2016) stated that performing digital storytelling activities in the online environment would attract students' attention, accelerate the digital storytelling process, increase communication between students, and contribute to the development of students' digital stories. In addition, both pre-service teachers and primary school students agreed that digital storytelling improves students'21st-century skills. Özüdoğru (2021) stated that it increases motivation, facilitates learning, enables multiple learning, and develops technology use and creativity skills. Similar results were obtained in this study.

When the development of the teachers by means of the stories they prepared is examined, it can be said that they all made progress and that there was no problem with the final products that emerged, and therefore, that the process was efficient.

The presentation of the digital stories prepared in the research to students in the classroom environment was limited. The study was conducted in order to teach the DS design process to teachers so that they could carry out mathematics education more effectively and efficiently. However, it is thought that more comprehensive observations about the effectiveness of the process can be obtained by examining its use in the classroom environment. Therefore, it can be recommended that classroom applications are carried out after completing the DS workshop process.

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Are Reality, Simulation, and Augmented Reality Interchangeable?

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Abstract

Students often ask why they should learn or where they would use this knowledge when learning. Real-life experiences make learning more meaningful for the students. Thus, learning environments where the students could acquire real-life experiences are important. However, due to the student profile, crowded classes, inadequate course hours, technological advances, natural disasters, etc., conventional instruction methods could not meet student requirements and they could not practice. This negatively affects learning achievements and psychomotor skills of the students. Effective real-life educational experiences are required to improve learning achievements and psychomotor skills of the students. Thus, the present study aimed to investigate learning achievement and psychomotor skills levels of college students in the ICT course and substitution of augmented reality applications and simulations with real-life experiences. The study data were collected from 63 college students. Descriptive statistics, two-way ANOVA, and Wilcoxon Signed Rank Test analysis were employed to answer the research questions. The findings demonstrated that augmented reality and simulation-assisted learning environments were as effective as real-life learning environments in the improvement of the learning achievements and psychomotor skills of the students in the ICT course. Thus, it could be suggested that augmented reality or simulation applications could be employed in learning environments that lack real-life experiences.

Keywords: Reality, Augmented reality, Improving classroom teaching, Simulations, Achievement

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Introduction

Learning is a process where knowledge is construction via transformation of experiences. The most effective factor in learning is not the storage of knowledge but the production of new knowledge with real-life experiences. The most permanent, effective and concrete learning is acquired through real-life experiences. Real-life experiences are the foundation of future experiences and learning. Individuals make sense of and learn from their experiences, and could analyze the outcomes of learning (Morris, 2020). Real-life experiences support permanent learning and contribute to the learning of each student to the extent of personal skills (Yalın, 2015: 123). Furthermore, it could facilitate observation and research of the students (Cited by Musyaddad & Suyanto, 2019), and improve their creativity and enthusiasm for learning (Kiewra & Veselack, 2016). An adequate learning environment where students could reinforce acquired knowledge and learn from the pedagogical approach is important (Chiu, 2019). The association of the learning environment with the real world would lead to real-life experiences. Students experience the sensory properties of objects in these environments and become familiar with the environment (Zacharia & Olympiou, 2011). Thus, they could achieve predetermined objectives easily. In these environments, students could develop their conceptual comprehension (Chiu, 2019; Morris, 2020) and apply acquired knowledge and skills in different real-life conditions. Real-life experiences include in-classroom (models, real objects, etc.) and out-of-classroom activities (laboratory applications, internships, exchange programs, field studies, case studies, virtual learning environments, in-service training) where students work individually or as a team under the supervision of an instructor.

Real-life experiences play a key role in the Information and Communication Technologies (ICT) course. ICT course could improve the quality of education. Previous studies emphasized that the ICT course could facilitate the development of higher cognitive skills such as analysis and evaluation (Claro et al., 2012). The ICT course includes theoretical (knowledge) and practical (real-life experiences) education (de Brock, 2001). Theoretical education aims at the acquisition of knowledge-comprehension where the content is instructed with conventional or various methods. In practical education, students could experience real-life and use material objects (computer parts such as motherboards, processors, etc.) in the learning environment. It aims the acquisition of psychomotor skills. When compared to theoretical education, applied education conducted with equipment could improve inquiry, problem-solving skills of the students, allow them to experience challenges and explore the nature of science (De et al., 2013). However, due to various factors (individual differences, crowded classrooms, lack of required material, costs, learning environment problems, etc.), students could not acquire real-life experiences since they could not apply learned knowledge, leading to inadequate ICT education, adversely affecting learning achievements and psychomotor skills. Although the ICT course aims to contribute to the professional skills of the students, it was reported that several students could not acquire the targeted skills (Akkoyunlu & Kurbanoğlu, 2003). Similarly, certain studies (Topu & Göktaş, 2012;) reported that college students considered the ICT course inadequate and stated that available hardware were inadequate. Thus, solutions that could lead to real-life experiences are important for the students. There is a need for alternative learning environments that would lead to real-life experiences in the ICT course based on student requirements and positive learning outcomes (similar to real-life learning environments).

AR and SM in Education

Various technological solutions that employ different learning methodologies are available to support education (Moro et al., 2021). The integration of technologies with education is important to ensure that every student could practice, to improve learning environments and student participation (Sahin & Yılmaz, 2020). The employment of projectors, computers, and other technical equipment in the classroom could lead to fun and enjoyable learning (Haleem et al., 2022). New classroom technologies allow the students to diversify knowledge construction methods (Sampaio, & Almeida, 2016) and analyze their interests in a broader context by exposing them to real-life experiences. To ensure successful learning, knowledge, and practice should be instructed in real or realistic environments (Koçyiğit, 2011). Solutions such as virtual 3D, intelligent tutor systems, immersive worlds, simulations, and augmented reality are particularly adequate for hands-on training (Moro et al., 2021).

For example, it was reported that simulated learning environments could be developed to support laboratory work and improve student access to education and educational opportunities (Alfred et al., 2018). Virtual reality simulations could be an alternative to real-life experiences by turning them into virtual manipulatives (Moyer et al., 2002). Thus, learning environments that included simulation and augmented reality technologies (including concrete objects and 3D simulations) were designed in the present study.

Simulations are computer applications employed to animate events that could not be conducted in daily life due to various factors, where individuals take responsibility for, were designed to achieve a specific objective, and reflect reality (Babur, 2016). These were generally described as an imitation of a process or situation (Rooney & Nyström, 2018). Conventional instruction could be successfully developed with computer simulations (Rutten et al., 2012). Studies demonstrated that educational simulations were constructive in learning outcomes (Almasri, 2022; Matute-Vallejo & Melero-Polo, 2019, Sanina et al., 2020; Vlachopoulos & Makri, 2017). Simulations allow students to learn at their own pace and proficiency, leading to more efficient learning (Henderson et al., 2017; Kim et al., 2013). They allow them to improve their skills without exposure to situations with negative financial or ethical consequences (Almasri, 2022). They do not only increase student participation and motivation to construct new knowledge, but also facilitate comprehension of the course content (Lindgren et al., 2016). Although various types of simulations (Deterministic and Probabilistic, Time Dependent and Time Independent, Games, Virtual interactive etc.) are available, computer simulations that run on desktop or laptop computers with mouse and keyboard controls were employed in the current study.

Augmented reality (AR), another technology employed in the study, allows human-computer interaction (Azuma et al., 2001). It allows individuals to interact within a real environment by superimposing pre-recorded virtual data on the environment. Technically, AR takes the image of the real objects with a camera, adds virtual objects at predetermined locations, and combines the real and virtual worlds (Azuma et al., 2001; Cai et al., 2014; Milgram & Kishino, 1994;). Thus, it alters the way individuals interact with the real world. The effectiveness of AR has been investigated in almost every field, including entertainment, business, health, tourism, military, manufacturing and education industries. AR has been employed in the design of pedagogical tools that would improve learning and instruction experiences in education (Garzón et al., 2017). Several studies reported that AR allowed students to acquire more meaningful knowledge and helped them develop special skills that were more difficult to acquire with other pedagogical tools (Akçayir & Akçayir, 2017; Safar, 2016). It is a powerful technology that supports education, especially in industrial service procedures (Webel et al., 2011). AR learning environments have a positive effect on educational outcomes such as learning achievements, attitudes, motivation, interest, and retention (Akçayır & Akçayır, 2017; Garzón et al., 2019; Kucuk Avci et al., 2019). AR leads to flexibility in learning in an interactive environment that could be adapted to the real world (Barsom et al., 2016). A well-designed AR environment could improve awareness about the real world and learning (Wu et al., 2018). Based on the advantages and strengths of AR, it could be suggested that it could be one of the most promising tools in education.

There are several studies on simulation and AR in the literature. Lichti and Roth (2018) investigated the impact of computer-based simulations or concrete objects in learning environments on functional thinking skills of sixth graders. Although both environments led to significant increases in functional thinking skills, the increase in the simulation group was higher. The study findings demonstrated that computer-based simulation was superior to learning environments that employed concrete objects in the development of functional thinking skills. Evangelou and Kotsis (2019) compared conceptual comprehension of friction force in a study conducted with concrete objects and simulation. They reported no significant difference in conceptual comprehension between the students who conducted virtual friction force experiments and those who conducted real-world experiments. Zendler and Greiner (2020) compared the empirical method and simulation based on various learning outcomes in chemistry education. They determined that both groups exhibited similar observation and application knowledge performances. Furthermore, the authors designated simulation and empirical methods as complementary instructional methods. Krüger et al., (2022) observed the effects of applied experimentation and interactive computer simulation in science education on secondary school

students' learning achievements, contextual interests, and cognitive loads. It was determined that despite the high cognitive load, the students who conducted simulations exhibited higher learning achievements when compared to the students who conducted experiments. However, the contextual interest levels of the experimenters were higher when compared to those who simulated. It was also emphasized that simulations could be suitable for the instruction of complex topics, and both methods could be used to complement the weaknesses of the other. Similarly, in a study where conventional and simulation-based instruction methods were compared, the visuals did not provide better learning, but complementary use of both conventional instruction and computer simulations could improve education (Rutten et al., 2012).

The review of the studies on AR demonstrated that Hsiao et al., (2012) quantitatively compared student achievements and attitudes in three learning environments, including AR, simulation-based, and conventional face-to-face instruction of the ecosystems. The study findings demonstrated that there were no differences between the three learning environments based on student learning achievements. On the other hand, since the students in the AR group had higher attitude scores when compared to the other groups, the students perceived the AR environment as more beneficial when compared to the other two. Chang and Hwang (2018) compared AR-based flipped learning and conventional learning in a study conducted with primary school students. The empirical findings revealed that the AR-based flipped learning approach improved the learning motivation, critical thinking skills and group self-efficacy, and increased student performance in projects. Chang et al., (2016) compared augmented reality and interactive simulation technologies to support learning in social sciences. The study findings demonstrated that there were no significant differences in knowledge and attitudes; however, a significant difference was determined that favored AR in perceptions. Hsiao et al., (2016) compared mobile AR and multimedia instruction in a natural science course. The study reported that AR had a significant positive impact on academic achievements and motivation of the students when compared to multimedia instruction. Also, certain studies compared AR and virtual reality or mixed reality. However, these were not included in the study since these were out of the scope of the present study.

Studies demonstrated that the effectiveness of AR and simulation-based learning environments varied based on the study group, discipline, content, and research variables. Studies generally investigated achievements, motivation, attitudes, and cognitive load in science, physics, chemistry, and mathematics courses. In contrast, the present study focused on alternative solutions that could improve learning achievements and psychomotor skills of the students, similar to learning environments that provide real-life experiences. Furthermore, further studies are required to determine effective educational technologies in different conditions (Chang et al., 2016). The present study is unique in the sense that three learning environments (AR, simulation, and real-life experiences) were compared. The study was conducted based on the requirements reported in the literature and aimed to investigate the effects of learning environments (AR, simulation, and real-life experiences) on learning achievements and psychomotor skills of college students. Thus, the following research questions were determined.

1) Can AR and simulation be used to replace real-life experiences in terms of learning achievements?
2) Can AR and simulation be used to replace real-life experiences in terms of psychomotor skills?

Method

Research Model

The present study was conducted with a quasi-experimental design, a quantitative research method. In cases where experimental and control groups could not be assigned randomly, a quasi-experimental design is employed and groups are assigned based on existing classes (Fraenkel & Wallen, 2000; McMillan & Schumacher, 2010). The research model is presented in Figure 1.

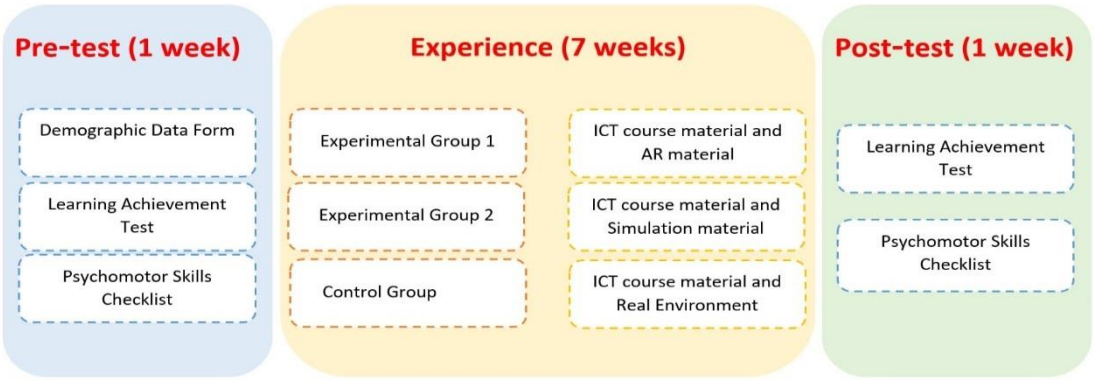

Figure 1. The Research Model

As seen in Fig 1, the research model included three parts and the study was completed in 9 weeks. Before the experience, a demographic data form, psychomotor skills checklist, and learning achievement test were applied to each group as a pre-test (1 week). During the experimental process, the same ICT course was instructed to each group (2 hours a week, by the same instructor, with the same course material), but different materials were used during the practice hour. After the instruction with the ICT course material, the practice session was conducted with AR material in Experimental Group 1, simulation material in Experimental Group 2, and with real objects (real-life experience) in the Control group (7 weeks). At the end of the experience, psychomotor skills checklist and learning achievement test were applied as a post-test (1 week).

Participants

The study data were collected from 63 associate degree students attending a public university. The participants were assigned with the convenience sampling method. Convenience sampling method allows fast and easy assignment of the sample (Patton, 2014). The demographic characteristics of the participants are presented in Table 1.

Table 1.

Demographic Characteristics of the Participants

Demographics		Count (N)	Percentage (%)
Gender	Male	39	61.9
	Female	24	38.1
Age	18-19	42	66.6
	20-21	18	28.5
	22-29	3	4.7
ICT course experience	Yes	42	66.6
	No	21	33.3
Smartphone or tablet ownership	Yes	59	93.6
	No	4	6.4

As seen in Table 1, 39 (61.9%) participants were male, and 24 (38.1%) were female. Most participants were 18 or 19 years old (N = 42, 66.6%), and 18 were 20 or 21 (21.5%), and only three (4.7%) were 22 or older. Two-third of the participants (N = 42, 66.6%) had taken an ICT course before, and one-third of the participants (N = 21, 33.3%) did not. Fifty-nine (93.6%) participants owned a smartphone, and only four (6.4%) participants did not. The participants were divided into three groups: 2 experimental (augmented reality (AR) and simulation (SM)) and 1 control (Real-Experience (RE)) groups. The participants were assigned to these groups based on 3 criteria (CR) presented in Figure 2.

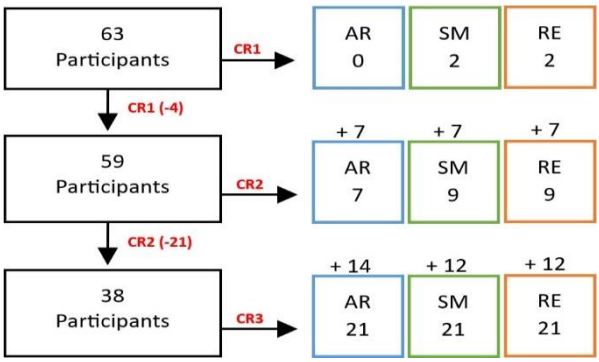

Figure 2. Sample assignment strategy

1st.CR *Based on smart mobile phone ownership*: The students had to own a smartphone or a tablet to use the AR material. Thus, basic demographic data were analyzed (the question was included in the form) to determine the participants without a smartphone, or a tablet. There were 4 participants who did not own a smartphone. 2 were randomly assigned to the RE group, and the remaining 2 were assigned to the SM group.

2nd.CR *Based on ICT course experience*: 21 of the remaining 59 participants, who did not take the ICT course, were equally distributed into 3 groups.

3rd.CR *Based on Learning Achievement pre-test scores*: The Learning Achievement test was applied to determine the statistical equivalence of the groups. Students were ranked based on the learning achievement scores. The score ranges were determined based on the "Regulation on Associate and Undergraduate Education and Evaluation". According to the regulation, students should score at least 50 to be successful. Participants were randomly assigned to groups. The score ranges formed as a result of matching scores are presented in Table 2.

Table 2.
Score Ranges of Groups

Score	AR Group		SM Group		RE Group		Total	
	N	%	N	%	N	%e	N	%
0-49	3	14.2	3	14.2	3	14.2	9	14.2
50-83	12	57.1	12	57.14	12	57.14	36	57.1
84-100	6	28.5	6	28.5	6	28.5	18	28.5
Total	21	33.3	21	33.3	21	33.3	63	100

As seen in Table 2, 9 (14.2%) participants scored between 0 and 49 (3 participants in each group), 36 (57.1%) scored between 50 and 83 (12 participants in each group), and the remaining 18 (28.5%) scored between 84 and 100 (6 participants in each group). Then, one-way analysis of variance (ANOVA) was employed to compare the equivalent between the groups. The results are presented in Table 3.

Table 3.
Equivalence of the Groups

Group	Sum of squares	sd	Mean square	F	p
Between Groups	3.55	2	1.77	.007	.993*
Within Groups	16144.7	60	269.07		
Total	16148.3	62			

ANOVA results demonstrated that there were no significant differences between learning achievement scores of the groups ($F_{(2,60)}$= .007; p<.05). This finding implied that the groups were similar equivalent to the learning achievement scores. Post-assignment group demographics are presented in Table 4.

Table 4.
Post-Assignment Group Demographics

Demographics		AR Group		SM Group		RE Group		Total	
		N	%	N	%	N	%	N	%
Gender	Female	5	23.8	11	52.3	8	38.1	24	38.1
	Male	16	76.1	10	47.6	13	61.9	39	61.9
Total		21	100	21	100	21	100	63	100

As seen in Table 4, in the AR (21) group 5 (23.8%) participants were female and 16 (76.1%) were male. In the SM (21) group, 11 (52.3%) were female and 10 (47.6%) were male. In the RE (21) group, 8 (38.1%) were female and 13 (61.9%) were male. The groups' pre-test scores (learning accomplishment and psychomotor performance pre-test) were compared, and they were determined to be equal.

Experimental procedure design

The experimental procedure is presented in Table 5. The design of both the experimental procedure and each material is addressed. As seen in Table 5, the experimental procedure was conducted over 9 weeks. In the first week, the demographic data form, learning achievement test, and psychomotor skills checklist were applied to each participant as a pre-test. ICT course instruction was conducted theoretically and practically. In theoretical instruction, the topics were instructed to all three groups with the same method (by the same instructor, using the same course material, with the presentation method). In practical instruction, the same instructor used different material in each group (AR material in the AR group, SM material in the SM group, and real objects in the RE group) to acquire real-life experiences. This process lasted for 7 weeks. On the ninth week, the learning achievement test and psychomotor skills checklist were applied to each participant as the post-test.

Table 5.
Experimental Procedure

1st Week **Pre-test**
(Demographic Information Form, Learning Achievement Test, and the Psychomotor Skills Checklist)

Weeks	Topics	Learning Outcomes		Teaching Method	Materials by Group		
		Theoretical	Practical		AR	SM	RE
2	CPU	Could explain the task of the processor cache. Could identify the processor at once.	Could assembly the processor on the motherboard at once. Could disassembly the processor from the motherboard at once.	Explanatory instruction with **course material** (PowerPoint presentation)	AR Material	SM Material	Real Environment with real objects
3	RAM	Knows that RAM is a temporary memory. Has the knowledge to install RAM. Deducts the reasons for RAM errors. Recognizes the RAM memory at once. Deducts the reasons for hard disk errors.	Could assembly the RAM on the motherboard at once. Could disassembly the RAM from the motherboard at once.				
4	Hard Disk	Deducts the reasons for hard disk errors. Recognizes the hard disc at once.	Could assembly the hard disk in the computer case at once. Could disassembly the hard disk in the computer case at once.				

Table 5 continuing

5	Graphics Card	Knows the functions of the graphics card. Could list the steps of mounting the graphics card without error. Recognizes the graphics card at once.	Could assembly the graphics card on the motherboard at once. Could disassembly the graphics card from the motherboard at once.
6	Sound Card	Could list the steps of sound card assembly steps without error. Recognizes the sound card at once.	Could assembly the sound card on the motherboard at once. Could disassembly the sound card from the motherboard at once.
7	Network Card	Could list the network card assembly steps without error. Recognizes the network card at once.	Could assembly the network card on the motherboard at once. Could disassembly the network card from the motherboard at once.
	Power Supply	Knows the functions of the power supply. Recognizes the power supply at once.	Could assembly the power supply in the computer case at once. Could disassembly the power supply from the computer case at once.
8	Motherboard	Knows the functions of BIOS. Knows the integrated motherboard circuit. Recognizes the motherboard at once. Recognizes the motherboard parts.	Could assembly the motherboard in the computer case at once. Could disassembly the motherboard from the computer case at once.
9th Week **Post-test** (Learning Achievement Test, and Psychomotor Skills Checklist)			

Course material and real environment design

Course material was an audio, visual and textual presentation file employed to instruct the topic. The "A+ Computer Technical Staff Training" file was developed by the Cizgi Technology Research and Development Center (Cizgi TAGEM) based on the CompTIA A+ curriculum. To determine the adequacy of the course material for course objectives, an analysis form was developed and submitted to three faculty members (at the Department of Computer and Instructional Technologies Education) who had instructed the ICT course before. Based on their comments, it was determined that the material was adequate for course achievements. The course material was presented in Figure 3.

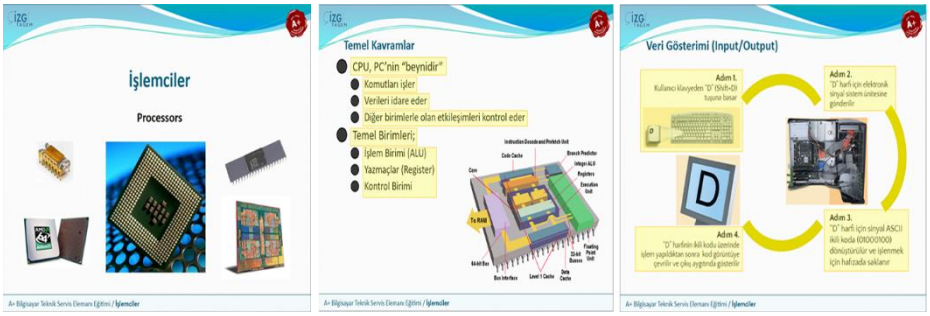

Figure 3. Course Material

Practical education (real-environment) visuals are presented in Figure 4. The course content was instructed to the students in the RE group with the course material. After 45 minutes of instruction (up to 1 hour), practical instruction was initiated.

Figure 4. Real Environment Experience

In the RE group, students were asked to disassemble and assemble computer parts with real objects (processor, ram, computer case, etc.). This stage took about 1 hour. The same instruction continued for 7 weeks.

AR Material and AR Experience Design

In the AR group, after the course was instructed with the ICT course material, the AR material was employed in the practical instruction. The AR material included a smartphone and an AR ICT book with QR codes. The AR material development included: storyboard development, barcode development, modeling, AR ICT notebook development, animation development, barcode and animation interaction, and the development of the mobile application. In the first stage, storyboards were developed based on the ICT course content. Then, barcode images were developed on Adobe Photoshop CS6 software. The barcodes included the pictures of the processor, RAM, video card, network card, sound card, motherboard, hard disk, power supply, and the computer case. Modeling and animation stages were designed on the Cinema 4D software. An AR ICT notebook was developed to allow the students to run the application and take notes. Two-dimensional images (QR codes) were defined as 'markers' with AR technology in the notebook. Thus, an infrastructure was developed for the students to interact with the notebook on their smart phones. The development of the animations with AR technology depends on the interaction between barcodes and animations. In the final stage, Armedia, a Cinema 4D add-on, was used for barcode - animation interaction, and the material included Android and IOS printouts. Before the experimental process, the students were informed in a seminar where they were allowed to try the AR material. Technical support was also provided during the seminar. The AR material was presented in Figure 5 and the experience images were presented in Figure 6.

Figure 5. AR Material

Figure 6. AR Experience

SM Material and SM Experience

In the SM group, after the class was instructed with ICT course material, the practice phase was conducted with the simulation material. A computer was required to use the simulation material. The material development process was generally similar to the AR material (except for book development). Part models were animated with Adobe Flash software and Action Script 3.0 code (Flash application was available on school computers), and simulation material was loaded on the computers. The student actively participated in some certain AR processes (e.g., the student could not proceed without disassembling the processor). Information was provided for the students in a seminar, and they were allowed to try the simulation material. The simulation material and experience images were presented to the students in Figure 7 and Figure 8.

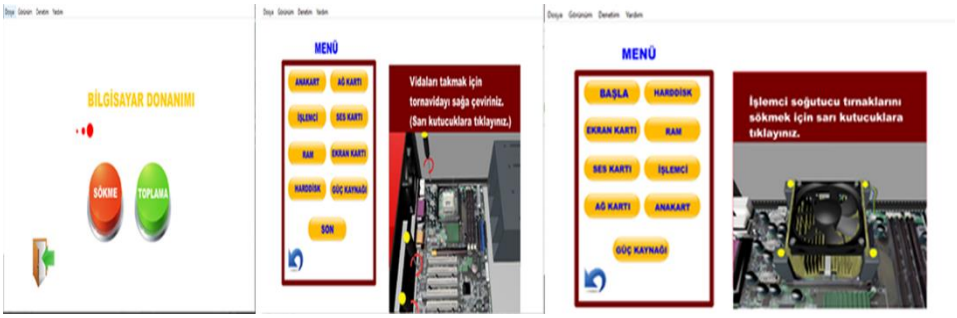

Figure 7. SM Material

Figure 8. SM Experience

Data Collection Instruments

The data were collected with the Demographic Data Form, Learning Achievement Test, and the Psychomotor Skills Checklist

Demographic Data Form: A draft demographic data form was developed by the author to collect detailed participant data and determine the control and experimental groups. To ensure the content

validity of the form, it was edited and finalized based on the views of two faculty members with a PhD on educational technologies.

Learning Achievement Test: The learning achievement test was developed by the authors. The test included 25 multiple choice questions. The test was scored out of 100 points, with four points awarded for each correct answer. The test questions were based on the ICT course achievements. A specification table was developed, and questions that reflected each achievement were determined. The final test was reviewed by three academic experts in computer education (Department of Computer Education and Instructional Technologies). The items were revised based on expert opinion. The reliability of the achievement test was calculated with the pilot scheme data (N=446). A Cronbach's Alpha coefficient of $\alpha < 0.50$ reflects low reliability, $0.50 \leq \alpha < 0.80$ reflects moderate (acceptable) reliability, and $\alpha > 0.80$ reflects high (good) reliability (Taber, 2018). Since the Cronbach's Alpha coefficient was 0.867 for the learning achievement test, it was accepted as reliable.

Psychomotor Skills Checklist: To analyze participant psychomotor performances, a psychomotor skills checklist was developed by the author to determine whether certain behaviors were performed in a certain order and submitted for expert opinion (2 assessment and evaluation specialists, 2 educational technology specialists with PhD degrees). The draft, the lowest possible score of which was 0 and the highest possible score of which was 146, was a 3-point Likert-type scale where performing the behavior at once was scored 2 points, performing the behavior on the second try was scored 1 point, and inability to perform the behavior was scored 0 points, and the checklist was finalized based on expert opinion. To ensure interrater agreement, students were evaluated by an educational technology specialist and researcher with a PhD during the application, and the results were analyzed with the Pearson correlation coefficient. Pearson analysis revealed that there was a statistically significant positive and high correlation (.93) between the author and expert scores. The checklist included 73 steps for each part (case, processor, ram, etc.), computer disassembly (i.e., "1. recognizes RAM. Unlocks RAM. Removes RAM from the socket"), and computer assembly.

Data Analysis

Quantitative study data were imported to the IBM SPSS 23.0 software. The normality of each variable was analyzed. A Two Way ANOVA was employed for composite measurements since there were three groups and two measurements (pretest and posttest) of learning achievement. A Wilcoxon signed-rank test was used to determine inter-group differences, since students' pre-test and post-test scores in psychomotor skills did not exhibit normal distribution ($p<.05$).

Findings

In the study, learning achievement levels and psychomotor skills of the students were determined. Descriptive findings for each group before and after the experiment are interpreted in Table 6.

Table 6.

Learning Achievement and Psychomotor Skills Score

Group	Test	N	Learning Achievement		Psychomotor Skills	
			Mean	SD	Mean	SD
AR	Pre-test	21	70.66	17.17	77.85	58.19
	Post-test		79.42	15.24	136.90	15.19
SM	Pre-test	21	70.09	15.47	61.52	61.60
	Post-test		73.71	13.59	134.85	11.09
RE	Pre-test	21	70.28	16.52	64.71	51.35
	Post-test		78.09	14.89	133.00	11.98

As seen in Table 6, The mean pre-test learning achievement scores of the AR, SM and RE groups (M_{AR}=70.66, SD_{AR}=17.17; M_{SM}=70.09, SD_{SM}=15.47; M_{RE}=70.28, SD_{RE}=16.52) were almost equal. Thus, the learning achievement scores of the groups were similar before the application. The mean post-test learning achievement scores of the AR, SM and RE groups (M_{AR}=79.42, SD_{AR}=15.24; M_{SM}=73.71, SD_{SM}=13.59; M_{RE}=78.09, SD_{RE}=14.89) demonstrated that the achievements increased in each group, and the highest increase was in AR group.

The mean pre-test psychomotor skills scores of the students demonstrated that the mean score was higher in the AR group (M_{AR}=77.85, SD_{AR}=58.19) when compared to RE (M_{RE} =64.71, SD_{RE}=51.35) and SM (M_{SM}=61.52, SD_{SM}=61.60) groups. The lowest mean pre-test psychomotor skills score was observed in the SM (M_{SM}=61.52, SD_{SM}=61.60) group. The mean post-test psychomotor skills scores of the students revealed that the mean score in AR group (M_{AR}=136.90, SD_{AR}=15.19) was higher when compared to the SM (M_{SM}=134.85, SD_{SM}=11.09) and RE (M_{RE} =133.00, SD_{RE}=11.98) groups. The lowest mean post-test psychomotor skills score was observed in the RE group (M_{RE} =133.00, SD_{RE}=11.98).

Can AR and SM Replace Real-Life Experiences in Learning Achievement?

Two-way Mixed Design ANOVA was employed to determine the significance of the effect of the increase in the mean learning achievements of the groups on post-test scores. The findings are presented in Table 7.

Table 7.
Learning Achievement of the Groups

Source of the variance	Sum of Squares	Sd	Mean square	F	Significant (p)
Between subjects effects	21245.71	62			
Group (Experimantal/Control)	233.90	2	116.95	.33	.71
Error	21011.81	60	350.19		
Within subjects effects	9991.99	63			
Measurement(pretest/posttest)	1347.17	1	1347.17	9.52	.00
Group* measurement	161.77	2	80.88	.57	.56
Error	8483.04	60	141.38		
Total	31237.70	125			

As seen in Table 7, there was a significant difference between the learning achievements of the students in each group based on time (between pre-test and post-test) (F=9.52, p>.05). This finding demonstrated that the experimental procedure led to a significant difference in the learning achievement scores of the students. However, there were no significant differences between the experimental groups and pre-test and post-test learning achievements ($F_{(2,60)}$=.572, p>.05). Thus, it could be suggested that the learning achievement scores of the students in the AR and SM groups increased between the tests when compared to RE; however, the difference was not significant.

Can AR and SM Replace Real-Life Experiences in the Development of Psychomotor Skills?

In the study, the Wilcoxon signed-rank test was employed to determine whether the psychomotor skills of the students significantly differed before and after the application, and analysis results are presented in Table 8.

Table 8.
Pre-Test and Post-Test Psychomotor Skills Scores of the Students

Group	Pre-Test – Post-Test	N	Mean Rank	Sum of Ranks	z	p	r
AR	Negative	0	.00	.00	-4.01	.00	-0.57
	Positive	21	11.00	231.00			
	Tie	0					
SM	Negative	1	5.50	5.50	-3.82	.00	-0.63
	Positive	20	11.28	225.50			
	Tie	0					
RE	Negative	0	0.00	0.00	-3.92	.00	-0.67
	Positive	20	10.50	210.00			
	Tie	1					

As seen in Table 8, the difference between the pre-test and post-test scores of the students in the experimental and control groups was statistically significant (z_{AR} = -4.01; $p < .05$, z_{SM} = -3.82; $p < .05$, z_{RE} = -3.92; $p < .05$). Based on the mean rank and total ranks of the score differences, the difference favored the positive ranks; thus, the post-test scores. Effect size analysis revealed that the psychomotor skills of the students in the AR (r=-0.57), SM (-0.63) and RE (r=-0.67) groups improved moderately. According to Cohen (1992), an effect size of 0.2 could be considered as a weak effect, 0.5 as a moderate effect, and 0.8 as a high effect.

Discussion, Conclusion, and Suggestions

Alternative solutions that are effective and equivalent to real-life experiences are required to improve the learning achievements and psychomotor skills of the students. Thus, the possibility to replace real-life experiences with augmented reality and simulation applications to improve the learning achievements and psychomotor skills of university students in the ICT course was investigated in the present study.

The analysis of the three environments based on learning achievement demonstrated an increase in the post-test scores when compared to the pre-test scores in all groups. However, there was no significant difference between the experimental groups and pre-test and post-test learning achievement scores. This finding demonstrated that all three environments increased learning achievement. Thus, augmented reality, simulation, and real-life experiences in the ICT course learning environment similarly affected the learning achievements of the students. The insignificance of the difference could be due to the course. Garzon et al. (2017) and Li et al. (2021) reported that the field where AR was implemented had a significant effect on student academic achievements. Previous study findings revealed that AR had a moderate effect on academic achievement in earth and space sciences, physics, and mathematics, while the effect was low in biology. It also had a minor impact on broad fields such as information and communication technologies and education (Garzón & Acevedo, 2019). It has been reported that AR affected academic achievement more in disciplines where abstract concepts are instructed. Since actual objects were employed in our study, the low effect size was acceptable. The analysis of the differences between the pre- and post-test learning achievement scores in all groups revealed that the learning achievements of the students in the AR group were higher when compared to the SM and RE groups, the learning achievements of students in the RE group were higher when compared to the SM group. In contrast to our study findings in the literature, students' learning achievements in AR-assisted learning environments in different disciplines were better when compared to conventional instruction (Gül & Şahin, 2017; Ibáñez et al., 2020; Şahin & Yılmaz, 2020; Yip et al., 2019), and it has been reported that the effect was moderate (Batdı and Talan, 2019; Chang et al., 2022; Garzón and Acevedo, 2019; Küçük-Avcı et al., 2019; Özdemir et al., 2018). Similarly, it was reported that AR was more effective on learning achievement when compared to SM (Aldalalah et al., 2019). The positive effect of AR on learning achievement could be due to the employment of new technologies (first time exposure to AR). The inclusion of the students in different learning environments could help them acquire knowledge more effectively. Integration of new technologies into educational environments increased active participation in the class and student interest and facilitated learning (Bacca Acosta et all., 2014; Godwin-Jones, 2016; Hsiao et al., 2016; Ibáñez et al., 20120 Vermeulen & Buuren, 2013). The effect could also be due to the realistic, effective, efficient and interesting learning environment provided by AR systems. Simulated learning environments allow students to practice at their own pace and based on their skills, leading to a more flexible learning environment when compared to physical learning environments (Krueger, 1993; Zacharia & Olympiou, 2011). AR system features such as simultaneous virtual and real objects, high interaction and hands-on experiences also play a key role in academic achievements (Hsiao et al., 2016; Lai & Chang, 2021).

In the analysis of the three environments based on psychomotor skills, a statistically significant difference was determined between the pre-test and post-test psychomotor skill scores of the groups. The effect was moderate in the AR, SM and RE group. Thus, effects of the augmented reality, simulation or real-life experiences in ICT course learning environment were similar on the psychomotor skills of the students. The acquisition of psychomotor skills is critical in certain areas. Garzón and Acevedo (2019) reported that it could have higher effects in engineering, manufacturing

and construction education when compared to other fields. It was reported that AR was more effective in learning complex and difficult psychomotor skills such as physical education (Chang et al., 2020), music (Orman et al., 2017), maintenance and repair (Chiang et al., 2022; Eswaran et al., 2023; Wagner et al., 2023). Thus, the field and topic selected in the research are important. Studies demonstrated that AR was effective in procedural tasks that improve psychomotor skills (Mourtzis et al., 2020, Webel et al., 2013; van Lopik et al., 2020). This could be due to the association of AR with real objects and 3D images. The biggest advantage of AR was that it allowed interaction with real-world objects and simultaneous access to virtual information for reference. Realistic conditions could easily be created with AR using audio, video, links and text in a 3D object. In this realistic environment, students could repeat certain tasks several times. It allows the development of movement patterns and psychomotor skills as the students repeat certain tasks. The psychomotor skills begin to develop when the task is performed for the first time (Webel et al., 2013). Thus, students could acquire direct experiences similar to those in the real world (Khan et al., 2023). AR could reduce psychomotor errors (Blattgerste et al., 2012; Uva et al., 2018; Vanneste et al., 2020) and student stress during novel tasks (Vanneste et al., 2020). Thus, it could reduce mistakes since the learners feel safer. AR allows inactive students in learning due to individual differences to participate more. It contributes to the development of psychomotor skills by allowing students to learn by doing and experiencing. AR technology is immersive, ensuring the participation of students and facilitating learning by doing (Chiang et al., 2022), leading to an almost real-life experience. Similarly, the psychomotor skill scores of the students who practiced with SM were higher when compared to the RE group. Simulation has several benefits for students who learn psychomotor skills. It allows students to synthesize relevant components before working in a real environment. Like AR, SM also reduces student anxiety during practice and improves their confidence, satisfaction and self-efficacy in learning (Karataş & Tüzer, 2020; Lei et al., 2022; Üzen-Cura et al., 2020). Since real environments are imitated in SM, students are expected to apply learned knowledge in simulations easily when compared to real environments (Wilford & Doyle, 2006). The overall findings suggested that AR and SM could improve university students' psychomotor skills in the ICT course, similar to the real-life setting.

In conclusion, the benefit of real-life experiences for learning outcomes has been documented in several studies. However, when factors such as student profiles, crowded classrooms, technological advances, natural disasters, etc. are considered, the conventional method can not meet the requirements and the students can not practice. Thus, solutions that would meet student requirements, allow practice, and be equivalent to real-life experiences are needed. The present study was designed due to meet this requirement. The study findings demonstrated that learning environments assisted by augmented reality and simulation applications were at least as effective as learning environments that offer real-life experiences in terms of learning achievements and psychomotor skills. Chang et al. (2022) reported that augmented reality-assisted learning environments were better than other environments in learning achievements and psychomotor skills. Because the realistic conditions provided by AR allow the students to acquire experiences similar to the real world. Thus, the present study concluded that augmented reality or simulation applications could be employed in learning environments where real-life experiences were not available.

The present study findings should be interpreted based on certain limitations and revised based on the recommendations. Initially, the study was designed as a media comparison, and is limited to concurrent simulation, augmented reality, and real object use as mentioned in Milgram and Kishino's (1994) reality-virtual reality continuum. Future studies could compare other technologies used in AR and other environments (Augmented Virtuality, Virtual Environment). Also, value-added studies should be conducted instead of media studies. In these studies, a variable is investigated by comparing different variations of the same technology (Buncher et al., 2021). Different learning environments could affect learning outcomes differently. Thus, learning outcomes should be investigated with different learning strategies in AR or SM environments. For example, a study could be planned based on learning environments and learner traits. Second, learning achievements and psychomotor skills were limited to learning outcomes in the present study. Several studies have evidenced that AR supports learning. However, since the number of studies on psychomotor skills is limited, future value-added studies could be conducted on this variable. Thus, the effects of mobile AR and traditional AR on psychomotor skills could be investigated. Also, the effect of the learning

environment on knowledge retention should be investigated. The third limitation of the study was the limited sample size (63 students). One of the parameters that directly affects the significance of the findings is the sample size. The sample size could affect statistical strength and influence the results. A large sample increases the probability of meaningful findings (Keskin, 2020). Thus, it was recommended to repeat the study with a larger sample size. Fidalgo et al. (2023) reported that augmented reality was more effective on skill acquisition as well as academic achievement in virtual classrooms when compared to virtual classrooms that were not assisted by augmented reality in online education. Thus, augmented reality could have an important potential in distance education. The same learning outcomes could be investigated with different AR tools in online learning environments in future studies. The present study would assist future applications, instruction, and research. It would be beneficial for the students, who desire to improve themselves and their professional skills by practicing ICT course, teachers who desire to include current technologies in their instruction and employ alternative material in learning environment, and researchers who desire to conduct research on educational technologies, interested in the educational aspects of computers (computing), and educational technologists.

Acknowledgment

Ethics statement: In this study, we declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that we do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, we declare that there is no conflict of interest between the authors, which all authors contribute to the study, and that all the responsibility belongs to the article authors in case of all ethical violations.

Author Contributions: “Conceptualization, author 1 & author 2; methodology, author 1 & author 2; analysis, author 1 & author 2; writing, review and editing, author 1 & author 2; supervision, author 2.

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Institutional Review Board Statement: An ethics committee decision was taken by the Ethics Committee of the Rectorate of xxxx University with document number E-61923333-050.99-85962.

Data Availability Statement: Data generated or analyzed during this study should be available from the authors on request.

Conflict of Interest: Authors should declare that there is no conflict of interest among authors.

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