e-ISSN: 2148-8940

e-Kafkas Journal of Educational Research

KAFKAS UNIVERSITY 1992

DEDE KORKUT FACULTY OF EDUCATION 1998

e-KJER

Year
2024

Volume | Issue
11(1)

*KAFKAS UNIVERSITY
e-Kafkas Journal of Educational Research
Volume 11, Number 1, April 2024
e-ISSN: 2148 – 8940

Owner
Dr. Murat TAŞDAN

Editor in Chief
Dr. Ali İbrahim Can GÖZÜM

Editors
Dr. Ali SAĞDIÇ, Kafkas University, Turkey
Dr. Gökhan YİGİT, Kafkas University, Turkey
Dr. Tuğba BARUTCU, Kafkas University, Turkey
Dr. Hüseyin YILMAZ, Kafkas University
Dr. Stamatis PAPADAKİS, University of Crete, Greece
Dr. Şəhla ƏLİYEVA, State Pedagogy University, Azerbaijan
Dr. Madona MİKELADZE, Şota Rustaveli Devlet University, Georgia
Dr. Lucia MİKURCİKOVA, Prešov University, Slovakia
Dr. Alois GHERGUT, Alexandru Ioan Cuza University, Romania
Dr. Jana KOŽÁROVÁ, Prešov University, Slovakya
Dr. Lisa KAHLE- PİASECKİ, Louisville University, USA
Dr. Monika KAMPER-KUBANSKA, Włocławek University, Poland
Dr. Karolina KASZLİNSKA, Włocławek University, Polonya
Dr. Sarkhan JAFAROV, Khazar University, Azerbaijan

Field Editors
Dr. Elvan ŞAHİN, Middle East Technical University, Turkey
Dr. Fadime ULUSOY, Kastamonu University, Turkey
Dr. Betül TEKEREK, Kahramanmaraş Sütçü İmam University, Turkey
Dr. Adalet KANDIR, Gazi University, Turkey
Dr. Eren Halil ÖZBERK, Trakya University, Turkey
Dr. Sirri AKBABA, Üsküdar University, Turkey
Dr. Tuğba TÜRK KURTÇA, Trakya University, Turkey
Dr. Uğur AKIN, Tokat Gaziosmanpaşa University, Turkey
Dr. Nesrin ÖZTÜRK, İzmir Democracy niversity, Turkey
Dr. Yusuf UYAR, Gazi University, Turkey
Dr. Banu ÖZDEMİR, Sakarya University, Turkey
Dr. Mehmet Barış HORZUM, Sakarya University, Turkey
Dr. Orhan AYDIN, Erzincan Binali Yıldırım Üniversitesi, Turkey
Dr. İlker ÖZMUTLU, Tekirdağ Namık Kemal University, Turkey
Dr. Nimet KESER, Çukurova University, Turkey
Dr. Onur ZAHAL, İnönü University, Türkiye

Dil Danışmanları/Language Controllers
Ahmet Baran Perçin, Ardahan Üniversitesi, Turkey
Gökhan YİGİT, Kafkas Üniversitesi, Turkey
Merve BAŞKUTLU, Kafkas Üniversitesi, Turkey
Erol Poyraz, Kafkas Üniversitesi; Turkey

Web Adress : http://dergipark.gov.tr/kafkasegt
E-mail : editor.kafead@gmail.com
Adress : Kafkas University Dede Korkut Education Faculty Center Campus 36100-Kars

e-Kafkas Journal of Educational Research is indexed by TR-Dizin, H. W. Wilson Databases, EBSCO Central & Eastern Eurooean Academic Source / Database Coverage List, EBSCO Education Source Ultimate Database Coverage List, Index Copernicus, DOAJ, Sherpa Romeo, Erih Plus, Türk Eğitim Indeksi, Sobiad, Scilit, Ulrichsweb, Journal Tocs, WorldCat, BASE, Catalogue SUDOC and Dimensions.

e-Kafkas Journal of Educational Research is a peer-reviewed journal published three times a year.

Table of Content

Editorial

Dear readers and researchers,

We are proud and honored to present you the first issue of the eleventh volume of the eKafkas Journal of Educational Research (e-KJER) as a result of the devoted and disciplined work of the new editorial board with international and national participation, field editors, reviewers, and journal team in April 2024. e-KJER is proud to share that it has been accepted by new indexes such as EBSCO and H.W. Wilson Databases, providing that the journal is on the way to become one of the significant journals in Educational science. This issue contains 15 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.

- Oğuz, E. (2024)'s study challenges misconceptions about online education by demonstrating its effectiveness in teaching English as a Foreign Language (EFL) writing skills. Sixteen undergraduate students received online EFL writing lessons for two months via Google Classroom. Results show that participants experienced improved feedback quality and quantity, enhanced interaction, and better group work, leading to superior learning outcomes. This study underscores the transformative potential of online platforms in shaping the future of education.
- Mataboge, S.K.C., & Mahlangu, V.P. (2024).conducted a study to determine the role of principals on empowering school management teams. Data from 55 principals in South Africa's Tshwane-West District was collected via questionnaire, literature review, and interviews. Key findings highlight the importance of principals possessing attributes such as strong communication skills, a clear vision, and a focus on teaching and learning. However, shortcomings include a lack of assertiveness and reluctance to share power. The implications extend to policymakers and schools, offering insights to strengthen policies and practices for better school performance.
- In the study of Selçuk, Karakaya & Yılmaz (2024), the shift from TEOG to LGS in 2018 introduced new-generation items in education. This study aimed to gauge teachers' opinions on these items. With 192 participants from 23 fields, a mixed-method strategy was employed. Results showed a split among teachers, with 39% denying and 61% acknowledging new-generation items. Notably, no significant correlation was found between teachers' backgrounds and their perception of these items. Qualitative analysis revealed seven themes, emphasizing the focus on formal reading comprehension and higher-order thinking skills in new-generation items.
- Türker-Biber, B., & Saralar-Aras, İ. (2024) examines how the RETA model affects senior-grade pre-service teachers' STEM attitudes. With 65 participants from a Turkish public university, the research used a STEM attitude scale, RETA-based lesson evaluation rubric, and interviews. Results showed a positive correlation between RETA and effective lesson planning. Participants expressed increased interest in innovative teaching strategies and 21st-century skills integration. Post-course assessments indicated improved attitudes, recognizing RETA's potential to promote equity in teaching. This research offers insights for pre-service teachers to enhance their pedagogical approaches with digital technologies.
- In the study of Ertaş, H. & Bilici, K. (2024), the researchers aimed to enhance third graders' understanding of the nature of science using children's literature. Eighteen third graders (12 females, 6 males) aged 8-9 participated. Data were collected through questionnaires, reflective journals, and interviews over seven weeks. Students engaged in nature of science activities and read literature emphasizing these concepts. Initially, students held

misconceptions, but after the intervention, their understanding improved significantly. Storytelling proved effective in enhancing their grasp of the nature of science.

- In the study of Kılıç, M. E, Kılıç. M. Y. & Uzunyaylalı, M. E. (2024), the researchers explores how ethical leadership affects organizational justice, citizenship, and job satisfaction among 488 teachers. Data collected using various scales confirmed their reliability. Structural equation modeling tested research hypotheses, showing that ethical leadership positively influences organizational justice, citizenship, and job satisfaction. Results indicate the importance of ethical leadership in shaping organizational outcomes.
- Karabulut, N. & Balcı, A. (2024) investigated the link between organizational vulnerability and self-confidence levels among teachers in public secondary schools in Ankara. Using a relational survey and causal comparative models, data were collected from 377 teachers sampled from nine central districts. Findings showed that teachers exhibited higher levels of defenselessness compared to sadness, incompetence, and intolerance. Organizational vulnerability did not significantly vary by gender, school type, professional experience, or union membership, but did by education level and branch. Self-confidence did not significantly differ by gender, union membership, education level, or school type, but did by branch and professional experience. There was a low, negative correlation between incompetence and intrinsic and extrinsic self-confidence. However, self-confidence did not significantly predict organizational vulnerability.
- Hamiden Karaca, N., Çelik, F. N. & Kaya,Ü. Ü. (2024) examine the relationship between mothers' perceptions of risky play in preschoolers and children's self-concept, with a focus on gender differences. Using a relational survey model, data were collected from 257 volunteer children and their mothers. Results showed a positive correlation between children's self-concept and mothers' perceptions of risky play, particularly in terms of beliefs about risky play. Gender differences were observed, with girls' self-concept correlating significantly with various aspects of risky play, while boys' self-concept correlated mainly with beliefs about risky play. Suggestions based on the findings were provided.
- In the study of Karaduman, T. & Akman, B. (2024), this comprehensive review, analyzing 36 studies, delves into the Technological Pedagogical Content Knowledge (TPACK) framework across diverse educational environments. Employing the PRISMA method, the review primarily examines pre-service and in-service teachers, emphasizing the intricate nature of TPACK research. Through a thorough examination, the review considers demographic factors, technological aspects, and methodological strategies, revealing a range of approaches, characteristics, and emerging trends. Notably, the majority of studies utilized non-probability sampling methods, underscoring the need for standardized sampling techniques to facilitate cohesive comparisons and synthesis of results. The findings underscore the importance of refining research inquiries and data management practices to ensure the accuracy and dependability of outcomes. Moreover, future investigations should continue exploring the intricate connections between TPACK and instructional methodologies, alongside its potential influence on student learning outcomes.
- Damar, M. (2024) examines how the language skills of second-grade students, who underwent initial literacy education via distance learning during the pandemic, were affected. Through interviews with 18 teachers who transitioned from teaching first grade remotely to second grade in the subsequent year, the study found that students' listening, speaking, reading, and writing skills were negatively impacted by the limitations of distance education. This led to deficiencies in their second-grade performance compared to previous years.
- In the study of Bozan, M. A. (2024), the researcher explores how reading and comprehension activities are conducted in primary schools in Turkey and their impact on students. It involved 207 students and eight teachers, gathering data through comprehension tests and

teacher interviews. Results show that teachers often use rewards to promote reading habits and implement activities to enhance comprehension skills. Notably, 70.53% of students struggled with comprehension questions, highlighting a significant issue.

- Kaya, N., Yağan, F., Çenesiz, G. Z. & Taşdelen Karçkay, A. (2024) examines how teaching motivation and life satisfaction among teacher candidates are related, and whether psychological well-being mediates this relationship. 618 volunteer teacher candidates participated, mostly female (54.4%). Results show that teaching motivation, psychological well-being, and life satisfaction are positively correlated. Teaching motivation and psychological well-being predict life satisfaction, with psychological well-being partially mediating the relationship. Together, teaching motivation and psychological well-being explain about 60% of the variance in life satisfaction. Improving teacher candidates' psychological well-being could strengthen the link between teaching motivation and life satisfaction.
- Altınkaynak, H. & Özel, Ö. (2024) investigated how the Quiver app affects science learning in preschoolers. Using an experimental design, 40 children from two kindergartens were randomly assigned. Pre- and post-tests, conducted with five checklists, measured learning before and after interventions. Analysis showed significant improvement in science learning with augmented reality compared to traditional methods, particularly in topics like the water cycle and plant life cycles. No significant difference was found in knowledge of frog life cycles and sea creatures between experimental and control groups.
- Yaprak, Z. (2024) investigated how reflecting on teaching experiences helps future teachers improve. Ten student teachers used tools like a self-assessment app and video blogs to reflect on their classroom practice. The researchers analyzed both numerical data (like how often they reflected) and written discussions to see how reflecting with others influenced the student teachers. The results showed that reflecting regularly with classmates helped them better understand their own teaching style, beliefs, and the classroom environment. This collaborative reflection made them more confident in reflecting, sharing their experiences, and applying what they learned to solve problems in their classrooms.
- Ece Bülbül, N. & Çuhadar, S. (2024) conducted a review research on children with ADHD that often struggle in school. Studies suggest this might be linked to difficulties understanding spoken information (listening comprehension) and reading. This review explores how ADHD might impact these skills, which are both crucial for learning to read well.

We are honored to see that the interest of valuable researchers towards our journal is increasing day by day. It is extremely important that the articles submitted to our journal are original and of high quality. As a matter of fact, the primary goal of our journal is to publish qualified research in the field of education in accordance with scientific ethical values. In line with this goal, our journal is indexed by important indexes such as Ulakbim TR Index, EBSCO (Discovery Service Indexes), Central & Eastern Eurooean Academic Source / Database Coverage List, Education Source Ultimate Database Coverage List / EBSCO, H. W. Wilson Databases (Education Full Text Database Covarage List), DOAJ, Sharpe Romeo. In addition, our journal continues with all efforts and determination to meet the ERIC and SSCI indexing conditions. In this regard, we kindly request that valuable authors take our sensitivity into account. We would like to thank dear readers and researchers once again for their interest. Wishing that 2024 will bring bright days to our country and to all humanity, we celebrate April 23 National Sovereignty and Children's Day and wish all children and humanity to live in peace and tranquility.

Best regards,

Dr. Ali İbrahim Can GÖZÜM

Editor in chief, e-KJER

References

Altınkaynak, H. & Özel, Ö. (2024). Augmented reality in early childhood education: The effect of quiver application on science learning. *e-Kafkas Journal of Educational Research, 11*(1), 211-226. doi:10.30900/kafkasegt.1367709

Bozan, M. A. (2024). We read but how: research on reading and reading comprehension skills. *e-Kafkas Journal of Educational Research, 11,* 178-192. doi: 10.30900/kafkasegt. 1370135

Damar, M. (2024). Teachers' opinions on second grade language skills of students who learned initial literacy through distance education. *e-Kafkas Journal of Educational Research, 11*, 160-177. doi: 10.30900/kafkasegt. 1295965

Ece Bülbül, N. & Çuhadar, S. (2024). Listening comprehension skills in children with attention deficit and hyperactivity disorder: A review study. *e-Kafkas Journal of Educational Research, 11,* 243-263. doi: 10.30900/kafkasegt. 1434673

Ertaş, H. & Bilican, K. (2024). Developing primary school students' views on the nature of science by storytelling. *e-Kafkas Journal of Educational Research, 11,* 65-79. doi:10.30900/kafkasegt.1448983

Hamiden Karaca, N., Çelik, F. N. & Kaya,Ü. Ü. (2024). Investigation of the relationship between mothers' perceptions of risky play and their children's self-concepts. *e-Kafkas Journal of Educational Research, 11,* 124-140. doi: 10.30900/kafkasegt.1312953

Karabulut, N. & Balcı, A. (2024). The relationship between teachers' levels of organizational vulnerability and self-confidence. *e-Kafkas Journal of Educational Research, 11,* 95-123. doi: 10.30900/kafkasegt.1411532

Karaduman, T. & Akman, B. (2024). A Comprehensive review of technological pedagogical content knowledge (TPACK). *e-Kafkas Journal of Educational Research, 11,* 141-159. doi:10.30900/kafkasegt.1282126

Kaya, N., Yağan, F., Çenesiz, G. Z. & Taşdelen Karçkay, A. (2024). The mediating role of psychological well-being in the relationship between motivation to teach and life satisfaction *e-Kafkas Journal of Educational Research, 11,* 193-210. doi: 10.30900/kafkasegt. 1370135

Kılıç, M. E, Kılıç. M. Y. & Uzunyaylalı, M. E. (2024). The effect of ethical leadership on organizational justice, organizational citizenship and job satisfaction. *e-Kafkas Journal of Educational Research, 11,* 80-94. doi:10.30900/kafkasegt.1321880

Mataboge, S.K.C., & Mahlangu, V.P. (2024). Attributes and actions of principals as instructional leaders in empowering school management teams (SMTs) in schools. *e- Kafkas Journal of Educational Research, 11,* 20-32. doi: 10.30900/kafkasegt.1192563

Oğuz, E. (2024). Using an online teaching platform to improve corrective feedback practices in EFL writing lessons. *e-Kafkas Journal of Educational Research, 11,* 1-19. doi: 10.30900/kafkasegt. 1351339

Selçuk, Karakaya & Yılmaz (2024). Examination of Teachers' Opinions on The Concept of New Generation Item According to Some Variables. *e-Kafkas Journal of Educational Research, 11,* 33-47. doi:10.30900/kafkasegt.1435336

Türker-Biber, B., & Saralar-Aras, İ. (2024). Transforming stem education: The impact of the reta model on pre-service teachers' attitudes and lesson planning. *e-Kafkas Journal of Educational Research*, *11*, 48-64. doi:10.30900/kafkasegt.1412764

Yaprak, Z. (2024). The use of vlogs and collaborative reflection in teacher education. *e-Kafkas Journal of Educational Research*, *11*, 227-242. doi: 10.30900/kafkasegt.1318084

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

Using an Online Teaching Platform to Improve Corrective Feedback Practices in EFL Writing Lessons

Enis Oğuz[1]

To cite this article:
Oğuz, E. (2024). Using an online teaching platform to improve corrective feedback practices in EFL writing lessons. *e-Kafkas Journal of Educational Research, 11*, 1-19. doi: 10.30900/kafkasegt. 1351339

Research article **Received:** 28.08.2023 **Accepted:** 01.02.2024

Abstract

Distance education has become a prominent part of the education system around the globe in recent years. The limitations and problems encountered during online lessons have made teachers and administrators overlook the many benefits that distance education can offer. Research in applied linguistics has suggested that reduced feedback opportunities and less interaction are essential problems in EFL writing lessons due to the essential role of corrective feedback in second language acquisition. Since distance education is usually associated with such limitations, online EFL writing lessons are believed to be less effective. In an attempt to dispel this misconception, this study shows that not only can online lessons match the efficiency of traditional face-to-face lessons, but they can actually become more efficient in teaching writing to EFL students through the utilisation of online teaching platforms. Sixteen undergraduate students from a state university received online EFL writing lessons for two months using one of these platforms, Google Classroom. A questionnaire was created to investigate the benefits of using this online platform for online EFL writing lessons. The results were interpreted by calculating the average means for each questionnaire section and examining participant answers to open-ended questions. Overall, the participants declared that the use of Google Classroom improved both the quality and quantity of feedback, resulting in better learning outcomes.

Keywords: EFL writing lessons, second language acquisition, online teaching platforms.

[1] Corresponding author, enisgoguz@gmail.com, Middle East Technical University

Introduction

The devastating earthquakes that impacted millions of people in Turkey led universities to switch to distance education in the 2022–2023 academic year. Such abrupt transition posed great challenges for both instructors and students alike; during the distance education period in the pandemic, students were less motivated to participate or even to turn on their cameras (Güven, 2023), the interaction between the teacher and students decreased, and monitoring student work became much more difficult (Tas et al., 2021). These problems have become more prominent in English as a Foreign Language (EFL) writing classes, which already require significant individual effort and self-management in face-to-face lessons. While keeping track of student writing is already difficult in traditional writing lessons, the challenge has the potential to become even bigger due to the aforementioned limitations of online lessons if instructors are to carry traditional methods of teaching into online classrooms.

The lack of interaction is an essential threat to the quality and quantity of corrective feedback, which is regarded as an important tool in EFL writing classes (Ferris, 2004). Without the utilisation of corrective feedback, implicit corrective feedback in particular, students would not benefit from the problem-solving-like processes involved in self-correction (Bitchener & Knoch, 2008) that result in more cognitive effort (Khadawardi 2020) and better learning (Baleghizadeh & Dadashi, 2011; Ferris, 2004). Combined with the lower student motivation and participation attributed to distance education, inefficient feedback practices are likely to decrease the efficiency of learning.

Although decreased interaction and feedback are essential obstacles in teaching EFL writing, the literature suggests that using online teaching platforms can overcome the shortcomings of online writing lessons and improve writing skills (e.g., Yim et al., 2017). Despite the great potential of such platforms, however, the number of studies investigating this phenomenon is limited. To help overcome this limitation, this study investigated the efficiency of using an online teaching platform, Google Classroom, in online EFL writing lessons. By exploring student perceptions regarding the use of online teaching platforms, I focused on the potential benefits of using these tools in terms of feedback efficiency, which could improve learning in turn. The secondary objectives of the study were to investigate potential improvements in student motivation and to examine student attitudes towards the efficiency of Google Classroom and its applicability to face-to-face lessons. The following research questions were asked in the study:

1) How do EFL students perceive using online teaching platforms during writing lessons in terms of feedback, interaction, and group work?
2) To what extent do EFL students believe that the use of online teaching platforms is effective in improving L2 writing?
3) How motivated do EFL students feel when using online teaching platforms in EFL writing lessons?
4) Do EFL students believe that online teaching platforms can also be used in face-to-face writing lessons?

The findings are significant in showing that students find EFL writing lessons conducted on online teaching platforms to be more effective in terms of feedback practices, interaction, learning process and outcomes, and student motivation.

Literature Review

The pandemic introduced most people to distance education as universities and schools switched to online classes all over the globe. This sudden change to distance education was challenging for a myriad of reasons, including but not limited to students with their cameras off (Castelli & Sarvary, 2021), limited contact with students resulting in decreased chances for providing motivation and support (Mikušková & Verešová, 2020), and unreliable and unreliable internet connections (Wallace et al., 2021). The Turkish context was no exception when it came to the limitations of distance education. Teachers faced difficulties with learning online tools and using the provided materials, which they referred to as inadequate, to carry out their teaching (Tas et al., 2021). They also experienced problems

during online lessons due to technical problems, low attendance, and low motivation (Güven, 2023). Furthermore, the absence of face-to-face interaction and real-time monitoring of student activities made it hard for teachers to assess learning and provide feedback, most of whom found their assessment and evaluation during online lessons inadequate (Tas et al., 2021). Similar to teachers, students in Türkiye also faced difficulties during distance education. In addition to feeling isolated due to being deprived of their social school environment (Temiz, 2020), students found it difficult to feel motivated and continue their studies without directly interacting with their teachers (Durak & Çankaya, 2020).

Despite its challenges, distance education has also brought certain benefits, such as improved teamwork and collaboration (Ece & Bastas, 2022) and a positive attitude towards online teaching tools (Krstić & Radulović, 2021). Online teaching platforms, such as Google Classroom, became helpful during the pandemic by facilitating the adoption of Information and Communications Technology (ICT) learning (Ali & Maksum, 2020), and students welcomed the use of such platforms due to their ease and utility (Fauzi et al., 2021). Teachers might assign certain learning tasks using such platforms since they are especially useful for "flipping the classroom" (Cummings, 2016), giving the teacher more opportunities to focus on interactive tasks during the lessons. In addition, the use of online teaching platforms encourages students to participate more and boosts learning (Heggart & Yoo, 2018).

In online EFL writing lessons, the advantages or disadvantages of distance education can be amplified depending on how lessons are conducted. If teachers carry out online writing lessons in a similar way to traditional writing lessons, which rely mostly on individual effort and engagement, interaction might become extremely minimal or even absent. Teachers usually provide written feedback for writing tasks after collecting student papers and allow students to revise their texts later on. This lack of interaction is especially concerning since teacher or peer-support might be essential in self-correction; students should attempt to revise their mistakes in class as they might need such assistance (Ferris 2004). Combined with the previously mentioned problems of low motivation and attendance (Güven, 2023; Mikušková & Verešová, 2020), the reduced interaction problem in writing classes might be further enhanced in online lessons.

The benefits of distance education can also become most prominent in writing lessons when online tools are used correctly. One way to promote the advantages is to use online teaching platforms such as Google Classroom, Edmodo, and Moodle. Students find platforms like Google Classroom easy to use in writing classes (Syarifah, 2021), and the tasks are easier to submit without the physical need for paper (Ali & Maksum, 2020). Adopting a blended learning environment through online teaching platforms improves the English ability of EFL learners, especially their writing and reading skills (Warman, 2021). Teachers can create a rubric for each task on an online teaching platform (Sharda & Bajpai, 2021), making it easier for students to understand the required objectives for writing tasks. EFL students learning academic writing in English find the features of Google Classroom practical, and their writing performance shows a positive correlation with their usage of the online platform (Rosyada & Sundari, 2021). Self-efficacy, which can be defined as a person's self-belief in their competency for accomplishing a task, is also improved in EFL academic writing classrooms carried out with online teaching platforms (Zhang, 2018). Even secondary school students report that using these platforms boosts their self-confidence and motivation to write more qualified essays (Shelvam, 2022). By using third-party addons, the already high functionality of online teaching platforms like Google Classroom can be further enhanced (Crane, 2016).

Among the many advantages of using online teaching platforms, increasing the quality and quantity of feedback is perhaps the most crucial one. Corrective feedback has been regarded as an inseparable part of L2 writing education (Ferris, 2004), since it can improve student writing and decrease errors over time (Khadawardi 2020), including grammatical and lexical errors (Chandler, 2003). Direct and indirect feedback can both improve writing performances (Van Beuningen et al., 2008), and this boost is shown to have the same effect two months later in a delayed post-test (Bitchener, 2008). Even a single corrective feedback session sustains its positive effects a month later, which suggests that regular feedback sessions might result in even greater improvement (van Beuningen et al. 2012). Although Truscott (2004) argues that corrective feedback can be detrimental as students might avoid complex

structures and suggests additional writing practice instead of providing feedback, Van Beuningen et al. (2012) showed that their sample of students did not simplify their writings after corrective feedback, and extra writing practice was not more effective than feedback practices. Therefore, enhanced feedback practices through online teaching platforms can improve the writing skills of EFL students, as corrective feedback is shown to be a useful practice.

The ways online teaching platforms can enrich feedback practices are varied and ample. Teachers can use videos and audio recordings to provide feedback along with written feedback on online teaching platforms, such as Google Classroom (Johnson & Cooke, 2016). Similarly, these tools can be used for tracking student progress and increasing interaction between teachers and students (Sharda & Bajpai, 2021); the interactive features of such platforms allow teachers to give instant feedback as students continue writing, allowing students to attempt self-correction while the error-making process is still fresh in their memory. This is especially useful in providing implicit feedback (Ebadi & Rahimi, 2019), which allows students to realise the type of mistake they made and become collaborators in their learning process (Bitchener, 2012; Mahmoud & Oraby, 2015). The benefits of using implicit feedback in writing lessons are apparent both in short term (Khadawardi 2020) and in long term (Ferris, 2006), and such indirect feedback can even result in better learning outcomes than explicit (or direct) feedback (Baleghizadeh & Dadashi, 2011; Ferris, 2004). The better learning outcomes are often attributed to the higher cognitive effort stemming from the attempt at self-correction (Khadawardi 2020), which involves problem solving (Bitchener & Knoch, 2008). The advantage of online teaching platforms over traditional ones is the increased amount of interaction in providing implicit feedback; students and teachers interact more efficiently on online platforms, allowing better scaffolding by creating a "zone of proximal development" (Vygotsky 1978). Although dialogues in the form of scaffolding between teachers and students have the potential to improve writing skills (Williams, 2002), such back and forth interaction for each student might be challenging or even impossible in traditional writing classrooms, especially in crowded ones. By using an online teaching platform, teachers can quickly examine student work as they continue to write and provide feedback through codes, markings, and comments.

Online teaching platforms also ease the detection of the need for feedback and correction. Students who find it difficult to ask questions to their teachers in face-to-face classrooms can do this using online teaching platforms without feeling stressed (Suryani et al., 2021). Even if such students are still reluctant to ask their questions, these platforms make it easier to identify the students who are experiencing difficulties with certain tasks (Ali & Maksum, 2020). While students can benefit from the comfort of staying anonymous, teachers can see the contributions made by each student by using revision history (Woodrich & Fan, 2017), allowing for keeping track of student error-correction patterns and development.

Improving peer feedback and collaboration is another way of increasing both the quality and quantity of feedback in online writing lessons. Using online office tools in synchronous collaborative writing, students show more balanced participation and group work, thus increasing their quality of writing (Yim et al., 2017). In addition to increased student participation and engagement, online teaching platforms like Google Classroom allow students to improve flexible strategies in writing with their peers (Cummings, 2016), and such flexibility is likely to increase the efficiency of peer feedback and make students more positive about using this type of correction.

Based on this literature review, the potential benefits of using online teaching platforms for online writing lessons can be summarised as follows:

- Online teaching platforms allow easy assignment submission without the need for paper (Ali & Maksum, 2020; Syarifah, 2021).

- Such platforms have the potential to increase student participation, engagement, motivation, and self-efficacy (Cummings, 2016; Heggart & Yoo, 2018; Rosyada & Sundari, 2021; Shelvam, 2022; Zhang, 2018).

- These platforms keep track of the changes made to a document and store multiple versions of the same assignment (Woodrich & Fan, 2017). This way, teachers and students can see the development of a task through subsequent versions.

- It is easy to integrate online teaching platforms such as Google Classroom with other writing tools and built-in addons (Crane, 2016), which allows flexibility and creativity in planning writing lessons along with more efficiency.

- Grading and creating rubrics are practical on online teaching platforms (Sharda & Bajpai, 2021). Students can see the rubric for a certain assignment and complete the task according to the given criteria.

- The implementation of online teaching platforms into online writing lessons allows for giving comments and feedback in multiple ways, including but not limited to comments, colour codes, and videos (Ebadi & Rahimi, 2019; Johnson & Cooke, 2016). Videos and other multimedia materials can also be used for the presentation of the lesson (Saini & Goel, 2020).

- Teachers and students can collaborate in real-time, which leads to a more efficient and interactive feedback process during writing lessons (Cummings, 2016; Suryani et al., 2021; Yim et al., 2017). In particular, more implicit feedback can be provided for each student, resulting in better error correction and learning (Baleghizadeh & Dadashi, 2011; Bitchener & Knoch, 2008; Ferris, 2006; Khadawardi, 2020).

- Using online teaching platforms in online writing classes can improve learning outcomes, including the quality of writing (Rosyada & Sundari, 2021; Warman, 2021; Yim et al., 2017).

Despite the abundance of findings in favor of using corrective feedback and online teaching platforms, the delivery of this feedback through such platforms has been mostly asynchronous in the few available studies (e.g., Rosyada & Sundari, 2021). As shown above, this is unfortunate since implementing the practice of scyhronous feedback during online EFL lessons could overcome the limitations associated with distance education and bring additional advantages over traditional classrooms. First, providing implicit feedback interactively during writing lessons can allow students to realize their mistakes immediately and adjust their decision making processes when using similar structures, as they would still remember how they committed the error and become an active collaborator in their own learning (Bitchener, 2012; Mahmoud & Oraby, 2015). This would also help them to engage in a problem-solving process, which is associated with better learning outcomes (Bitchener & Knoch, 2008). Additionally, teachers can provide further scaffolding for students as they attempt to correct their own mistakes, providing immediate and interactive guidance (Ferris 2004). Acknowledging the importance of such advantages, this study focuses on student perceptions about using an online teaching platform to improve the quality and quantity of feedback during online EFL writing lessons and whether such improvement would enhance writing processes and learning outcomes. Additionally, I investigated student motivation and attitudes towards using online teaching platforms and implementing them into traditional lessons.

Method

The current descriptive study aimed to obtain preliminary results from a single EFL class and pave the way for larger-scale studies using the same questionnaire by using descriptive statistics and quotations from student answers rather than more complicated statistical and qualitative analyses. The study is quantitative in nature, as it mostly relied on quantitative data (descriptive statistics) to reveal a general pattern rather than investigating personal perspectives regarding a phenomenon using detailed quantitative analysis (Loeb et al., 2017). The ethical approval for the study was granted by the METU Human Research Ethics Committee.

Participants

Sixteen students (9 females) from Middle East Technical University participated in the study. The average age was 18.82 (SD: 1.13). The participants were from the same upper-intermediate level class in the School of Foreign Language Teaching; therefore, their L2 English proficiency was rated as upper-intermediate based on multiple English language tests applied by the university. They had all started learning English after the age of 7 through formal education, starting in the second grade of their primary schools. No problems were reported during the experiment with online teaching platforms and tools, as the participants were skilled in using technological tools. Participation was voluntary.

Materials

Google Classroom

Teachers using less-interactive tools might face the limitations experienced in online learning even more severely as a result of this shortcoming. Therefore, using effective tools and software in online lessons is of uttermost importance in online teaching. Google Classroom stood out as one of the most common solutions to overcome the limitations of online lessons, as the benefits of using online teaching platforms are abundant in the literature, specifically in teaching L2 writing (see the Literature Review above). The participants in the current study registered on this website using their email addresses and joined the online classroom using the class code.

Highlight addon tool

Besides increasing the amount and effectiveness of feedback, adopting an appropriate feedback strategy is also crucial in EFL writing lessons. As mentioned above, using implicit feedback strategies and making students realise their own mistakes has been proven to be beneficial for the learning process (Bitchener, 2012; Mahmoud & Oraby, 2015). I decided to adopt implicit corrective feedback by using colour codes, as students show positive attitudes toward implicit feedback provided in codes (Khadawardi, 2020). Google Classroom offers innumerable add-ons to improve the overall experience of the activities. In the current study, I found the "Highlight Tool" to be a perfect match for my goals, as this tool automatically gives the labelling key and lists the errors they have made (Appendix 2).

Questionnaire

Creating a questionnaire based on Likert-Scale items can be tricky due to the acquiescence effect, which can be described as the tendency to give positive answers for all items (Hinz, 2007). It is essential to reverse some items in the Likert scales to prevent participants from giving high scores to all items (Colet, 2020), instead of creating all items in a way to declare positive attitudes (e.g., Google Classroom was useful in receiving peer feedback). Furthermore, items in such questionnaires should use positive language (e.g., avoiding the use of "not"), and the meanings of key vocabulary items should be revised in order to avoid a lack of comprehension in reading questions (Colet, 2020). Examining the literature regarding online teaching platforms, I created 11 different sections and 63 questions using Likert-Scale items. In the brainstorming phase, ChatGPT was used to generate ideas for questionnaire sections (OpenAI, 2023). In addition to Likert-scale items, I added two open-ended questions, asking the participants if they wanted to add any more advantages or disadvantages regarding using an online teaching platform, Google Classroom, in online EFL writing lessons. Four experts rated the relevance of questionnaire items for each section using a Content Validity Index (CVI). The indices of S-CVI/UA and S-CVI/Av were calculated as 0.94 and 0.98, respectively, signifying excellent content validity as the value of 0.78 or higher is considered as an indicator of good content validity with three experts or more (Polit et al. 2007). The Cronbach's alpha for the questionnaire was calculated as 0.95 after data collection (The reliability of this questionnaire should be investigated further in future studies with more participants.)

Data Collection and Analysis

I used Google Classroom in my online writing lessons in the second term for 2 months. I started the lessons with a presentation about the topic of that particular day, such as essay types, writing topic sentences, or creating a logical flow in essays. Following this presentation, students engaged in collaborative tasks (e.g., brainstorming and writing thesis statements). Since Google Classroom allowed both peer and teacher interaction at the same time, the quality and quantity of feedback increased during these writing activities. Group activities were followed by individual writing sessions, in which students wrote their essays on an individualised page, and I followed their whole writing process. This allowed me to give instant feedback using colour codes and comments. Although implicit feedback was the common form of feedback during the online sessions, such feedback was focused on particular errors so that the participants could attempt self-correction and ask further questions without feeling overwhelmed. Additionally, explicit feedback was provided for the errors that were too challenging for the students to correct immediately, in line with the suggestions of Ferris (2004). After the online

lessons, I provided feedback for all the errors in the essays, which allowed students to correct their own mistakes in their available time (Appendix 3).

In addition to grammar, paraphrasing, and vocabulary activities completed in the online sessions, students wrote three essays during the 2-month period. Each essay task required writing a different type of essay: The first task was an opinion essay, the second a problem-solution essay, and the third a cause-and-effect essay. This way, the students had the chance to improve their skills in writing different types of essays. Towards the end of the term, I asked the students to complete the questionnaire I created in Google Classroom. The participation was voluntary, and 16 students completed it. Before starting the questionnaire, the participants saw the meanings and uses of some key vocabulary items from the questionnaire since their comprehension was crucial to giving accurate answers.

All data observations, analyses, and figure generation were done using R (Version: 4.2.3; R Core Team, 2022) and the ggplot2 package (Version:3.4.2; Wickham, 2016). Since the design of the current study included only one group of participants without any pre-tests, statistical tests were not suitable for the collected data. Instead, I discussed the benefits of using Google Classroom by referring to descriptive statistics in the following subsections. The frequency table for the questionnaire answers is given in Appendix 1.

Findings

The average score for each section is calculated and examined. Figure 3 shows the average scores (out of 5) per section in the questionnaire, and the frequency table of the given is given in the Appendix.

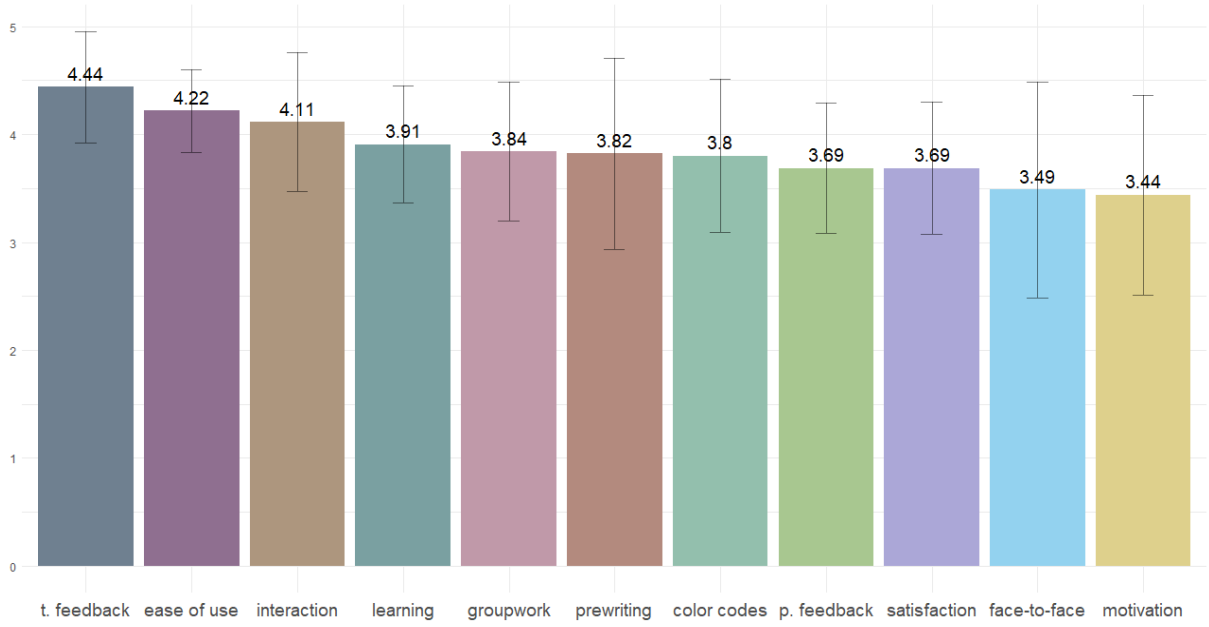


Figure 1. Average scores for each section of the questionnaire. Error bars show the standard deviations of the average scores.

Higher scores show more agreement with the benefits. Likert-scale items were rated as the following: 5:Strongly Agree, 4:Agree, 3:Neutral, 2:Disagree, 1: Strongly Disagree; reverse item ratings were normalised before including them in section averages. From left to right, bars refer to 1) teacher feedback, 2) ease of use, 3) interaction, 4) learning outcomes, 5) efficiency of group work, 6) pre-writing stage, 7) using colour codes, 8) peer feedback, 9) overall satisfaction, 10) potential integration into the face-to-face classroom, and 11) student motivation. The sections in the figure are strategically arranged to prioritise those with higher positive ratings, showcasing a noticeable leftward trend indicative of increasing values.

The students declared the highest positive ratings for teacher feedback in Google Classroom (4.44 out of 5), followed by ease of use (4.22 out of 5), increased interaction (4.11 out of 5), and improved learning (3.91 out of 5). The students also believed that the use of Google Classroom in online writing classes improved group work (3.84 out of 5), pre-writing stage (3.82 out of 5), and peer feedback (3.69 out of 5). In addition, colour codes were rated as useful (3.80 out of 5), and students declared overall positive attitudes toward the use of an online teaching platform (3.69). The two lowest-rated sections were increased motivation (3.44) and the application of such practice in face-to-face lessons (3.49), but the average ratings were still above the mid-value of the 5-point Likert-Scale.

Discussion

In an attempt to reveal how students perceive using an online teaching platform in online EFL writing lessons, the current study examined a group of upper-intermediate students over a period of 2 months. In addition to teacher presentations, the students carried out various pre-writing activities in each writing lesson. The immediate feedback provided during the lessons was further supported by the delayed feedback given for the final versions of the essays. A questionnaire, with a focus on how students perceive the integration of an online teaching platform into EFL writing lessons, was created and given to the students. The results of the questionnaire showed positive attitudes towards the use of online platforms in many aspects. The findings are discussed in the same order as the research questions given in the literature review part.

First and foremost, students believed that using an online teaching platform (Google Classroom) increased the effectiveness of feedback and interaction. Especially teacher feedback, which received the highest rating average (4.44 out of 5), seemed to be improved by using an online teaching platform. Corrective feedback is regarded as highly important in EFL writing (Ferris, 2004), and its positive effects are both apparent in different aspects of writing (Chandler, 2003; Khadawardi, 2020) and long-lasting (Bitchener, 2008). As revealed by the student answers, using an online teaching platform increased the quality and quantity of corrective feedback and helped overcome the limitations of inadequately tracking and assessing student work in online lessons (Tas et al., 2021). Immediate feedback is crucial in writing lessons, as students might need further help in their attempts to fix their mistakes (Ferris, 2004). While fixing their own mistakes in accordance with the given corrective feedback, the students in the current study could maximise the benefits of teacher assistance due to the increased opportunities for guidance during the lessons in a zone of proximal development (Vygotsky 1978). The answers to the open-ended questions also show that the most prominent advantage of using Google Classroom was feedback efficiency.

“Google Classroom allows a teacher to see everything that their students do in the lesson and give immediate feedback.” (Participant 2)

“Enable students to get feedback faster.” (Participant 7)

“Instant feedback.” (Participant 5)

Increased interaction was another essential finding given that the lack of direct interaction makes students feel demotivated and unwilling to carry out their educational tasks (Durak & Çankaya, 2020). In line with previous work suggesting that online teaching platforms like Google Classroom have the potential to increase the interaction between teachers and students (Sharda & Bajpai, 2021), the students in the current study declared that the interaction was greatly improved by using Google Classroom in their online writing lessons. In fact, this section received the third highest rating average, indicating that interactivity was one of the best aspects of implementing an online teaching platform (4.11 out of 5).

The scope of interactivity goes beyond teacher feedback, as students could also compare their ideas, work with each other, and engage in meaningful conversations. By using additional tools offered by Google Classroom (e.g., Google Slides), the students completed tasks successfully with their groups, confirming the finding of more effective group work created by online teaching platforms (Yim et al., 2017). This is expected since group work mostly relies on interaction and collaboration with peers, and the use of online teaching platforms can increase the amount and efficiency of such aspects (Cummings, 2016). While small group discussions might also be used in face-to-face writing classrooms, students using online teaching platforms can refer to certain limitations or ideas by using a multitude of online tools, such as graphs, highlighting, and comments. This feature of such platforms also allows students

to benefit from the countless sources and materials available on the internet. In order to show how a topic sentence needs improvement, for example, a student might add good examples of topic sentences written for a similar topic or provide a source explaining the qualities of good topic sentences.

The students in the current study used such strategies to give each other feedback and improve the quality of their group work. Although the rating average was less than the average for teacher feedback (3.69 vs. 4.44), peer-feedback was rated as effective in the lessons carried out on online teaching platforms. The students mostly gave each other feedback during the pre-writing stage in small groups, while the feedback for the final work was provided by the teacher. As discussed above, this allowed students to engage in group work more effectively. One way to increase peer feedback and extend its scope beyond the pre-writing stage might be to use additional tools, such as the Eduflow website. The anonymous feedback system offered by Eduflow can help students evaluate each other's work without knowing the author of the essay. Such a tool might be especially helpful, as some students felt uncomfortable with their real names on the screen during online lessons, especially when their contribution was being evaluated by others in the pre-writing stage.

"When my name appears on the screen, it makes me slightly uncomfortable." (Participant 4).

Another domain where the use of an online teaching platform excelled was the overall writing process. The students found using Google Classroom easy in online writing classes (4.22 out of 5), in line with Fauzi et al. (2021) and Syarifah (2021). This is especially important since such a radical change in the way a lesson is carried out usually presents a challenge to both students and teachers, similar to the case in Türkiye during the pandemic (Tas et al., 2021). The students mentioned how easy it was to prepare and submit assignments in Google Classroom in their answers to the open-ended questions.

"It helps me to get better feedback. it is easy to submit assignments." (Participant 13)

"It facilitates the writing process." (Participant 12)

"It is easier to write through computer." (Participant 16)

"Easy to write and delete and see the mistakes." (Participant 4)

The students were able to use different pre-writing techniques (e.g., brainstorming) using Google Classroom tools. Their overall attitude towards the improvement of the pre-writing stage was positive (3.82 out of 5). The effectiveness of this stage can be further improved by using more multimedia to support pre-writing activities, which was not possible during this study due to insufficient time for preparing online materials.

One part that could be improved in the overall writing process was the guidance given for implicit error codes. Although most students found colour codes useful (3.80 out of 5), some thought they were difficult to understand and could be improved. Preparing guidelines on how to interpret and use colour codes to identify one's own mistakes can improve the usage of these codes and thus their efficiency in online writing classes.

"Color codes are useful for feedback." (Participant 11)

"The color codes can be improved." (Participant 15)

"I think color codes are hard to understand." (Participant 6)

Such criticism might also stem from the increased difficulty of revising errors through implicit feedback as opposed to explicit feedback. As mentioned above, while students might find it challenging to find and correct their own mistakes, it results in better learning, especially for upper-level L2 learners (Bitchener, 2012; Mahmoud & Oraby, 2015). Therefore, teachers should insist on providing implicit feedback and find ways to make self-correction the common way of fixing errors in EFL writing lessons instead of spoon-feeding students through explicit corrections.

Confirming the necessity of this suggestion, the students declared that using Google Classroom in online writing classes improved their overall learning process and resulted in more learning. The dominance of implicit feedback over explicit feedback was likely to be the main factor in this outcome, as the prior feedback type is argued to result in better learning outcomes (Baleghizadeh & Dadashi, 2011; Ferris,

2004). In accordance with the previous findings (e.g., Bitchener, 2008), the positive learning outcomes brought by implicit feedback are likely to be long-lasting or even permanent. The enhanced interactivity in the online lessons allowed students to ask for further confirmation after feedback, providing much-needed guidance during the lesson as they corrected their mistakes. The main goal of any teaching method or tool is usually to improve learning, and in line with the literature showing better learning as a result of using online teaching platforms (Rosyada & Sundari, 2021; Warman, 2021; Yim et al., 2017), the current study also suggests that such tools can improve learning outcomes. The results, in that regard, seem to contradict the heavy criticism of Truscott (2004) against the use of corrective feedback.

As for motivation, the students reported feeling more motivated to engage in writing tasks while using an online teaching platform (3.44 out of 5); however, this was the lowest-rated section in the questionnaire. They also declared an overall positive attitude toward using the platform, Google Classroom, in online writing lessons (3.69 out of 5), in line with Fauzi et al. (2021). Relatively lower rating averages for these sections were expected since students might need some time to get used to using online teaching platforms, which can in turn increase the observed benefits (Rosyada & Sundari, 2021). The initial challenge of using such platforms can be mitigated by overcoming the aforementioned limitations, namely, creating useful guidelines and combining other tools with online teaching platforms like Google Classroom. This could allow students to feel even more motivated and develop a more positive attitude toward online teaching platforms, even in the first weeks of using these platforms.

One final investigation of the study was the student perceptions about the applicability of an online teaching platform to face-to-face lessons. Although the students declared that using Google Classroom in face-to-face classrooms could be beneficial (3.49 out of 5), some were worried about carrying their laptops or failing to take full advantage of this tool with their mobile phones.

“Carrying a computer every day in face-to-face classes can be difficult for students.” (Participant 1)

“Using google classrooms with phones is challenging. I cannot take my computer to school.” (Participant 16)

Such concerns can be alleviated by making students familiar with mobile applications that are used to maximise the utility of online teaching platforms. These applications provide a better user experience compared to using online teaching tools with web browsers on mobile phones. For example, one student mentioned the inefficiency of notifications for tasks and assignments, which can be easily improved by using the mobile application of Google Classroom.

Conclusion

This study shows that using an online teaching platform (e.g., Google Classroom) can improve important aspects of second language learning in online EFL writing lessons, especially the quality and quantity of feedback, interaction, and group work. As revealed by the questionnaire results, the students thought that such benefits resulted in better learning outcomes. Although one of the most prominent advantages of using online teaching platforms is the availability of instant and varied feedback, this issue has been understudied in second language acquisition research. Therefore, the current findings are important in showing that using online platforms can enhance feedback practices in online EFL lessons. In particular, teachers and instructors could give immediate and interactive implicit feedback during online writing lessons and thus provide the scaffolding their students need, allowing them to correct their mistakes through problem-solving processes. As a result, students are likely to improve their writing skills and feel more motivated and engaged in EFL writing lessons.

Creating detailed guidelines can help students overcome the initial challenges of using online teaching platforms. Although I guided my students on how to use Google Classroom, preparing detailed guidelines could have provided a better learning experience, especially regarding self-correction using colour codes and the use of the mobile application. Further improvements can include using aliases instead of real names to promote anonymity and preparing more multimedia-based materials for the activities in Google Classroom. By alleviating such limitations, which mainly resulted from the limited time to switch to distance education in the current study, online teaching platforms can offer more interactive and fun EFL writing lessons in both online and face-to-face lessons, resulting in better learning. By heeding these suggestions and using the questionnaire created for this study with larger

participant pools, further studies can use more advanced data analysis methods to reveal the full potential of using online teaching platforms in EFL writing lessons.

Limitations

Due to the abrupt change to distance education, I could not create an experimental design with a control group. The generalizability of the results requires further studies with larger and more varied sample groups, as the current study included a limited number of participants. Finally, experimental studies can compare the writing scores of experimental and control groups to investigate potential improvements in learning outcomes in a more objective way.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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 we do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics".

Author Contributions: Not applicable.

Funding: The study was not funded.

Institutional Review Board Statement: This study was approved by the Applied Ethics Research Center of Middle East Technical University (Protocol number: 311-ODTUİAEK-2023)

Data Availability Statement: Data will be shared.

Conflict of Interest: I have no conflict of interest to declare.

References

Ali, M. K., & Maksum, H. (2020). Utilization of E-Learning-Based ICT Learning Using the Google Classroom Application During the COVID-19 Pandemic. *Journal of Education Research and Evaluation, 4*(4), 373. https://doi.org/10.23887/jere.v4i4.29181

Bitchener, John (2008): Evidence in support of written corrective feedback. In *Journal of Second Language Writing 17* (2), pp. 102–118. DOI: 10.1016/j.jslw.2007.11.004.

Bitchener, J. (2012). Written Corrective Feedback for L2 Development: Current Knowledge and Future Research. *TESOL Quarterly*, *46*(4), 855–860. https://doi.org/10.1002/tesq.62

Castelli, F. R., & Sarvary, M. A. (2021). Why students do not turn on their video cameras during online classes and an equitable and inclusive plan to encourage them to do so. *Ecology and Evolution, 11*(8), 3565–3576. https://doi.org/10.1002/ece3.7123

Crane, G. (2016). Leveraging Digital Communications Technology in Higher Education: Exploring URI's Adoption of Google Apps for Education 2015. Open Access Master's Theses. Advance online publication. https://doi.org/10.23860/thesis-crane-g.-2016

Cummings, L. (2016). Flipping the Online Classroom With Web 2.0. *Business and Professional Communication Quarterly, 79*(1), 81–101. https://doi.org/10.1177/2329490615602250

Durak, G., & Çankaya, S. (2020). Undergraduate Students' Views about Emergency Distance Education during the COVID-19 Pandemic. *Online Submission, 5*(1), 122-147.

Ebadi, S., & Rahimi, M. (2019). Mediating EFL learners' academic writing skills in online dynamic assessment using Google Docs. *Computer Assisted Language Learning, 32*(5-6), 527–555. https://doi.org/10.1080/09588221.2018.1527362

Ece, Ö., & Bastas, M. (2022). Classroom management problems faced by education administrators in distance education during the pandemic period. *Frontiers in Psychology, 13*, 962559. https://doi.org/10.3389/fpsyg.2022.962559

Fauzi, A., Wandira, R., Sepri, D., & Hafid, A. (2021). Exploring Students' Acceptance of Google Classroom during the COVID-19 Pandemic by Using the Technology Acceptance Model in West Sumatera Universities. *Electronic Journal of E-Learning, 19*(4), 233–240. https://eric.ed.gov/?id=EJ1312065

Ferris, Dana R. (2004): The "Grammar Correction" Debate in L2 Writing: Where are we, and where do we go from here? (and what do we do in the meantime …?). In *Journal of Second Language Writing* 13 (1), pp. 49–62. DOI: 10.1016/j.jslw.2004.04.005.

Güven, A. Z. (2023). Facilitating and Complicating Factors in Distance Language Teaching: Instructors' Views. SAGE Open, 13(1), 215824402311572. https://doi.org/10.1177/21582440231157283

Heggart, K., & Yoo, J. (2018). Getting the Most from Google Classroom: A Pedagogical Framework for Tertiary Educators. *Australian Journal of Teacher Education, 43*(3), 140–153. https://doi.org/10.14221/ajte.2018v43n3.9

Hinz, A., Michalski, D., Schwarz, R., & Herzberg, P. Y. (2007). The acquiescence effect in responding to a questionnaire. *Psycho-Social Medicine, 4*, Doc07. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2736523/

Hyland, Ken; Hyland, Fiona (2006): Feedback on second language students' writing. In *Lang. Teach.* 39 (2), pp. 83–101. DOI: 10.1017/S0261444806003399.

Johnson, G. M., & Cooke, A. (2016). Self-regulation of learning and preference for written versus audio-recorded feedback by distance education students. *Distance Education, 37*(1), 107–120. https://doi.org/10.1080/01587919.2015.1081737

Khadawardi, Hanadi Abdulrahman (2020): The Effect of Implicit Corrective Feedback on English Writing of International Second Language Learners. In *ELT 14* (1), p. 123. DOI: 10.5539/elt.v14n1p123.

Krstić, S. M., & Radulović, L. M. (2021). Evaluating Distance Education in Servia During the Covid-19 Pandemic. *Problems of Education in the 21st Century, 79*(3), 467–484. https://doi.org/10.33225/pec/21.79.467

Loeb, S., Dynarski, S., McFarland, D., Morris, P., Reardon, S., & Reber, S. (2017). Descriptive Analysis in Education: A Guide for Researchers. NCEE 2017-4023. *National Center for Education Evaluation and Regional Assistance*.

Mahmoud, S. S., & Oraby, K. K. (2015). Let Them Toil to Learn: Implicit Feedback, Self- correction and Performance in EFL Writing. *Theory and Practice in Language Studies, 5*(8), 1672. https://doi.org/10.17507/tpls.0508.18

Mikušková, E. B., & Verešová, M. (2020). Distance Education During Covid-19: The Perspective of Slovak Teachers. *Problems of Education in the 21st Century, 78*(6), 884–906. https://doi.org/10.33225/pec/20.78.884

OpenAI. (2023). *ChatGPT* (Mar 14 version) [Large language model]. https://chat.openai.com/chat

Polit, D. F., Beck, C. T., & Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in nursing & health, 30*(4), 459-467. https://doi.org/10.23750/abm.v88i4.6341

R Core Team (2022). R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/.

Rosyada, A., & Sundari, H. (2021). Learning from home environment: Academic writing course for EFL undergraduates through Google Classroom application. *Studies in English Language and Education, 8*(2), 710–725. https://doi.org/10.24815/siele.v8i2.18374

Saini, M. K., & Goel, N. (2020). How Smart Are Smart Classrooms? A Review of Smart Classroom Technologies. *ACM Computing Surveys*, *52*(6), 1–28. https://doi.org/10.1145/3365757

Sharda, P., & Bajpai, M. K. (2021). Online Learning and Teaching using Google Classroom during the COVID 19 Pandemic. *DESIDOC Journal of Library & Information Technology, 41*(5), 352–357. https://doi.org/10.14429/djlit.41.5.16205

Shelvam, H., Jayarajah, K., Kandasamy, S., Xiao, S., Durairaj, Y., Singh, C. K. S., & Maniam, M. (2021). An Investigation on the Learners' Perceptions and Experiences in Engaging with Online Writing Lessons Conducted via Google Classroom. *International Journal of Asian Social Science, 12*(1), 13–25. https://doi.org/10.18488/5007.v12i1.4389

Subandi, S., Choirudin, C., Mahmudi, M., Nizaruddin, N., Hermanita, H., & Hermanita, H. (2018). Building interactive communication with Google Classroom. *International Journal of Engineering & Technology, 7*(2.13), 460-463.

Suryani, D., Yunita, W., & Harahap, A. (2021). EFL teachers reasons, problems and solutions of using google classroom in teaching and learning english during covid-19 pandemic in bengkulu. *Journal of English Education and Linguistics, 4*(2), 1. https://doi.org/10.32663/edu-ling.v4i2.1982

Syarifah, E. F. (2021). Students' Perception Towards the Use of Google Classroom in Writing Subject. *Journal of English Language Learning, 5*(2). https://doi.org/10.31949/jell.v5i2.3457

Tas, Y., Eminoglu, S., Atila, G., Yildiz, Y., & Bozkurt, U. (2021). Teachers' Self-Efficacy Beliefs and Opinions About Distance Education During the Covid-19 Pandemic. *Turkish Online Journal of Distance Education, 22*(4), 229–253. https://doi.org/10.17718/tojde.1002868

Truscott, John (1996): The Case Against Grammar Correction in L2 Writing Classes. In *Language Learning* 46 (2), pp. 327–369. DOI: 10.1111/j.1467-1770.1996.tb01238.x.

Truscott, John (2004): Evidence and conjecture on the effects of correction: A response to Chandler. In *Journal of Second Language Writing* 13 (4), pp. 337–343. DOI: 10.1016/j.jslw.2004.05.002.

van Beuningen, Catherine G.; Jong, Nivja H. de; Kuiken, Folkert (2012): Evidence on the Effectiveness of Comprehensive Error Correction in Second Language Writing. In *Language Learning* 62 (1), pp. 1–41. DOI: 10.1111/j.1467-9922.2011.00674.x.

Vigil-Colet, A., Navarro-González, D., & Morales-Vives, F. (2020). To reverse or to not reverse Likert-type items: That is the question. *Psicothema, 32*(1), 108–114. https://doi.org/10.7334/psicothema2019.286

Wallace, S., Schuler, M. S., Kaulback, M., Hunt, K., & Baker, M. (2021). Nursing student experiences of remote learning during the COVID-19 pandemic. *Nursing Forum, 56*(3), 612–618. https://doi.org/10.1111/nuf.12568

Warman, L. A. D. (2021). The Effect of Google Classroom in Blended Learning on University Students' English Ability. J-SHMIC : *Journal of English for Academic, 8*(1), 12–23. https://doi.org/10.25299/jshmic.2021.vol8(1).6216

Wickham, H. (2016). Data Analysis. In ggplot2 (pp. 189–201). Springer, Cham. https://doi.org/10.1007/978-3-319-24277-4_9

Woodrich, M., & Fan, Y. (2017). Google Docs as a Tool for Collaborative Writing in the Middle School Classroom. *Journal of Information Technology Education: Research, 16*, 391–410. https://doi.org/10.28945/3870

Yim, S., Wang, D., Olson, J., Vu, V., & Warschauer, M. (2017, February). Synchronous collaborative writing in the classroom: undergraduates' collaboration practices and their impact on writing style, quality, and quantity. *In Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (pp. 468-479).

Zeynep, T. (2020). Nursing Students' Anxiety Levels and Coping Strategies during the COVID-19 Pandemic. *International Archives of Nursing and Health Care, 6*(4). https://doi.org/10.23937/2469-5823/1510150

Zhang, Y. (2018). Exploring EFL Learners' Self-Efficacy in Academic Writing Based on Process-Genre Approach. *English Language Teaching, 11*(6), 115. https://doi.org/10.5539/elt.v11n6p115

Appendices

Appendix 1. Frequency Table for the Answers in the Questionnaire

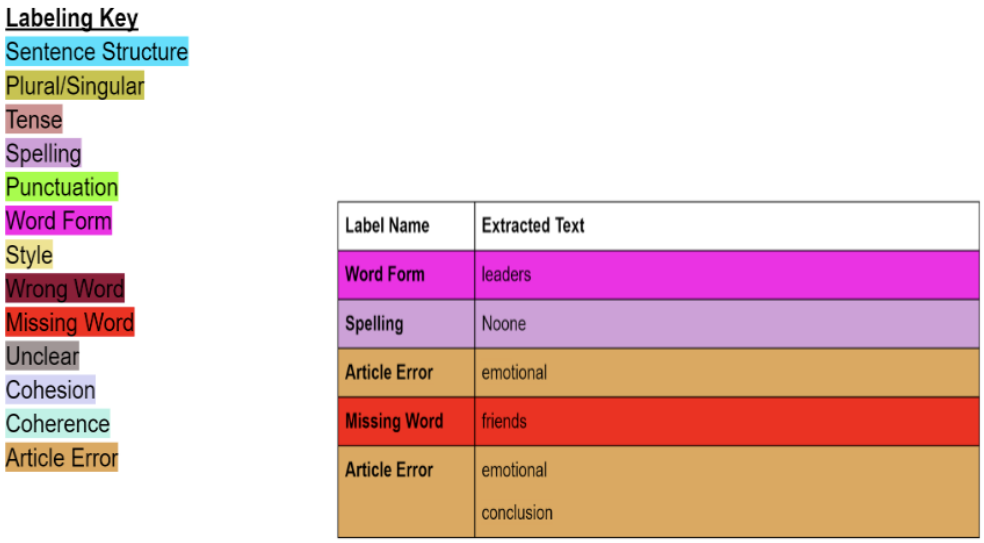
Likert-scale Item	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1. The Google Classroom interface was easy to navigate.	7	9	0	0	0
2. Technical difficulties were minimal when using Google Classroom	4	11	1	0	0
3. Using Google Classroom was convenient for submitting assignments.	9	6	1	0	0
4. I experienced difficulty in using Google Classroom.	0	1	2	9	4
5. The instructions provided for using Google Classroom were clear.	7	8	0	1	0
6. I felt comfortable using Google Classroom.	6	5	3	1	1
7. Using Google Classroom increased my motivation to learn English.	2	3	6	2	3
8. Using Google Classroom increased my motivation to write in English.	3	4	4	3	2
9. I felt demotivated in participating activities in Google Classroom.	0	0	6	6	4
10. Using Google Classroom helped me feel more engaged in the course.	3	6	5	2	0
11. Using Google Classroom made me more interested in writing assignments.	4	4	6	1	1
12. I found peer feedback on my writing to be helpful.	1	8	5	2	0
13. The feedback I received from peers in Google Classroom helped me improve my writing.	1	8	6	1	0
14. I found peer feedback in Google Classroom to be fair and unbiased.	2	6	7	1	0
15. The feedback I received in Google Classroom was useless.	0	0	2	3	11
16. I felt comfortable giving feedback to my peers in Google Classroom.	1	4	6	5	0
17. I struggled with giving and receiving feedback in Google Classroom.	1	1	2	7	5
18. I found the teacher feedback on my writing to be helpful.	12	2	2	0	0

19. The feedback I received from the teacher in Google Classroom helped me improve my writing.	11	3	2	0	0
20. The teacher feedback in Google classroom was useless.	1	0	1	3	11
21. I found the teacher feedback in Google Classroom to be clear and understandable.	9	5	2	0	0
22. I felt comfortable asking the teacher for help in Google Classroom.	5	5	5	1	0
23. I am dissatisfied with the feedback I received in Google Classroom.	0	0	0	5	11
24. My teacher's delayed feedback (the feedback provided later for the writing assignments) on my writing assignments helped me improve my writing skills.	5	5	2	1	3
25. My teacher's use of color codes helped me understand my mistakes and improved my self-correction skills.	8	4	3	1	0
26. Using color codes instead of direct corrections (i.e., corrections made directly on the student's writing) are better for understanding my mistakes and avoiding making similar mistakes in future.	6	6	3	0	1
27. Colors codes failed to improve my understanding of self-mistakes.	0	1	1	6	8
28. Receiving feedback on my writing via color codes increased my motivation to write in English.	1	5	7	2	1
29. Colors codes were difficult to understand.	2	2	2	4	6
30. The interactive tools in Google Classroom (e.g., comments, instant feedback) were helpful in learning to write in English.	8	6	2	0	0
31. The interactive tools in Google Classroom (e.g., comments, instant feedback) were ineffective.	0	0	0	6	10
32. The interactive tools in Google Classroom (e.g., comments, instant feedback) helped me feel more connected to my classmates and teacher.	4	6	4	1	1
33. The interactive tools in Google Classroom (e.g., comments, instant feedback) were easy to use.	6	8	1	1	0
34. I found the use of multimedia (e.g., pictures, mind maps) helpful in learning to write in English in Google Classroom.	3	5	7	0	1
35. I struggled with the interactive tools in Google Classroom.	0	1	1	7	7
36. I participated in group work writing activities in Google Classroom in an efficient way.	4	9	3	0	0

37. Participating in group activities in Google classroom increased my collaboration skills to work with others.	4	4	6	2	0
38. Participating in group work activities in Google Classroom improved my ability to give and receive feedback in a group.	2	7	4	2	1
39. Group works were terrible and useless in Google Classroom.	1	0	2	5	8
40. Participating in group work activities in Google Classroom improved my ability to think critically and creatively.	1	6	7	2	0
41. I had enough opportunity to participate and contribute during group work activities in Google Classroom.	3	10	3	0	0
42. Google classroom failed to give me enough chances to engage in group work.	0	2	0	7	7
43. Using Google classroom makes brainstorming easier.	3	9	2	1	1
44. Using Google Classroom allowed me to engage in a more efficient brainstorming phase through the use of comments, lists, and visuals.	3	9	2	1	1
45. After completing prewriting activities in Google Classroom (e.g., brainstorming, writing the thesis statement), I felt more comfortable in writing an essay in English (compared to a face-to-face classroom).	5	6	4	0	1
46. Using google classroom for brainstorming and other pre-writing activities was ineffective.	2	1	0	7	6
47. After completing prewriting activities in Google Classroom (e.g., brainstorming, writing the thesis statement), I wrote better essays in English (compared to a face-to-face classroom).	4	5	5	0	2
48. Google classroom activities before the actual writing (brainstorming) failed to improve my writing performance and skills.	0	2	2	4	8
49. Using Google Classroom improved my English writing skills.	4	8	3	1	0
50. Using Google Classroom made it easier for me to complete writing assignments.	5	9	2	0	0
51. I received enough practice on my writing assignments in Google Classroom.	3	8	4	1	0
52. My English writing skills have stayed the same after using Google Classroom in online writing lessons.	0	0	4	10	2

53. Using Google Classroom allowed me to use other online tools (e.g., Online dictionaries) effectively during writing English writing lessons.	5	7	4	0	0
54. I feel more confident in my writing ability in English after using Google classroom.	1	8	6	1	0
55. I think the use of Google Classroom could be implemented in face-to-face EFL writing classes to increase learning.	3	7	5	0	1
56. Google Classroom can be helpful in the English learning activities other than writing in face-to-face lessons.	2	7	2	2	3
57. Google Classroom would be an inefficient tool in face-to-face lessons.	2	2	2	8	2
58. I would feel comfortable with using Google Classroom in face-to-face lesson activities.	2	6	5	2	1
59. I have the necessary equipment (e.g., smartphone, tablet) to participate Google Classroom activities in face-to-face lessons.	5	7	2	0	2
60. I would prefer using Google Classroom in an online writing lesson compared to a regular face-to-face writing lesson.	2	6	6	1	1
61. I would recommend my peers using Google classroom for English writing lessons.	1	12	1	1	1
62. I would avoid using Google Classroom altogether if I am given the chance.	0	1	3	6	6
63. I want to continue using Google Classroom in future.	1	9	5	0	1

Appendix 2. The labeling key and list of errors.



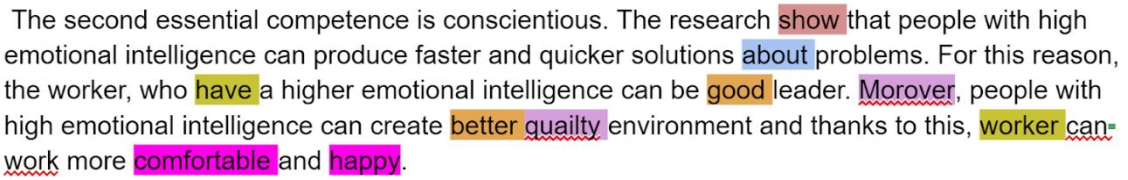
Labeling Key

Sentence Structure
Plural/Singular
Tense
Spelling
Punctuation
Word Form
Style
Wrong Word
Missing Word
Unclear
Cohesion
Coherence
Article Error

Label Name	Extracted Text
Word Form	leaders
Spelling	Noone
Article Error	emotional
Missing Word	friends
Article Error	emotional conclusion

Figure 2. An example of how errors were listed using color codes.

Appendix 3. Color codes used in the text.



The second essential competence is conscientious. The research show that people with high emotional intelligence can produce faster and quicker solutions about problems. For this reason, the worker, who have a higher emotional intelligence can be good leader. Morover, people with high emotional intelligence can create better quailty environment and thanks to this, worker can work more comfortable and happy.

Figure 3. An example of using color codes in Google Classroom.

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

Attributes and Actions of Principals as Instructional Leaders in Empowering School Management Teams (SMTs) in Schools [1]

Saltiel Khololo Collen Mataboge[2], Vimbi Petrus Mahlangu[3]

To cite this article:

Mataboge, S.K.C., & Mahlangu, V.P. (2024). Attributes and actions of principals as instructional leaders in empowering school management teams (SMTs) in schools. *e- Kafkas Journal of Educational Research*, *11*, 20-32. doi: 10.30900/kafkasegt.1192563

Research article **Received: 18.04.2023** **Accepted: 21.03.2024**

Abstract

The purpose and scope of the article was to examine the attributes and actions of principals as instructional leaders in empowering School Management Teams (SMTs) in Schools. The focus is on trying to answer the main research question: What are the attributes and actions that principals as instructional leaders should have in performing their obligations? Method: Data collection was done through a questionnaire, literature review, and interviews. A pilot study was initially conducted before the commencement of the study to validate the contents of the questionnaire. To ensure validity, triangulation was undertaken (literature review, the questionnaire, and the focus-group interviews). The sample consisted of 55 principals (n=55) of schools in the Tshwane-West District of Gauteng in South Africa. Data analysis was done thematically, and the narratives of respondents were examined. Additionally, field data was verbatim transcribed from voice tapes. The transcribed information was completed as soon as the interviews were conducted to prevent incorrect interpretation of crucial information from the recordings and focus group interviews. Findings/Results: In empowering SMTs in schools' attributes like communication skills; it was found out a clear vision of the future of the school; an attitude of self-confidence; focusing on teaching and learning; tough feedback; courage to raise controversial issues. It was found that the principals lack assertiveness; are tolerant of mistakes, and are sympathetic to wrongdoers. Principals are reluctant to share power and practice distributed leadership. Implications for Research and Practice: Policymakers and schools will be able to review policies and practices to strengthen schools.

Keywords: Communication, administration, monitoring, equal opportunities, support**.**

[1] This article was produced from the thesis of the first author.

[2] Author, University of South Africa

[3] Corresponding Author, mahlavp@unisa.ac.za, University of South Africa

Introduction

Yurttaş and Aksu (2022) advise that school principals need to think and act on their leadership behaviors and school culture in order to ensure school dynamism. The study reports about the attributes and actions principals only. Maybe, those principal participants might not be willing to tell it all. The Department of Basic Education and school principals may use the study's findings and recommendations as a resource to help policymakers and other stakeholders understand the roles that school principals play in empowering SMTs and ensuring their accountability for matters relating to school management. The functions and duties for which the principal is answerable to the head of department (HOD) in the province in South Africa as an employee of the Department of Basic Education and in his official capacity as contemplated in Sections 23(1) and 24(1) (j) of the same Act are listed in Section 16A of SASA and underpinned the study.

This article examined the attributes and actions of principals as instructional leaders in empowering School Management Teams (SMTs) in Schools. The article's focus is to answer the following main question: What are the attributes and actions that principals as instructional leaders should have in performing their obligations in schools? The South African School Act encapsulates the principal's responsibility for exercising leadership and ensuring that learner achievement is increased (Department of Education, 1996). A public school shall be professionally managed by the principal under the direction of the Head of Department in accordance with Section 16(3) of the South African School Act. The principal's responsibility in performing this job is to make sure that the learners' education is promoted appropriately and in compliance with established policies. A yearly report on the academic performance of that school must also be prepared and submitted to the Head of Department in accordance with Section 16A(b)(i)-(iii) of the Act (Department of Education, 1996). The principal is ultimately responsible for creating a strategy outlining how academic achievement at the school will be improved. The principal's responsibilities include providing instructional leadership within the school by directing, supervising, and mentoring the school management team, ensuring fair workload distribution among staff, taking part in appraisal systems to enhance teaching and learning, and ensuring the proper and effective organization of all evaluations and assessments carried out in the school. The argument in this article is about the attributes and actions that principals as instructional leader should have in performing their obligations in schools. An increasing body of evidence supports the idea that the attributes and actions of principals are important in teaching and learning. Principals are expected to oversee and direct the activities of SMTs in enhancing teaching and learning in schools. One of the principal's core responsibilities is to manage teaching and learning by being accountable for equipping the SMTs with the requisite attributes and action in instructional leadership in schools.

This study was carried out in the District of Tshwane West area in Gauteng province of the Republic of South Africa. Generally, principals are expected to perform the following duties, namely: To set clear goals for the implementation of the curriculum; guide and assist the SMTs to ensure that teaching reflects the objectives of the curriculum; ensure that the SMTs offering the right guidance to teachers; ensure that the learners are assessed regularly; meet with the SMTs to discuss learner progress and academic achievement; manage and coordinate the curriculum in such a way that teaching time is utilized optimally; monitor the learner books to reflect the curriculum; identify the learners who need remedial and extra classes; ensuring that teaching and learning reflect the aims of the subjects; provide guidance and support to the SMTs; inspire the SMTs to take ownership of the school’s vision; and to work collaboratively with staff, to set a vision that will enhance teaching and learning in schools. The sample consisted of 55 principals (n=55) of schools in Tshwane-West District of Gauteng in South Africa. Research done by Shakel, Shangolo, and Sheared (2018) found that female principals consistently obtain higher ratings on instructional leadership when compared with their male counterparts. In comparing male and female principals, these authors found that the female principals are more active in instructional leadership and demonstrated transformational leadership more than their counterpart and were having more attributes and actions. They also found that female principals as administrators were more able to conduct their school work systematically and hardworking. They were more ambitious than their male counterparts.

Literature Review

Attributes and actions of principals as instructional leaders

Merritt and Wang (2022) found that principals who act as instructional leaders must establish school goals with student learning as the primary focus. The attributes that these principals must is to ensure that SMTs use high-quality curriculum-instruction, manage assessment, and promote a positive school climate for students and staff through systems of accountability. In addition, Bhujel (2021) advise that a principal must act as the guideline, change agent, role model, director of educational institution, and manager of human resources at every school level to influence the behaviour SMTs so that the academic outcomes of students can be enhanced. Similarly, Tedla and Redda (2022) advise that SMTs need to be empowered to have attributes that relate to values, goals, morals and vision of the school. SMTs, as leaders and managers ought to be decisive decision-makers. They need to demonstrate leadership attributes that display a strong personality and be able handle issues through problem-solving skills.

In support of Merritt and Wang (2022); Bhujel (2021); and Tedla and Redda (2022), the advice of Hajarin and Yazar (2022) is that SMTs must come down to commitment and dedication to having a support system that strengthen the link between SMTs and student learning. SMTs must be in a provide schools the tools and feedback needed to improve student results and school performance. They ought to practice aspects such as discipline, obedience, control, motivation, dedication, and be consistent in discharging their work. Consequently, Malinga, Loyiso et al. (2022) suggest that SMTs attributes must involve subject proficiency, professional credibility and agency in resourcing the subject departments in schools. Again, in their leadership practices, SMTs must know how to set the vision of the school, building collegiality, developing management teams including teachers. Some of the attributes that SMTs need to possess is the promotion of student achievement through sharing of mission and vision of the school with teachers to create a conducive climate of teaching and learning (Polatcan & Cansoy, 2019). Generally, SMTS ought to be open to new teaching methodologies and serve as teacher-mentors to develop their capabilities, skills and knowledge including those of students (Muyunda, 2022).

SMTs' tacit knowledge must provide teachers with an understanding of their problem-solving capabilities to improve school performance and whole school effectiveness (Rahman & Tahir, et. al., 2022). SMTs must be able to influence school performance, as well as teacher development and learner performace in schools (Caluza, 2022). Sanchez, Paul, et al. (2020)) are of the view that Some of the attributes that SMTs need to portray include reducing/eliminate the risk of total collapse of teaching and learning that would render schools dysfunctional. Zulu et al. (2021) found that a well-grounded SMT member need to have servant leadership skills that will enhance the collaboration of all stakeholders in a school to ensure effective teaching and learning.

Hence, Alhebshi, Aishah et al (2022) advise that SMTs need to be continuously encouraged to have high expectations and be innovative to make provision of required resources within the schools' subject departments. Their priority ought to be on the outcomes of learning and curriculum coordination and implementation. They ought to ensure that the school's mission is reflected on all activities of the school management teams. In support of the previous scholars, the Western Governors University (2020), believe that SMTs in performing the role of Instructional Leadership, their actions must be to direct, guide, and influence their own work and those of teachers. In addition, SMTs are expected to use their actions to express a vision, encourage teams, and ensure that their members are as productive as possible to ensure the success of the school.

School leaders can be assigned to roles that match their skills and motivations regardless of their ethnicity, socioeconomic status, or other potentially marginalizing qualities thanks to instructional leadership, which emerged from a social justice perspective (DeMatthews, 2018). The ability to develop positive working relationships with the management team and the teachers, enhance teaching techniques through supervision, and develop management team competencies to lead and manage efficient teaching and learning in the school are just a few of the capabilities that make it possible to apply instructional leadership. Principals must also be dedicated to influencing and enhancing student outcomes (Leithwood et al., 2020).

Shaked (2021) thinks that instructional leadership qualities are expected of school principals. In his study, Shaked (2021) discovered that some principals merely place a secondary value on instructional leadership, with only a tiny percentage of principals' time going toward these activities. Therefore, principals must put enhancing instruction and curriculum ahead of managerial responsibilities in their role as instructional leaders. Coordination of the curriculum, supervision and evaluation of instruction, and progress tracking of students should be the principals' responsibilities in terms of instructional leadership.

Principals must be led by evidence-based treatments that are informed by students' strengths-based, individualized student profiles when performing their instructional tasks (Fitzgerald & Radford, 2022).

Merritt and Wang (2022) assert that in order to guarantee that teachers employ top-notch curricula, instruction, and evaluation, principals who serve as instructional leaders must develop school goals with student learning as the main priority. This could help teachers and students feel more comfortable in the classroom. Principals must create systems of accountability that prioritize student learning in all decisions in order to fulfill their duties as instructional leadership roles.

According to Bhujel (2021), each school's principal should serve as a mentor, change agent, role model, director of the educational institution, and manager of human resources in order to empower SMTs. The student behavior and academic outcomes must be the principal's main concerns when empowering the SMTs. Yang and Liu (2019) discovered a positive relationship between servant leadership and follower psychological empowerment and employee creativity. Once more, Yang and Liu (2019) cite Bhujel (2021) as their source when they assert that empowerment occurs when servant leaders assist and enable their followers' personal growth, which must include independent decision-making, information sharing, and creative performance activities. According to them (Yang and Liu, 2019), it is critical that principals foster the growth of SMT competencies and act independently. Academic success and school effectiveness can be improved in schools where the principle has adopted a participatory leadership style and encouraged the management team to accept sharing responsibility and decision-making.

According to Lee, Lyubovnikova, et al. (2020), the principal must implement and exhibit SMT empowerment capabilities if he or she wants to inspire underperforming SMTs in schools. Once this happens, the SMTs will gradually start to emulate the principal's behavior and be eager to contribute positively to their schools.

Limon (2022) advises principals that when empowering SMTs, the following considerations must be kept in mind, specifically: To foster trust in SMTs, the principal must develop shared management structures, ensure SMT participation in problem-solving and decision-making mechanisms, enable SMT autonomy, encourage innovation, creativity, and risk-taking, offer support by delegating authority to SMTs, provide them with intellectual stimulation, affirm, and appreciate their accomplishments. The principle should serve as a positive role model by exhibiting qualities like interest, enthusiasm, optimism, honesty, and approachability.

According to Muyunda (2022), although it is well recognized that the principal's leadership style has a crucial role in fostering the teaching and learning process, it is less obvious how SMTs actually experience and put that leadership into effect in the classroom. The following qualities are necessary for principals to perform their jobs as instructional leaders: They must possess morals, values, and goals, as well as vision. Similar to this, instructional leadership, according to Lamsal (2022), is the role in any educational setting that may make use of unique abilities and knowledge to guarantee kids' academic performance while providing the essential assistance to all teachers, pupils, and school personnel. Planning, curriculum design and development, training delivery and professional development, teacher evaluation and monitoring, and student assessment are just a few of the different aspects and dimensions of instructional leadership. As a result, Tedla and Redda (2022) counsel principals that they should function as decision-makers by exhibiting leadership qualities such a strong personality, the capacity to handle problems, and decision-making/problem-solving skills. Modern school leaders oversee the intricate structures known as schools rather than just being "the principal instructor." As a result, principals are expected to develop a working relationship with other stakeholders as well as the SMTs. School principals must address the issues of effective stakeholder

participation and empowerment if they are to accomplish their schools' objectives. Zulu, who support the idea that the duty of the school administrator must entail working with other stakeholders like the SMTs and aiding them with the necessary abilities, reaffirm this viewpoint.

The Department of Basic Education (2020) in South Africa urged principals to be more helpful than directive and asked for a completely new method of conducting business. Since it is essential to all school operations, principals were asked to implement change by giving SMTs instructions on how to carry out shared educational objectives. Since then, the same appeal has been supported as a component of the 2030 school vision. The school principal is required to serve as an instructional leader by engaging in instructional projects, expressing the school's mission and vision with SMTs, and fostering an atmosphere that supports teaching and learning (Polatcan & Cansoy, 2019). In order to fulfill their responsibilities, principals must be receptive to innovative working procedures that use SMTs to enhance instructional leadership in classrooms. The principals are anticipated to act as mentors in the development of SMTs' skills.

Mayger and Provinzano (2022) belive that school principals must resituate improvement efforts through expanded and collaborative partnerships that simultaneously support SMTs development and empowerment on a continual basis. Therefore, the quality of teaching is the key factor that must be used by linking principal instructional leadership with SMTs empowerment. Moreover, principals who demonstrate this trait can transfer knowledge and mediating process very effectively, and could avoid challenges and difficulties, by finding alternative teaching methods for mediating the educational process (Siriparp, Buasuwan, et al. (2022).

Method

Research Design

This article in used a mixed method approach (qualitative and quantitative methods) in collecting information. A questionnaire, focus group interviews, and literature review were used to collect the data. A pilot study was initially done and followed by the actual field work. The primary method of reliability employed in this study was the triangulation of information from many sources, including focus groups and questionnaires. The sampled consisted of fifty-five (55) principals in Tshwane-West District. Using quantitative approach, the data was described using descriptive statistics, e.g. the frequencies and mean scores, the explanatory methods and inferential statistics, the factor analysis and Cronbach's alpha coefficient were done.

Research problem

The problem that was investigated emanated from the assumption that school principals as leaders were not sharing management functions and were not involving all stakeholders in managing schools. This led to the researchers to establish and to look at the attributes and actions that principals must display as instructional leaders for them to empower their school management teams (SMTs).

Aims of the research

The aim of the article was to examine the attributes and actions that principals as instructional leaders should have in performing their obligations in schools.

Theoretical foundation

This article’s theoretical foundation is underpinned by the theories of empowerment and ambidexterity**.** The empowerment theory deals with the power relationship within an organization and involves a transfer of authority, power, and responsibility from managers to school management teams as front-line employees (Kanjanakan, Wang et al. 2023). The expectation is that principals as managers who hold power must be willing to share authority or to relinquish some responsibilities and a stronger level of autonomy to be given to other stakeholders and this is referred to as ‘empowering process’. Siyal, Liu et al. (2023) regard empowerment as an attribute of inclusivity and principals as leaders ought to create a situation in the workplace where voices are respected, and the principals’ words and actions must motivate others to participate and value their contributions in the organisation.

Ambidexterity is a theory derived from innovation that puts forward two elements, namely investigation and exploitation. The theory of ambidexterity emphasized that people in the organization can be more innovative and creative by exploring new ideas, processes, or even solutions that have not existed (Fortunisa, Putri et al. 2023). They can also exploit ideas, process, or methods from the existing that have never been implemented in the organization. This theory therefore explains that being a principal does not mean that s/he can create new ideas and implementing them or methods without the involvement of other stakeholders who may have creative skills. The problem of creativity and innovation, especially in schools has the potential of conflict because of the role dualism ambidexterity (innovation and exploration) of the leadership dynamics in organisations.

Research Sample (Study Group)

The attributes and actions of principals as instructional leaders in empowering School Management Teams (SMTs) in schools were examined. The sampling procedure was purposive because fifty-five principals were chosen to take part in the study. The objective was to look at the attributes and actions of principals as instructional leaders in empowering School Management Teams (SMTs). Those principal as SMTs were selected for interviews and their positions and knowledge as principals was used as the inclusion criteria. We followed the mentioned sampling procedure because Nomatshila, Apalata, et al. (2022) advised that the sampling process must be designed with the expectation in mind. That is why the participants were restricted only to the principals. The sampling process was designed with the expectation that a sampled population of principals would provide thorough and varied knowledge about their attributes and actions.

Research Instruments and Procedures

Mixed method was used in collecting information and the focus group interview session was also used which lasted for about an hour. To learn more about the principals' attributes and actions as instructional leaders in empowering School Management Teams (SMTs) in schools were explored. The talks that were held to examine the perspectives and expertise of principals about their attributes and actions. Open-ended, unstructured questions in accordance with interview protocol was followed by the researchers and medium of communication used was in English, which understood by all the participants in the study. Also, a tape recorder was used to capture the conversations while doing the interviews. Verbatim transcription of data was done throughout and then followed data analysis as advised by scholars such as Nomatshila, et al., (2022).

Validity and Reliability

The content of the questionnaire was validated through a rigorous application of the content gained from literature study. A pilot study to validate the questionnaires was used to pre-test whether the question items were understandable, relevant and cover the principal's role adequately. For the pilot study, two principals, two deputy principals and two heads of department in Tshwane West District responded to the questionnaire prior to distribution. These principals, deputy principals and Heads of Department did not form part of the selected respondents for the main research. They were chosen because they share similar attributes with the selected respondents involved in the main research. To further ensure validity, the questionnaire was also submitted to experts in the field of educational management to scrutinize and comment on it. These comments were used to improve the questionnaire. To test the extent to which groups of question items of the questionnaire reflect the same attribute, internal consistency reliability was used. Groups of question items under the same heading were subjected to the Cronbach's coefficient alpha test.

Data Analysis

In drawing conclusion in data analysis, Nomatshila, et al., (2022) advise that the evidence foundation from which conclusions must be drawn ought to be composed of the themes and sub-themes that must be identifiable. The transcribed information was completed soon after the interviews to prevent incorrect interpretation of information from the tape recordings and the interviews. Thematic analysis was followed and field data was transcribed from recorded tapes verbatim. The transcribed information was completed as soon as the interviews were conducted to prevent incorrect interpretation of information as captured in the recordings and from the interviews. To accurately

capture the information on the audio tapes, the recordings were played in spurts. The major transcripts of all the themes included all the meanings, ensuring the completeness of the data. The researchers read the transcripts several times to decipher the meaning and significance of the data. Themes were drawn and specified to symbolize the clustered categories, which were categories with comparable meanings that were put together.

Findings

The results are based on the experiences and knowledge of principals about the attributes and actions that they must carry out to empower the SMTs in instructional leadership duties. Fifty-five principals(n=55) in Tshwane West District in Gauteng Province, in the republic South Africa took part in the study. The interviews lasted for about an hour. The results are presented and discussed below.

Principal A said,…"one needs to make sure that all members of the management team are exposed to equal opportunities that will allow them to grow and develop by making sure that there is monitoring of progress, they are also motivated, there is feedback, by doing so, the team will achieve the objectives of the institution. Principal A said, "a principal … one needs to be a role model and delegate tasks with clear instructions of expectations and follow-up on tracking progress. Principal A said,…one needs to make sure that all members of the management team are exposed to equal opportunities that will allow them to grow and develop by making sure that there is monitoring of progress, they are also motivated, there is feedback, by doing so, the team will achieve the objectives of the institution"... Principal A added, "As principal...I encourage regular feedback and rigorous constructive discussion in our meetings'.

Principal B said, "I will ensure my management team attends programs that are conducted by SACE [South African Council for Educators], MGSLG [Matthew Goniwe School of Leadership and Governance] and to encourage them to register with institutions and higher learners so that they can be empowered with a variety of skills knowledge and the required application or implementation in their workplace or stations. He [the principal] must allow room for mistakes and ultimately create a conducive teaching and learning environment".

Principal C, said, "I would like to add just a few aspects such as involvement in professional learning committees (PLC) in order to exchange good practices in coaching and teaching, seminars, conferences, and symposiums so that they enrich and empower themselves with knowledge and skills. Principal C said,An instructional leader promotes an environment of peace and harmony to allow managers to feel at ease and clear or avoid unnecessary tension which do not enhance a good working and productive atmosphere.

Principal D said,"an instructional leader are to be visionary, to lead by example, manage people in this case teachers and learners, be passionate about his/her work. He needs to be a role model both at school and in the society".

Principal E said, "they [the SMT] will be tasked to draw the school assessment plan to equally distributed subject allocation and the school timetable.

Principal F said, "they must be fair and avoid biasness in dealing with their teachers to avoid conflicts.

Discussion

Most of the participants pointed out that the instructional leader should be a role model in many ways. The role model attribute summarizes all the attributes of an instructional leader, including fairness, consistency, honesty, trustworthiness, and accountability.

Principal A said,…"one needs to make sure that all members of the management team are exposed to equal opportunities that will allow them to grow and develop by making sure that there is monitoring of progress, they are also motivated, there is feedback, by doing so, the team will achieve the objectives of the institution. Principal A said, "a principal … one needs to be a role model and delegate tasks with clear instructions of expectations and follow-up on tracking progress. Principal A said,…one needs to make sure that all members of the management team are exposed to equal opportunities that will allow them to grow and develop by making sure that there is monitoring of

progress, they are also motivated, there is feedback, by doing so, the team will achieve the objectives of the institution"... Principal A added, "As principal...I encourage regular feedback and rigorous constructive discussion in our meetings'. Principal A was rather vague when he said, I will encourage my management team in the following: workshop, training, monitoring, and coaching, facilitation and also make sure that they develop themselves in ICT [Information Computer Technology] and other new approaches in teaching and learning". The findings by Principal A are supported by Bhujel (2021) who found that SMTs need advice and the principal must act as the guideline, change agent, role model, director of educational institution, and manager of human resources at every school level to influence the behaviour SMTs so that the academic outcomes of students can be enhanced. Another way of empowering the SMT, which featured strongly in discussions of the focus group, was the creation of an atmosphere of peace and harmony. This is what

In empowering the SMT, the participants alluded to regular feedback. As pointed out by Principal F who said, allow them to take ownership and to give regular feedback. Principal B said, "I will ensure my management team attends programs that are conducted by SACE [South African Council for Educators], MGSLG [Matthew Goniwe School of Leadership and Governance] and to encourage them to register with institutions and higher learners so that they can be empowered with a variety of skills knowledge and the required application or implementation in their workplace or stations. He [the principal] must allow room for mistakes and ultimately create a conducive teaching and learning environment". The ideas of principal B are supported by Limon (2022) who advised that principals when empowering SMTs, they must foster trust in SMTs, develop shared management structures, ensure SMT participation in problem-solving and decision-making mechanisms, enable SMT autonomy, encourage innovation, creativity, and risk-taking, offer support by delegating authority to SMTs.

Principal C, said, "I would like to add just a few aspects such as involvement in professional learning committees (PLC) in order to exchange good practices in coaching and teaching, seminars, conferences, and symposiums so that they enrich and empower themselves with knowledge and skills. Principal C said, An instructional leader promotes an environment of peace and harmony to allow managers to feel at ease and clear or avoid unnecessary tension which do not enhance a good working and productive atmosphere. Principal C said, "A successful principal as an instructional leader must motivate, coach and mentor the management team at all the time". Another participant, Principal E added by saying the following, "they [the SMT] should know …. how to become mentors and coaches… Principal C added, …an instructional leader must be fair, be consistent and decisive". On this score, To this Principal C said, A successful principal as an instructional leader must motivate, coach and mentor the management team at all the time. In addition, Principal C added, …"an instructional leader must be fair, be consistent and decisive". Also, Principal D said,…"an instructional leader are to be visionary, to lead by example, manage people in this case teachers and learners, be passionate about his/her work. He needs to be a role model both at school and in the society". The above attribute was confirmed by Lamsal (2022) who think principals must possess morals, values, and goals, as well as vision. It seemed that the participants viewed mentoring and coaching from two angles: the principal as mentor and coach of the SMT and the SMT as mentors and coaches. Both these angles lead to empowerment of the SMT.

The data revealed that the principals empowered the SMT by delegation. This way of empowering the SMT included how to develop subject policies, how to conduct meetings, how to do administrative activities such as drafting, developing a school timetable and how to distribute the workload equally among the teachers. To this end, Principal C said, "I think what I should do is to try and build capacity amongst my fellow SMT members. I would ensure that I delegate effectively with good articulated instructions. I would also give support, give direction, encourage lifelong learning, and also encourage participation". Principal A spoke about delegating administrative duties to the SMT when he said, "I also empower the management team with administrative activities such as drafting and designing the comprehensive school timetabling where policy on time allocation is correctly implemented. The management team is also empowered to do different subject teacher allocations with an equal distribution of workload". Principal D said,…"an instructional leader are to be visionary, to lead by example, manage people in this case teachers and learners, be passionate about his/her work. He needs

to be a role model both at school and in the society".The above attribute was confirmed by Muyunda (2022), who recognized that the principal's leadership style has a crucial role in fostering the teaching and learning process. Motivation, monitoring, mentoring and participation in the activities of the school, delegation and meetings are mentioned as ways of empowering the SMT.

Principal E said, "they [the SMT] will be tasked to draw the school assessment plan to equally distributed subject allocation and the school timetable. Principal E put it this way. Attributes which an instructional leader should have in order to perform his duties effectively are among others, to be honest, trustful and be a true leader with good leadership skills". Principal E put it this way. "Attributes which an instructional leader should have in order to perform his duties effectively are among others, to be honest, trustful and be a true leader with good leadership skills". Another participant, Principal E added by saying the following, "they[the SMT] should know …. how to become mentors and coaches". It seemed that the participants viewed mentoring and coaching from two angles: the principal as mentor and coach of the SMT and the SMT as mentors and coaches. Both these angles lead to empowerment of the SMT. Principal E had this to say,…I will make sure that my management team is exposed to seminars, symposiums and developmental workshops and team building societies and postgraduate programmes for qualification and empowerment. Principal D simply said, …"exposure to workshops and collaborative skills shared from others".This was affirmed by the Department of Basic Education (2020) in South Africa by urging principals to be more helpful than directive and by using new methods of mentoring and coaching.

Principal F spoke of meetings and subject policies when he said, "allow them [the SMT] to develop policies like subject policies. The management team must be allowed to chair meetings. Allow them to take charge of the subject in their different departments. Give them an opportunity to run meetings as I have indicated". Principal F said, "they must be fair and avoid biasness in dealing with their teachers to avoid conflicts. They must encourage good working relationships with trust and honesty". Principal D commented, … "enhance team spirit, conducive working environment, support teachers and learners, and provide feedback as well". Asked about provincial department activities the principals exposed their management teams as part of empowering the SMT. The participants referred to workshops, seminars, symposiums training sessions, conferences, and professional learning committees.

Tedla and Redda (2022) counsel principals that they should function as decision-makers by exhibiting leadership qualities such a strong personality, the capacity to handle problems, and decision-making/problem-solving skills. Modern school leaders ought to oversee the intricate structures known as schools rather than just being "the principal instructor." concurs with the ways of empowering the SMT through coaching, mentoring, workshops, seminars, conferences, symposiums, and professional learning committees (PLCs). It may be said that the principals employ acceptable ways of empowering the SMT and this will augur well for the success of instructional leadership in schools and the coveted distributive leadership.

Summary about Attributes and Empowering Strategies that Emerged from the participants

Principal participants suggested the following strategies in empowering the SMTs.

Principal A:[equal opportunities; monitoring; role model and delegate tasks; clear instructions; feedback; workshop, training, coaching, facilitation; and develop themselves in ICT]. According to Trenerry, Dunn et al. (2023), many organisations have committed to workplace diversity; however, work-related racism remains the most common forms of discrimination. Efforts to increase workplace diversity will fail in the absence of measures to address discriminatory attitudes, behaviours, practices, and cultures. Also, the lack of strategic development, including knowledge of how to implement workplace diversity and anti-racism strategies at cannot support SMTs empowerment.

Principal B: [team attends programs; room for mistakes; create a conducive teaching and learning environment]. Principals are required to have the right leadership and strategy to increase the professionalism of teaching staff in their schools, so they are able to create a conducive school climate, provide advice to school members, provide encouragement to all teaching staff and implement an interesting learning model (Safrida,Tannady et al.,2023).

Principal C: [build capacity; delegate; good articulated instructions; give support, give direction, encourage lifelong learning, participation; subject teacher allocations; equal distribution of workload]. Cox and Mullen (2023) found that principals are charged with delivering high-quality, equitable educational opportunities and ensuring that students achieve academically, and to graduate on time.

Principal D: [visionary, to lead by example, manage people; role model; Motivation, monitoring, mentoring and participation; delegation and meetings]. The role of employees is very important in the success or failure of a company. Because of the importance of this, the principals must monitor the performance of each employee and monitor whether they have fulfilled their duties and responsibilities as expected (Susanto, Syailendra et al., 2023).

Principal E: [school assessment plan to equally distributed subject allocation; school timetable; honest, trustful; good leadership skills; be a true leader; mentoring; and coaching]. Albert, Scott et al. (2023) found that teacher mentoring in schools often involves pairing experienced teachers with beginning teachers (BTs) to offer support. However, not all schools have experienced SMT members to serve as mentors to teachers.

Principal F: [develop policies; chair meetings- opportunity to run meetings; take charge of the subject; avoid biasness; avoid conflicts; encourage good work relationships; trustworthy and honesty. Mendez and Quark (2023) found that school board members abandoned high school rezoning in the face of fierce opposition from white, affluent residents who saw school reassignments as a threat to their entitlements to a highly rated school and to their property values.

Conclusion

Some participants were not willing to say the truth in fear of being victimized. SMTs are responsible for executing the obligations of instructional leadership and management of schools. However, when things go wrong, it is the SMTs that must be accountable for school effectiveness, irrespective of the underperformance. SMTs must be held liable in terms of which they are accountable to the Department of Education only in so far as their mandated instructional leadership duties are concerned. SMTs need to mitigate the risks of communication collapse and breakdown in schools. To remedy the challenges that SMTs might experience in instructional leadership, they need to be empowered with the requisite knowledge, attributes and skills of the school trade. The lack of strategic development, including knowledge of how to implement workplace diversity and anti-racism strategies at cannot support SMTs empowerment.

Suggestions

The focus was on the attributes and actions of school principals only. The findings and recommendations from this study may be used by the Department of Basic Education and school principals as a source of information for policymakers and stakeholders to understand the attributes and actions of school principals in empowering SMTs to ensure that schools are managed accountably and effectively. Based on article, policymakers and schools will then be able to revisit their policies and practices for the purpose of strengthening them. The study provides a theoretical and empirical contribution to the existing literature on the attributes and actions that principals ought to use in the empowerment of SMTs. The knowledge provided can add to the existing literature about attributes and actions of school leadership in schools. Principals will tap into the new knowledge and they will be in a position to create a sense of trust in SMTs. Also, they will be able to develop shared management structures and ensure that SMTs participate in problem-solving, decision-making, as well as encouraging innovation, and creativity.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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: If the articles are written by several authors a short paragraph identifying their contributions must be clarified. For example: "Conceptualization, first author. and second author.; methodology, author. and second author.; validation, author. and second author, and author. and second author analysis, author. and second author.; writing, review and editing, author. and second author.; supervision, author. and second author.; project administration, author. and second author.

Funding: If this research is funded, please state the name of the funder. If not, please state "This research received no funding".

Institutional Review Board Statement: Institutional Review Board Statement: This study was approved by the North-West University Research Ethics Committee (Ethics number: NWU- 00284-18- A2)

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.

References

Albert, M., Scott, C. E., & Rincon, M. (2023). Can even one adult please just listen to me? Rethinking the mentoring of beginning teachers by positioning secondary students as guides. *Teaching and Teacher Education*, 128, 104111. https://doi.org/10.1016/j.tate.2023.104111

Alhebshi, S.H., Aishah, N., & Al-Maswary, N.A.A (2022).Leadership as a Factor of School Quality in International Schools. *Journal of Economics, Finance and Management Studies*, 5: 1084-1091, DOI: 10.47191/jefms/v5-i4-17.

Bhujel, C. B. (2021). The role of principal in improvement of school performance: A qualitative study in community school of Nepal. *Artech Journal of Art Social Sciences*., 3, 11-22.

Caluza, P. N. (2022). *From a sinking school to a moving school: a case study of a school-teacher union partnership to facilitate school improvement* (Doctoral dissertation). Submitted in fulfilment of the Master of Education degree in the discipline Educational Leadership, Management and Policy, School of Education, College of Humanities, University of KwaZulu-Natal. Republic of South Africa.

Cox, J. S., & Mullen, C. A. (2023). Impacting student achievement: Principals' instructional leadership practice in two Title I rural schools. *Journal of School Leadership*, 33(1), 3-25. https://doi.org/10.1177/105268462211339

DeMatthews, D.E. (2018), *Community engaged leadership for school justice: A critical approach in urban schools.* New York: Routledge.

Malinga, C.B., Loyiso, C Jita, L.C., and Bada, A.A. 2022 .Comparing the organizational infrastructure for instructional leadership in natural sciences teaching among formerly segregated schools in Gauteng. *International Journal of Educational Best Practices*, 6. 1-29, DOI: 10.32851/ijebp.v6n1.p1-29

Department of Basic Education. (2020). Schooling 2025. Accessed 02 August 2022. education.gov.za/Curriculum/Schooling2025.aspx. Accessed 02 August 2022. education.gov.za/Curriculum/Schooling2025.aspx.

Department of Education. (1996). South African Schools Act. (Act No. 84 of 1996.) Government Gazette, 377. Nov. 15. (Regulation Gazette. No 1323.) Pretoria: Government Printers.

Fortunisa, A., Putri, D. M., Elsyah, R. D. (2023). The Influence of Empowering Leadership Towards Employee Ambidexterity: Study Literature Review. *Journal of Community Development in Asia*, 6(1), 21-33. DOI: https://doi.org/10.32535/jcda.v6i1.1985

Kanjanakan, P., Wang, P. Q., & Kim, P. B. (2023). The empowering, the empovered, and the empoverment disparity: A multilevel analysis of the integrated model of employee empoverment. *Tourism Management*, 94, 104633. https://doi.org/10.1016/j.tourman.2022.104635

Lamsal, B. (2022). Instructional Leadership Behavior among Principals of Two Schools in Lalitpur, Nepal. *Journal of Technical and Vocational Education and Training* ,1(16).

Leithwood, K., Harris, A., &Hopkins, D. (2020). Seven strong claims about successful school leadership revisited. *School Leadership and Management*, 40(1), 5-22.

Limon, E. (2022). The Relationship between Empowering Leadership and Teachers' Job Performance: Organizational Commitment as a Mediator. *Journal of Theoretical Educational Science*, 15(1), 16-4.

Mendez, J. B., & A. Quark, A. (2023). Debating Equity through Integration: School Officials' Decision-Making and Community Advocacy During a School Rezoning in Williamsburg, Virginia. Critical Sociology, 49(4-5), 749-766. https://doi.org/10.1177/08969205221118000

Merritt, A. B., & Wang, Y. (2022). Destructive Leaders in Schools: Can They Be Instructional Leaders. NASSP Bulletin, Vol. 106(2), 109–132.

Muyunda, G. (2022). Perceptions and Implications of Principals' Instructional Leadership Practices. *Asian Journal of Management, Entrepreneurship and Social Science*, 2(03), 157-170.

Nomatshila, S.C., Apalata, T.R., & Mabunda, S.A., (2022). 'Perceptions and knowledge of school management teams about non-communicable diseases and strategies to prevent them', Health SA Gesondheid 27(0), a1781. https://doi.org/10.4102/ hsag.v27i0.1781

Polatcan, M., & Cansoy, R. (2019). Examining studies on the factors predicting teachers' job satisfaction: A systematic review. *International Online Journal of Education and Teaching*, 6(1), 1154-1172.

Provinzano, K., & Mayger, L.K. (2022). Betwixt and Between Justice and Inaction: Full-Service Community School Principals and Community Equity Literacy. *Urban Education* 6, pages 004208592110738.

Rahman, R.A., Tahir, L. M., & Ali, M.F. (2022). Tacit knowledge in instructional leadership: Evidence from Malaysian secondary principal. Malaysian *Online Journal of Educational Management*, 10(2), 50-72.

Safrida, S., Tannady, H., Solissa, E. M., Sapulete, H., & Al Haddar, G. (2023). Strategic Leadership Analysis of School Principal to Improve Learning Quality. *Jurnal Pendidikan dan Kewirausahaan*, *11*(2), 391-399. https://doi.org/10.47668/pkwu.v11i2.741

Sanchez, J.E., Paul, J.M., & Thornton, B.W. (2020). Relationships among teachers' perceptions of principal leadership and teachers' perceptions of school climate in the high school setting. *International Journal of Leadership in Education*, Doi:10.1080/13603124.2019.1708471.

Shaked, H. (2021). Between center and periphery: instructional leadership in Israeli rural schools. *International Journal of Educational Management*, 35 (7), 1361-1374.

Shakel, R.D., Shangolo, H.P & Sheared, A.G. (2018). Participatory management: an opportunity for human resource s in education. *Procedia Social and Behavioural Sciences*, 1(1):1939-1943.

Siriparp, T., Buasuwan, P., & Nanthachai, S. (2022). The effects of principal instructional leadership, collective teacher efficacy and teacher role on teacher self-efficacy: A moderated mediation examination. *Kasetsart Journal of Social Sciences*, 43(2), 353-360.

Siyal, S., Liu, J., Ma, L., Kumari, K., Saeed, M., Xin, C., & Hussain, S. N. (2023). Does inclusive leadership influence task performance of hospitality industry employees? Role of psychological empowerment and trust in leader. *Heliyon, 9*(5), 1-18. https://doi.org/10.1016/j.heliyon.2023.e15507

Susanto, P. C., Syailendra, S., & Suryawan, R. F. (2023). Determination of Motivation and Performance: Analysis of Job Satisfaction, Employee Engagement and Leadership. International *Journal of Business and Applied Economics*, 2(2), 59-68. https://doi.org/10.55927/ijbae.v2i2.2135

Tedla, B.A., & Redda, E.H. (2022). Teacher professionalism as an impetus for teacher leadership to lead schools: A retrospective study. Eurasian Journal of Social Sciences, 10(1), 1-15.

Trenerry, B., Dunn, K., & Paradies, Y. (2023). Productive disruptions: Supporting diversity and anti-racism in the workplace through multi-level organisational strategies. *Australian Journal of Management*, 03128962231175182.

Yang, J., Gu, J., & Liu, H. (2019). Servant leadership and employee creativity: The roles of psychological empowerment and work–family conflict. Current Psychology: *A Journal for Diverse Perspectives on Diverse Psychological Issues*, 38(6), 1417–1427. https://doi.org/10.1007/s12144-019-0161-3

Yurttaş, A. ve Aksu, A. (2022). Liderlik stilleri, okul kültürü ve okul dinamizmi ilişkisi. *e- Kafkas Eğitim Araştırmaları Dergisi*, *9*, 581-602. doi:10.30900/kafkasegt.1028940

Zulu, J.K., Bhengu, T.T., & Mkhize, B.N. (2021). Leadership challenges and responses to complex township school life: perspectives from four secondary schools in South Africa. *International Journal of Leadership in Education* 24(2)

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

Examination of Teachers' Opinions on The Concept of New Generation Item According to Some Variables

Eray Selçuk[1] Ferhat Karakaya[2] Mehmet Yılmaz[3]

To cite this article:
Selçuk, Karakaya & Yılmaz (2024). Examination of Teachers' Opinions on The Concept of New Generation Item According to Some Variables. *e-Kafkas Journal of Educational Research*, *11*, 33-47. doi:10.30900/kafkasegt.1435336

Research article **Received:** 11.02.2024 **Accepted:** 17.04.2024

Abstract

With the replacement of TEOG in 2018 by the LGS, as known a new concept has emerged in the measurement and evaluation. This concept is called the new generation item. This research aims to determine teachers' opinions about new-generation items. This study was designed with a mixed-method strategy. Chi-square analysis was applied to the quantitatively collected data and content analysis was applied to the qualitatively collected data. A total of 192 teachers from 23 different fields participated in the study. The research data were collected using a semi-structured questionnaire form prepared by the researchers. 75 (39 %) of the teachers stated that there is no concept of a new generation item, and 117 (71 %) of them stated that there is such a concept. It was found that there was no statistically significant correlation between the branch of the teachers, their professional time and whether they attended any course/seminar/workshop and their answers about the existence of the concept of new generation items. Seven themes were revealed in the qualitative part, where teachers' views on the concept of new generation items were taken. These themes are the Formal view, Skill-based, Taxonomic view, Reading comprehension-based, Reconstructing knowledge, Daily life skills-based, and New view. According to these themes, new generation items predominantly consist of formal reading comprehension and higher-order thinking skills.

Keywords: New generation item, skill-based item, test development, item writing, measurement and evaluation

[1] Corresponding Author, erayselcuk84@gmail.com, Ministry of National Education
[2] Yozgat Bozok University, Faculty of Education
[3] Gazi University, Gazi Faculty of Education

Introduction

Measurement and evaluation procedures are utilized at all stages of education and training to obtain feedback for accountability in education. These procedures are also a control system to determine the quality of education and training. Accordingly, valid and reliable measurement and evaluation tools should be used for the process to function correctly (Miller, Linn & Gronlund, 2009). The first step in the measurement and evaluation procedure is to define the trait to be measured and to carry out the measurement operation. The priority for this is to have a measurement rule or a measurement tool. With the use of valid and reliable measurement tools, various data about individuals are obtained. The results obtained from measurement tools are used to make judgments about the measured traits of individuals (Gelbal, 1994).

Measurement in the education and training system is carried out through tests to determine the outcomes of the curriculum or the students' achievement standards. Tests used in education are measurement tools used to determine students' achievement levels or measure the teaching process's efficiency (Brookhart, 2010; McMillan, 2014). In a way, tests are tools for determining the traits of an individual under standard conditions (Anastasi & Urbina, 1997). These tests are designed to measure students' level of proficiency in a specific content or ability. Test development is the process of developing and creating tests that are used to measure and assess a knowledge area or topic. According to Thorndike (1982), several activities (such as defining the purpose and scope, writing test items, piloting, and item analysis) are applied successively in the test development process. One of the most essential steps in these processes is writing the items that make up the test. The item, which is part of a test or assessment tool, i.e., the most basic unit of observation (Osterlind, 1990; Haladyna, 2004), usually refers to a specific item or statement used to assess an individual's traits, abilities, or attitudes (Anastasi & Urbina, 1997). The item writing procedure involves specific guidelines depending on the item type and requires proficiency. While preparing the item, the item writer should have accurate scientific knowledge about the behaviour to be measured, should know the group to be measured well, should define the behaviour to be measured clearly, and should have sufficient measurement and evaluation knowledge about the type of item used (Selçuk, 2022). There are many exams in various fields in many institutions in our country, especially SSPC [OSYM] and MoNE [MEB], and these exams contain many sub-tests. In a country with so many exams, test development and item writing are increasingly important areas of specialization. The exam-oriented approach that dominates the education system (Taşdemir, 2015; Ural, 2016) encourages many private publishing companies to produce test books in this field. For this reason, this gap in the field is tried to be filled by many educators who have or have not received item writing preparation training.

The High School Entrance Examination (LGS), seen as a high-stakes exam in our country, is often brought to the spotlight and discussed, mainly due to its content. In the 2023 Education Vision prepared and published by the Ministry of National Education (MoNE) in October 2018, the "Competency-Based Assessment and Evaluation System" is mentioned. This system states that the assessment of students' cognitive skills, such as reasoning, creative thinking, critical thinking, reflective thinking, lateral thinking, interpretation, prediction, and so on, will be emphasized. An approach that eliminates the need for processes such as memorizing formulas and storing knowledge will be displayed (MoNE, 2018). In this context, MoNE published "Skill-Based Example Items" every month before the exam. Recently, MoNE published new measurement and evaluation legislation. In the measurement and evaluation legislation published in the Turkish Government's Legal Gazette dated 09/09/2023 and no. 32304, "formative measurement and evaluation" was emphasized, and decisions were made to use different types of items, mainly open-ended (MoNE, 2023). At the same time, the legislation emphasizes that the concept of skill-based assessment and evaluation will continue. Many teachers and publishing companies refer to skill-based questions as "new generation questions or items." This concept has recently appeared in the LGS and is defined differently by specialists.

These items, which are very similar to the items asked in international exams, are often referred to as new generation items, skill-based items, or context-based items in the education system (Erden, 2020; Kertil et al., 2021). Çaldıran and Özkan (2022) defined new generation items as complex items that require students to comprehend what they read, make inferences, solve problems, analyze, think

critically, and use scientific processing skills. Karakeçe (2021) referred to such new generation items that develop higher-order thinking skills in students and enable them to think critically as "skill-based items". Sanca et al., (2021) stated that new generation items aim to provide students with high-level skills. Yiğit et al., (2022) noted that new generation items aim to measure students' higher-order thinking skills such as reasoning, inferring, problem solving, analyzing, critical and creative thinking. Şahan and Şahin (2023) defined new generation items as questions that help students understand, construct, interpret, and analyze information associated with real life and aim to move students away from memorization and help them think. They also stated that the new generation items are problems created with real-life shapes and scenarios, which the MoNE has defined as skill-based since 2018. In general, it is seen that the new generation items measure high-level thinking skills, are related to daily life, and are presented with a wide range of content.

Reviewing the Turkish literature, context-based and skill-based items were prepared and used (Elmas & Eryılmaz, 2015; Kabuklu et al., 2019; Şan & İlhan, 2022; Türkel, 2022), context-based items were compared with traditional items or PISA items (Sak, 2018; Tekbıyık & Akdeniz, 2010; Ünal, 2019), students' solving processes of context-based and new generation items (Nasırlıel, 2020; İlkörücü & Altaş, 2022), the opinions of teachers and students on skill-based and LGS items (Erden, 2020; Kablan & Bozkuş, 2021; Kertil et al. 2021; Çaldıran & Özkan, 2022; Karabulut et al., 2022; Ceylan & Orhan, 2023; Kaya & Şahin, 2023), and the development of attitude and perception scales for new generation items (Kılcan, 2021; Yiğit et al., 2022). The item types examined in these studies are mostly called new generation items. It was observed that only qualitative data were collected in the studies. Examining qualitative data and various variables will provide deeper insights into these studies. When the literature on assessment and evaluation in other countries was reviewed, no such concept (new generation item) was found, especially in Web of Science (WoS) and Scopus databases. This is because there is no such type among the commonly accepted types of substances globally. This study investigated the reasons for this concept's appearance and common use in our country. Accordingly, this study examines teachers' views on new generation items according to various variables. For this purpose, answers to the following research questions were sought:

1. Is there a significant difference in whether there is a “new generation item” concept according to the fields of teachers?

2. Is there a significant difference in whether there is a “new generation item” regarding teachers' occupational years?

3. Is there a significant difference in whether teachers have a “new generation item” concept according to whether they attended any course, seminar, or workshop related to measurement and evaluation?

4. What are teachers' opinions on the concept of “new generation items”?

This research is distinguished from other research because teachers' views are examined in terms of various variables; qualitative and quantitative data are collected simultaneously. In this study, the reason for determining teachers' fields, occupational years, and whether or not they have taken any measurement and evaluation courses as quantitative variables is that these variables directly or indirectly affect the concept of "new generation item." Because the concept of "new generation item" is used mainly by mathematics and science teachers in the field. This is because these two disciplines are more important than others in LGS. Therefore, it is thought that the teachers' field will have a different concept. Likewise, it is believed that this concept will differ in terms of the professional duration of teaching. Because this concept is used more frequently by teachers new to the occupational period. Accordingly, does the increased occupational duration change the thoughts about this concept? Thirdly, the reason for asking whether any measurement and evaluation courses were taken is that it is known that this concept has no equivalent in the measurement and evaluation literature. Experts frequently state that there is no such concept in such courses. Therefore, it is thought that there will be a difference between those who attended such a course and those who did not.

A review of the literature on measurement and evaluation reveals that there is no such concept as new generation item. However, this concept has recently been frequently used in test development and item writing processes, and many studies have been conducted on it. In this study, if there is such a concept,

how teachers define it was emphasized. Based on these definitions, it was tried to explain with scientific evidence that nothing is new. This study will contribute to the literature by showing that teachers misuse a non-scientific concept.

Method

This section includes information about the research model, study group, process, data collection, data analysis, and validity and reliability in the qualitative part of the research.

Research Design

This research is a mixed-method research design. Mixed-method research is a research method used in the fields of education, health, social and behavioural sciences where the researcher collects both quantitative and qualitative data to understand the research purpose, combines the two data sets, and then draws conclusions using the superior advantages of these two data sets (Creswell, 2021). The research uses a concurrent nested mixed method design. Concurrent nested mixed method design is a research design quantitative and qualitative data are collected and analyzed at the same time. However, the emphasis is usually on either quantitative or qualitative data. In these designs, one type of data is embedded in the other, so less attention is paid to the embedded data type. One reason is that the less important type of data is being used to help answer an entirely different question or set of questions. Combining data is usually done at the data analysis stage. This design is useful when it is desirable to gain a broad view of the studied topic and to survey different groups or levels within a study. (Creswell, 2021). The mixed method was preferred in this research because it is thought that by using qualitative and quantitative data together, the weakness of each data set will be strengthened by the other. The mutual results will contribute to the validity of the research by complementing each other.

Sample

The study group consisted of 192 teachers working in various cities of Turkey, from 23 different disciplines and with different occupational durations, who participated or did not participate in any measurement and evaluation seminar/course/workshop. Descriptive statistics of the study group is given in Table 1, Table 2 and Table 3. Descriptive statistics of teachers according to their fields of study is given in Table 1.

Table 1.
The Frequency and Percentage Frequency Values According to Teachers' Branches

Branches	N	%	Branches	N	%
Physical Education	1	0.5	Mathematics	21	10.9
ICT Technologies	2	1.0	Music	1	0.5
Biology	8	4.2	Special Education	2	1.0
Geography	4	2.1	Psychological counseling and Guidance	3	1.6
Religious Culture and Ethics	4	2.1	Primary School Education	24	12.5
Philosophy	3	1.6	Social Sciences	9	4.7
Science Education	43	22.4	History	1	0.5
Physics	4	2.1	Technology and Design	6	3.1
Arts	1	0.5	Turkish Language and Literature	7	3.6
IHL Vocational Lessons	4	2.1	Turkish	18	9.4
Elementary Mathematics	9	4.7	Foreign Languages	12	6.3
Chemistry	5	2.6	Sum	192	100

In Table 1, science teachers participated in the research the most with 43 (22.4 %) participants, while physical education, visual arts, music and history teachers participated the least with one (0.5 %) each. Descriptive statistics of the teachers according to their occupational duration is given in Table 2.

Table 2.
The Frequency and Percentage Frequency and Percentage Frequency Values According to Teachers' Occupational Periods

Occupational Periods	N	%
0-5 years	16	8.3
6-10 years	49	25.5
11-15 years	52	27.1

Table 2 continuing

16-20 years	42	21.9
21 or above years	33	17.2
Sum	192	100

In Table 2, 16 (8.3 %) between 0-5 years, 49 (25.5 %) between 6-10 years, 52 (27.1 %) between 11-15 years, 42 (21.9 %) between 16-20 years, and 33 (17.2 %) between 21 years and above. Descriptive statistics about whether the teachers participated in any courses, seminars or workshops related to measurement and evaluation is given in Table 3.

Table 3.
The Frequency and Percentage Frequency Values According to Teachers' Participation in Courses/Seminars/Workshops

Participation in Courses/Seminars/Workshops	N	%
Yes	142	74
No	50	26
Sum	192	100

In Table 3, it is seen that 142 (74 %) of the teachers participated in any course, seminar or workshop related to measurement and evaluation, while 50 (26 %) of the teachers did not. In the following process, the data collection phase was started.

Process

Ethical approval was obtained from Yozgat Bozok University Social and Human Sciences Ethics Committee to conduct the research with the decision dated 20/04/2022 and no. 32/40. At the same time, the necessary authorization was obtained from the Ministry of National Education to conduct the online application to teachers all over Turkey. Data were collected through Google Forms via the link https://forms.gle/y2p3orKYWVVEPDVo7. Teachers participated in the data collection phase voluntarily. The participants were assured that the data were collected only for academic purposes.

Data Collection

The data were collected through a a semi-structured questionnaire form developed by the researchers. This form consists of five questions. The first four questions constitute the quantitative data of the research, and the fifth question constitutes the qualitative data. The fifth question is opened according to the answer given to the fourth question. This question is, "Is there such a thing (concept, item type, etc.) as "New Generation Item?". If the participant answered "No" to this question, the data collection phase ended; if the participant answered "Yes," the fifth question was opened. The fifth question of the form is "What does the New Generation Item mean to you?". After the data were collected, the quantitative and qualitative data were analyzed.

Data Analysis

The data were analyzed in two steps. In the first step, the Chi-square independence test was performed on the variables mentioned for the first three questions of the research. The chi-square test of independence is a statistical method used to determine whether there is a significant relationship between two categorical variables. This test involves comparing observed frequencies in a contingency table with expected frequencies under the assumption of independence between two variables (Koch, 1982). The Chi-square statistic is then calculated, and the difference between the observed and expected frequencies is measured. A significant difference between the observed and expected frequencies indicates a relationship between the two variables (Agresti, 2018). For the Chi-square independence test to give a robust result, the lowest expected frequency in each cell should be 5 or more. Some authors state that at least 80% of the cells should have an expected frequency of 5 or more. In cases where this is not the desired frequency, Fisher's Exact Likelihood Test results should be reported in addition to the Chi-square values. In addition, when there are two categories in each variable, i.e., in a 2 x 2 Chi-square design, Yates Correction for Continuity is required (Pallant, 2015). Therefore, Fisher's Exact Likelihood Test was performed for the first research problem, Chi-square independence test for the second problem, and Yates Correction for Continuity as well as Chi-square independence test for the third research problem.

In the second step, content analysis was performed on the qualitative data for the fourth problem of the research. Content analysis is the process of systematically coding the collected data and collecting them under specified themes (Büyüköztürk et al., 2013). There are four phases in content analysis. These are (1) Coding the data, (2) Creating themes of the coded data, (3) Organizing the codes and themes, and (4) Creating, interpreting, and reporting the findings (Yıldırım & Şimşek, 2021).

Validity and Reliability in Research

In the qualitative section of the research, the similarity ratio, which is defined as internal consistency in the Miles and Huberman formula for reliability and defined as the agreement between the coders, was calculated with the following equation: $\Delta = C \div (C + \partial) \times 100$: $\Delta = C \div (C + \partial) \times 100$. In the equation, Δ: Reliability coefficient, C: The number of topics/terms on which there is agreement, ∂: Represents the number of topics/terms on which there is disagreement. According to the coding check that provides internal consistency, it is expected that the agreement between the coders should be at least 80% (Miles & Huberman, 1994). According to this method, the codes and themes created by the responsible author were given to the other two researchers, who were asked to perform recoding. Accordingly, the reliability between the three researchers was calculated as .87.

In the qualitative part of the study, the validity study was conducted as internal (credibility). Triangulation/triangulation method was used for internal validity. In this method, multiple methods, multiple data sources and a large number of participants are utilized in data collection (Creswell, 2020; Merriam, 2013). In this research, internal validity was ensured by working with 192 participants from 23 different disciplines. At the same time, the data obtained from the quantitative part of the research were supported by the data obtained from the qualitative part. Hence, it was meticulously examined whether the participants were accurate in their responses.

Findings

The findings of the analysis conducted in response to the research questions are given under sub-headings.

Is there a significant difference, according to the branches of the teachers, about whether there is a new generation item concept or not?

The results of the Chi-square independence test on whether there is a new generation item concept according to the branches of the teachers are given in Table 4.

Table 4.
Results of Chi-Square Independence Test Regarding Whether Teachers Have a New Generation Item Concept According to Their Branches

Branches	New generation item		Sum	χ^2	df	p*	Fisher' p*
	Yes	No					
Physical Education	1	0	1				
ICT Technologies	1	1	2				
Biology	4	4	8				
Geography	3	1	4				
Religious Culture and Ethics	4	0	4				
Philosophy	2	1	3				
Science Education	20	23	43				
Physics	2	2	4				
Arts	1	0	1				
IHL Vocational Lessons	3	1	4	22.830	22	.411	.372
Elementary Mathematics	4	5	9				
Chemistry	2	3	5				
Mathematics	12	9	21				
Music	0	1	1				
Special Education	2	0	2				
Psychological counseling and Guidance	2	1	3				
Primary School Education	17	7	24				
Social Sciences	5	4	9				
History	0	1	1				

Table 4 continuing

Technology and Design	6	0	6
Turkish Language and Literature	4	3	7
Turkish	14	4	18
Foreign Languages	8	4	12
Sum	117	75	192

*p<.05

In Table 4, it was found that the difference observed in the opinions of teachers from different branches on whether the concept of new generation item exists was not significant ($\chi2_{(22, 192)}$=22.830; p>.05). This means there is no relationship between teachers' branches and their views on the concept of new generation item.

Is there a significant difference in whether there is a new generation item concept regarding teachers' occupational years?

The results of the Chi-square independence test on whether there is a new generation item concept according to the occupational years of the teachers are given in Table 5.

Table 5.
The Results of the Chi-Square Independence Test for the Presence of the New Generation Item Concept According to the Occupational Periods of the Teachers

Occupational periods	New generation item		Sum	χ^2	df	p*
	Yes	No				
0-5 years	13	3	16	4.749	4	.314
6-10 years	28	21	49			
11-15 years	28	24	52			
16-20 years	28	14	42			
21 or above years	20	13	33			
Sum	117	75	192			

*p<.05

In Table 5, it was found that the difference observed in the opinions of teachers with different occupational periods on whether there is a new generation item concept is not significant ($\chi2_{(4, 192)}$=4.749; p>.05). This means that there is no relationship between teachers' occupational periods and their views on the concept of new generation item.

Is there a significant difference between the teachers' participation in any course, seminar, or workshop related to measurement and evaluation and whether they have a new generation item concept or not?

The results of the chi-square independence test on whether there is a new generation item concept according to whether the teachers attended a course, seminar, or workshop on measurement and evaluation are given in Table 6.

Table 6.
The Results of Chi-Square Independence Test Regarding Whether Teachers Have a New Generation Item Concept According to Whether They Participated in a Course, Seminar or Workshop Related to Measurement and Evaluation

Participation in Courses/Seminars/Workshops	New generation item		Sum	χ^2	df	p*
	Yes	No				
Yes	82	60	142	1.846	1	.174
No	35	15	50			
Sum	117	75	192			

*p<.05

In Table 6, it was found that the difference observed in the opinions of the teachers who attended a course, seminar, or workshop in the field of measurement and evaluation regarding the existence of the concept of new generation item was not significant ($\chi2_{(1, 192)}$=1.846; p>.05). This means that there is no relationship between teachers' participation in any course, seminar or workshop in the field of measurement and evaluation and their views on the concept of new generation item.

Which themes are the teachers' opinions on the concept of new generation items?

The results of the content analysis of the opinions of 117 teachers who stated that there is a concept called new generation item are given in Table 7.

Table 7.
The Results of Content Analysis of Teachers' Opinions on the New Generation Item Concept

Themes	Subthemes	Codes	N	Teachers
Formal view	Text	Long text, long sentences	3	T2, T44, T130
	Visual	Graphic, Infographic, Image, Table, Figure	4	T27, T66, T109, T131
	Item type	Options, More than one topic, Meandering, Narrativized	2	T6, T178
Skill-based		Stem, Steam, Learning outcome based, Multidisciplinary	6	T3, T24, T45, T62, T104, T132
Taxonomic view	Bloom taxonomy	Comprehension, application, analysis, synthesis, evaluation, Bloom, upper stage, upper level	13	T4, T47, T60, T64, T72, T79, T89, T117, T119, T152, T157, T172, T177,
	High level skills	Skills, thinking, mind-straining, inferencing, algorithm understanding	12	T17, T18, T28, T55, T78, T85, T91, T96, T136, T162, T165, T192
	21st century skills	Millennium, 21st century	3	T43, T48, T188
	Learning outcome based	Multiple learning outcomes, outcome-item interaction, using more than one piece of knowledge, distinguishing between those who know and those who don't know	4	T54, T100, T140, T146
Reading comprehension-based		Understanding, comprehension, rapid reading, visual reading, transferring, interpreting, reading skills	19	T15, T39, T44, T102, T103, T105, T110, T118, T121, T125, T126, T135, T142, T145, T158, T159, T163, T168, T180
Reconstructing knowledge	Use of knowledge	Establishing relations, different from memorization, creating connections, testing of knowledge, prior knowledge, what is given to solve the problem	13	T9, T10, T19, T28, T34, T51, T67, T71, T73, T74, T87, T95, T164
	Interpretation of knowledge	Interpreting, explaining, inquiring, not asking for direct knowledge, evaluating knowledge, analyzing knowledge	15	T9, T11, T13, T26, T86, T98, T99, T127, T133, T138, T141, T149, T154, T160, T170
	Thinking differently	Reasoning, deduction, comprehension, progressive thinking	5	T69, T127, T137, T144, T171
Daily life skills-based	The actual world and daily life	Experiencing by doing, real life, outdoor life, daily life skills	10	T21, T31, T42, T50, T82, T112, T166, T169, T175, T179
	Gain-oriented	Multidisciplinary, Multilearning outcomes, Multibehaviour	6	T52, T68, T76, T107, T124, T186
New view		Adapting to the times, artificial intelligence assisted, next generation human	2	T22, T155
Sum				117

In Table 7, it is seen that the new generation item concept consists of seven different themes as a result of the opinions received from 117 teachers. These themes are Formal view (9), Skill-based (6), Taxonomic view (32), Reading comprehension-based (19), Reconstructing knowledge (33), Daily life skills-based (16), and New view (2).

The theme of Formal view consists of Text (2), Visual (4), and Item type (3) subthemes. Teachers stated that this concept consists of long texts and sentences in the Text subtheme. Some expressions related to teachers' views on this subtheme are given below: "Long text" (T2), "It contains slightly longer sentences and visuals." (T44).

In the Visual subtheme, teachers stated that this concept consists of visuals such as tables, figures, and graphics. Some expressions related to teachers' views on this subtheme are given below: "A Graphic, an infographic and a table is an item type that also measures visual reading skills." (T27), "The item includes information about the content as well as visuals, tables or graphics." (T109)

In the Item type subtheme, teachers stated that the options or the item's text differed in format. They also emphasized that the text part of the item was meandering and consisted of narratives. Some expressions related to teachers' views on this subtheme are given below:

> ...items with edited options... (T6)
> The new generation items are a bit too meandering; as far as I observe, it is a style that keeps students away from the lessons; when they see the item, they do not even want to solve it. I think it should be shorter and appealing to every student. (T178)

The Skill-based theme does not consist of any subthemes. In the Skill-based theme, teachers identified the new generation item concept with expressions such as "Stem, Steam, Outcome-based, Multidisciplinary." It is thought that teaching science, technology, engineering, art, and mathematics with an interdisciplinary approach, especially in the recent period, has also affected how teachers ask questions. Some of the teacher opinions in this theme are given below: “...It means a skill-based item that includes steam skills and is prepared with a multidisciplinary approach." (T45), "I had heard that it was different from the current education system, more exam-oriented." (T104)

The Taxonomic view theme consists of Bloom's taxonomy (13), higher level skills (12), 21st century skills (3) and learning outcome based (4) subthemes. In Bloom's taxonomy subtheme, teachers evaluated the new generation items in terms of their levels. Accordingly, they stated that this concept is at the comprehension, application, synthesis, and evaluation level. Some of the teacher opinions in this subtheme are given below:

> They are items above the comprehension level. They are items involving measurement at the level of analysis and synthesis. (T4)
> Item types that are at the levels of analysis and synthesis and even evaluation, rather than knowledge and comprehension, are very difficult for students, especially in the field of mathematics. (T60)

In the High-level skills subtheme, teachers defined the new generation item concept with expressions such as skill, thinking, mind-straining, making inferences, and understanding algorithms. Some of the teacher opinions in this subtheme are given below:

> To measure the application and high-level skills of the student other than measuring memorization knowledge. (T17)
> It is an item that requires high-level thinking skills. It is a problem situation that requires not knowledge but how knowledge should be used. (T28)

In the 21st century skills subtheme, teachers associated this concept with the skills necessary for the modern age. Some of the teachers' views on this subtheme are given below:

> It means ensuring that 21st century skills (such as scientific literacy, critical thinking, creativity) are acquired. (T43)
> New generation items are those that address higher skill levels based on problem solving, which is one of the 21st century skills required by the millennium age. (T188)

In the Learning outcome based subtheme, they tried to explain the new generation items with explanations such as being related to multiple learning outcomes, outcome-item interaction, using more than one piece of knowledge, and discriminating between those who know and those who do not know. Some of the teacher opinions on this subtheme are given below: "I think of the item that distinguishes the knower from the learner and tests many learning outcomes." (T54), "Problem solving method using more than one knowledge and skills..." (T140)

The Reading comprehension-based theme does not consist of any subthemes. In this theme, teachers tried to define the new generation item concept with statements such as reading comprehension, rapid reading, visual reading, transferring what they read, interpreting what they read, and reading skills. Some of the teacher responses to this theme are given below:

> These are items that require the student to move away from the classical memorization method and use his/her ability to understand and interpret what he/she reads and to combine this skill with his/her knowledge. (T39)
> Reading means understanding, interpreting, inferring. It includes longer sentences and visuals. (T44)

The theme of Restructuring knowledge consists of the subthemes of Use of knowledge (13), interpretation of knowledge (15), and thinking differently (5). In the subtheme of Use of knowledge, teachers defined the concept of new generation items as establishing relationships, different from rote memorization, creating connections, evaluating knowledge, analyzing knowledge and what is given to solve the problem. Some of the teachers' views on this subtheme are as follows: "New generation item means better use of knowledge." (T10), "It measures the ability to use data by giving prior knowledge, the ability to make interpretations..." (T95)

In the subtheme of Interpretation of knowledge, teachers tried to explain the new generation item concept with statements such as interpreting, explaining, inquiring, not asking direct knowledge, evaluating knowledge, and analyzing knowledge. In this subtheme, some of the teachers expressed the following opinions:

> The new generation item is the student answering the item by interpreting it. It is to move away from the memorization approach. It is to make them understand. (T86)
> In new generation items, the student does not need to memorize knowledge; instead, he/she answers the items by analyzing the knowledge he/she has learned for years and adding his/her interpretation. (T149)

In the subtheme that makes you Thinking differently, statements such as reasoning, deduction, comprehension and progressive thinking were used to explain the concept of new generation items. Some teachers' opinions on these expressions in this subtheme are given below: "In addition to knowledge, logic, reasoning, intelligence, comprehension of interdisciplinary collaboration." (T69), "The type of item that measures students' reasoning skills..." (T137)

The Daily life skills-based theme consists of Real world and daily life (10) and Gain-oriented (6) subthemes. In the actual world and daily life subtheme, the teachers tried to explain the concept of new generation items as experiencing by doing, real life, outdoor life, and daily life skills. Some of the teachers' views on this subtheme are given below: "The items that measure students' conceptual understanding and their ability to relate knowledge to daily life..." (T21), "...an item that makes connections with daily life..." (T82)

In the Gain-oriented subtheme, statements such as multidisciplinary, multilearning outcomes, and multibehaviours were related to the concept of new generation items. Teacher opinions on this subtheme are as follows: "... combining multiple learning outcomes..." (T52), "It includes learning outcomes from more than one discipline and contains interdisciplinary knowledge..." (T107)

The New view theme does not contain a subtheme. When the teacher responses under this theme were examined, it was seen that concepts such as adapting to the times, artificial intelligence assisted, and next generation humans were used. Some of the opinions of teachers on this theme are given below: “The items that adapt to the time...” (T22), “The item that chooses the person sought after in the new

generation...” (T155), “...the modern item that selects brains that create ideas that do that artificial intelligence cannot do. (T155)”

The theme of Reading comprehension-based," and the subtheme of "comprehension" in Kablan and Bozkuş's (2021) research, the theme of "reading comprehension skills" in Çaldıran and Özkan's (2022) research, and the subtheme of "reading and comprehension" in Kaya and Şahin's (2023) research are highly similar to the responses given in this research.

Discussion, Conclusion, and Suggestions

This research analyzed teachers' views on new generation items according to various variables. While 117 out of 192 teachers pointed out the existence of a new generation item concept, 92 of them stated that there was no such concept. It was observed that there was no significant difference between the teachers' responses regarding the concept of new generation item and their branches, occupational period, and whether they attended any course/seminar/workshop. A situation similar to this result is not found in the literature because there is no research examining the relationship between the new generation item concept and these variables.

In the qualitative section, where teachers' views on the concept of new generation items were taken, seven themes were identified. According to these themes, new generation items are mainly formal in measuring reading comprehension and higher-order thinking skills. According to teachers, new generation items consist of complicated structures of long texts, visuals, and various scenarios in which reading comprehension predominates, measuring higher-order thinking skills and incorporating many disciplines. In Erden's (2020) research, teachers' association of new generation items with learning outcomes is similar to the statements in the learning outcome-based subtheme in the taxonomic view theme of this research. In Çaldıran and Özkan's (2022) research, statements such as difficulty and complexity mentioned in student opinions are similar to the answers given in the formal perspective theme of the study. At the same time, when the old-type items were compared with the new items, it was seen that the students used expressions similar to the teachers' in this research, such as length, difficulty, and high-level thinking. In Kaya and Şahin's (2023) research, while Turkish teachers stated that the new generation items were incompatible with the learning outcomes of the curriculum, they used the statements of over-achievement or high-level thinking skills. These statements are similar to the statements in the taxonomic perspective theme of this research. The subthemes of problem-solving, critical thinking, and interpretation under the theme of cognitive skills in Şahan and Şahin's (2023) research are similar to the statements given in the higher-order skills subtheme under the taxonomic view theme and the reading comprehension-based theme in this research. The statements in the proximity to the life subtheme of the contextual features theme of the same research are similar to the statements in the actual world and daily life subtheme of the daily life skills-based theme of this research.

According to the opinions of teachers and the studies conducted, the concept of new generation items corresponds to the concepts of skill-based items used by MoNE, context-based items with studies in the literature, and item-like items used in PISA. Erden (2020), Kablan and Bozkuş (2021), Karakeçe (2021), Kertil et al. (2021), Kılcan (2021), Sanca et al. (2021), Çaldıran and Özkan (2022), İlkörücü and Altaş (2022), Karabulut, Tosunbayraktar and Kariper (2022), Şan and İlhan (2022), Yiğit, Deveci and Dadandı (2022), Türkel (2022), Ceylan and Orhan (2023), Şahan and Şahin (2023) stated that such items are called new generation items in their studies. However, the concept of new generation items is not found in any of MoNE's (2018, 2023) documents on measurement and evaluation processes. In this process that emerged with the MoNE (2018), 2023 Vision Document, this concept has never been used in the competency-based assessment and evaluation process. In addition, the concept of new-generation items is not mentioned in the formative assessment and evaluation process specified by MoNE (2023) in the new assessment and evaluation legislation. When this concept was searched in Turkish and English in international refereed journals published in assessment and evaluation indexed in indexes such as WoS and Scopus, no research was found. In addition, when the studies of Ahmed and Pollitt (2007), Chi, Wang, and Liu (2022), Hanberger (2014), and Roehl (2015), which are stated to be related to new generation items in the international literature, it is seen that the concept of "new generation item" is not included in their content in any way. When these studies were examined meticulously, it was determined that their content was context-based or based on reviewing

the items used in PISA. Accordingly, the concept of a new generation item is not used in local or international literature in a way identical to the concepts of competence, skill, or context-based or formative assessment and evaluation, which should be seen as evidence that this concept is not scientific.

An essential limitation of scientific research in the social sciences is the accurate construction and discussion of concepts. Concepts cannot be formed according to a scientist's preferences. There are specific criteria to be considered in this regard. Concepts are developed and named by these criteria, and no scientist can define that concept with a different name (Yalçın, 2017). Accordingly, to accept the existence of the new generation item, it needs to be rearranged according to the concept formation criteria.

The results obtained from the quantitative data and the results obtained from the qualitative data of the study were analyzed together, and it was seen that there was no significant relationship between the related variables. There was no significant difference between the fields of the teachers who stated that the new generation item concept existed, their occupational period, and whether they had taken any measurement and evaluation course or not. Accordingly, the variables examined do not affect the presence or absence of this concept.

Accordingly, it is recommended that item writers, teachers, and publishing organizations should not use the new generation item concept, which the researchers of this study claim is not a scientific concept. In addition, it is suggested that other researchers should know the historical process and basic knowledge of the relevant field well when generating concepts in a scientific field and should correctly determine the cognitive and intellectual meanings of the concepts.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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, Eray Selçuk; methodology, Eray Selçuk; validation, Eray Selçuk, Ferhat Karakaya and Mehmet Yılmaz; analysis, Eray Selçuk; coding themes, Eray Selçuk, Ferhat Karakaya and Mehmet Yılmaz; writing, review and editing, Eray Selçuk and Ferhat Karakaya; supervision, Mehmet Yılmaz; project administration, Mehmet Yılmaz.

Funding: This research received no funding.

Institutional Review Board Statement: Ethical approval was obtained from Yozgat Bozok University Social and Human Sciences Ethics Committee to conduct the research with the decision dated 20/04/2022 and no. 32/40.

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.

References

Agresti, A. (2018). *An Introduction to Categorical Data Analysis*. John Wiley & Sons.

Ahmed, A. & Pollitt, A. (2007). Improving the quality of contextualized questions: An experimental investigation of focus. *Assessment in Education Principles Policy and Practice, 14*(2), 201–232. doi:10.1080/09695940701478909

Anastasi, A., & Urbina, S. (1997). *Psychological testing* (7th ed.). Prentice Hall/Pearson Education.

Brookhart, S. M. (2010). *Assess higher-order thinking skills in your classroom.* Alexandria, VA: ASCD.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. A., Karadeniz, Ş. & Demirel, F. (2013). *Bilimsel araştırma yöntemleri.* Ankara: Pegem Akademi Yayıncılık.

Ceylan, G., & Orhan, A. T. (2023). Beceri temelli fen sorularına yönelik fen bilimleri öğretmenlerinin görüşlerinin incelenmesi. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 19*(1), 84-11. doi:10.17860/mersinefd.1193968

Chi, S., Wang, Z. & Liu, X. (2022) Assessment of Context-Based Chemistry Problem-Solving Skills: Test Design and Results from Ninth-Grade Students. *Research in Science Education, 53,* 295-318. doi:10.1007/s11165-022-10056-8

Creswell, J. W. (2020). *Nitel araştırma yöntemleri beş yaklaşıma göre nitel araştırma ve araştırma desenib.* Ankara: Siyasal Kitabevi.

Creswell, J. W. (2021) *Karma Yöntem Araştırmalarına Giriş* (Çeviri Ed. M. Sözbilir). Ankara: Pegem Akademi Yayıncılık.

Çaldıran, Ü. E., & Özkan, M. (2022). Çevrimiçi öğretim ortamlarında yeni nesil sorulara dayalı fen öğretimine ilişkin öğrenci görüşlerinin belirlenmesi. *Türk Akademik Yayınlar Dergisi (TAY Journal), 6*(2), 311-328. doi:10.29329/tayjournal.2022.510.07

Elmas, R., & Eryılmaz, A. (2015). Bağlam temelli fen soru yazımı: Kriterler ve efsaneler. *Kuramsal Eğitimbilim Dergisi, 8*(4), 564-580. doi:10.5578/keg.10135

Erden, B. (2020). Türkçe, matematik ve fen bilimleri dersi beceri temelli sorularına ilişkin öğretmen görüşleri. *Academia Eğitim Araştırmaları Dergisi, 5*(2), 270-292.

Gelbal, S. (1994). pMadde güçlük indeksi ile Rasch modelinin b parametresi ve bunlara dayalı yetenek ölçüleri üzerine bir karşılaştırma. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 10*(1994), 85-94.

Haladyna, T. M. (2004). *Developing and validating multiple-choice test items* (3rd ed.). Lawrence Erlbaum Associates, Inc.

Hanberger, A. (2014). What PISA intends to and can possibly achieve: A critical programme theory analysis. *European Educatıonal Research Journal, 13*(2), 167–180. doi:10.2304/eerj.2014.13.2.167

İlkörücü, Ş., & Altaş, R. (2022). Evaluation of 8th-grade students' approaches to solving new-generation science questions based on variable determination from scientific process skills. *Online Science Education Journal, 7*(1), 17-27.

Kablan, Z., & Bozkuş, F. (2021). Liselere giriş sınavı matematik problemlerine ilişkin öğretmen ve öğrenci görüşleri. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 17*(1), 211-231. doi:10.17860/mersinefd.800738

Kabuklu, Ü. N., Yüzbaşıoğlu, M. K., & Kurnaz, M. A. (Nisan, 2019). *Fen eğitimiyle alakalı araştırmalarda bağlam temelli soru yazma ölçütlerinin belirlenmesi.* Uluslararası Fen, Matematik, Girişimcilik ve Teknoloji Eğitimi Kongresi.

Karabulut, H., Tosunbayraktar, G., & Kariper, İ.A. (2022). Ortaokul öğrencilerinin beceri temelli (yeni nesil) fen bilimleri sorularına yönelik görüşlerinin incelenmesi. *EDUCATIONE, 1*(2), 301-320.

Karakeçe, B. (2021). *Ortaokul matematik öğretmenlerinin beceri temelli sorulara ilişkin değerlendirmeleri.* [Yayınlanmamış yüksek lisans tezi]. Gaziantep Üniversitesi, Gaziantep, Türkiye.

Kaya, A., & Şahin, Ç. (2023). Sınıf öğretmenlerinin yeni nesil Türkçe sorularına ilişkin görüşleri. *Ana Dili Eğitimi Dergisi, 11*(2), 437-453. doi:10.16916/aded.1236839

Kertil, M., Gülbağcı Dede, H., & Ulusoy, E. G. (2021). Skill-based mathematics questions: What do middle school mathematics teachers think about and how do they implement them? *Turkish*

Journal of Computer and Mathematics Education, 12(1), 151-186. doi:10.16949/turkbilmat.774651

Kılcan, T. (2021). Yeni nesil matematik sorularına ilişkin tutum ölçeği geliştirme: Geçerlik ve güvenirlik çalışması. *Anadolu Kültürel Araştırmalar Dergisi*, 5(2), 170-180

Kirk, R. E. (2013). *Experimental Design: Procedures for the Behavioral Sciences.* Sage Publications.

Koch, G. G. (1982). *Intraclass correlation coefficient*. In Encyclopedia of Statistical Sciences (Vol. 4, pp. 213-217). Wiley.

Nasırlıel, E. (2020). *8. sınıf öğrencilerinin bağlam temelli basınç sorularını çözme süreçleri.* [Yayımlanmamış yüksek lisans tezi]. Tokat Gaziosmanpaşa Üniversitesi, Tokat, Türkiye.

McMillan, J. H. (2014). *Classroom assessment: principles and practice for effective standard-based instruction.* New York, NY: Pearson.

MEB [MoNE] (2018). *2023 Eğitim Vizyonu*. Erişim adresi: https://www.gmka.gov.tr/dokumanlar/yayinlar/2023_Eğitim%20Vizyonu.pdf Erişim tarihi:17.05.2023

MEB [MoNE] (2023). Milli Eğitim Bakanlığı Ölçme ve Değerlendirme Yönetmeliği. *T.C. Resmî Gazete* (32304, 9 Eylül 2023). Erişim adresi: https://www.resmigazete.gov.tr/eskiler/2023/09/20230909-2.htm

Merriam, S. B (2013). *Nitel araştırma: Desen ve uygulama için bir rehber* (S. Turan, Çev. Edit.). Ankara: Nobel Akademik Yayıncılık.

Miller, D., Linn, R., & Gronlund, N. (2009). *Measurement and Assessment in Teaching.* New Jersey: Pearson.

Miles, M, B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded Sourcebook.* (2nd ed). Thousand Oaks, CA: Sage.

Osterlind, S. J. (1990). Toward a uniform definition of a test item. *Educational Research Quarterly, 14*(4), 2-5.

Osterlind, S.J. (2002). What is constructing test items? In S. J. Osterlind (Ed.), *Constructing test items: Multiple-choice, constructed-response, performance, and other formats* (pp. 1–16), Springer. doi:10.1007/0-306-47535-9_1

Pallant, J. (2015). *SPSS Survival Manual: A Step by Step Guide to Data Analysis using SPSS.* (4th ed.). Maidenhead: Open University Press.

Roehl, T. (2015) What PISA measures: some remarks on standardized assessment and science education. *Cultural Studies of Science Education 10*, 1215–1222. doi:10.1007/s11422-015-9662-z

Sak, M. (2018). *Ortaokul öğrencilerinin ışık konusundaki bağlam temelli sorular ile geleneksel soruları cevaplama düzeylerinin karşılaştırılması.* [Yayımlanmamış yüksek lisans tezi]. Kocaeli Üniversitesi, Kocaeli, Türkiye.

Sanca, M., Artun, H., Bakırcı, H. & Okur, M. (2021). Ortaokul beceri temelli soruların yeniden yapılandırılmış Bloom Taksonomisine göre değerlendirilmesi. *Van Yüzüncü Yıl Üniversitesi Eğitim Fakültesi Dergisi, 18*(1), 219-248.

Selçuk, E. (2022). Eray Selçuk ile Beceri Temelli Çoktan Seçmeli Maddelere Geçiş Süreci. Youtube: https://www.youtube.com/watch?v=Dat4TzIlZyc Erişim Tarihi: 17.05.2023.

Şahan, H., & Şahin, Ç. (2023). İlkokul 4. sınıf matematik dersindeki yeni nesil sorularının öğretmen görüşlerine göre incelenmesi. *Uluslararası Bilim ve Eğitim Dergisi, 6*(1), 83-98. doi:10.47477/ubed.1231419

Şan, S., & İlhan. N. (2022). Fen bilimleri dersi beceri temelli sorulara (yeni nesil) yönelik kuramsal ve kavramsal çerçeve. *İnönü Üniversitesi Eğitim Bilimleri Enstitüsü Dergisi, 9*(17), 17-36. doi:10.29129/inujgse.1089655

Taşdemir, M. (2015). Öğretmen adaylarının Türk millî eğitim sistemi üzerine algıladıkları sorunlar. *Turkish Studies-International Periodical for the Languages, Literature and History of Turkish or Turkic*, 10(7), 881-898. doi:10.7827/TurkishStudies.7898

Tekbıyık, A., & Akdeniz, A. R. (2010). Bağlam temelli ve geleneksel fizik problemlerinin karşılaştırılması üzerine bir inceleme. *Necatibey Eğitim Fakültesi Elektronik Fen ve Matematik Eğitimi Dergisi, 4*(1), 123-140.

Thorndike, L. R. (1982). *Applied Psychometrics.* Boston: Houghton Mifflin Co.

Türkel, R. (2022). İslam mezhepleri tarihi ders kazanımlarının ölçme ve değerlendirmesinde beceri temelli çoktan seçmeli madde (yeni nesil soru) kullanımı. *Mezhep Araştırmaları Dergisi, 15*(2), 755-768. doi:10.18403/emakalat.1223301

Ural, A. (2016). Yarışmacı eğitim anlayışının etkileri üzerine bir çözümleme. *Journal of Critical Pedagogy, 43,* 19-24.

Ünal, M. (2019). *PISA sınavlarının özelliklerinin fen bilimleri öğretmenlerinin hazırlamış oldukları sınav soruları ile karşılaştırılması: PISA kültürünü yaygınlaştırma model önerisi.* [Yayımlanmamış doktora tezi]. Uludağ Üniversitesi, Bursa, Türkiye.

Yalçın, A. (2017). Bilimsel çalışmalarda kavram oluşturma ve sözsüz iletişim kavramları üzerine. *Avrasya Terim Dergisi, 5*(2): 74-79

Yıldırım A., & Şimşek H. (2021). *Sosyal Bilimlerde Nitel Araştırma Yöntemleri* (12. Baskı). Ankara: Seçkin Yayıncılık.

Yiğit, N., Deveci, İ. & Dadandı, N. (2022). Yeni nesil fen bilimleri sorularına yönelik algı ölçeğinin geliştirilmesi. *Van YYÜ Eğitim Fakültesi Dergisi*, Şubat Özel Sayı, 108-130. doi:10.33711/yyuefd.1068089

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

Transforming STEM Education: The Impact of the RETA Model on Pre-Service Teachers' Attitudes and Lesson Planning

Belma Türker-Biber[1] **İpek Saralar-Aras**[2]

To cite this article:
Türker-Biber, B., & Saralar-Aras, İ. (2024). Transforming stem education: The impact of the reta model on pre-service teachers' attitudes and lesson planning. *e-Kafkas Journal of Educational Research*, *11*, 48-64. doi:10.30900/kafkasegt.1412764

Research article **Received:**31.12.2023 **Accepted:**19.04.2024

Abstract

This study investigates the influence of an innovative teaching model, the Realistic, Exploratory, Technology-enhanced, and Active (RETA) model, on the STEM attitudes of senior-grade pre-service teachers. The research involved 65 participants from a public university in Turkey. Employing a comprehensive approach, the study utilized a STEM attitude scale, a RETA-based lesson evaluation rubric, and semi-structured interviews to gather both qualitative and quantitative data. The results revealed a noteworthy correlation between pre-service teachers with positive attitudes towards the RETA approach and their heightened efficacy in developing impactful lesson plans. Through the application of the RETA model, participants demonstrated an increased inclination towards innovative teaching strategies, emphasizing the integration of 21st-century skills. Furthermore, post-course assessments indicated a significant positive shift in attitudes, with participants recognizing the model's potential to foster equity within their teaching practices. This research contributes valuable insights into the integration of digital technologies in the classroom, offering a robust framework for pre-service teachers to enhance their pedagogical approaches.

Keywords: STEM education, pre-service teachers, innovative teaching model, lesson design, attitude shift.

[1] Belma Türker-Biber, Aksaray University
[2] İpek Saralar-Aras, ipek.saralararas@gmail.com, Ministry of National Education

Introduction

National and international test results indicate persistent challenges in students' mastery of mathematics, not only in Turkey (MoNE, 2018a, 2019) but also in various countries such as England and Wales (Standards and Testing Agency [STA], 2019a, 2019b) and the United States of America (Brown et al., 1988; National Centre for Education Statistics [NCES], 2018a, 2018b). In response, several nations are adopting teacher education programs that incorporate 21st-century skills, such as critical thinking and collaboration. These skills are deemed essential for pre-service teachers to effectively teach mathematics to their future students. In Turkey, the Ministry of National Education (MoNE) (2018b) has recommended the integration of these skills into the mathematics program. However, research within the same context reveals that pre-service teachers often struggle to acquire these skills, posing a challenge for them in teaching mathematics along with these challenging skills.

The STEM approach has been a recent addition to many education faculties' programs in Turkey. Therefore, it is crucial to assess pre-service teachers' inclination to utilize this approach in designing their lessons, alongside evaluating their competencies and attitudes towards it. Despite claims by many researchers that pre-service teachers generally feel competent in planning lessons with their chosen teaching approach (Cady et al., 2006; Mostofo, 2014; Ruys et al., 2012), there is limited data on whether they feel confident in integrating the STEM approach, which encourages the inclusion of 21st-century skills in their lessons (Özdemir et al., 2018). It is widely agreed that 21st-century skills can be developed in classrooms with well-structured lesson plans.

The RETA model, as a novel teaching model, incorporates principles for imparting 21st-century skills (Saralar-Aras, 2022). In RETA-based lessons, students receive plans supported by Realistic, Exploratory, Technology-enhanced, and Active principles. Realistic lessons aim to integrate real-life examples into the curriculum. Exploratory lessons support students in exploring examples, including deliberately designed mistakes, to enhance learning. Technology-enhanced lessons focus on integrating technology suitable for the relevant acquisition and supporting learning. Active lessons advocate for the active use of concrete materials and technologies by students in classrooms. Originating in the United Kingdom as part of design-based research with four cycles, this student-centered model has proven its effect in the Turkish context according to research findings. The details of the RETA model were further explained in the RETA Model Section.

When recent studies in our context such as Altan and Ucuncuoglu (2019) and Eker Uka and Bedir (2023) are examined, it is necessary for pre-service teachers to be competent in planning lessons with STEM approach to have 21st-century skills. In particular, it is necessary to improve the STEM attitudes of pre-service teachers who feel themselves deficient due to subjects such as engineering and technology in various ways. This study aims to investigate the effect of the RETA model, an innovative teaching model, on the STEM attitudes of pre-service teachers. The study plans to involve pre-service teachers in an effective learning process that transforms them to a STEM approach.

STEM Education

The changing demands of the future highlight the need to educate students who are conscious and capable of creating various technological designs by applying scientific and mathematical principles to solve problems. STEM education is a teaching approach that prepares students for the competitive global workforce, by fostering individuals who are curious, innovative, collaborative, and possesses critical thinking skills.

STEM education defined by Shaughnessy (2013) specifically emphasizes mathematics and science disciplines as "STEM education refers to problem-solving that not only utilizes concepts and procedures from mathematics and science, but also incorporates the teamwork and designs methodology of engineering and uses appropriate technology" (p. 324). However, Bybee (2013) highlights ongoing debates surrounding the definition of STEM, including which disciplines should be integrated into STEM education and to what extent. Additionally, there is a discussion around whether the disciplines in the acronym should be used consistently and each discipline contributes equally or not (English, 2017). Although there are ongoing debates about the definition of STEM, it is clear that the integration of STEM is becoming increasingly necessary for finding interdisciplinary solutions to many problems

encountered in daily life (English 2017; Honey et al., 2014; Sanders, 2009). Within the scope of this study, Shaughnessy's (2013) definition is taken into consideration.

It is widely argued that interdisciplinary teaching approaches, such as STEM or RETA, should be used at the primary and middle school levels because reaching students at an early age have a significant impact on their interest in STEM-related fields (Daugherty et al., 2017). Research has shown that introducing these approaches at early stages of schooling can increase students' interest in STEM disciplines (Daugherty & Carter, 2018; English, 2017). Therefore, it is important to introduce these approaches to students at an early age. Interdisciplinary teaching approaches can help to develop problem-solving skills, critical thinking, and creativity, by laying a strong foundation for further learning (Hamilton et al., 2008). To ensure that teachers are equipped with the necessary skills to use these teaching methods, they need to be trained and supported with various approaches. Therefore, it is important to develop positive attitudes in pre-service teachers towards STEM and support them in developing teaching methods that emphasize interdisciplinary learning (Campbell & Damico, 2023). This study addresses the effectiveness of RETA, a teaching method, in supporting future teachers to implement interdisciplinary teaching approaches.

RETA Model

The RETA model is an innovative way of teaching that stands on four principles: realistic (R), exploratory (E), technology-enhanced (T), and active (A) (Saralar-Aras, 2022). To briefly touch upon these principles, the *Realistic* principle aims to increase students' awareness of the relevance of the topic in their daily lives, help them make inferences about the real-world connections of mathematical ideas, boost their motivation to study mathematics and aid them in solving real-world problems in the future. The *Exploration* principle is related to the use of worked examples in teaching. These examples already exist and provide students with information about the topic, helping them investigate it. Studies have shown that students contribute to teaching by analyzing answers that contain various errors (Evans & Swan, 2014; Renkl, 2011). The selected examples should include common errors related to the subject matter and provide students opportunities to solve problems. *Technology-enhanced* principle concerns the strategic use of technology in teaching mathematics. Technology can enhance the interactivity and engagement of students with mathematics. It can also improve accessibility by providing visual and auditory cues to help students understand concepts better (Yu-Wen & Andrews, 2009). The fourth principle pertains to *Active learning environments*, where students manage the use of concrete manipulatives. Several studies indicate that instructional activities, where students participate in active learning by creating new structures with concrete materials, lead to success (Chi, 2009; Schank, 1994). Inspired by Moch (2001) and Van de Walle et al. (2010), the active principle aims to increase students' motivation and academic performance in the target subjects through student-centred manipulatives. The RETA model was preferred in STEM education for several reasons. The most important reason is that it is specifically designed for teaching mathematics not general for all disciplines neither with a focus of science nor technology, which is the case in most of the studies reviewed (e.g., Kennedy & Odell, 2014; Sutaphan & Yeunyong, 2019). Moreover, the RETA model is close to STEM education in its existance as it has already focused on mathematics teaching and technology in it –which are T and M of STEM education compared to other models focusing on various other principles such as problem-solving and modelling (Stohlmann, 2019).

Significance of the Study

Designing lesson plans for pre-service teachers not only introduces them to the reality that they will be preparing lesson plans for different grade levels once they become teachers but also contributes to the development of their knowledge and skills by creating plans using different models (Balgalmış, 2013). It has been observed that lesson plans, emplyed in this study, prepared by using the RETA model, are effective in student learning (Saralar et al., 2018). In fact, in a quasi-experimental study, it was found to be statistically more effective than current ongoing methods (Saralar et al., 2019). This student-centered model, which is compatible with the STEM approach and provides opportunities for mathematical modeling, has been designed in the UK over approximately four years with four different studies and its effectiveness in Turkish classrooms has been revealed through research. However, previous studies have mostly focused on geometry topics. For example, while Saralar and colleagues (2018) focused on lesson plans related to three-dimensional shapes and their effects on teachers and students, Esen and Saralar-

Aras (2022) concentrated on the learning of polygons and their impact on STEM approaches. This study is valuable in investigating whether RETA is effective in other areas of mathematics, such as numbers and fractions, and also in exploring the mutual relationship between STEM and RETA.

Research Questions

1. What are the pre-service teachers' attitudes towards STEM approach?

   a. How do individual characteristics and prior experiences of pre-service teachers influence their initial attitudes towards the STEM approach?

   b. What are the long-term effects on pre-service teachers' attitudes towards the STEM approach after implementing the RETA model in their lesson planning?

2. Is there a relationship between RETA lesson planning and STEM attitudes?

   a. How do variations in the implementation depth of RETA principles in lesson plans correlate with the degree of change in STEM attitudes among pre-service teachers?

3. How do the lesson plans change?

   a. To what extent do changes observed in lesson plans align with the key principles of the RETA model?

   b. How do specific components of the RETA model contribute to the development of more concrete, participatory, and applicable lesson plans in different mathematical topics?

4. How do the pre-service teachers experience the RETA Model?

   a. In what ways do the experiences with the Realistic Principle contribute to pre-service teachers' perceptions of the relevance and applicability of mathematics in real-life scenarios?

   b. How do the Exploratory questions developed by pre-service teachers influence students' critical thinking and problem-solving skills?

   c. What are the nuanced effects of using Technology-enhanced activities, such as GeoGebra and mathematics videos, on students' understanding of mathematical concepts and STEM awareness?

   d. How does making students Active with the integration of tangible materials in lesson plans impact students' comprehension of abstract mathematical concepts and their levels of participation?

Method

Research Model

The study employed a mixed-method approach, integrating both qualitative and quantitative research methods. To ensure a comprehensive exploration of the research questions and to achieve in-depth data analysis, the study utilized a convergent parallel research design, which is a type of mixed-method design. In this design, both quantitative and qualitative data are collected concurrently, and the findings from both approaches are integrated to offer a comprehensive and nuanced analysis (Creswell & Clark, 2017).

Study Group

The research focused on a study group consisting of 65 junior-grade pre-service teachers from a state university in Turkey. The selection process was based on a criterion sampling method, which is one of the purposive sampling designs employed in research. The specific criterion used for sampling was the pre-service teachers' level of knowledge in lesson plan preparation, acquired from their previous courses. This criterion was set at the 3rd-grade level.

The rationale behind selecting pre-service teachers at the 3rd-grade level was to ensure a foundational understanding of lesson plan preparation. Although these individuals had not yet engaged in teaching practice, their prior coursework equipped them with the necessary theoretical knowledge to engage with

the study's objectives. This criterion is significant because it establishes a baseline understanding of lesson planning skills among the participants. By selecting individuals who have reached a certain level of theoretical understanding, the study aims to assess their ability to apply this knowledge practically through the development of mathematics lesson plans by using the RETA model.

Data Collection Tools

In the data collection process of the study, three main instruments were employed: the Teacher Efficacy and Attitudes towards STEM (T-STEM) Survey, a rubric designed for evaluating lesson plans using the RETA model, and semi-structured interviews. The T-STEM Survey, originally developed by the Friday Institute for Educational Innovation (2012), was adapted into Turkish by Tas, Yerdelen and Kahraman (2016) specifically for elementary teachers. The survey encompasses various dimensions, providing insights into science teaching efficacy and beliefs, science teaching outcome expectancy, mathematics teaching efficacy and beliefs, mathematics teaching outcome expectancy, STEM instruction, 21st-century learning attitudes, teacher leadership attitudes, and STEM career awareness. Administered both before and after the 14-week implementations that imparted knowledge about the RETA model, the survey aimed to gauge changes in pre-service teachers' perspectives. The reliability of the questionnaire was assessed by using Cronbach's alpha test, resulting in a range from 0.86 to 0.95 for all sub-items, indicating a high level of internal consistency.

Additionally, the study employed a lesson design rubric with RETA model, created by the researchers to evaluate the process of lesson plan development by pre-service teachers (see Appendix 1). The rubric was validated through the expert opinions of two professors working in the fields of mathematics education and computer and instructional technology education. This rubric comprised four sub-items aligned with the RETA principles: Realistic (R), Exploratory (E), Technology-enhanced (T), and Active (A). The assessment of lesson plans was conducted using this rubric (see Appendix 1).

To complement the quantitative data, semi-structured group interviews were conducted with selected pre-service teachers, focusing on evaluating their experiences with designing lessons using the RETA model. The interview forms, developed by the researchers and subjected to expert opinions, served as valuable tools for collecting qualitative data. The various data collection tools employed in the study are presented in Appendix 1 and Appendix 2.

As presented in Appendix 1, the rubric consisted of two parts. The first part (Part 1) aimed to evaluate the mathematics lesson plans prepared by the researchers. The second part (Part 2: Self-assessment) aimed to evaluate the mathematics lesson plan preparation processes that the pre-service teachers gradually developed during the one-semester teaching methods course they attended.

Group interviews were conducted with the participants after the lessons using the questions given in Appendix 2. The pre-service teachers' comments on their awareness of STEM and RETA approaches, the lesson plan preparation process, their evaluations of the integration process of RETA principles into lesson plans, and their STEM attitude changes were obtained. These comments were triangulated with the answers given by the pre-service teachers in the self-assessment section, observation notes, and the lesson plans they prepared.

Data Collection Process

In the study, the 14-week implementation process was divided into three parts. In the first part, the RETA model, which is a technology-enhanced interdisciplinary teaching approach, was introduced to pre-service teachers, and lesson plans using the RETA model were implemented in the classroom environment. During this first part of the research process, the selected pre-service teachers underwent a five-week instructional program focused on the development of mathematics lesson plans utilizing the RETA model. This hands-on approach aimed to bridge the gap between theoretical knowledge and practical application, preparing the participants for future teaching endeavors. In the second part, in the devoted 4 weeks, the pre-service teachers were asked to analyze the RETA-based lesson plans and exemplify each stage and principle. Thus, it was ensured that pre-service teachers examined RETA-based lesson designs and practices in detail through examples. In the third part, pre-service teachers were asked to develop their lesson plans using the RETA model for different topics and objectives of

the mathematics curriculum, and the prepared lesson plans were obtained. In the process of designing lessons with the RETA model, pre-service teachers had the opportunity to integrate and utilize STEM components in their lesson plans, without realizing it.

Data Analysis

The study employed both qualitative and quantitative data analysis methods. The qualitative data gathered during the process underwent analysis through the descriptive analysis method, guided by the principles of the RETA model. This approach aimed to uncover and articulate the experiences and opinions of pre-service teachers regarding RETA-based courses, providing a nuanced understanding of their perspectives.

On the other hand, the quantitative data were subjected to statistical analyses to elucidate the relationship between the rubric scores gathered after the development of RETA-based courses and the attitudes of pre-service teachers towards the STEM approach. This quantitative analysis aimed to reveal any significant associations or correlations between these variables, providing a quantitative perspective on the effectiveness of the implemented courses.

Limitations

This study introduces the RETA model as an innovative approach illustrating STEM applications in mathematics teaching and sheds light on the variations in pre-service teachers' STEM attitudes when exposed to diverse teaching styles. While the findings offer valuable insights, it's important to acknowledge a limitation in the sample selection, as it was drawn exclusively from a single grade in a public university. Although the study provides meaningful perspectives, its broader applicability could be enhanced by including more diverse samples from various institutions in future research.

Given that the RETA model is a technology-enhanced approach with interdisciplinary connections to mathematics, the study hypothesized its potential impact on STEM attitudes and aimed to foster these attitudes through this method. Additionally, the study assumed that pre-service teachers provided sincere and accurate responses to the scale and interview questions administered during the research process. Despite these acknowledged limitations, the study's results contribute valuable information regarding the STEM attitudes of pre-service teachers. Future research endeavors should aim to address these limitations by incorporating more diverse samples and exploring the generalizability of the RETA model across various educational settings.

Findings

This section delves into the findings of the study, exploring the impact of the RETA model on pre-service teachers' attitudes towards the STEM approach, the relationship between RETA-based lesson planning and STEM attitudes, changes observed in lesson plans, and the overall experiences of pre-service teachers with the RETA model.

Attitudes toward the STEM Approach

The results of the study indicated that initially, pre-service teachers' attitudes toward the STEM approach were generally neutral or moderately positive. This suggests that their views on the STEM concept might not have been fully formed, or they could have varied based on previous experiences. However, at the end of the 14-week lesson planning process using the RETA model, a positive change in attitudes towards the STEM approach was observed (see Table 1). The t-test results, obtained from a sample of 65 pre-service teachers, indicated a significant improvement in STEM attitudes following the 14-week implementation of lesson plans aligned with the RETA model. The computed t-value was 3.21, with a corresponding p-value of .002. This statistical outcome suggests a substantial influence of integrating RETA model principles—realism, exploratory learning, technology-enhanced learning, and active learning—on the positive development of STEM attitudes among the participating pre-service teachers.

Table 1.

Results of t-test on Pre-Service Teachers' Attitudes towards STEM Approach

				t-test		
	N	*M*	*SD*	*t*	*df*	*p*
Pre-test	65	61.2	10.5	3.21	64	.002
Post-test	65	68.4	8.7			

These findings were consistently supported by qualitative insights gathered through in-depth interviews with the participants, underscoring the effectiveness of the RETA model in shaping STEM perspectives. To put differently, the t-test results revealed significant findings, supporting the notion that the incorporation of the RETA model principles—realism, exploratory learning, technology-enhanced learning, and active learning—effectively contributed to the development of positive STEM attitudes among pre-service teachers, similar to those reported in interviews with participants (n = 8). For instance, one participant expressed, "The RETA model helped me see the real-world applications of STEM concepts in a more tangible way."

Relationship between Lesson Planning with RETA Model and STEM Attitudes

The findings demonstrated a positive relationship between pre-service teachers' use of the RETA model in lesson planning and their attitudes toward the STEM approach. The statistical analysis indicated a significant correlation ($p < .05$, $r = .67$) between the pre-service teachers' rubric scores gathered from developing RETA-based courses and the improvement in pre-service teachers' STEM attitudes (n = 65). The RETA model encompasses principles such as realism, inquiry-based learning, technology integration, and active learning. Therefore, effective implementation of these principles in lesson plans appeared to positively influence pre-service teachers' attitudes towards the STEM approach.

In detail, in the statistical analysis assessing the relationship between the rubric scores gathered from developing RETA-based courses and the improvement in pre-service teachers' STEM attitudes, the calculated correlation coefficient (r) was found to be .67. This positive r value indicates a moderately strong positive correlation between the two variables. The p-value associated with this correlation was below the conventional significance level of .05, further confirming the statistical significance of the observed relationship. The results suggest that as the gathered rubric score from developing courses aligned with the RETA model increased, there was a notable positive impact on pre-service teachers' attitudes towards the STEM approach.

Changes in Lesson Plans

Over the 14-week research period, pre-service teachers' lesson plans, developed using the RETA model, were observed to become enriched based on four RETA principles. The incorporation of student-centered approaches, the use of tangible materials and technology, and the integration of real-world examples resulted in more concrete, participatory, and applicable lesson plans. This developmental shift in lesson plans was interpreted as assisting pre-service teachers in more effectively embracing and implementing the STEM approach. For example, a participant mentioned, "My lesson plans became more engaging and applicable to real-life situations, making mathematics more accessible for students."

RETA Model Experiences

The findings indicated that pre-service teachers generally had positive experiences using the RETA model. The integration of student-centered approaches into lesson design was found to enhance student engagement and make learning more meaningful (n = 8).

Additionally, RETA model experiences were seen as a crucial step in shaping pre-service teachers' skills and approaches for their future teaching careers (n = 6). As most of the interviewed pre-service teacher self-reported, these experiences were perceived as enabling pre-service teachers to make their educational practices more authentic, engaging, and student-centered (n = 7). Experiences related to each RETA principle are detailed below.

a. Experiencing the Realistic Principle

Pre-service teachers had the opportunity to integrate real-life examples into their mathematics lesson plans when experiencing the realistic principle. They chose to bring everyday situations into the lesson content, presenting mathematical concepts in a tangible and meaningful context. This experience served the purpose of capturing students' attention and demonstrating how mathematics can be applied into the real world. The goal was to contextualize mathematical concepts within tangible and meaningful scenarios, fostering a deeper understanding among students. Several activities were designed to achieve this objective. A few examples of activities used in lesson plans are presented below:

- Unit Fractions: Pre-service teachers employed real-world objects and scenarios to introduce the concept of unit fractions. For instance, students were tasked with dividing various objects, such as pizzas or chocolate bars, into equal parts to understand the fundamental idea of unit fractions.
- Equivalent Fractions: To teach equivalent fractions, pre-service teachers designed activities that drew parallels with real-life situations. Students engaged in tasks like recipe adjustments, where they had to scale up or down ingredient quantities while maintaining the same proportional relationships, thereby reinforcing the concept of equivalent fractions.
- Grocery Shopping: The realistic principle was further applied through a grocery shopping activity. Students were given a budget and a shopping list with items in fractional quantities. They had to make real-world decisions on purchasing fractional amounts of items, emphasizing practical applications of fraction operations.

These activities not only made the learning experience more engaging but also allowed students to see the relevance of fractions in everyday situations. The Realistic Principle, as implemented in these activities, aimed to bridge the gap between abstract mathematical concepts and their practical utility in students' lives.

b. Experiencing the Exploratory Principle

When experiencing the exploratory principle, pre-service teachers preferred to offer students opportunities for questioning, problem-solving, and conducting research in their lesson plans. Enriching the lesson content with questions that intrigued and encouraged exploration, this experience allowed students to enhance their mathematical thinking skills and actively engage in learning. A snippet of pre-service teachers' exploratory questions is presented below:

- Question 1: Explore different methods for adding positive integers with three digits. How can breaking down the addition into smaller steps enhance your understanding?
- Question 2: Create a real-world scenario that involves adding positive integers with three digits. What is the mathematical expression for the total in this situation?
- Question 3: Investigate the concept of regrouping or carrying over when adding three-digit numbers. How does regrouping contribute to the accuracy of your addition?
- Question 4: Develop a problem-solving activity that requires the addition of positive integers. What strategies can you employ to efficiently solve this problem?
- Question 5: Consider scenarios where the sum of two positive integers is a multiple of 10. Can you identify patterns or rules for finding pairs of integers that result in a multiple of 10?

These questions aim to stimulate students' exploration of various aspects of adding positive integers with three digits, promoting critical thinking and application of mathematical concepts in different contexts. In addition to serving as exploratory questions for students, the aforementioned inquiries underscore the pre-service teachers' pedagogical prowess in formulating and structuring intellectually stimulating queries. These questions not only encourage critical thinking and problem-solving skills among students but also demonstrate the educators' adeptness in constructing inquiries that promote active engagement and deeper understanding of mathematical concepts. The design of these exploratory questions reflects the pedagogical acumen of pre-service teachers in fostering an environment conducive to inquiry-based learning and mathematical exploration.

c. Experiencing the Technology-enhanced Principle

While experiencing the technology-enhanced principle, pre-service teachers developed strategies to use technological tools such as interactive simulations, calculators, and mathematics application software in their lesson plans. Integrating these technologies into the lesson content enabled students to explore mathematical concepts more effectively. This experience enhanced students' ability to use technology in mathematical learning and contributed to an increase in STEM awareness, as evidenced by significant differences in STEM awareness questions related to technology. Below we included examples illustrating the technology-enhanced principle, showcasing how pre-service teachers incorporated various technological tools into their lesson plans to enhance the learning experience for students in themes of dynamic geometry, mathematics videos and interactive problem-solving:

Firstly, some of the pre-service teachers employed GeoGebra, a dynamic mathematics software, to create interactive simulations illustrating geometric concepts. For instance, they designed dynamic models that allowed students to manipulate angles and shapes in real-time. This hands-on experience not only facilitated a deeper understanding of geometry but also honed students' spatial reasoning skills. Secondly, some pre-service teachers chose to integrate mathematics videos for conceptual understanding. As part of the lesson plan, pre-service teachers integrated educational mathematics videos. For example, they curated videos that visually explained complex mathematical concepts, such as the addition of fractions with different denominators. The multimedia approach provided an additional layer of explanation, catering to diverse learning styles and fostering conceptual understanding among students. Lastly, a few pre-service teachers used interactive problem solving on smart board. These pre-service teachers leveraged smart board technology to conduct interactive problem-solving sessions. They projected mathematical problems onto the smart board, allowing students to come to the board and collaboratively solve equations, work through algorithms, and discuss problem-solving strategies as a class. This interactive approach not only enhanced students' problem-solving skills but also promoted a collaborative learning environment.

These examples highlight how the integration of technology, including GeoGebra, mathematics videos, and Smart Board interactions, enriched the learning process, making it more dynamic and engaging. Moreover, the incorporation of such technological tools contributed to an increased awareness of STEM disciplines by providing students with hands-on experiences that bridge theoretical concepts with real-world applications.

d. Experiencing the Active Principle

When experiencing the active principle, pre-service teachers provided opportunities for students to use tangible materials and models in their lesson plans. Enabling students to understand abstract mathematical concepts through concrete objects or visual representations, this experience helped students better comprehend abstract mathematical concepts and increased their levels of participation. Table 2 presents examples of used tangible materials, where pre-service teachers are referred to as teachers.

Table 2.

Sample Uses of Tangible Materials Developed by the Pre-service Teachers

Questions/ Examples	Related material
1. The teacher introduced a material to the class, such as a box with a tree drawn on it. Each pompom represented an apple, and a realistic story was narrated about the apples, including their rotting and falling to the ground. The teacher then wrote a subtraction problem, for instance, 19-8 = ? The student pushed three pompoms to make them fall into the box, and by counting the remaining apples, they found the result of the operation, 19-8.	

Table 2 continuing

2. The teacher brought pre-prepared materials to the class and demonstrated operations that required and did not require decimal breaking. For example, when subtracting 168 from 293, the student placed 2 hundreds, 9 tens, and 3 ones in the missing part, and 1 hundred, 6 tens, and 8 units in the output part. By performing the subtraction step by step, the student learns with hands-on experiences.	
3. Similarly, Nilgün expressed her difficulties in deciding whether the activities she prepared were appropriate for the grade levels and whether the students would be able to complete them. However, upon receiving feedback, an examination of Nilgün's revised lesson plan revealed that the activities she prepared were indeed suitable for the grade level she had chosen. Figure 1 provides an example of the activity she developed for teaching the objective, "Making mental subtraction with natural numbers."	
4. The teacher placed five paper clips on the desk and stated, "I need to use five of them for filing. How many paper clips do I have left for future use?"	
5. Balls from the gym were brought into the classroom. The teacher presented the situation: "We have seven balls. If three of these balls explode," and then hid three balls under the table, "how many balls are left?"	

In conclusion, the study's findings illuminate the transformative impact of the RETA model on pre-service teachers' attitudes towards STEM, showcasing a significant positive correlation between RETA-based lesson planning and STEM attitudes, evident changes in lesson plans, and the overall positive experiences of pre-service teachers.

Discussion, Suggestion and Conclusion

Discussion

The findings of this study underscore the effectiveness of the RETA model in positively influencing the STEM attitudes of senior-grade pre-service teachers. As seen in other topics, the integration of Realistic, Exploratory, Technology-enhanced, and Active principles in lesson planning in fractions and integers contributed to a perceptible shift in participants' perceptions and beliefs regarding STEM education (Renkl, 2011; Saralar-Aras & Tiflis, 2020). This study revealed that providing training that encourages pre-service teachers to use these resources in courses created with appropriate technology-enhanced mathematics resources positively impacted their attitudes towards the STEM approach.

Previous study findings (Clark-Wilson & Hoyles, 2019; Dick & Hollebrands, 2011) concluded that technology-based mathematics teaching courses were useful in developing pre-service teachers' skills in designing and teaching technology-based tasks. Similar to their approach with the addition of the RETA model, in this study, pre-service teachers were expected to design mathematics lessons with technology and various concrete materials in order to explore mathematics in daily life. The students, who were encouraged to use these features of the RETA model, provided an important transition to the STEM approach with the engineering and science knowledge they addressed in the realistic part of RETA. Therefore, supporting pre-service teachers with the specific teaching model we chose in their teaching courses enriched their course design knowledge, supporting earlier research findings (Bozkurt & Yiğit Koyunkaya, 2022; Dick & Hollebrands, 2011) and adding on to them with the specific model we used.

In this study, in particular, pre-service teachers who received high scores during the evaluations for the RETA approach showed a higher competence in developing comprehensive and interesting lesson plans.

Contributing to the literature regarding this need (Özdemir et al., 2018), the correlation between attitudes and the quality of lesson plans suggests that a favourable mindset towards innovative teaching models contributes to the effective implementation of such strategies in the classroom (Huang, & Zbiek, 2017). Post-course evaluations revealed an increased awareness among participants regarding the equity-promoting potential of the RETA model. Aligning with the literature (Bybee, 2013; English, 2017), interdisciplinary principles embedded in the model were perceived by pre-service teachers as agents for fostering inclusivity and addressing diverse learning needs.

Suggestions

Future research should explore the long-term impact of the RETA model on pre-service teachers as they transition to professional roles. Longitudinal studies can provide insights into the sustained influence of the model on teaching practices and attitudes over an extended period.

Comparative analyses with other innovative teaching models can shed light on the unique contributions and advantages of the RETA model. Understanding how different models impact STEM education can inform educators and policymakers in selecting the most effective approaches.

Investigating the impact of the RETA model on student learning outcomes is crucial. Future research should focus on assessing whether the positive attitudes and enhanced lesson planning translate into improved academic performance and increased interest in STEM subjects among students.

Implications for Practice

Educators and policymakers should consider incorporating the RETA model or similar innovative teaching approaches in pre-service teacher training programs to foster positive STEM attitudes and enhance lesson planning efficacy. The findings of this study contribute to the ongoing discourse on effective strategies for transforming STEM education and promoting equity in the classroom.

Conclusion

In conclusion, the integration of the RETA model in pre-service teacher education demonstrated promising outcomes in shaping STEM attitudes and lesson planning efficacy. The positive shift in attitudes post-course suggests the model's potential to contribute significantly to the ongoing evolution of STEM education methodologies. Recognizing the importance of fostering positive attitudes towards innovative teaching approaches, this study advocates for the continuing exploration and integration of similar models to enhance the quality of STEM education.

Acknowledgement

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

Ethics statement: Due to COVID-19, the distance education process was postponed and completed with face-to-face training. In the research, pre-service teachers were asked to prepare individual lesson plans during the process. The lesson plans were requested to be as original as possible, and they were warned to pay attention to the sharing of different ideas among themselves. In addition, before the semi-structured interviews were conducted, all participants were informed about the content of the study and it was stated that their answers would be used only for research purposes, that the data would be kept, and that they could leave the study if they wished. However, it was emphasized that their sincere answers to the research questions were important for the scientific validity and reliability of the research.

Author Contributions: Conceptualization, Türker-Biber, B., and Saralar-Aras, İ.; methodology, Türker-Biber, B., and Saralar-Aras, İ.; validation, Türker-Biber, B., and Saralar-Aras, İ.; analysis, Türker-Biber, B., and Saralar-Aras, İ.; writing, review and editing, Türker-Biber, B., and Saralar-Aras, İ.

Funding: This research received no funding.

Institutional Review Board Statement: The research started with the decision of the Aksaray University Human Research and Ethics Committee dated 25/10/2021 and numbered 2021/07-21.

Data Availability Statement: Data generated or analyzed during this study will be available from the authors upon request.

Conflict of Interest: We declare that there is no conflict of interest among authors.

References

Altan, E. B., & Ucuncuoglu, I. (2019). Examining the development of pre-service science teachers' STEM-focused lesson planning skills. *Eurasian Journal of Educational Research, 19*(83), 103-124.

Brown, C. A., Kouba, V. L., Carpenter, T. P., Lindquist, M. M., Silver, E. A., & Swafford, J. O. (1988). Secondary school results for the Fourth NAEP 270 Mathematics Assessment: Algebra, geometry, mathematical methods, and attitudes. *The Mathematics Teacher, 81*(5), 337–397.

Bybee, R. W. (2013). *The case for STEM education: Challenges and opportunities.* NSTA Press.

Bozkurt, G., & Yiğit Koyunkaya, M. (2022). Supporting prospective mathematics teachers' planning and teaching technology-based tasks in the context of a practicum course. *Teaching and Teacher Education, 119,* 103830. https://doi.org/https://doi.org/10.1016/j.tate.2022.103830

Cady, J., Meier, S. L., & Lubinski, C. A. (2006). Developing mathematics teachers: The transition from preservice to experienced teacher. *The Journal of Educational Research, 99*(5), 295-306. https://doi.org/10.3200/JOER.99.5.295-306

Campbell, L. O., & Damico, N. (2023). Investigating an Instructional Model for Integrated STEM in Teacher Education. *Journal of STEM Teacher Education, 58*(1), 70-86.

Chi, M. T. H. (2009). Active-constructive-interactive: A conceptual framework for differentiating learning activities. *Topics in Cognitive Science, 1*(1), 73–105.

Clark-Wilson, A., & Hoyles, C. (2019). From curriculum design to enactment in technology enhanced mathematics instruction—Mind the gap!. *International Journal of Educational Research, 94,* 66-76. https://doi.org/10.1016/j.ijer.2018.11.015

Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Sage publications.

Daugherty, M. K., & Carter, V. (2018). The nature of interdisciplinary STEM education. In M. J. de Vries (Ed.), *Handbook of technology education* (pp. 159–171). Berlin: Springer.

Daugherty, M. K., Kindall, H. D., Carter, V., Swagerty, L. M., Wissehr, C., & Robertson, S. (2017). Integrating informational text and STEM: An innovative and necessary curricular approach. *Journal of STEM Teacher Education, 52*(1), 4.

Dick, T. P., & Hollebrands, K. F. (2011). *Focus in high school mathematics: Technology to support reasoning and sense making* (pp. 11-17). National Council of Teachers of Mathematics.

Eker Uka, E., & Bedir, H. (2023). Exploring EFL teachers' perceptions on 21st century skills: A case study. *e-Kafkas Journal of Educational Research, 10*(2), 169-182. https://doi.org/10.30900/kafkasegt.1240904

English, L. D. (2017). Advancing Elementary and Middle School STEM Education. *International Journal of Science and Mathematics Education, 15*(1), 5-24. https://doi.org/10.1007/s10763-017-9802-x

English, L. D. (2018). Learning while designing in a fourth-grade integrated STEM problem. *International Journal of Technology and Design Education, 29,* 1011-1032. www.doi.org/10.1007/s10798-018-9482-z.

Esen, B., & Saralar-Aras, İ. (2022). The effects of RETA Model on student achievement and perception: Case of polygons. *Necmettin Erbakan University Ereğli Education Faculty Journal, 4*(2) , 96-121.

Evans, S., & Swan, M. (2014). Developing students' strategies for problem solving in mathematics: The role of pre-designed "Sample Student Work". *Educational Designer, 2*(7), 1-30.

Gravemeijer, K. (1994). Educational development and developmental research in mathematics education. *Journal for Research in Mathematics Education, 25*(5), 443–471.

Hamilton, E., Lesh, R., Lester, F., & Brilleslyper, M. (2008). Model-eliciting activities (MEAs) as a bridge between engineering education research and mathematics education research. *Advances in Engineering Education, 1*(2), 1-25.

Honey, M., Pearson, G. & Schweingruber (Eds.). (2014). *STEM integration in K-12 education: Status, prospects, and an agenda for research.* Washington, DC: National Academies Press.

Huang, R., & Zbiek, R. M. (2017). Prospective secondary mathematics teacher preparation and technology. In M. E. Strutchens, R. Huang, L. Losano, D. Potari, M. C. d. C. T. Cyrino, J. P. da Ponte, & R. M. Zbiek (Eds.), *The mathematics education of prospective secondary teachers*

around the world (pp. 17-23). Springer International Publishing. https://doi.org/10.1007/978-3-319-38965-3_3

Kelly, K. (2021). Planning an intervention for learners with mathematics difficulties: models of mathematical development (M. H. Sarı & İ. Saralar-Aras, Trans). In *Identifying, assessing and supporting learners with dyscalculia* (pp. 166-182). Vizetek Publication. (Original work published 2020).

Kennedy, T. J., & Odell, M. R. (2014). Engaging students in STEM education. *Science Education International, 25*(3), 246-258.

Ministry of National Education. (2010). *Movement of Enhancing Opportunities and Improving Technology (FATIH).* http://fatihprojesi.meb.gov.tr/en/

Ministry of National Education. (2018a). *2018 LGS merkezi sinavla yerlesen ogrencilerin performansi [The performance of the students placed by LGS 2018 National Exam].* Ankara: MoNE.

Ministry of National Education. (2018b). *Primary and middle school mathematics program update (Grades 1-8).* Ankara: MoNE.

Ministry of National Education. (2019). *2019 LGS ortaogretim kurumlarına ilişkin merkezi sınav analiz ve değerlendirme raporu [Analysis and evaluation report of the LGS 2019 National Exam for entering secondary education institutions].* Ankara: MoNE.

Moch, P. L. (2001). Manipulatives work! *Educational Forum, 66*(1), 81–87.

Mostofo, J. (2014). The impact of using lesson study with pre-service mathematics teachers. *Journal of Instructional Research, 3*(1), 55-63.

National Centre for Education Statistics [NCES]. (2018a). NAEP - Distribution of M-mathematics questions: 2017. https://nces.ed.gov/nationsreportcard/mathematics/distributequest.aspx

National Centre for Education Statistics [NCES]. (2018b). NAEP Mathematics: National student group scores and score gaps. https://www.nationsreportcard.gov/math_2017/nation/gaps?grade=8

Özdemir, A., Yaman, C., & Vural, R. A. (2018). STEM uygulamaları öğretmen öz-yeterlik ölçeğinin geliştirilmesi: Bir geçerlik ve güvenirlik çalışması. *Adnan Menderes Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 5*(2), 93-104.

Renkl, A. (2011). Instruction based on examples. In R. E. Mayer, & P. A. Alexander (Eds.), *Handbook of research on learning and instruction* (pp. 272–295). Routledge.

Ruys, I., Keer, H. V., & Aelterman, A. (2012). Examining pre-service teacher competence in lesson planning pertaining to collaborative learning. *Journal of Curriculum Studies, 44*(3), 349-379. https://doi.org/10.1080/00220272.2012.675355

Salomon, G., & Perkins, D. (2005). Do technologies make us smarter? Intellectual amplification with, of, and through technology. In R. J. Sternberg, & D. D. Preiss (Eds.), *Intelligence and technology: The impact of tools on the nature and development of human abilities* (pp. 71–86). Erlbaum.

Sanders, M. (2009). STEM, STEM education, STEMmania. *Technology Teacher, 68,* 20–26.

Saralar-Aras, İ. (2022). RETA model for mathematics teaching: From the United Kingdom to Turkey. In O. Kartal, G. Popovic & S. Morrissey (Eds.), Global Perspectives and Practices for Reform-based Mathematics Teaching (pp. 42-78). IGI Global. https://doi.org/10.4018/978-1-7998-9422-3.ch003

Saralar-Aras, İ., & Tiflis, O. (2020, November). *A literature review on technology use of British and Chinese pre-service mathematics teachers*. Paper presented at the British Society for Research into Learning Mathematics Autumn Conference 2020. Online, UK: BSRLM.

Saralar, İ., Ainsworth, S., & Wake, G. (2019, March). A design study on improving spatial thinking of middle school children. *Proceedings of the British Society for Research into Learning Mathematics, 39*(1), 1-6.

Saralar, İ., Ainsworth, S., & Wake, G. (2018, November). *Helping students learn two-dimensional representations of polycubical shapes*. Paper presented at the British Society for Research into Learning Mathematics Conference 2018. King's College London, London, The UK: BSRLM.

Schank, R. C. (1994). Active learning through multimedia. *IEEE MultiMedia, 1*(1), 69–78. https://doi.org/10.1109/93.295270

Shaughnessy, M. (2013). By way of introduction: Mathematics in a STEM context. *Mathematics Teaching in the Middle School, 18*(6), 324.

Standards and Testing Agency (STA). (2019a). Key stage 2 tests: 2019 mathematics test materials. https://www.gov.uk/government/publications/key-stage-2-tests-2019-mathematics-test-materials

Standards and Testing Agency (STA). (2019b). Mathematics paper 2: Reasoning. In *2019 National Curriculum Tests: Key stage 2*.

Stohlmann, M. (2019). Three modes of STEM integration for middle school mathematics teachers. *School Science and Mathematics, 119*(5), 287-296. https://doi.org/10.1111/ssm.12339

Sutaphan, S., & Yuenyong, C. (2019, October). STEM education teaching approach: Inquiry from the context based. *Journal of Physics: Conference Series, 1340*(1), 12003. https://doi.org/10.1088/1742-6596/1340/1/012003

Tas, Y., Yerdelen, S., & Kahraman, N. (2016). Adaptation of Teacher Efficacy and Attitudes Toward STEM (T-STEM) Survey into Turkish. In *International Conference on Education in Mathematics, Science & Technology (ICEMST).* Bodrum, Türkiye.

van de Walle, J. A., Karp, K. S., & Bay-Williams, J. M. (2010). Geometric thinking and geometric concepts. In *Elementary and middle school mathematics teaching developmentally* (7th ed., pp. 402–433). Pearson Education.

Wang, F., & Hannafin, M. J. (2005). Design-based research and technology-enhanced learning environments. *Educational Technology Research and Development, 53*(4), 5–23.

Yu-Wen, L. A., & Andrews, P. (2009). Linking geometry and algebra: English and Taiwanese upper secondary teachers' approaches to the use of GeoGebra. *Proceedings of the British Society for Research into Learning Mathematics, 29*(1), 61–65.

Appendix 1. Rubric for Assessing the Use of the Reta Model Lesson Plan

Lesson Design Rubric with RETA Model
PART 1 (To be filled in by the researchers)
Item 1. Incorporation of the principle of realistic learning into the lesson plan (0 points) The pre-service teacher did not include the principle of realistic learning in the lesson plan. (1 point) The pre-service teacher included a real-life example in the lesson plan but designed a teacher-taught environment. (2 points) The pre-service teacher included one real-life example in the lesson plan and provided a discussion environment for the students. (3 points) The pre-service teacher included more than one real-life example in the lesson plan and encouraged students to find different real-life examples.
Item 2. Incorporation of the investigative learning principle into the lesson plan (0 points) The pre-service teacher did not include the principle of investigative learning in the lesson plan. (1 points) The pre-service teacher included worked examples in the lesson plan but designed a teacher-taught environment. (2 points) The pre-service teacher included a worked example in the lesson plan and provided the students with a solution and discussion environment. (3 points) The pre-service teacher included more than one worked example in the lesson plan and encouraged students to reflect on the worked examples and reach a conclusion.
Item 3. Incorporation of the principle of technology-facilitated learning into the lesson plan (0 points) The pre-service teacher did not include the principle of technology-facilitated learning in the lesson plan. (1 point) The pre-service teacher included a technology (calculator, GeoGebra, etc.) in the lesson plan but designed a teacher-taught environment. (2 points) The pre-service teacher included one technology in the lesson plan and provided opportunities for students to use this technology. (3 points) The pre-service teacher included more than one technology in the lesson plan and used technology to enhance student learning at different stages of the lesson (e.g. showing a video in the introduction, using a calculator in the content, using assessment tools such as Kahoot, etc. in the assessment phase)
Item 4. Incorporation of the active learning principle into the lesson plan (0 points) The student teacher did not include the principle of active learning in the lesson plan. (1 point) The pre-service teacher included a concrete material/tool in the lesson plan but designed an environment where the teacher narrates. (2 points) The pre-service teacher included one concrete material/tool in the lesson plan and provided an environment for students to use the materials actively. (3 points) The pre-service teacher included more than one concrete material/tool in the lesson plan and encouraged students to find innovative examples and/or mathematical modelling with the help of these tools.

Appendix 1. Rubric for Assessing the Use of the Reta Model Lesson Plan (Continue)

PART 2 (to be filled in by the participant) **Self-assessment**
What did I know? …….
What did I want to learn? ……
What did I learn? ……..

Appendix 2. Interview Form

Interview Questions
(Introduction) Thank you for volunteering for the interview, informing that the interview will be audio-recorded, introductory speech reiterating the aims of the study
1. What do you think is the STEM approach?
2. Can you describe the RETA model in a few sentences?
3. What would you say if you were asked to associate the STEM approach with RETA?
3.a. Which characteristics are similar/not similar? How did you realize this?
4. What are the challenges you faced while preparing lessons with the RETA model?
5. What are the advantages of preparing lessons with the RETA model?
6. Which of the principles: realistic, investigative, technology-facilitated, and active, do you think is the most/least effective among them? Why?
7. Is it important to integrate real-life examples into lesson plans? Why is this important? What are your experiences in this regard?
8. Is it important to integrate worked examples into lesson plans? Why is this important? What are your experiences in this regard?
9. Is it important to integrate technology into lesson plans? Why is this important? What are your experiences in this regard?
10. Is it important to integrate concrete materials and/or modelling into lesson plans? Why is this important? What are your experiences in this regard?
11. What do you think are the advantages/disadvantages of having active students and preparing student-centered lesson plans?
12. After 14 weeks of experiencing the lessons, when we check the scale, the change in your attitudes is as follows (*here the relevant result is reported*). What do you think could be the reason for this? How would you evaluate yourself in this field?
(Conclusion) Asking the participant for any extra topics he/she would like to add, thank you

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

Developing Primary School Students' Views on the Nature of Science by Storytelling

Hakan Ertaş [1] **Kader Bilican**[2]

To cite this article:
Ertaş, H. & Bilici, K. (2024). Developing primary school students' views on the nature of science by storytelling. *e-Kafkas Journal of Educational Research*, *11*, 65-79. doi:10.30900/kafkasegt.1448983

Research article **Received:**08.03.2024 **Accepted:**21.04.2024

Abstract

The study aimed to explore the development of third graders' nature of science views by using children's literature. The participants of the study were 18 third graders (12 F, 6 M) aged 8-9 years old. The method of the study was a basic interpretive qualitative study and data were collected by means of open-ended questionnaires, (Views of Nature of scientific views, VNOS-D) reflective journals, and semi-structured interviews. The implementation of the study was taken for seven weeks and students enrolled in explicit-reflective nature of science activities coupled with children's literature highlighting stories including nature of science. The results of the study showed that primary students held misconceptions regarding of nature of science mostly on the aspects of the difference between observation and inference, the tentative nature of scientific knowledge, the subjective nature of scientific knowledge, and scientific models. Results of the study revealed that students improved their nature of science views substantially. The majority of the nature of science aspects have been improved to informed views, only the views on scientific models improved to adequate views after the intervention. Our research findings have claimed that storytelling could be a strong pedagogical tool in developing children's nature of science views.

Keywords: Nature of science teaching, primary students' nature of science views, children's literature

[1] Corresponding Author, hakanertas83@gmail.com, Ministry of National Education
[2] Author, Kırıkkale University, Elementary Education.

Introduction

In the century we live in, science and technology are undergoing rapid development and change. This change that is taking place reveals the necessity for human communities and countries to prioritize educational programs in the field of science. According to Lederman (2004), one of the main goals of teaching activities in the scientific field is to help people understand science and scientific developments. In order for individuals to reach the right decisions by making use of scientific results, they must first learn how knowledge is created and then reach the basic elements that make up this knowledge. Therefore, people's ability to understand and properly apply technological innovations and science-related information depends on being a scientifically literate individual (Roberts & Bybee, 2014). For this reason, it is considered very important for people to be science-literate individuals, to learn new inventions with scientific concepts, and to be at a level that will raise the standards of social life (Liu, 2009). Scientifically literate people are those who can comprehend the nature of science, adapt the laws, definitions, and principles related to science to their daily lives, see the connections between human beings and developing technology, and want to research science. As well as it can be defined as the ones who have a desire to study nature and the planet we live on, believe that scientific knowledge can change with new information, and appreciate the good and bad aspects of science on the individual's life (Anagün, 2008). Viewing science as a human activity, and appreciating the values inherited in the development of scientific knowledge has been a vital part of scientific literacy (Tatar, Karakuyu, & Tüysüz, 2011). That is known as a concept of the nature of science is also included in the science curriculum implemented in Turkey for years (MoNE, 2018).

Although there is no single, clear, and unambiguous definition of the nature of science, the agreed definition is recognizing science as way of knowing, and appreciating the beliefs and values inherent in development of scientific knowledge(Lederman, 1992). Although there is no clear definition of the nature of science, researchers have similar views on the characteristics that constitute the nature of science. The nature of science shows how scientists construct events and phenomena by developing different perspectives, the relationship between observation and inference and the difference between them, the changing and evolving nature of scientific results, the impact of society on scientists and scientific studies, and especially the importance of creativity at every stage of scientific work (Hanuscin & Lee, 2009; Khishfe & Lederman, 2007). The tenets of the nature of scientific knowledge which were the concern of the current study were the empirical nature of scientific knowledge, the difference between observation and inference, the tentative nature of scientific knowledge, the subjective nature of science, the scientific models and imagination and creativity in the development of scientific knowledge.

In the Turkish context, the studies related to the nature of science (NOS) with younger students have been conducted very limited. The literature showed that the research has been mostly focused on the students at the second level of primary education and secondary education levels, as well as some few studies at the preschool level (Alan, 2014; Çelik, 2016; Çetin, 2019; Deve, 2015; Kapucu, 2013; Yılmaz, 2016). Considering the fact that it was an early age for children to develop a positive attitude towards science as well as an adequate understanding of scientific knowledge as well as the misconceptions regarding science, it is important to look for better ways to improve better image of science in their young minds. Therefore, it will be promising specifically for primary teachers as well as science who have less experience with teaching science as a way of knowing within a context of actual teaching practice in the path of raising young students as scientifically literate individuals. Additionally, specifically in teaching contexts in which science classes begin in the third grade (around the age of 8), it is important to emphasize the nature of science while introducing scientific concepts to facilitate ease of understanding of these concepts and developing a more positive attitude towards science by young learners.

Teaching nature of science mainly embodies two approaches: implicit and explicit approach (Abd-El-Khalick & Lederman, 2000a, 2000b; Doğan, Çakıroğlu, Bilican, & Çavuş, 2012; Khishfe & Abd-El-Khalick, 2002; Köseoğlu, Tümay, & Budak, 2008). Studies showed that the use of an explicit reflective nature of science instruction has been more effective in improving both in/pre-service teachers, and students from various age groups. (Quigley, Pongsanon, & Akerson, 2010). The main focus idea embodying the explicit reflective nature of science teaching has been, intentional and direct-explicit teaching of NOS concepts and recognizing it as a cognitive outcome (Khishfe & Abd-El Khalick, 2002).

In the current study, it was aimed to reveal the effect of direct reflective NOS activities integrated with stories on primary school students' NOS views. For this purpose, it was aimed to improve the views of the third-grade primary school students with explicit reflective NOS activities integrated with stories. In line with this goal, the study aims to investigate the contribution of explicit reflective NOS activities coupled with stories to the NOS views of primary school students. In this direction, this study seeks answers to the following questions:

-What are the students' NOS views before participating in open reflective NOS activities integrated with stories?

-What are the students' NOS views after participating in open reflective NOS activities integrated with stories?

Method

This section includes information on the research model, population and sample, data collection process, data collection tools, data collection and analysis.

Research Model

This study is interpretive qualitative research. According to Merriam (2015), interpretive qualitative research adopts an in-depth examination of individuals' experiences and experiences related to the situations compared and is frequently used in the field of education. In this study, a basic qualitative research design was used to examine the development of third-grade primary school students' NOS views using stories. The third-grade primary school students' views on the nature of science, students' experiences in the classroom, and their thoughts about the products they produced as a result of their experiences were examined in depth.

Participants

This study was conducted with 18 third-grade students (12 F, 6 M) studying in a primary school in the Middle central part of Turkey. A convenient sampling method was used to select the participants (Patton, 1990). The researcher used this method because the participants were his students, he had easy access to students and their parents, he had the opportunity to examine the participants in depth because he knew them closely, and the fact that they were his students created the opportunity to work flexibly. In such cases, the aim is not to generalize the results to the population. For this reason, care was taken to understand the sample holistically and in-depth. All of the students participated in the implementation process one-on-one. The ages of the students were between 8-9 years old. Since the participants were third-grade students, they were taking science courses for the first time. They had taken courses related to science such as "natural phenomena, plants and animals, natural disasters, directions and movements of the earth" at a basic level in the life science course in previous years. The study was conducted voluntarily by obtaining the necessary permissions from the participants and their parents. The real names of the students were not used in the current study, the participants were named with numbers such as S1, S2….S16, etc.

Data Collection Tools

In this study, the Views of Nature of Science questionnaire form D (VNOS-D) semi-structured interviews, reflective writings (diaries), and stories written by students were used as data collection tools.

Views of the Nature of Science Questionnaire Form D (VNOS-D): The Views of the Nature of Science Version D (VNOS-D) developed by Lederman and Khishfe (2002) was used in this study. VNOS-D consisted of seven separate survey questions designed to determine the views of elementary school students on the following aspects of the nature of science: the difference between observation and inference, the subjectivity of science and scientific knowledge, the formation of scientific knowledge in the light of data, the characteristics and definitions of scientific models, the evolving and changing nature of scientific knowledge, and the place of creativity and imagination in science. This questionnaire was suitable for the study because it allowed students to express their opinions without being bound by stereotypes and choices determined by the practitioner, it was appropriate for students'

readiness and age groups, and it allowed six different NOS dimensions to be measured in one questionnaire (Akerson & Abd-El-Khalick, 2005).

Semi-structured Interviews: Semi-structured interviews were conducted by using the questions in the VNOS-D forms to ask the students to give their written answers in a broader and more detailed way and to eliminate misinterpretation of the data. Semi-structured interviews were recorded with a voice recorder and these interview recordings were then transcribed to obtain the data.

Documents

In this study, the NOS stories written by the students after all the activities were evaluated as documents. In addition, transcribing the audio recordings of the interviews conducted with eight students before and after the application and comparing them with the VNOS-D scale data kept during the interview will prevent or minimize data loss. Prior to the stories prepared by the researcher, expert opinion was obtained from the consultant, and feedback was provided and created in this way. In addition to these documents, reflective writings (student diaries) are among the tools used in data collection.

Implementation and Data Collection Process

This study was carried out using free activity lessons within the scope of science lessons for third-grade primary school students. The activities and the implementation process were carried out over seven weeks in the spring semester of the 2018-2019 academic year, using different NOS activities each week. In addition to these NOS activities, stories written by the researcher and in which NOS dimensions were integrated were used, supported by expert opinion. In the study, the implementation and data collection process was carried out in the order of data collection before the implementation, data collection during the implementation, and data collection after the implementation. The activities and studies carried out during the implementation process, which lasted a total of seven weeks, were implemented as shown in Figure 1 below.

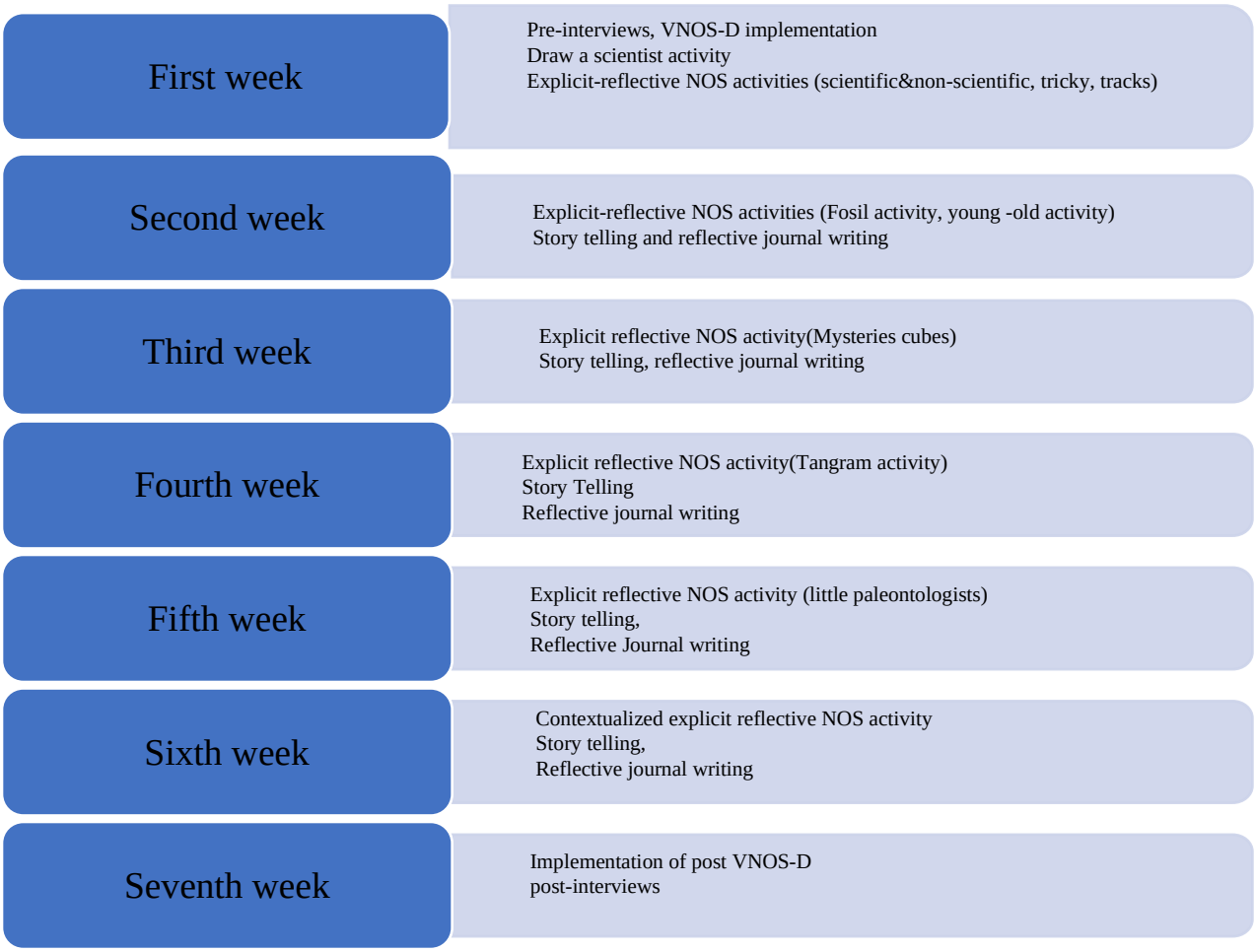


Figure 1. Implementation and Data Collection Process

Data Analysis

The interviews with the students were recorded with a voice recorder and the resulting data were analyzed using the content analysis method. Content analysis requires in-depth analysis of the collected data and allows the emergence of themes and dimensions that were not previously evident. In this way, content analysis is tried to interpret the opinions and find the results hidden in these data (Yıldırım & Şimşek, 2016). During data analysis, the answers given to each interview question were analyzed and categorized according to the concepts extracted from the data. Then, in the opinion determination process carried out by applying the VNOS-D form to the students, the opinions given by the participants were analyzed and categorized according to the content analysis method. This categorization was adapted by the practitioner from the research conducted by Akerson and Donnelly (2010). The opinions of the students on the VNOS-D form were categorized and analyzed as inadequate, adequate, and informed for the NOS subscales. Another data analysis applied was semi-structured interviews with five students before the application and eight students after the application using VNOS-D questions. In this way, higher validity and reliability were ensured in the analysis of the written form. In addition, a diary book was created for all participant students before the implementation. The students were asked to evaluate the activities related to the weekly practices, the activities in the process, and the stories written by the practitioner and read along with the activities in these diaries with dates and titles. They were also asked to write the parts that interested them and that they liked and to summarize the process. The VNOS-D forms, reflective writings, interviews, and observations conducted in the classroom were analyzed with a holistic approach, and the information revealed was realized by making connections between all these tools and supporting the data in the creation of categories. In the analysis of all data, the systematic method created by Huberman and Miles (as cited in Creswell, 2016) was used to find the significant points of all data sources and to establish connections between the points found and the dimensions. In this context, reflective literatures were examined in connection with the categorization created. At the end of the whole application, students were asked to write a scientific story in which the dimensions of NOS were also mentioned. In the analysis of these stories, like the others, all data were associated with each other. The NOS views used by the students in their stories were also used by associating them with categories. The resulting data were analyzed in a holistic structure by associating the views expressed by the participants in the VNOS-D form.

Validity and Reliability of the Study

When the literature is examined, there are different approaches, but three elements applied for validity come to the fore. These elements are reliability, authenticity, and credibility (Creswell, 2016). In this study, the researcher was present in the field where the study was conducted and had the opportunity to observe the whole process since the researcher had her students. In order to triangulate, she linked the pre and post-implementation forms with semi-structured interviews and student diaries. All personal characteristics of the researcher were explained in detail. The findings of the study were described in detail to ensure transferability. The interpretation of the collected data was checked by two different people who were not involved in the research. These people are experts who have sufficient knowledge about the nature of science. In short, research validity was ensured by applying all of the above-mentioned items.

If the results of a research overlap with the first results in the repetition of the research, the reliability of this research is ensured. However, since it is difficult to ensure the repetition of the data collected, especially in qualitative research, the relationship between the data collected and the results is very important when reliability is considered (Merriam, 2015). While observation, interview, and other information were obtained from the data collection methods used in this study, especially during the activities, audio and video recordings were made by prioritizing the volunteerism of students and parents. The written and digital records obtained were examined many times to ensure that important points were not overlooked. The counselor also made the necessary examinations and gave feedback. In this way, necessary coding was done. The categorization used in the analysis of the VNOS-D forms before and after the implementation was used by many researchers in the literature and general concepts were reached. All data sources used in the study were associated with the data obtained from the forms filled out by the students before and after the application. At the same time, all coding was examined and categorized by the counselor, the researcher, and another expert.

Findings

This study aims to investigate the effect of direct reflective NOS activities integrated with stories prepared by the researcher and in which NOS sub-dimensions are integrated into the content on the NOS views of primary school students. In this direction, with the data obtained from the students, the answer to the question "How did the NOS views of third-grade primary school students change by using explicit reflective NOS activities integrated with stories?" was sought. VNOS-D form directed to the students, student opinions before the implementation, student opinions after the implementation. The data obtained from semi-structured interviews and student diaries (reflective writing) were analyzed, then these data were transferred with the help of quotations and tables, and then the findings were formed with the help of the analysis of the data. The findings of the students' views on the NOS dimensions before the implementation, categorized as inadequate, adequate, and informed, are given in Table 1.

Table 1.
Third-grade primary school students' views on the nature of science before the implementation

Nature of science dimension	Inadequate	Adequate	Informed
The empirical nature of scientific knowledge	8	10	0
The difference between observation and inference	16	2	0
Scientific models	9	8	1
The tentative nature of scientific knowledge	13	2	3
Subjective nature of scientific knowledge	13	4	1
Imagination and creativity in science	6	10	2

Previous to the implementation of the study, VNOS-D form and semi-structured interviews applied to third-grade primary school students, it was observed that students had more adequate views than inadequate views in the dimensions of the empirical nature of scientific knowledge, scientific models, imagination, and creativity in science, and more inadequate views in other dimensions. On the other hand, it is seen that the opinions at the Informed level were not at all in the dimensions of the difference between observation and inference and the experimental nature of scientific knowledge, and very few changes were detected in the other tenets.

When the post-implementation VNOS-D (Children's Views on the Nature of Science Questionnaire Part D) form and semi-structured interviews applied to third-grade primary school students were analyzed, there was one inadequate opinion from the students in the dimensions of the scientific model, the difference between observation and inference, and the experiment-based nature of scientific knowledge. There were no inadequate opinions in other dimensions. Regarding the adequate views, 10 students responded in the adequate category in the dimension of scientific models, five students in the dimension of the difference between observation and inference, four students in the dimension of the empirical nature of scientific knowledge, and only one student in the dimension of the changeable nature of scientific knowledge. There were no opinions in the sufficient category in the subjective nature of scientific knowledge and imagination and creativity in science dimensions.

When the opinions of the students in the Informed category are analyzed, the most striking result is that all of the students in the dimensions of imagination and creativity in science and the subjective nature of scientific knowledge reported opinions in the Informed category. It is seen that 17 students in the dimension of the changeable nature of scientific knowledge, 13 students in the dimension of the experimental nature of scientific knowledge, 12 students in the dimension of the difference between observation and inference, and seven students in the dimension of scientific models expressed opinions at the Informed level. When Table 2 is examined, it is seen that in almost all of the dimensions of the

nature of science, the number of students expressing opinions in the Informed category is the highest. Only in the scientific model dimension, the number of adequate opinions is higher than the number of students in the Informed category. The findings of the students' views on the NOS dimensions after the application, categorized as insufficient, sufficient, and Informed, are given in Table 2.

Table 2.
Third-grade primary school students' views on the nature of science after the implementation

Nature of science dimension	Inadequate	Adequate	Informed
The empirical nature of scientific knowledge	1	4	13
The difference between observation and inference	1	5	12
Scientific models	1	10	7
The tentative nature of scientific knowledge	0	1	17
Subjective nature of scientific knowledge	0	0	18
Imagination and creativity in science	0	0	18

When Table 2 is examined, it is seen that in the post-application VNOS-D form and semi-structured interviews applied to third-grade primary school students, the students' Informed opinions were higher than the other opinions in the dimensions of the experimental nature of scientific knowledge, imagination, and creativity in science, the difference between observation and inference, the subjective nature of scientific knowledge and the changeable nature of scientific knowledge, and the adequate opinions were higher in the scientific models' dimension. Views in the inadequate category were very few in all dimensions and none in the dimensions of the changeable nature of scientific knowledge, the subjective nature of scientific knowledge, and imagination and creativity in science.

As can be seen in Table 2, in the NOS forms used to collect data before the intervention, there were more inadequate opinions on the dimensions of the difference between observation and inference, scientific models, the changeable nature of scientific knowledge, and the subjective nature of scientific knowledge, whereas, in the NOS forms used after the intervention, there were more students' opinions at the adequate level in the dimension of scientific models and the Informed level in all other dimensions. The findings showing the change in student opinions about the NOS dimensions during the implementation are given in Figure 2.

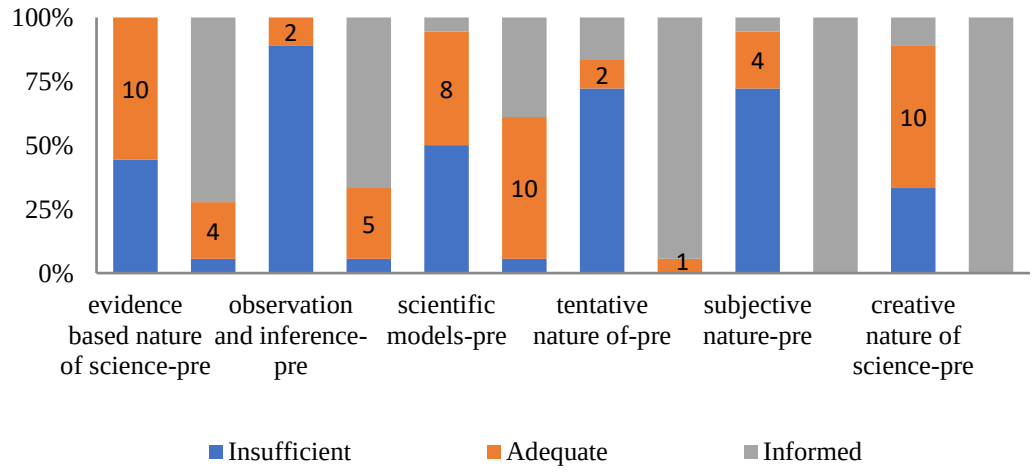


Figure 2. Change In Students' Views on the Nature Of Science.

In Figure 2, the change in the NOS dimensions and some student views examined during the implementation period are presented in order to compare student views before and after the implementation. When the pre-implementation findings of the experiment-based nature of scientific knowledge are analyzed, it is seen that eight students expressed inadequate, 10 students expressed adequate, and no opinion was expressed in the Informed category. After the implementation one student expressed inadequate, four students expressed adequate, and 13 students expressed Informed opinions. When the change in students' views on the experimental nature of scientific knowledge was analyzed, no negative change was observed. One student remained in the inadequate category and one student remained in the adequate category, and no change occurred. The remaining 16 students showed positive development and moved to higher categories. The change in (S15)'s view on the experimental nature of scientific knowledge was as follows. He showed inadequate views of the empirical nature of science before the implementation; "I think science makes beautiful experiments. People get better... I think science finds something. They cannot know the other subject." (S15). His views evolve to informed views after the implementation; "Science is observation, evidence, research. Science is done in groups. There is research and experimentation. They collect information and reach an invention" (S15).

When the pre-implementation findings of the dimension of the difference between observation and inference are examined, it is seen that 16 students expressed inadequate, 2 students expressed adequate, and no opinion was expressed in the Informed category. After the application, one student expressed an inadequate opinion, five students expressed an adequate opinion, and 12 students expressed an informed opinion. When the change in students' views on the difference between observation and inference was analyzed, no negative change was observed. One student remained in the inadequate category and no change occurred. The remaining 17 students improved positively and moved to higher categories. The change in (S1)'s opinion on the difference between observation and inference was as follows:

> Scientists do research. Dinosaurs know very well by research. They see it in their dreams or they go back in time. I think it is very true. Because scientists find things by researching. Scientists are very smart. (T1, Pre-implementation).

> They researched and found dinosaur fossils. By studying the fossils they find, they can know what time they belong to. It's not very precise. Because they all think differently, they can misplace the fossils. Because scientists have different ideas. They study the fossils and make different conclusions. The dinosaur in their minds is different.(T1, post implementation).

When the pre-implementation findings of the scientific models' dimension are analyzed, it is seen that nine students expressed inadequate, eight students expressed adequate, and one student expressed Informed opinions. After the application, one student expressed inadequate, 10 students expressed adequate, and seven students expressed Informed opinions. When the change in the students' views on the scientific models' dimension was analyzed, one student dropped from the sufficient category to the insufficient category and a negative change was realized. One student remained in the sufficient category and no change occurred. The remaining 12 students improved positively and moved to higher categories.

> A scientific model is the reality of something we make. For example, a model house is its reality. In other words, a scientific model is the reality of something. (S13. Pre-implementation)

> It's making a model of something and then making a model. It is not exactly the same. It happens with the information gathered by the scientist and his/her dreams. (S13, post implementation)

When the pre-implementation findings of the changeable nature of scientific knowledge are analyzed, it is seen that 13 students expressed inadequate, two students expressed adequate and three students expressed Informed opinions. After the application, there were no students who expressed inadequate views, one student expressed adequate views and 17 students expressed Informed views. When the change in students' views on the changeable nature of scientific knowledge was analyzed, no negative change was observed. All of the students showed positive development and moved to higher categories. The change in (S11)'s view on the changeable nature of scientific knowledge was realized as follows:

> No, it doesn't change. For example, schools can become more electronic. For example, lessons can be taught with tablets. But nothing changes in science. (S11. Pre-implementation)

> Yes, it changes. They used to call the world a box, now it's round. Because a lot of new information has been collected. A very long time has passed. Everything has improved.(S11. After Implementation)

When the findings of the subjective structure of scientific knowledge before the application are examined, it is seen that 13 students expressed inadequate, four students expressed adequate, and one student expressed an opinion in the Informed category. After the application, all of the students expressed an opinion in the Informed category. When the change in students' views on the subjective structure of scientific knowledge was analyzed, no negative change was observed. Since all of the students moved to the Informed category, they showed positive development and moved to higher categories. The change in (S13)'s view of the subjective nature of scientific knowledge was as follows:

> Because scientists have not experimented. If they did experiments, everybody's would be the same. They are very precise. Because experts always predict the weather conditions very accurately. (S13. Before Implementation)

> Because the environment they live in is different; because the theories they believe in are different... They are a bit precise. They cannot collect the information completely. Even if they collect it, they cannot predict it completely. (S13. After the Application)

When the pre-implementation findings of the dimension of imagination and creativity in science are examined, it is seen that six students expressed inadequate opinions, 10 students expressed adequate opinions, and one student expressed an opinion in the Informed category. After the application, all of the students expressed opinions in the Informed category. When the change in students' views on the dimension of imagination and creativity in science was analyzed, no negative change was observed. Since all of the students moved to the Informed category, they showed positive development and moved to higher categories. The change in (S18)'s opinion on the dimension of imagination and creativity in science was as follows:

> No. They don't use it... They don't imagine...(S18. Pre-implementation)

> Yes. They use it...I think they use it in all of them. Planning, experimenting, observing, analyzing data. (S18. After Implementation)

In addition to all these findings and student opinions, when the scientific story samples written by the students at the end of the implementation were analyzed, it was observed that the students mentioned the dimensions of the nature of science in their stories. Especially the subjective nature of scientific knowledge and the difference between observation and inference were found in almost all students' stories. This finding shows that students internalized these dimensions of NOS after the implementation. In addition, other NOS dimensions were also used in the stories.

Another finding in these stories written by the students is that the scientific model dimension was used by very few students. The students frequently used the dimensions of scientists working in cooperation, imagination, and creativity in science, the experimental nature of scientific knowledge, and the changeable nature of scientific knowledge in their stories. The dimensions of the nature of science used by S16 in her story are as follows:

> A few days later, the dinosaur was gone. Kara said it was a sheep. Keloğlan said it was a chicken. Balkız said it was a bear. Then Balkız found another fossil piece and added it. Everyone's interpretation changed.(S16)

Discussion, Conclusion, and Suggestions

This study aims to investigate the effect of direct reflective NOS activities integrated with stories prepared by the researcher and in which NOS sub-dimensions are integrated into the content on the NOS views of primary school students. In this direction, the study was conducted to examine the development of third-grade primary school students' NOS views by using the direct reflective NOS method integrated with stories. For this purpose, the opinions of the students about the NOS were obtained through the VNOS-D form and interviews before and after the 7-week NOS activity process. The changes in students' views during the activity process were analyzed. The NOS-D version (VNOS-D), reflective

writings, scientific stories written by students, and semi-structured interviews were used as data collection tools.

When the VNOS-D forms were applied to the third-grade primary school students before and after the activities were compared, the changes of the students on the dimensions of the nature of science such as the difference between observation and inference, the changeable nature of scientific knowledge, scientific models, the experimental nature of scientific knowledge, imagination and creativity in science, and the subjective nature of science were examined and it was concluded that the students' opinions changed positively on all dimensions. Especially in the pre-implementation student views, students reported inadequate views on the subjective nature of science, scientific models, the difference between observation and inference, and the changeable nature of scientific knowledge, and it was seen that they did not have many concepts of the nature of science. In many studies conducted with students on NOS in Turkiye and abroad, (Akerson et.al., 2024, Doğan & Abd-El Khalick, 2008; Khishfe & Abd-El Khalick, 2002; Khishfe, 2008). At the end of the study, the majority of the students showed substation improvements in their NOS views. In parallel with the study of Murphy, Smith, and Broderick (2021), engagement with NOS issues with both teachers and students had a positive influence on students' thinking of science and the improvement of better NOS views as a result.

The effect of the stories in which NOS dimensions were integrated, which is an important point of the research, is objectively seen in the reflective writings. While the students wrote in their reflective writings what they learned during the course and what interested them, it was observed that they liked the stories very much and mentioned the NOS elements in the stories. In light of this information, it is concluded that direct reflective NOS activities integrated with stories positively affect students' NOS views. The findings of the study conducted by Avşar-Erümit and Aversion (2022) also support the findings of the current study and state that appropriately designed children's science books can be used as classroom tools to support NOS teaching.

In the analysis of the VNOS-D form applied before the application to develop the NOS views of primary school students within the scope of the study, it was determined that the majority of the students were distant from the NOS concepts and had never heard of some concepts. In other studies in which NOS views of primary school students were investigated, it was observed that students were mistaken about NOS concepts, and suggestions were made on this situation (Erdoğan, 2004; Lederman, & O'Malley, 1990).

All these dimensions, the results of which are explained after the implementation, reveal that the NOS activities integrated with the direct reflective teaching method and stories were very successful in developing students' NOS views. In many previous studies, it was found that NOS activities provided positive developments. The most important result that draws attention here is that student views have improved more in all dimensions, especially imagination and creativity in science, the subjective nature of science, and the changeable nature of scientific knowledge, compared to the results of other studies (Çalışkan, 2005; Pekmezci, 2014; Yılmaz, 2013; Yiğit, 2007).

There may be many reasons for this high-value improvement in students' views, which is found in other studies. The factors that are thought to be important among these reasons are the stories in which NOS dimensions are integrated and the implementation of direct reflective teaching. Stories make difficult-to-understand experiences understandable. As such, students are motivated towards the lesson and meaningful learning takes place (Turgut & Kışla, 2015). Since students in this age group are very interested in reading and comprehension activities, stories make the subject more fun and understandable for them. Stories are created to enable students to have fun, learn while having fun, meet their mental and spiritual development needs, be curious about the subject they read, and perceive social life as it is (Biçici, 2006). During the implementations, first, the stories were read and then the activities were carried out. Thus, the stories first introduced the concepts to the students. It is thought that the students who recognized the concepts better understood the NOS concepts through direct reflective activities. Akerson, Avşar Erümit & Evcan Kaynak (2019) provided information supporting this information in their study and stated that teachers with pedagogical content knowledge can bring the activities to a level that students can understand and can translate NOS knowledge into a form that young students can understand and comprehend. In addition to all these features, the use of stories in the

research can be thought to help students become more enthusiastic, put themselves in the place of story heroes, create a fun lesson process, and make the lessons more understandable and more permanent, thus helping to achieve positive results. When the cartoon heroes that children like are integrated with stories and combined with science subjects in the lesson, students will become curious and enthusiastic about science and will be interested in science lessons (Coşkun, 2012).

When the results of the research were evaluated, positive changes were realized in students' NOS views. It is thought that the most important variable that contributed to these developments was the direct reflective transfer of NOS elements through stories. Students at the primary school level especially like stories and story heroes and experience the story in their imagination. Especially 3rd-grade students, who are in the concrete operations period, have great difficulty in learning and understanding NOS dimensions that have abstract concepts. Since many science-related topics and definitions in the science curriculum are complex and abstract for students, they have difficulty in making sense of these definitions and therefore tend to memorize them. For this reason, the concepts explained to students should be made concrete and they should find materials that will develop their imagination, emphasize their curiosity, and enable them to become active in the process. Stories are among these materials (Demircioğlu et al., 2006; Gölcük, 2017). One of the starting points in this research is how to teach these abstract concepts to students in this age group. At this point, stories helped the researcher to concretize these abstract concepts. Stories have an important place in ensuring that students both listen carefully and retain the concepts. This idea is supported by many studies conducted with primary school students with the help of stories and with positive results (Cruz & Breda, 2024; Çalışkan, 2005; Pekmezci, 2014; Yılmaz, 2013; Yiğit, 2007).

Recommendations

Within the scope of the research, it has been investigated how it affects the NOS development of third grade primary school students through direct reflective activities using stories and the results have been found to be quite positive. It was found that the use of stories with the direct reflective method had positive contributions to students' learning. Therefore, such studies can be conducted with students at other grade levels. The reason for this is that students should be introduced to NOS concepts at a younger age.

Within the scope of this research, it was concluded that stories are effective. For this reason, it is thought that the research we have conducted will benefit both researchers and teachers within the scope of activities with stories. In this study, stories were created by the researcher and their effects on NOS views were examined together with the direct reflective method. These stories can also be written by students. In this way, both reading comprehension and writing skills can be improved and student materials can be created. In addition, these activities can eliminate the congestion in the lessons and allow the NOS teaching to continue within the scope of Turkish lessons. It is recommended to research what kind of methods and materials should be used according to the age groups and age levels of students within the scope of NOS teaching. In addition, the NOS objectives in science textbooks should be given more space and should even be included in all education and training activities in the form of inclusion at all grade levels. In this way, permanence in NOS views can be ensured. It was stated that there is a need for materials for teachers and students in NOS activities (Yenice & Özden, 2015). In this context, it is thought that the stories to be created can significantly meet the need for materials.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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, in which all authors contribute to the study, and that all the responsibility belongs to the article authors in case of any ethical violations.

Author Contributions: Authors contributed equally to the study.

Funding: This research received no funding.

Institutional Review Board Statement: During the writing process of the study titled "Improving Primary School Students' Views on the Nature of Science by Using Stories", scientific rules, ethics, and citation rules were followed; no tampering was made on the collected data and this study was not sent to any other academic publication environment for evaluation. The necessary ethics committee permissions were obtained at Kırıkkale University Ethics Committee's session dated 12.06.2019 and numbered 05.

Data Availability Statement: Data generated or analyzed during this study should be available from the authors on request.

Conflict of Interest: There is no conflict of interest between the authors in the study.

References

Abd-El Khalick, F., & Lederman, N.G. (2000a). The influence of history of science courses on students‟ views of nature of science. *Journal of Research in Science Teaching, 37*(10),1057–1095. doi:10.1002/1098-2736(200012)37:10<1057::AID-TEA3>3.0.CO;2-C

Abd-El-Khalick, F. & Lederman, N.G. (2000)b. Improving ScienceTeachers‟ Conceptions of Nature of Science: A Critical Review of the Literature. *International Journal of Science Education ,22* (7), 665-701. doi:10.1080/09500690050044044

Akerson, V. L., Cesljarev, C., Liu, C., Lederman, J., Lederman, N., & El Ahmadie, N. (2024). Third and fourth grade students 'conceptions of the nature of scientific inquiry. International Journal of Science Education, 46(3), 205-221. doi:10.1080/09500693.2023.2226333

Akerson,, V.& Donnelly, L.A. (2010). Teaching Nature of Science to K-2 Students: What Understandings Can They Attain? *International Journal of Science Education, 32* (1), 97-124. doi:10.1080/09500690902717283

Akerson, V.L. & Abd-El-Khalick, F. (2005) "How should I know what scientists do?- I am just a kid" : fourth-grade students‟ conceptions of nature of science, *Journal of Elementary Science Education*, *17*(1), 1-11. doi:10.1007/BF03174669

Akerson, V.L., Avşar Erumit, B. & Elcan Kaynak, N. (2019) Teaching Nature of Science through children's literature: an early childhood preservice teacher study. *International Journal of Science Education,* 1464-5289. doi:10.1080/09500693.2019.1698785

Alan, Ü. (2014). *Okulöncesi dönem çocuklarının bilimin doğasına ilişkin anlayışlarının incelenmesi.* (Unpublished master's thesis). Anadolu Üniversitesi Eğitim Bilimleri Enstitüsü, Eskişehir.

Anagün, Ş. S.(2008). *İlköğretim beşinci sınıf öğrencilerinde yapılandırmacı öğrenme yoluyla fen okuryazarlığının geliştirilmesi: Bir eylem araştırması.* (Yayınlanmamış doktora tezi). Anadolu Üniversitesi Eğitim Bilimleri Enstitüsü, Eskişehir.

Avşar-Erumit, B., & Akerson, V. L. (2022). Using Children's Literature in the Middle School Science Class to Teach Nature of Science: Preservice Teachers 'Development of Sources. *Science & Education*, 1-25. doi:10.1007/s11191-021-00274-3

Biçici, N. (2006). *Annelerin çocuk kitabı seçimi hakkındaki görüşleri.* (Unpublished master's thesis). Afyon Kocatepe Üniversitesi Sosyal Bilimler Enstitüsü, Afyonkarahisar.

Coşkun, H. (2012). *Bilimsel öyküler içeren eğitsel oyunlar ile fen öğretiminin öğrencilerin akademik başarısına etkisi.* (Unpublished master's thesis). Erciyes Üniversitesi Eğitim Bilimleri Enstitüsü, Kayseri.

Creswell, J. W.(2016). *Nitel araştırma yöntemleri*. Siyasal: Ankara.

Cruz, C., & Breda, A. (2024). Children's Literature: A Contribution to the Emergence of Science in the Early Years. *International Journal on Social and Education Sciences, 6*(1), 1-19. . doi:10.46328/ijonses.613

Çalışkan, F (2005). *İlköğretim 4. sınıf sosyal bilgiler dersinde aktif öğrenme yöntemlerinden çözümlemeli öykü yönteminin öğrencilerin akademik başarılarına, tutumlarına ve aktif öğrenme düzeylerine etkisi. (*Unpublished master's thesis). Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü, Hatay.

Çelik, S. (2016). *Sekizinci sınıf öğrencilerinin bilimin doğasına yönelik anlayışlarının geliştirilmesinde kavram karikatürü kullanımı*. (Unpublished master's thesis). Balıkesir Üniversitesi Fen Bilimleri Enstitüsü, Balıkesir.

Çetin, G. (2019). *Kavram karikatürlerinin öğrencilerin bilimin doğası anlayışları üzerine etkisi.* (Unpublished master's thesis). Hatay Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü, Hatay.

Demircioğlu, H. Demircioğlu, G. & Ayas, A. (2006). Hikâyeler ve kimya öğretimi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 30*(30), 110-119.

Deve, F. (2015). *Bilim tarihi destekli ışık ünitesinin 7. sınıf öğrencilerinin bilimin doğası anlayışlarına etkisi*. (Unpublished master's thesis). Recep Tayyip Erdoğan Üniversitesi Fen Bilimleri Enstitüsü, Rize.

Doğan, N., & Abd-El-Khalick, F. (2008). Turkish grade 10 students' and science teachers' conceptions of nature of science: A national study. *Journal of research in Science Teaching, 45*(10), 1083-1112. doi:10.1002/tea.20243

Doğan, N., Çakıroğlu, J., Bilican, K., & Çavuş, S. (2012). *Bilimin doğası ve öğretimi* ,Ankara: Pegem Akademi

Erdoğan, R. (2004). *Investigation of the preservice science teachers 'views on nature of science.* (Unpublished master's thesis). Middle East Technical University, Ankara.

Avsar Erumit, B., & Akerson, V. L. (2022). Using Children's Literature in the Middle School Science Class to Teach Nature of Science: Preservice Teachers 'Development of Sources. *Science & Education*, 1-25. doi:10.1007/s11191-021-00274-3

Gölcük, A. (2017). *Bilimsel hikâyelerle desteklenen fen eğitiminin öğrencilerin yaratıcılıkları ve duyuşsal özellikleri üzerindeki etkileri.* (Unpublished master's thesis). Hacettepe Üniversitesi Eğitim Bilimleri Enstitüsü, Ankara.

Hanuscin, D. ve Lee, E. (2009). helping students understand the nature of science. *Science and Children*, 64-65. https://search.proquest.com/openview/d8aabec64fa3b602c405c67e5a6c553f/1?pq-origsite=gscholar&cbl=41736 sitesinden 11.09.2019 tarihinde alınmıştır.

Kampourakis, K. ve Gripiotis, C. (2015). Darwinism in context: An interdisciplinary, highly contextualized course on nature of science. *Perspectives in Science, 5*, 25–35. doi:10.1016/j.pisc.2015.05.002

Kapucu, M.S. (2013). *Fen ve teknoloji dersinde belgesel kullanılmasının 8. Sınıf öğrencilerinin hücre ile kuvvet konularındaki başarılarına ve bilimin doğası hakkındaki görüşlerine etkisi. (*Yayınlanmamış doktora tezi). Hacettepe Üniversitesi. Sosyal Bilimler Enstitüsü, Ankara.

Khishfe, R. (2008). The development of seventh graders' views of nature of science. *Journal of Research in Science Teaching, 45*(4), 470-496. doi:10.1002/tea.20230

Khishfe, R. F., & Abd-El Khalick, F. (2002). Influence of the explicit and implicit inqury-oriented instruction on sixth graders‟ views of nature of science. *Journal of Research in Science Teaching, 39*(7), 551-578. doi:10.1002/tea.10036

Khishfe, R. ve Lederman, N. (2007). Relationship between instructional context and views of nature of science. *International Journal of Science Education, 29*(8), 939–961. doi:10.1080/09500690601110947

Köseoğlu, F., Tümay, H., & Budak, E. (2008). Bilimin doğası hakkında paradigma değişimleri ve öğretimi ile ilgili yeni anlayışlar. *Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi, 28*(2), 221-237.

Lederman, J. S., & Khishfe, R. (2002). Views of nature of science, Form D. *Unpublished paper. Illinois Institute of Technology, Chicago, IL*.

Lederman, N. G. & O'Malley, M. (1990). Students 'perceptions of tentativeness in science: development, use, and sources of change. *Science Education*, 74, 2, 225-239. doi:10.1002/sce.3730740207

Lederman, N. G. (1992). Students 'and teachers 'conceptions about the nature ofscience: A review of the research. *Journal of Research in Science Teaching*,29, 331–359. doi:10.1002/tea.3660290404

Lederman, N. G. (2004). Syntax of nature of science within ınquiry and science ınstruction. *Scientific Inquiry and Nature of Science. Implications for Teaching, Learning and Teacher Education*. Flick, L. B. ve Lederman, N. G. (Editörler). s. 301-317. The Netherlands: Springer Academic Publishers.

Liu, X. (2009). Beyond Science Literacy: Science and the Public. *International Journal of Environmental & Science Education. 4*(3),301-311.

MEB (2018). Fen Bilimleri Dersi Öğretim Programı. Erişim Tarihi:10.11.2019.[http://mufredat.meb.gov.tr/Dosyalar/201812312311937-FEN%20B%C4%B0L%C4%B0MLER%C4%B0%20%C3%96%C4%9ERET%C4%B0M%20PROGRAMI2018.pdf]

Merriam, S. B. (2015). *Nitel araştırma; Desen ve uygulama için bir rehber*. Nobel: Ankara.

Murphy, C., Smith, G. & Broderick, N. A (2021).Starting Point: Provide Children Opportunities to Engage with Scientific Inquiry and Nature of Science. Research in Science Education, 51, 1759–1793 . doi:10.1007/s11165-019-9825-0

Pekmezci, S. (2014). *Bilişim teknolojileri destekli kısa hikâyelerin öğrencilerin başarıları, özyeterlik algıları ve fene yönelik tutumlarına etkisi.* (Unpublished master's thesis). Pamukkale Üniversitesi Eğitim Bilimleri Enstitüsü, Denizli.

Quigley, C., Pongsanon, K., ve Akerson, V. L. (2010). If we teach them, they can learn: Young students views of nature of science aspects to early elementary students during an informal science education program. *Journal of Science Teacher Education, 21* (7), 887–907 doi:10.1007/s10972-009-9164-5

Tatar, E., Karakuyu, Y., & Tüysüz, C. (2011). Sınıf öğretmeni adaylarının bilimin doğası kavramları: Teori, yasa ve hipotez. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *8*(15), 363-370.

Roberts, D. A., and Bybee, R. W. (2014). "Scientific literacy, science literacy, and science education," in Handbook of Research on Science Education. Vol. 2. eds. Lederman, N. G., and Abell, S. K. (New York: Routledge), 559–572.

Turgut, G. ve Tarık, K. (2015). Bilgisayar destekli hikâye anlatımı yöntemi: Alanyazın araştırması, *Turkish Online Journal of Qualitative Inquiry*, 6 (2), 97-121. doi:10.17569/tojqi.57305

Yıldırım, A. & Şimşek, H. (2016). *Sosyal bilimlerde nitel araştırma yöntemleri.* Ankara: Seçkin.

Yılmaz, A. (2016). *İlköğretim 8. sınıf fen ve teknoloji dersi hücre bölünmesi ve kalıtım ünitesi etkinliklerinin öğrencilerin bilimin doğasına ilişkin görüşlerine etkisi.* (Unpublished master's thesis). Balıkesir Üniversitesi Fen Bilimleri Enstitüsü, Balıkesir.

Yılmaz, T. (2013). *Kavram karikatürleriyle desteklenmiş bilimsel hikâyelerin öğrencilerin akademik başarıları, tutumları ve motivasyonları üzerine etkisi.* (Unpublished master's thesis). Celal Bayar Üniversitesi Fen Bilimleri Enstitüsü, Manisa.

Yiğit, E. Ö. (2007). *Öyküleştirme yönteminin 6. sınıf sosyal bilgiler programı ülkemizin kaynakları ünitesindeki öğrenci başarısı üzerine etkisi.* (Unpublished master's thesis), Abant İzzet Baysal Üniversitesi Sosyal Bilimler Enstitüsü, Bolu.

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

The Effect of Ethical Leadership on Organizational Justice, Organizational Citizenship and Job Satisfaction

Muhammet Emre Kılıç[1] **Mehmet Yaşar Kılıç**[2] **Muhammet Emin Uzunyaylalı**[3]

To cite this article:
Kılıç, M. E, Kılıç. M. Y. & Uzunyaylalı, M. E. (2024). The effect of ethical leadership on organizational justice, organizational citizenship and job satisfaction. *e-Kafkas Journal of Educational Research*, *11*, 80-94. doi:10.30900/kafkasegt.1321880

Research article **Received:** 03.07.2023 **Accepted:** 22.04.2024

Abstract

The aim of the study is to explain the effect of ethical leadership on organizational justice, organizational citizenship, and job satisfaction. The study group includes 488 teachers and the study was chosen by using a simple random sampling method. Teachers' participation is convenience sampling. Data were collected with the ethical leadership scale, organizational justice scale, and organizational citizenship scale. As a result of the analysis, it was concluded that the scales were reliable. The research hypotheses were tested using structural equation modeling as well as variables. According to the hypothesis, ethical leadership has an effect on organizational justice, organizational citizenship, and job satisfaction, organizational justice with ethical leadership has an effect on job satisfaction, and, organizational citizenship with ethical leadership affects job satisfaction. In light of these results, it shows that all hypotheses are supported. In summary, it can be said that ethical leadership has an effect on organizational outputs. This situation reveals the importance of ethical leadership.

Keywords: Ethical leadership, job satisfaction, organizational citizenship, organizational justice, teacher

[1] Author, Atatürk University
[2] Corresponding Author, myasarkilic@csu.edu.tr, Cyprus Science University
[3] Author, Atatürk University

Introduction

Ethics has become an increasingly popular and researched area in today's world. 2,130,000 searches have been made on Yahoo for business ethics and at least 16 institutes and centers are investigating this issue (Fulmer, 2004). In recent years, when we talk about institutions, there are also unethical behavior and scandals. These events seem to cover all areas from the business world to the education world (Brown & Trevino, 2006). Ethical problems such as student-teacher border violations in educational institutions carelessness in behavior (Barrett, Headley, Stovall, & Witte, 2006), subjectivity in grading, gift culture in schools (Aydın, Güner, Toptaş, & Erdemli, 2020), pressure and inadequacy are observed in these schools (Güngör & Özkara, 2017). Managers may solve these problems which are in educational institutions with value-based behaviors.

Some of the values-based executive behaviors are spiritual, ethical, servant, and authentic leadership (Dinh, Lord, Gardner, Liden, Meuser, & Hu, 2014). Ethical leaders transfer their values to people, become role models, and solve problems before they arise. If ethical leaders cause the existence of an ethical culture, ethical behaviors will increase (Brown, Treviño & Harrison, 2005; Key, 1999). Ethical leaders do not only follow the simple rules known but they are also a very important source for employees as ethical guidance and they are responsible for moral development in the organization (Lashway, 1996; Mihelic, Lipicnik & Tekavcic, 2010). It can be said that ethical leaders may encounter various challenges in these institutions.

When the perception of organizational justice perception is low these absenteeism and depressive symptoms increase (Ybema & Van, 2010), the employees's job performance decreases, they sabotage the work, and they give their responsibilities to someone else (Serinkan & Erdiş, 2014). If an injustice is perceived in the organization in disciplinary proceedings such as wages, promotions, shifts, rewards, and punishment, employees may exhibit negative behaviors towards the organization (İçerli, 2010). The health of the employees is negative due to the stress experienced by the employees who have the perception of injustice (Elovainio at all, 2005). Employees experience many problems such as psychiatric disorders, psychological distress, accident risks, and inflammatory disorder (Elovainio et all, 2010; Kivimäk et all., 2003; Kivimäki, at all., 2005; Tepper, 2001). In summary, the most important problem faced by employees may be the perception of organizational justice.

It is not possible to provide quality education, achieve the desired success, and achieve the expected goals without the behavior of organizational citizenship in schools (Belogolovsky & Somech, 2010; Chen, Hui & Sego, 1998; DiPaola & Hoy, 2005; DiPaola & Tschannen-Moran, 2001; Dunlop & Lee, 2004; Khalid, Jusoff, Othman, Rahman and Ismail, 2010; Podsakoff &. MacKenzie, 1997; Oplatka, 2009). If employees do not voluntarily contribute to their organizations outside of their responsibilities, this may have negative consequences for the organization in terms of performance (Bauer, Dekas, Welle, Kurkoski, & Sullivan, 2013; Katz, 1964). Organizational citizenship behaviors are a significant variable in the ascending performances of teachers in schools (Alanoğlu & Demirtaş, 2019; Tosun & Bostancı, 2019). The organizational citizenship of teachers' behaviors in schools could be significant for educational institutions.

If the job satisfaction for teachers is high, it is beneficial to the school and students, while teachers with low job satisfaction want to leave the school and they cannot provide the necessary support to the institution and the students (Altınkurt & Yılmaz, 2014; Rhodes, 1987 Gardner, 2010; Hoy & Miskel, 2010; Johnson, Kraft & Papay, 2012; Klassen and Chiu, 2010). The job satisfaction for teachers impacts on their performance (Koç, Yazıcıoğlu, & Hatipoğlu, 2009). In other words, the high job satisfaction of teachers is very important for institutions. Therefore, school administrators as leaders should positively affect the job satisfaction of teachers.

We believe that ethical leadership can solve problems related to organizational citizenship, justice, and job satisfaction. Some studies showing the direct impact of ethical leadership on organizational justice, organizational citizenship, and job satisfaction in the context of educational institutions show the contribution to the literature (Büyükyılmaz ve Ay, 2017; Kılıç 2020). However, school administrators need to identify the steps they need to take for more effective collaboration; these steps extend from their positive attitudes toward the school to their motivation in daily practices.

Ethical Leadership

Ethical leaders should be models, justify, produce ethical content, share authority, and have honesty and moral thinking. In this way, ethical leaders make ethical decisions and reveal useful behaviors (Anello, 1992; Brown & Trevino, 2006; Kalshoven, Hartog & Hoog, 2013). Ethical leadership is honesty, human focus, ethical awareness, encouragement, motivation, and accountability (Resick, Hanges, Dickson, & Mitchelson, 2006). In addition to the positive qualities that ethical leaders have, it is also very important to convey them to their followers.

Ethical leaders talk about values; act fairly in the distribution process; set ethical standards; and establish an ethical corporate culture (Key, 1999; Yukl, Mahsud, Hassan & Prussia, 2013). When leaders act ethically and head reward systems and punishment to support ethical behavior, they establish acceptable group norms (Mayer, Aquino, Greenbaum, & Kuenzi, 2012). That is, they model and encourage ethical behavior (Stouten, Dijke, & Cremeier, 2012). In this context, ethical leadership is an effort to produce and convey positive values and create an ethical corporate culture. The concept of ethical leadership could solve many problems related to organizational justice, satisfaction, and citizenship. Ethical leadership may form at different levels of organization and in different relationships with different variables even though the literature on ethical leadership has not paid enough attention to test the different variables in one SEM model. In other words, this study will determine the relationship among organizational justice, job satisfaction, organizational citizenship, and ethical leadership as defined below.

The Relationship between Organizational Justice and Ethical Leadership

Organizational justice can be about the justice of the managers (Whitman, Caleo, Horner, Carpenter, & Bernerth, 2012). In other words, justice in an organization helps us make personal evaluations of the ethical and moral behavior of managers (Cropanzano, Bowen, & Gilliland, 2007). Moral behavior is the characteristic of an ethical leader (Zhu, May, & Avolio, 2004). For ethical leaders, having an element of justice in the work environment may be the most important issue. Therefore, ethical leaders constantly emphasize justice in the work environment. Establishing as open relationships with employees as possible and making fair decisions about them are characteristics of an ethical leader (Strom, Sears, & Kelly, 2014; Neubert, Carlson, Kacmar, & Chonko, 2009) Ethical leaders are moral managers. Ethical leaders have adopted universal principles, such as equality, justice, and honesty, and they believe that their colleagues should also adopt these values. From this point of view, ethical leaders create and maintain a justice environment within the organization (Yıldız, 2019).

Managers who have fair and ethical behaviors in the organization exhibit ethical behaviors. The ethical environment helps employees to establish a positive relationship with each other (Zhu, May, & Avolio, 2004). Some studies show a positive relation between ethical leadership and justice (Acar, Kaya, & Şahin, 2012; Akatay, Kısat, & Yücekaya, 2016; Al Halbusi, Williams, Mansoor, Hassan & Hamid, 2020; Ayık, Yücel, & Savaş, 2014; İbrahim, 2016; Mıhcı & Uzun, 2020; Kğin, Aktaş & Köripek, 2013; Yıldız, 2019). Ethical leaders consider factors such as justice, reliability, and honesty as a part of their leadership behavior. Therefore, these are ethical leaders' characteristics.

The Relationship between Organizational Citizenship and Ethical Leadership

Organizational citizenship behavior is not compulsory for the employee. They do not contain a penalty or require a specific reward. Citizenship behavior is the behavior that is performed to enhance the organizations' effectiveness and efficiency depending on individual preference (DiPaola & Hoy, 2005). In short, organizational citizenship behaviors are individuals' voluntary contributions to them (Dekas, Bauer, Welle, Kurkoski, & Sullivan, 2013; Organ, Podsakoff, MacKenzie, 2006). Ethical leaders show their organizational citizenship behaviors by increasing the motivation of their followers. Followers trust fair ethical leaders. Accordingly, employees tend to increase their performance, take responsibility, and participate in decisions (Madenoğlu, Uysal, Sarıer, & Banoğlu, 2014). By imitating ethical leaders' behaviors, employees can exhibit organizational citizenship behaviors (Bedi, Alpaslan, & Green, 2016). In addition, some studies show which are indicating a significant and positive relationship between organizational citizenship behaviors and ethical leadership. Moreover, many studies revealed this type of moral leadership has a positive impact on the behavior of organizational citizenship (Çakıroğlu & Tabancalı, 2017; Wang & Sung, 2016; Yang, Ding & Lo, 2016; Ruiz-

Palomino, Ruiz-Amaya, & Knörr, 2011; Qasim, Rizvi & Irshad, 2020). The moral qualities of ethical leaders are important for individuals to exhibit the behavior of organizational citizenship.

The Relationship between Job Satisfaction and Ethical Leadership

Job satisfaction could be explained as a positive perception of the job as a result of her/his experiences. In addition to this, job satisfaction describes how the individual feels about her/his job (Locke, 1976; Spector, 1997). Managers' behaviors are related to employees' job satisfaction (Smith, 1997). Besides, teachers' job satisfaction is directly and indirectly affected by their managerial behavior (Bogler, 2001). Çelik, Dedeoğlu & İnanir (2015) revealed in their research that job satisfaction is affected by ethical leadership. Similarly, there are direct and indirect relations between job satisfaction and ethical leadership (Güngör, 2016; Işık, 2020; Neubert, Carlson, Roberts, Kacmar & Chonko, 2009; Shafique, Kalyar & Ahmad, 2018). In other words, their ethical behavior increases, and employees have more positive thoughts toward their jobs (Okan & Akyüz, 2015; Yates, 2014). If employees do not have job satisfaction, absenteeism occurs, stress and conflict occur, negativities occur in the state of health, and the rate of quitting increases (Şimşek, Çelik & Akgemci (2014).

The Relationship between Job Satisfaction and Organizational Justice

Organizational justice and job satisfaction are among the most studied subjects about organizations. In addition to this, the relationship between job satisfaction and organizational justice can be observed (Konovsky, Folger, & Cropanzano, 1987; Özer, 2007; Altınkurt & Yılmaz, 2012; ClayWarner, Reynolds & Roman, 2005; Yelboğa, 2012). If employees' perceptions of their organizations are positive, commitment and job satisfaction increase. Otherwise, motivation and job satisfaction are expected to decrease (Beugré, 2002; Tutar, 2007). As a result of justice's existence in the organization, it will ensure the formation of high productivity, a positive work environment, personal satisfaction, and a strong organizational culture. These factors provide job satisfaction for employees (Altınkurt & Yılmaz, 2012).

The Relationship Between Organizational Citizenship and Job Satisfaction

Some definitions are related to organizational citizenship that promotes employees' organizations apart from voluntary behaviors (Bauer, Dekas, Welle, Kurkoski & Sullivan, 2013; Katz, 1964; Organ, 1988). People with a high perception of organizational citizenship behavior help their colleagues in things they cannot do. In addition, these people take proactive measures before problems arise (Gök, 2007; Sezgin, 2005). Besides, it explains the attitude of the employee towards her/his job (Kondalkar, 2007). Individuals with high job satisfaction have higher job satisfaction. In fact, if employees have high job satisfaction, their job performance is also high (Robbins & Judge, 2015).

Consequently, the following research hypothesis will be tested and analyzed:

H1: The ethical leadership has an effect on organizational justice

H2: The ethical leadership has an effect on organizational citizenship

H3: The ethical leadership has an effect on job satisfaction

H4: The organizational justice with ethical leadership has an effect on job satisfaction

H5: The organizational citizenship with ethical leadership has an effect on job satisfaction

Method

The aim of the study is to explain the effect of ethical leadership on organizational justice, organizational citizenship, and job satisfaction. We used the relational survey model. This model is to find out the change's existence that coexists among the variables as well as this change's degree (Fraenkel & Wallen, 2009). The created model was performed with the structural equation modeling (SEM). Structural equation modeling was used with the AMOS program to test this model. In addition, structural equation modeling was used for the first time in the field of social sciences (Bayram, 2010). The main purpose of this model is to take into account the error rates of observed

variables when compared to traditional methods (Schumacker and Lomax, 2004). Figure 1 is presented for this model.

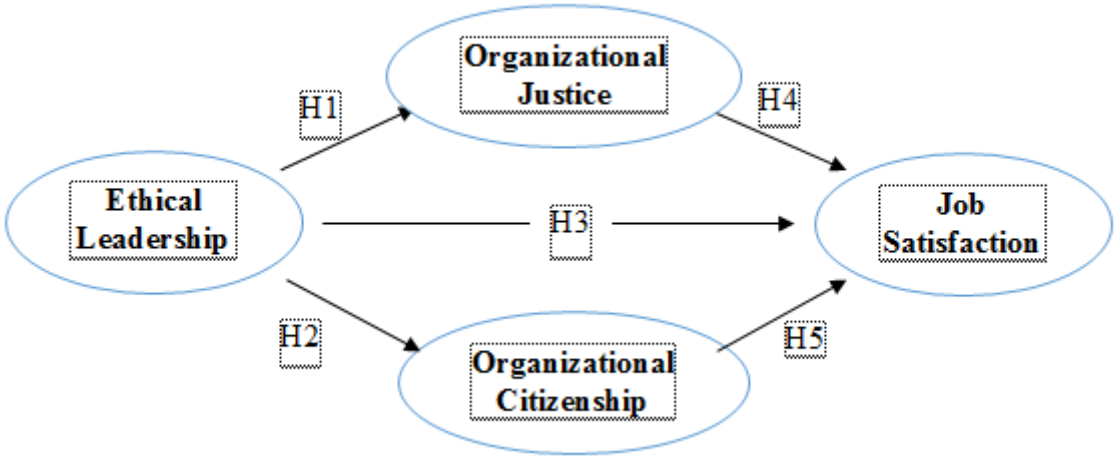


Figure 1. The Target Model for the Effect of Ethical Leadership on Organizational Justice, Organizational Citizenship and Job Satisfaction

This study was conducted in the central districts of Erzurum province. The study group consists of 488 randomly selected teachers. The participating teachers were chosen with a simple random sampling method and teachers' participation is convenience sampling (Balcı, 2015). It has been determined that the sample number of more than 200 people is a large sample size and the sample number is sufficient according to the result of the p(p+1)/2 formula (Bayram, 2011). 44.5% of the teachers participating in the study are female (n=217), and 55.5% are male (n=271). 37.3% of the teachers work in primary school (n=182), 35.9% of the teachers work in secondary school (n=175) and 26.8% of the teachers work in high school (n=131). 42% of them have teaching experience between 1-10 years (n=205), 37.1% of them teachers work between 11-20 years (n=181) and 20.9% of them have teaching experience of 21 years or more (n=102). When we look for the teachers according to their educational status, 59.8% of them have education at the undergraduate level (n=292) and 40.2% of them have graduate level (n=196).

Ethics Statement

Research ethics approval was obtained by Cyprus Science University Ethics Committee (Date: 17.01.2022/ Decision number: 2022/01.005).

Data Collection Tools

Ethical Leadership Scale

Brown, Treviño, and Harrison (2005) developed "Ethical Leadership Scale" and Tuba, Bircan, and Yeşiltaş (2012) adapted it into Turkish to determine education institution managers' ethical leadership behavior in terms of teachers. The scale includes ten items and these items form one factor. Tuna, Bircan, and Yesiltaş (2012) calculated Cronbach's Alpha reliability coefficient as .928. For this research, goodness-of-fit statistics are X^2/sd=2.24, GFI=.97, CFI=.98, AGFI=.95, NFI=.97, RMSEA=.05 and SRMR=.02. Cronbach's Alpha was .90.

Organizational Justice Scale

Hoy and Tarter (2004) developed the "Organizational Justice Scale", and Taştan and Yılmaz (2008) adapted it into Turkish to find out the perceptions of teachers on organizational justice. This scale includes 10 items and one factor. The Cronbach's Alpha value of the scale was .92. For this research, goodness-of-fit statistics are X^2/sd=1.49, GFI=.98, CFI=.99, AGFI=.97, NFI=.98, RMSEA=.03 and SRMR=.02. Cronbach's Alpha was .88.

Organizational Citizenship Scale

DiPaola, Tarter, and Hoy (2005) developed The "Organizational Citizenship Scale" and Taştan and Yılmaz (2008) adapted it into Turkish to find out teachers' perceptions of organizational citizenship. This scale includes twenty-one items and these items are the single factor. Fort his research, Cronbach's Alpha was .87. The confirmatory factor analysis for this research, goodness-of-fit statistics are X^2/sd=1.93, GFI=.96, CFI=.98, AGFI=.95, NFI=.97, RMSEA=.04 and SRMR=.03. Cronbach's Alpha was .89.

Job Satisfaction Scale

Ho and Au (2006) developed this scale and Demirtaş (2010) adapted it into Turkish to understand teachers' job satisfaction levels. The scale includes five items and a single factor. The goodness-of-fit statistics are X^2/sd=2.09, GFI=.99, CFI=.99, AGFI=.98, NFI=.98, RMSEA=.05 and SRMR=.02. The Cronbach's Alpha was .77.

Data Analysis

Hypotheses have been tested with structural equation modeling (SEM) and variables investigating relationships by using multiple regression (Balcı, 2015). We examined missing outliers and data. Accordingly, the z scores of the data were calculated and scores that were not ± 3 were evaluated the extreme values (Çokluk, Şekercioğlu, & Büyüköztürk, 2012) and were excluded from the analysis. Mahalonobis distances were evaluated to examine the multivariate extreme values of the data. Accordingly, the proposed value of 16.266 (Akbulut, 2011) was taken as a reference, since there are three predictive variables in the study. Therefore, data above this value were excluded from the analysis. There is no multi-connection problem when the Tolerance value is greater than 0.10 and the VIF value is less than ten (Hair, Black, Babin, Anderson, & Tatham, 2006). Tolerance and VIF values for organizational justice variables were (.82; 1.21), for organizational citizenship behavior (.89; 1.12), and job satisfaction (.77; 1.29), respectively. Durbin-Watson value was examined to examine whether there is autocorrelation between the variables. The Durbin-Watson value can be between 1.5 and 2.5, and the situation is an indication that there is no auto-correlation between variables (Öztürk 2005). The Durbin-Watson value was 1.742.

Findings

The mean, standard deviation, and correlation values of the research variables are presented in Table 1.

Table 1.
Mean, Standard Deviation and Correlation Values of Variables

	$\bar{X}$	Ss	Ethical Leadership	Organizational Justice	Organizational Citizenship	Job Satisfaction
Ethical Leadership	3.77	.63	1			
Organizational Justice	4.31	.51	.31*	1		
Organizational Citizenship	3.64	.66	.40*	.20*	1	
Job Satisfaction	3.94	.53	.37*	.41*	.32*	1

* p<.01; N=488

In Table 1, teachers 'perceptions of school administrators ethical leadership are $\bar{X}$=3.77, their perception of organizational justice is $\bar{X}$=4.31, their perception of organizational citizenship is $\bar{X}$=3.63, and their perception of job satisfaction is $\bar{X}$=3.94. There is a positive relationship between organizational justice and ethical leadership (r=.31; p<.01), organizational citizenship (r=.40; p<.01), and job satisfaction (r=.40; p<.01). It was concluded that there is a directional relationship. There is a positive relationship between organizational citizenship and organizational justice (r=.20; p<.01) and job satisfaction (r=.41; p<.01). In addition, organizational citizenship and job satisfaction have a positive relationship (r=.32; p<.01). SEM analysis is in Figure 1.

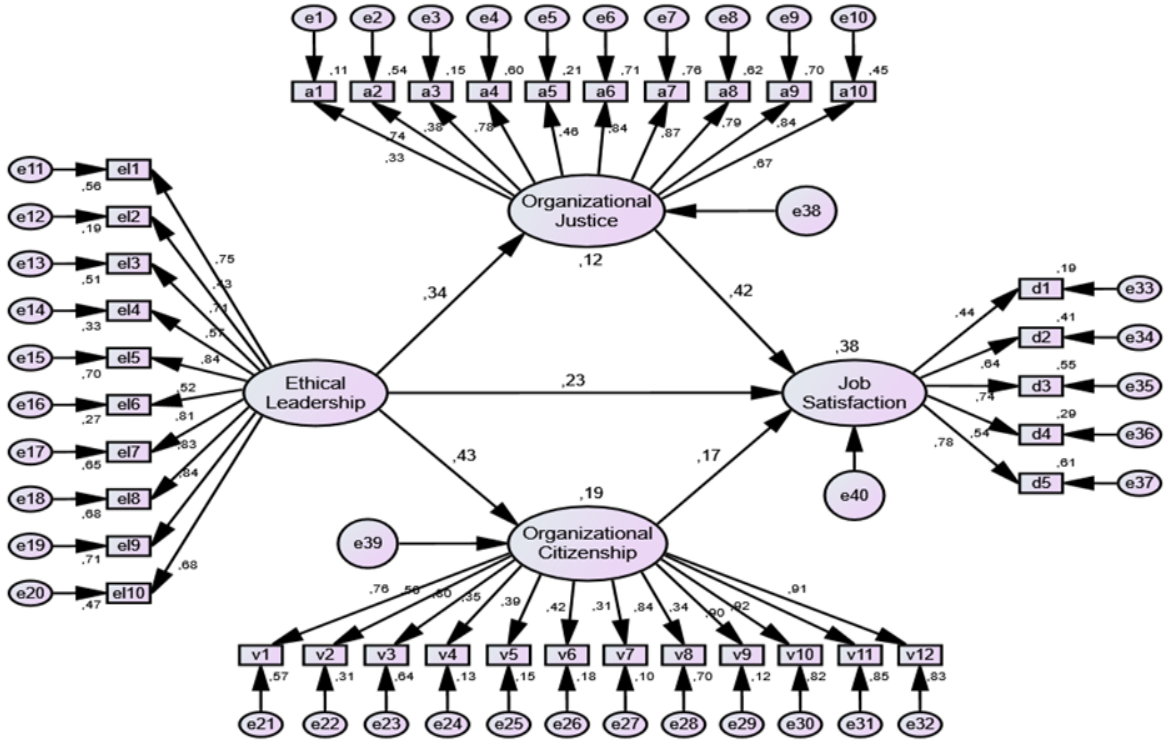


Figure 2. Model for the Relationship between Ethical Leadership, Organizational Justice, Organizational Citizenship, and Job Satisfaction

We use fit's goodness values to determine if the model created is verified or not (Byrne, 2010). The reference fit values' goodness and the values obtained from the model are in Table 2.

Table 2.
Reference Goodness of Fit Values and Values Obtained from the Model

Fit Indices	Reference Fit Values	Model Fit Values
X2/sd	$0 \leq X^2/sd \leq 3$	1.67
CFI	.90≤ CFI≤1.00	.95
GFI	.90≤ GFI≤1.00	.90
AGFI	.85≤ AGFI≤1.00	.88
NFI	.90≤ NFI≤1.00	.90
RMSEA	.00≤ RMSEA≤1.00	.04
SRMR	.00 ≤ SRMR ≤ .10	.05

In Table 2, the model fit values are $X^2/sd=1.67$, CFI=.95, GFI=.90, AGFI=.88, NFI=.90, RMSEA=.04 and SRMR=.05. It is within the limit values specified in the literature (Bollen, 1989; Byrne, 2010; Hu & Bentler, 1999; Schermelleh-Engel, Moosbrugger, & Müller, 2003; Kline, 2016; Tanaka & Huba, 1985). Connection coefficients, critical ratios, standard deviations, and significance values between variables in the model are in Table 3.

Table 3.
Connection Losses, Critical Ratios, Standard Deviation and Significance Value

Relationships	Regression Values	Standard Error	Critical Ratio
Ethical Leadership→ Organizational Justice	.34	.03	5.18*
Ethical Leadership → Organizational Citizenship	.43	.06	8.63*
Ethical Leadership → Job Satisfaction	.23	.03	3.98*
Organizational Justice → Job Satisfaction	.42	.11	5.04*
Organizational Citizenship →Job Satisfaction	.17	.02	3.17*

* p<.01; N=488

Regression values, standard error, and critical ratio are for ethical leadership (β=.34, p<.01, t=5.18), organizational citizenship (β=.43, p<.01, t=8.63), and job satisfaction (β=.23, p<.01, t=3.98) positively and significantly. In addition, organizational justice positively and significantly affected job satisfaction (β=.42, p<.01, t=5.04) and organizational citizenship (β=.17, p<.01, t=3.17). In addition, 38% of the total variance in job satisfaction can be explained by the model. Similarly, the 38% change in job satisfaction is job satisfaction organizational justice, and ethical leadership. In light of these results, it shows that all hypotheses are supported.

Discussion, Conclusion, and Suggestions

School principals have important responsibilities to achieve the goals. School principals have many duties such as the curriculum, professional development, providing discipline, and supervising them. In addition to these duties, the school principal should be the leader of the school. Ethical leadership contributes to the formation of holism by affecting all people in the school. In the light of the analysis, the hypotheses were confirmed.

According to the first hypothesis, ethical leadership has an effect on organizational justice The School principals' leadership affects organizational justice significantly and positively. Research about them supports this finding (Acar, Kaya, & Sahin, 2012; Ayık, Yücel & Savas, 2014; Mıhcı & Uzun, 2020; Gripper, 2021; Kuğun, Aktaş & Köripek, 2013). Ethical leaders are moral managers. They behave ethically and act according to ethical rules both in their daily and professional life (Ng & Feldman, 2015). Ethical leaders who display transparent behaviors in their organizations create a perception of organizational justice (Wells & Walker, 2016). Organizational commitment is about behaviors such as organizational trust and organizational conflict. In addition, these are closely related to ethical behavior (Cropanzano, Bowen, & Gilliland, 2007). Ethical behaviors and organizational justice are significant for achieving employees' satisfaction and reaching the organization's goals (Greenberg, 1990). Ethical leadership explains procedural, interactional, and distributive justice (Çıraklı, Uğurluoğlu, Şantaş, & Çelik, 2014).

According to the second hypothesis, ethical leadership has an effect on organizational citizenship. To sum up, the school principals' ethical leadership behaviors affect organizational citizenship significantly and positively. The result appears to be supported (Çakıroğlu & Tabancalı, 2017; Wang & Sung, 2016; Yang, Ding & Lo, 2016; Ruiz-Palomino, Ruiz-Amaya & Knörr, 2011; Qasim, Rizvi & Irshad, 2020). Organizational citizenship behavior is beneficial for the organization, however, it is optional behavior that is not followed and rewarded by the organization (Organ, 1988). Ethical leaders who consider the interests of employees have an effect on organizational citizenship by making fair and balanced decisions (Brown, Treviño, & Harrison, 2005). Similarly, ethical leaders form a reliable environment and contribute to organizational citizenship (Yang, Ding, & Lo, 2016). Employees tend to show pro-social behaviors such as organizational citizenship behaviors (Bedi, Alpaslan, & Green, 2016). In addition, ethical leadership enables employees to support each other in the organization and reveals organizational citizenship behavior (Avey, Wernsing, & Palanski, 2012).

According to the third hypothesis, ethical leadership has an effect on job satisfaction. The school principals' ethical leadership behaviors affect job satisfaction significantly and positively. When the studies which are about job satisfaction and ethical leadership are examined, the result appears to be supported (Çelik, Dedeoglu, & Inanir, 2015; Güngör, 2016; Işık, 2020; Neubert, Carlson, Kacmar, Roberts, & Chonko, 2009; Shafique, Kalyar, & Ahmad, 2018). Job satisfaction is the consequence of the values which employees attach to his/her job (Locke, 1976). Ethical leaders provide job satisfaction for the employees (Brown, 2005). The administrators' ethical behaviors in schools are

significant for target satisfaction (Güngör, 2016). The ethical behaviors increase the employees' job satisfaction and the commitment (Ahmed, Shad, Mumtaz, & Tanveer, 2012). Ethical leadership behaviors provide job satisfaction with their daily tasks (Brown & Treviño, 2006). Leaders are exemplary role models for their followers (Yukl, Mahsud, Hassan, & Prussia, 2013). When they have a positive attitude, it affects job satisfaction positively (Kacmar, Bachrach, Harris, & Zivnuska, 2011).

According to the fourth hypothesis, organizational justice with ethical leadership has an effect on job satisfaction Similarly, Al-Zu'bi (2010) stated that employees' job satisfaction depends on the organizational justice by the managers. There is a positive and significant relationship among distributive justice (Özer & Urtekin, 2007; Sezgin & Yıldızhan, 2013), procedural justice (İşcan & Sayın, 2010; Mossholder et al., 1998;), interpersonal justice (Özer & Urtekin, 2007; Yelboğa, 2012) and informational justice (Loi, Yang, & Diefendorff, 2009; Yelboğa, 2012) and job satisfaction. The fifth hypothesis, organizational citizenship with ethical leadership has an effect on job satisfaction. Similarly, Swaminathan & Jawahar (2013) showed a relationship between job satisfaction and organizational citizenship. Individuals have a positive attitude towards their jobs. Therefore, they focus on high job performance and revealing the behaviors that are helping others (Serinkan, & Erdiş, 2014; Murphy, Athanasou& King, 2002; Zeinabadi, 2010).

School managers should be enlightened on the importance of ethical leadership behaviors. Continuously creating ethical values that will provide an ethical environment can provide justice for the organization, increase the citizenship behavior of teachers, and provide satisfaction that is about the job. Schools should be fair. For example, teachers should be given equal duties and responsibilities. In order to increase organizational citizenship behaviors, activities should be organized to ensure and improve the cooperation of teachers. Ensuring that ethical values become a part of the institutional culture in schools can help managers and employees naturally adopt ethical leadership behaviors. This, in turn, can enhance organizational justice and job satisfaction. Developing open communication and collaboration strategies among school administrators can strengthen organizational citizenship and enable more effective implementation of ethical leadership principles. School administrators should be open to the views and feedback of employees, which can reinforce the perception of organizational justice and increase employee job satisfaction. Including ethical leadership criteria in the performance evaluations of school administrators can facilitate the encouragement and rewarding of ethical behaviors.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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 any ethical violations.

Author Contributions: Conceptualization, Kılıç M. E and Kılıç, M. Y.; methodology, Kılıç M. E and Kılıç, M. Y.; validation, Kılıç M. E and Kılıç, M. Y., and Uzunyaylalı, M. E.; analysis, Kılıç, M. Y.; writing, review and editing, Kılıç M. E and Kılıç, M. Y.; supervision, Kılıç M. E and Kılıç, M. Y.; project administration, Kılıç M. E and Kılıç, M. Y.

Funding: This research received no funding

Institutional Review Board Statement: Permissions were taken with the final decision of Cyprus Science University Ethics Committee's meeting dated 17/01/2022, and the decision number is 2022/01.005

Data Availability Statement: Data generated or analyzed during this study should be available from the authors on request.

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

References

Acar, G., Kaya, M., & Şahin, M. Y. (2012). School administrators' ethical leadership behavior effects on physical education teachers organizational justice level. *Turkish Journal of Sport and Exercise, 14*(3), 51-58.

Akatay, A., Yücekaya, P., & Kisat, N. Ç. (2016). Yöneticilerin etik liderlik davranışlarının, örgütsel adalet ve sinizm üzerine etkileri: Çanakkale İl Emniyet Müdürlüğü'nde bir araştırma. *Yönetim Bilimleri Dergisi, 14*(28), 483-509.

Al Halbusi, H., Williams, K. A., Mansoor, H. O., Hassan, M. S., & Hamid, F. A. H. (2020). Examining the impact of ethical leadership and organizational justice on employees' ethical behavior: Does person–organization fit play a role?. *Ethics & Behavior, 30*(7), 514-532. doi: 10.1080/10508422.2019.1694024

Alanoğlu, M., & Demirtaş, Z. (2019). Öğretmenlerin örgütsel adalet algılarının örgütsel vatandaşlık davranışı üzerindeki etkisi. *Marmara Üniversitesi Atatürk Eğitim Fakültesi Eğitim Bilimleri Dergisi, 49*(49), 1-16. doi: 10.15285/maruaebd.525250

Altınkurt, Y., & Yılmaz, K. (2014). Öğretmenlerin mesleki profesyonelliği ile iş doyumları arasındaki ilişki. *Sakarya University Journal of Education, 4*(2), 57- 71. doi: 10.19126/suje.46033

Altınkurt, Y., & Yılmaz, K. (2012). Ortaöğretim okullarında değerlerle yönetim, örgütsel adalet ve iş doyumu arasındaki ilişki. *Sakarya University Journal of Education, 2*(2), 65-79.

Al-Zu'bi, H. A. (2010). A study of relationship between organizational justice and job satisfaction. *International journal of business and management, 5*(12), 102-109.

Anello, E. (1992). *Sürdürülebilir bir gelecek için değerler, kurumlar ve liderlik*. In Global forum. Rio de Janerio.

Aydın, İ., Güner, D. T., Toptaş, B., & Erdemli, Ö. (2020). Teachers' struggle with gifts: gift culture at schools and associated ethical problems. *Ethics & Behavior,1*(1) 1-15. doi: 10.1080/10508422.2020.1765170

Ayık, A., Yücel, E., & Savaş, M. (2014). Öğretmenlerin örgütsel adalet algılarının yordayıcısı olarak okul yöneticilerinin etik liderlik davranışları. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 14*(2), 233-252.

Balcı, A. (2015). *Sosyal bilimlerde araştırma yöntem, teknik ve ilkeler*. Pegem Akademi.

Bayram, N. (2010). *Yapısal eşitlik modellemesine Giriş AMOS uygulamaları*. Ezgi Kitap Evi

Barrett, D. E., Neal Headley, K., Stovall, B., & Witte, J. C. (2006). Teachers' perceptions of the frequency and seriousness of violations of ethical standards. *The Journal of Psychology, 140*(5), 421-433. doi: 10.3200/JRLP.140.5.421-433

Bauer, T. N., Dekas, K. H., Welle, B., Kurkoski, J., & Sullivan, S. (2013). Organizational citizenship behavıor, version 2.0: A review and qualititive research of OCBs for knowledge workers at Google and beyond. *Academy of Management Learning & Education, 12*(3), 219-237. doi: 10.5465/amp.2011.0097

Bedi, A., Alpaslan, C. M., & Green, S. (2016). A meta-analytic review of ethical leadership outcomes and moderators. *Journal of Business Ethics, 139*(3), 517-536. doi: 10.1007/s10551-015-2625-1

Belogolovsky, E., & Somech, A. (2010). Teachers' organizational citizenship behavior: Examining the boundary between in-role behavior and extra-role behavior from theperspective of teachers, principals and parents. *Teaching and Teacher education, 26*(4), 914- 923. doi: 10.1016/j.tate.2009.10.032

Beugré, C. D. (2002). Understanding Organizational Justice and Its Impact on Managing Employees: An African Perspective. *The International Journal of Human Resource Management, 13*(7), 1091-1104. doi: 10.1080/09585190210131311

Bogler, R. (2001). The influence of leadership style on teacher job satisfaction. *Educational Administration Quarterly, 37*(5), 662-683. doi: 10.1177/00131610121969460

Bollen, K. A. (1989). A new incremental fit index for general structural equation models. *Sociological Methods and Research, 17*(3), 303-316. doi: .1177/0049124189017003004

Brown, M. E., Treviño, L. K., & Harrison, D. A. (2005). Ethical leadership: A social learning perspective for construct development and testing. *Organizational Behavior And Human Decision Processes, 97*(2), 117-134. doi: 10.1016/j.obhdp.2005.03.002

Brown, M., & Trevino, L. (2006). Ethical leadership: A review and future directions. *The Leadership Quarterly, 17*(6), 595-616. doi: 10.1016/j.leaqua.2006.10.004

Büyükyılmaz, O., & Ay, F. A. (2017). Etik liderliğin örgütsel vatandaşlık davranişina etkisinde örgütsel adaletin aracilik rolü. *Hitit Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 10*(1), 209-233. doi: 10.17218/hititsosbil.305431

Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* . Taylor and Francis.

Çakıroğlu, K., & Tabancalı, E. (2017). Okul müdürlerinin etik liderlik davranışları ile öğretmenlerin örgütsel vatandaşlık davranışları arasındaki ilişki. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 13*(1), 392-417. doi: 10.17860/mersinefd.296254

Çelik, S., Dedeoğlu, B. B., & İnanir, A. (2015). Relationship between ethical leadership, organizational commitment and job satisfaction at hotel organizations. *Ege Akademik Bakış Dergisi, 15*(1), 53-64.

Chen, X., Hui, C., & Sego, D. J. (1998). The role of organizational citizenship behavior in turnover: Conceptualization and preliminary tests of key hypotheses. *Journal of Applied Psychology, 83*, 922-931. doi: 10.1037/0021-9010.83.6.922

Clay-Warner, J., Reynolds, J. & Roman, P. (2005). Organizational justice and job satisfaction: A test of three competing models. *Social Justice Research, 18* (4), 391–409. doi: 10.1007/s11211-005-8567-5

Çokluk, O., Şekercioğlu, G., & Büyüköztürk, Ş. (2012). *Sosyal bilimler için çok değişkenli SPSS ve LISREL uygulamaları*. Pegem Akademi.

Cropanzano, R., Bowen, D. E., & Gilliland, S. W. (2007). The management of organizational justice. *Academy of Management Perspectives, 21*(4), 34-48. doi: 10.5465/amp.2007.27895338

Dekas, K. H., Bauer, T. N., Welle, B., Kurkoski, J., & Sullivan, S. (2013). Organizational citizenship behavior, version 2.0: A review and qualitative investigation of OCBs for knowledge workers at Google and beyond. *Academy of Management Perspectives, 27*(3), 219-237. doi: 10.5465/amp.2011.0097

Demirtaş, Z. (2010). Teachers' job satisfaction levels. *Procedia Social and Behavioral Sciences, 9*, 1069–1073. doi: 10.1016/j.sbspro.2010.12.287

Dinh, J. E., Lord, R. G., Gardner, W. L., Meuser, J. D., Liden, R. C., & Hu, J. (2014). Leadership theory and research in the new millennium: Current theoretical trends and changing perspectives. *The Leadership Quarterly, 25*(1), 36-62. doi: 10.1016/j.leaqua.2013.11.005

Dipaola, M. F., & Hoy, W. K. (2005), Organizational Citizenship of faculty and achvievement of high school students. *The High School Journal, 88*(33), 35-44.

DiPaola, M. F., & Tschannen-Moran, M. (2001). Organizational citizenship behavior in schools and its relationship to school climate. *Journal of School Leadership, 11*(5), 424- 447. doi: 10.1177/105268460101100503

DiPaola, M. F., Tarter, C. J. & Hoy, W. K. (2005). *Measuring organizational citizenship in schools: The OCB scale.* In W. K. Hoy & C. Miskel (Eds.). Educational Leadership and Reform (pp. 319–342). Information Age.

Dunlop, P. D., & Lee, K. (2004). Workplace deviance, organizational citizenship behavior, and business unit performance: The bad apples do spoil the whole barrel. *Journal of Organizational Behavior, 25*(1), 67–80. doi: 10.1002/job.243

Elovainio, M., Ferrie, J. E., Singh-Manoux, A., Gimeno, D., De Vogli, R., Shipley, M., ... & Kivimäki, M. (2010). Organisational justice and markers of inflammation: The Whitehall II study. *Occupational and Environmental Medicine, 67*(2), 78-83. doi: 10.1136/oem.2008.044917

Elovainio, M., van den Bos, K., Linna, A., Kivimäki, M., Ala-Mursula, L., Pentti, J., & Vahtera, J. (2005). Combined effects of uncertainty and organizational justice on employee health: Testing the uncertainty management model of fairness judgments among Finnish public sector employees. *Social Science & Medicine, 61*(12), 2501-2512. doi: 10.1016/j.socscimed.2005.04.046

Evy, G., Louw, D., & Badenhorst, G. (2008). Job Satisfaction Among Urban- Secondary School Teachers in Namibia-South African. *Journal of Education,1*(28), 135-154

Fraenkel, Jack R., & Wallen, N. E. (2009). *How to design and evaluate research in education* (Seventh ed.). McGraw-Hill.

Fulmer, R. M. (2004). The challenge of ethical leadership. *Organizational Dynamics, 33*(3), 307-317. doi: 10.1016/j.orgdyn.2004.06.007

Gardner, R. D. (2010). Should I stay of should I go? Factors that influence the retention,turnover, and attrition of K-12 music teachers in the United States. *Arts and Education Policy Review, 1*(11), 112-121. doi: 10.1080/10632910903458896

Gök, E. E. (2007). Örgütsel kültür bağlamında örgütsel vatandaşlık olgusu ve bir araştırma (Unpublished master's thesis). Pamukkale Üniversitesi, Denizli.

Güngör, S. K. (2016). The prediction power of servant and ethical leadership behaviours of administrators on teachers' job satisfaction. *Universal Journal of Educational Research, 4*(5), 1180-1188.

Güngör, S. K., & Özkara, F. (2017). Okulda yönetim etiği üzerine nitel bir araştırma. *Eğitim ve Öğretim Çalışmaları Dergisi , 5*(11), 44-55.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis*. Prentice Hall.

Ho, C. L., & Au, W. T. (2006). Teaching satisfaction scale: Measuring job satisfaction of teachers. *Educational and psychological Measurement, 66*(1), 172-185. doi: 10.1177/0013164405278573

Hoy, W. K., & Miskel, C. G. (2010). *Eğitim yönetimi.* Nobel.

Hoy, W. K., & Tarter, C. J. (2004). Organizational justice in schools: No justice without trust. *International Journal of Educational Management, 18*(4), 250-259

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *A Multidisciplinary Journal, 6*(1), 1-55. doi: 10.1080/10705519909540118

İbrahim, M. M. (2016). The mediating role of psychological ownership in the relationship between ethical leadership and organizational justice, and the multiple forms of employee performance behaviors. *European Journal of Business and Management, 8*(9), 188-202.

İçerli, L. (2010). Örgütsel adalet: Kuramsal bir yaklaşım. *Girişimcilik ve Kalkınma Dergisi, 5*(1), 67-92.

İşcan, Ö. F., & Sayın, U. (2010). Örgütsel adalet, iş tatmini ve örgütsel güven arasindaki ilişki. *Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi, 24*(4), 195-216.

Johnson S.M., Kraft M.A., & Papay J.P. (2012). How context matters in high-need schools: The effects of teachers' working conditions on their professional satisfaction and their students' achievement. *Teachers College Record, 114*(10), 1-39. doi: 10.1177/016146811211401004

Kalshoven, K., Den Hartog, D. N., & de Hoogh, A. H. (2013). Ethical leadership and followers' helping and initiative: The role of demonstrated responsibility and job autonomy. *European journal of work and organizational psychology, 22*(2), 165-181. doi: 10.1080/1359432X.2011.640773

Katz, D. (1964). The motivational basis of organizational behavior. *Behavioral Science. 9(*2), 131–146. doi: 10.1002/bs.3830090206

Key, S. (1999). Organizational ethical culture: Real or imaged? *Journal of Business Ethics, 20*(3), 217-225. doi: 10.1023/A:1006047421834

Khalid, S. A, Jusoff, K., Othman, M., Ismail, M., & Rahman, N. A. (2010). Organizational citizenship behavior as a predictor of student academic achievement. *International Journal of Economics and Finance, 2*(1), 65-71. doi: 10.24106/kefdergi.833521

Kılıç, M. Y. (2020). Otantik liderlik davranışlarının, örgütsel adalet ve öğretmenlerin iş tatmini üzerine etkisinin incelenmesi. *Kastamonu Eğitim Dergisi, 28*(6), 2271-2283. doi: 10.24106/kefdergi.833521

Kivimäki, M., Elovainio, M., Vahtera, J., & Ferrie, J. E. (2003). Organisational justice and health of employees: prospective cohort study. *Occupational and Environmental Medicine, 60*(1), 27-34. doi: 10.1136/oem.60.1.27

Kivimäki, M., Ferrie, J. E., Brunner, E., Head, J., Shipley, M. J., Vahtera, J., & Marmot, M. G. (2005). Justice at work and reduced risk of coronary heart disease among employees: The Whitehall II Study. *Archives of Internal Medicine, 165*(19), 2245-2251. doi: 10.1001/archinte.165.19.2245

Klassen, R., & Chiu, M.M. (2010). Effects of teachers' self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. *Journal of Educational Psychology 102*, 741-756. doi:10.1037/a0019237

Kline, R. B. (2016). *Principles and practice of structural equation modeling*. The Guilford Press

Koç, H., Yazıcıoğlu, İ. & Hatipoğlu, H. (2009). Öğretmenlerin iş doyum algıları ile performansları arasındaki ilişkinin belirlenmesine yönelik bir araştırma. *Ondokuz Mayıs Üniversitesi Eğitim Fakültesi Dergisi, 28*, 13-22.

Kondalkar, V. G. (2007). *Organisational behaviour.* New Age International Pvt. Ltd., Publishers,.

Konovsky, M. A., Folger, R., & Cropanzano, R. (1987). Relative effects of procedural and distributive justice on employee attitudes. *Representative Research in Social Psychology, 17(*1), 15-24.

Kuğun, O. A., Aktaş.E., & Güripek E. (2013). Çalışanların örgütsel adalet algılarında yöneticilerin etik liderlik davranışlarının rolü. *Balıkesir Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 16*(30), 151-166.

Lashway, L. (1996). Ethical leadership. Retrieved August 14, 2005, from https://eric.ed.gov/?id=ED397463

Locke, E.A. (1976), "The nature and causes of job satisfaction", in Dunnette, M.D. (Ed.), Handbook of Industrial and Organizational Psychology, Rand McNally, Chicago, IL, pp. 1297-349

Loi, R., Yang, J., & Diefendorff, J. M. (2009). Four-factor justice and daily job satisfaction: A multilevel investigation. *Journal of Applied Psychology, 94*(3), 770-781. doi: 10.1037/a0015714

Madenoğlu, C., Uysal, Ş., Sarıer, Y., & Banoğlu, K. (2014). Okul müdürlerinin etik liderlik davranışları ile öğretmenlerin iş doyumlarının örgütsel bağlılıkla ilişkisi. *Kuram ve Uygulamada Eğitim Yönetimi, 1*(1), 47-69. doi: 10.14527/kuey.2014.003

Mayer, D. M., Aquino, K., Greenbaum, R. L., & Kuenzi, M. (2012). Who displays ethical leadership, and why does it matter? An examination of antecedents and consequences of ethical leadership. *Academy of Management Journal, 55*(1), 151-171. doi: 10.5465/amj.2008.0276

McNeese-Smith, D. K. (1997). The influence of manager behavior on nurses' job satisfaction, productivity, and commitment. *Journal of Nursing Administration, 27*(9), 47-55.

Mihcı, H., & Uzun, T. (2020). Analyzing the relationship between ethical leadership and organizational justice and organizational identification in schools. *International Online Journal of Educational Sciences, 12*(3), 29-39.

Mihelic, K. K., Lipicnik, B., & Tekavcic, M. (2010). Ethical leadership. *International Journal of Management & Information Systems (IJMIS), 14*(5), 31-42. doi: 10.19030/ijmis.v14i5.11

Mossholder, K. W., Bennett, N., Kemery, E. R., & Wesolowski, M. A. (1998). Relationships between bases of power and work reactions: The mediational role of procedural justice. *Journal of Management, 24*(4), 533-552. doi: 10.1016/S0149-2063(99)80072-5

Murphy, G., Athanasou, J., & King, N. (2002). Job satisfaction and organizational citizenship behaviour: A study of Australian human-service professionals. *Journal of managerial Psychology, 14*(7), 287-297. doi: 10.1108/02683940210428092

Negiş Işik, A. (2020). Ethical leadership and school effectiveness: The mediating roles of affective commitment and job satisfaction. *International Journal of Educational Leadership and Management, 8*(1), 60-87. doi: 10.17583/ijelm.2020.4114

Neubert, M. J., Carlson, D. S., Kacmar, K. M., Roberts, J. A., & Chonko, L. B. (2009). The virtuous influence of ethical leadership behavior: Evidence from the field. *Journal of Business Ethics, 90*(2), 157–170. doi: 10.1007/s10551-009-0037-9

Okan, T., & Akyüz, A. M. (2015). Exploring the relationship between ethical leadership and job satisfaction with the mediating role of the level of loyalty to supervisor. *Business & Economics Research Journal, 6*(4), 155-177.

Oplatka, I. (2009). Organizational citizenship behavior in teaching: The consequences for teachers, pupils and the school. *International Journal of Educational Management, 23*(5), 375- 389. doi: 10.1108/09513540910970476

Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome.* Lexington books/DC heath .

Organ, D. W., Podsakoff, P. M., & MacKenzie, S. B. (2005). Organizational citizenship behavior: Its should be written in lowercase letters nature, antecedents, and consequences. Sage Publications.

Özer, P. S., & Urtekin, G.E. (2007). Örgütsel adalet algısı boyutları ve iş doyumu ilişkisi üzerine bir araştırma. *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 1(*28), 107-125.

Öztürk, E. (2005). *Çoklu doğrusal regresyon modeli. SPSS uygulamalı çok değişkenli istatistik teknikleri* (pp. 259-272). Asil Yayın Dağıtım.

Podsakoff, P. M., & MacKenzie, S. B. (1997). Impact of organizational citizenship behavior on organizational performance: A review and suggestion for future research. *Human Performance, 10*(2), 133–151.

Qasim, M., Rizvi, T. H., & Irshad, M. (2020). Impact of ethical leadership on task performance and organizational citizenship behavior: Moderating role of islamic work ethics. *Journal of Management and Research, 7*(2), 166-193.

Resick, C. J., Hanges, P. J., Dickson, M. W., & Mitchelson, J. K. (2006). A cross-cultural examination of the endorsement of ethical leadership. *Journal of Business Ethics, 63*(4), 345-359. doi: 10.1007/s10551-005-3242-1

Robbins, S. P., & Judge, T. A. (2015). Organizational behaviour. Pearson Prentice Hall.

Ruiz-Palomino, P., Ruiz-Amaya, C., & Knörr, H. (2011). Employee organizational citizenship behaviour: The direct and indirect impact of ethical leadership. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration, 28*(3), 244-258. doi: 10.1002/cjas.221

Schumacker, R. E., & Lomax, R. G. (2004). *A beginner's guide to structural equation modeling*. New Jersey: Lawrence Erlbaum Associates Publisher.

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online, 8*(2), 23-74.

Serinkan, C., & Erdiş, Y. Ü. (2014). *Dönüşümcü liderlik bağlamında örgütsel vatandaşlık ve örgütsel adalet.[Organizational citizenship and organizational justice in the context of transformational leadership]*. Nobel Yayınları.

Sezgin, F. (2005). Örgütsel vatandaşlık davranışları: kavramsal bir çözümleme ve okul açısından bazı çıkarımlar [Organizational citizenship behaviors: A conceptual analysis and some implications for school].*Gazi Eğitim Fakültesi Dergisi, 25*(1), 317-339.

Sezgin, F., & Yıldızhan, Y. (2013). Örgütsel adalet ile iş doyumu arasindaki ilişki: Eğitim Teknolojileri Genel Müdürlüğü Örneği. *Milli Eğitim Dergisi, 43*(200), 220-235.

Shafique, I., N Kalyar, M., & Ahmad, B. (2018). The nexus of ethical leadership, job performance, and turnover intention: The mediating role of job satisfaction. *Interdisciplinary Description of Complex Systems, 16*(1), 71-87. doi: 10.7906/indecs.16.1.5

Şimşek, M. Ş., Çelik, A., & Akgemci, T. (2014). *Davranış bilimlerine giriş ve örgütlerde davranış*. Eğitim Kitabevi.

Spector, P. E. (1997). Job satisfaction: Application, assessment, causes, and consequences (Vol. 3). Sage publications.

Steers, R.M., & Rhodes, S. R. (1987). Major influences of employee attendance: A process model, motivation and work behaviour. New York. McGrawHill.

Stouten, J., Van Dijke, M., & De Cremer, D. (2012). Ethical leadership. *Journal of Personnel Psychology 11*(1), 1–6. doi: 10.1027/1866-5888/a000059

Strom, D. L., Sears, K. L., & Kelly, K. M. (2014). Work engagement: The roles of organizational justice and leadership style in predicting engagement among employees. *Journal of Leadership & Organizational Studies, 21*(1), 71–82. doi:10.1177/1548051813485437

Swaminathan, S., & Jawahar, P. D. (2013). Job satisfaction as a predictor of organizational citizenship behavior: An empirical study. *Global journal of business research, 7*(1), 71-80.

Tanaka, J. S., & Huba, G. J. (1985). A fit index for covariance structure models under arbitrary GLS estimation. *British Journal of Mathematical and Statistical Psychology, 38*(2), 197-201. doi: 10.1111/j.2044-8317.1985.tb00834.x

Tastan, M., & Yilmaz, K. (2008). Organizational citizenship and organizational justice scales' adaptation to Turkish. *Education and Science, 33*(150), 87-96

Tepper, B. J. (2001). Health consequences of organizational injustice: Tests of main and interactive effects. *Organizational Behavior And Human Decision Processes, 86(*2), 197-215. doi: 10.1006/obhd.2001.2951

Tosun, A., & Bostancı, A. B. (2019). Okulların DNA profilleri ile öğretmenlerin örgütsel atandaşlık düzeyleri arasındaki ilişki. *Bolu Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 19*(3), 1115-1127. doi: /10.17240/aibuefd.2019.19.49440-541193

Tuna, M., Bircan, H., & Yeşiltaş, M. (2012). Etik liderlik ölçeği'nin geçerlilik ve güvenilirlik çalişması: Antalya örneği. *Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi, 26*(2), 143-155.

Tutar, H. (2007). Erzurum"da devlet ve özel hastanelerde çalışan sağlık personelinin işlem adaleti, iş tatmini ve duygusal bağlılık durumlarının incelenmesi. *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi, 12*(3), 97-120.

Wang, Y. D., & Sung, W. C. (2016). Predictors of organizational citizenship behavior: Ethical leadership and workplace jealousy. *Journal of Business Ethics, 135*(1), 117-128. doi: 10.1007/s10551-014-2480-5

Whitman, D. S., Caleo, S., Carpenter, N. C., Horner, M. T., & Bernerth, J. B. (2012). Fairness at the collective level: A meta-analytic examination of the consequences and boundary conditions of organizational justice climate. *Journal of Applied Psychology, 97*(4), 776-791. doi: 10.1037/a0028021

Xu, A. J., Loi, R., & Ngo, H. Y. (2016). Ethical leadership behavior and employee justice perceptions: The mediating role of trust in organization. *Journal of Business Ethics, 134*(3), 493-504. doi: 10.1007/s10551-014-2457-4

Yang, C., Ding, C. G., & Lo, K. W. (2016). Ethical leadership and multidimensional organizational citizenship behaviors: The mediating effects of self-efficacy, respect, and leader–member exchange. *Group & Organization Management, 41*(3), 343-374. doi: 10.1177/1059601115594973

Yang, Q. I., & Wei, H. (2018). The impact of ethical leadership on organizational citizenship behavior: The moderating role of workplace ostracism. *Leadership & Organization Development Journal, 39*(1), 100-113. doi: 10.1108/LODJ-12-2016-0313

Yates, L.A. (2014). Exploring the relationship of ethical leadership with job satisfaction organizational commitment and organizational citizenship behavior. *Journal of Values-based Leadership, 7*(1), 14-21.

Ybema, J. F., & Van den Bos, K. (2010). Effects of organizational justice on depressive symptoms and sickness absence: A longitudinal perspective. *Social Science & Medicine, 70*(10), 1609-1617. doi: 10.1016/j.socscimed.2010.01.027

Yelboğa, A. (2012). Örgütsel adalet ile iş doyumu ilişkisi: Ampirik bir çalışma. *Ege Akademik Bakış, 12*(2), 171-182.

Yıldız, M. L. (2019). Etik liderlik ve örgütsel adalet: İletişim tatmininin aracı rolü. *İş Ahlakı Dergisi, 12*(1), 75-112. doi: 10.12711/TJBE.2019.12.1.0122

Yukl, G., Mahsud, R., Hassan, S., & Prussia, G. E. (2013). An improved measure of ethical leadership. *Journal Of Leadership & Organizational Studies, 20*(1), 38-48. doi: 10.1177/154805181142935

Zeinabadi, H. (2010). Job satisfaction and organizational commitment as antecedents of organizational citizenship behavior (OCB) of teachers. *Procedia-Social and Behavioral Sciences, 5*, 998-1003. doi: 10.1016/j.sbspro.2010.07.225

Zhu, W., May, D. R., & Avolio, B. J. (2004). The impact of ethical leadership behavior on employee outcomes: The roles of psychological empowerment and authenticity. *Journal of Leadership & Organizational Studies, 11*(1), 16-26. doi: 10.1177/107179190401100104

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

The Relationship between Teachers' Levels of Organizational Vulnerability and Self-Confidence[1]

Nuriye KARABULUT[2] Ali BALCI[3]

To cite this article:
Karabulut, N. & Balcı, A. (2024). The relationship between teachers' levels of organizational vulnerability and self-confidence. *e-Kafkas Journal of Educational Research*, *11*, 95-123. doi: 10.30900/kafkasegt.1411532

Research article **Received:** 28.12.2023 **Accepted:** 10.04.2024

Abstract

In this study, it was aimed to determine the relationship between the organizational vulnerability and the self-confidence levels of teachers working in public secondary schools in Ankara. The study employed the relational survey model, one of the survey models and causal comparative model. The population of the study consisted of 16171 teachers working in nine central districts of Ankara, and the sample consisted of 377 teachers determined by using the stratified sampling method. Research data were collected with the Organizational Vulnerability Scale and the Self-Confidence Scale. In the analysis of the data, the statistics such as percentage, frequency and arithmetic mean were used to describe the situations related to the variables. In order to test whether the teachers' organizational vulnerability and the self-confidence levels varied significantly depending on the independent variables, t-test and one-way analysis of variance were used. The degree and the direction of the relationship between organizational vulnerability and self-confidence were determined by using the Pearson correlation coefficient, and whether self-confidence predicted organizational vulnerability was determined through multiple regression analysis. According to the analysis results, the teachers' level of defenselessness was relatively higher than their levels of sadness, incompetence and intolerance. The teachers' organizational vulnerability was found to not vary significantly depending on the variables of gender, school type, professional experience and union membership. However, their levels of defenselessness, sadness and general vulnerability were found to vary significantly depending on their education level and their level of incompetence was found to vary significantly depending on their branch. The teachers' level of self-confidence was found to not vary significantly depending on the variables of gender, union membership, education level and school type; however, their levels of intrinsic and general self-confidence were found to vary significantly depending on their branch and their levels of extrinsic self-confidence and general self-confidence were found to vary significantly depending on the variable of professional experience. There was low and negative correlation between the level of incompetence and the levels of intrinsic and extrinsic self-confidence. Self-confidence does not significantly predict organizational vulnerability.

Keywords: Vulnerability, Organizational Vulnerability, Intrinsic Self-Confidence, Extrinsic Self-Confidence, Teacher.

---

[1] This article was produced from Nuriye Karabulut's doctoral dissertation titled " The organizational vulnerability of teachers and its relationship with self-confidence ", prepared under the supervision of Prof. Dr. Ali Balcı.

[2] Corresponding Author, nuriyekarabulut@gmail.com, Kafkas University.

[3] Author, alibalc@gmail.com, Emeritus professor at Ankara University.

Introduction

Teachers bear significant responsibility for ensuring that the social, economic, political, and individual development that are expected of education is fulfilled. They play a pivotal role in the efficacy of education and the development of pupils academically and morally. In the case of students' failure, teachers are often declared as one of the parties having the greatest responsibility. In addition, rapid changes and developments in technology and knowledge production make it necessary for teachers to constantly improve themselves professionally. In fact, in an environment such as the internet where access to information is open to everyone, the authority of the teacher arising from being the only source of information is shaken. Especially the transformation of education into a competitive, exam-based system increases the pressure on teachers. With all these developments, the expectations of students, administrators and society from teachers can cause teachers to feel under threat, inadequate and vulnerable. This situation is addressed as vulnerability in the literature.

Vulnerability

The word "**v**ulnerability" comes from the Latin root "vulnerare" meaning "to be injured" and generally means "susceptibility to danger or attack" or "susceptibility to injury" (Brown, 2012; Lasky, 2004). In everyday language, the concept of vulnerability is commonly used to describe someone as more sensitive or fragile than others. It is commonly used to describe people who have little or no capacity to protect themselves, are likely to be exposed to risk and are susceptible to harm (Sellman, 2005). However, vulnerability is an inborn characteristic of human beings and it exists throughout every individual's entire life and in all social conditions. All individuals, and even organizations and governments, are continuously and universally vulnerable; they are sensitive to all changes related to their physical and social well-being, whether these changes are positive or negative (Fineman, 2018). In this context, vulnerability refers to the state where an individual, society, organization, or government feels open to attacks or potential harm. Vulnerability can be considered in a wide variety of contexts. Physical vulnerability as seen in extreme sports, financial vulnerability resulting from irrational financial choices, or technical vulnerability referring to the susceptibility of computers to hacker attacks can be given as examples (Hamilton and Pinnegar, 2015). Based on the discussions above, vulnerability can be defined as the state of being open to risks and dangers, feeling incompetent, powerless, or defenseless, whether it applies to an individual, group, organization, or system. In short, vulnerability is the state of being susceptible to harm and defenseless.

Organizational vulnerability

Like all employees, managers/employers are also vulnerable, but they are not equally or similarly vulnerable. Although vulnerabilities may differ, they are intertwined within the organization because both employees and employers are part of complex work relationships. Both groups suffer if business relationships fail (Fineman, 2018). According to Bunker (1997), vulnerability emerges when the changing environment threatens an individual's expectations regarding his/her job and career within organizational life. Organizational vulnerability refers to the inability to create and coordinate flexible responses to expectations and the inability to take advantage of opportunities in the social environment. Organizational vulnerability hinders effective adaptation in various contexts as it restricts the individual's ability to proactively respond to new stimuli and be flexible in his/her reactions (Bennett, 1998).

Teachers' organizational vulnerability

The questioning of a teacher's professional identity and moral integrity by principals, parents and others, as well as the loss of control over the tasks and processes he/she feels responsible for, constitute the foundation of a teacher's organizational vulnerability (Kelchtermans, 1996). In general, teacher vulnerability results from criticism and attacks from others. The expectations, demands and behaviors of both school administrators and families are extremely important in teacher vulnerability. In addition to these, inspectors, school boards and legal regulations are also factors that affect teacher vulnerability (Blase, 1988).

According to Gao (2008), the professional vulnerability of the teacher is related to the experiences in which the teacher feels threatened. Teachers don't just feel positive emotions such as pride, curiosity and enthusiasm. Teaching also includes emotions such as disappointment, powerlessness, disillusionment, fear and anger (Kelchtermans, 1996). According to Gao (2008), teacher vulnerability

is related to teacher experiences as well as emotions. Teachers' experiences of organizational vulnerability are generally mediated by the socio-cultural context they are in. Teachers feel insecure and threatened in particular because of low wages, reforming initiatives for the commercialization of education, and changing educational environments. Valuable cultural traditions, the main source of power for the teacher, are rapidly disappearing. As a result, the professional authority of the teacher is damaged and the ability of the teacher to influence the beliefs, attitudes and behaviors of his/her students decreases. In addition, the culture of respect for the teacher creates high expectations upon the teacher in countries with Asian cultures such as China and it can undermine his/her authority. This leads to the professional vulnerability of the teacher (Gao, 2008). On the other hand, increasing social pressure on teachers is not only in Asian countries, but also in the whole world. Most teachers feel that they live in an aquarium because they are constantly watched by others and school stakeholders, especially parents who might react very strongly even to insignificant events. Teachers state that their actions are mostly misunderstood, and their personal and professional information is interpreted differently and even distorted by the society and the school (Blase, 1988).

Self-confidence

The concept of self-confidence is the belief that one has in one's own abilities to make the right decision and take appropriate steps in situations no matter how difficult or easy they are (Richards, 2016). Similarly, Hambly (1997) states that self-confidence is expressed through concepts of courage and bravery but should be defined as "absolute belief in one's own abilities". Bakırcıoğlu (2012, 665) defines self-confidence with a similar perspective as "the belief and trust of an individual in his/her own strength and abilities; self-assurance". According to Perry (2011), self-confidence is the measure of an individual's self-perception related to his/her belief in his/her own abilities on the basis of his/her past experiences and environment.

Based on the explanations above, it is possible to define self-confidence as the feeling and belief of being sure of one's own power, decisions and abilities. Indeed, the belief that individuals hold within themselves also manifests in their behaviors during interactions with other people. As indicated by Hambly (1997) and Tyler (2016), these internal and external aspects of self-confidence are described by Lindenfield (1997) as "intrinsic self-confidence" and "extrinsic self-confidence".

Intrinsic self-confidence refers to an individual's belief that he/she is at peace with himself/herself and satisfied with who he/she is and expressing what he/she feels about this. Extrinsic self-confidence, on the other hand, refers to the appearance and attitudes and behaviours of the person indicating his/her self-confidence to other people. In fact, intrinsic self-confidence and extrinsic self-confidence complement each other, even if they have some shortcomings, and when they come together, they form a strong whole (Lindenfield, 1997).

Teacher self-confidence

Teachers are faced with students who try to understand and look at them with curiosity from the very first day of their professional lives. Whether a teacher is just starting his/her teaching career or trying to teach a subject he/she is not very familiar with, he/she must always be confident for his/her students to believe in him/her (Hesmondhalgh, 2011). Teachers with high level of self-confidence are more likely to create an effective classroom environment. Teachers with low level of self-confidence are expected to exhibit a perfectionist and unforgiving authoritarian attitude in the classroom, while teachers with high level of self-confidence are expected to approach their students with kindness, appreciate their achievements and refrain from blaming them for their failures (Koyuncu-Şahin, 2015). In fact, one of the important factors in teachers' preference for different teaching approaches is self-confidence. Teachers' self-confidence levels are low, especially in a new environment and when they think that they do not have enough knowledge about the subject. In such a situation, teachers tend to prefer teacher-centered approaches instead of student-centered ones, leading to a lack of interaction with students and an inability to foster active student engagement (Sadler, 2013). Indeed, the teacher also influences student self-confidence through informal processes outside the formal educational context of the school. For example, students who interact with their teachers outside the formal educational environment of the school are emotionally and intellectually more confident (Maclellan, 2014).

As a result, teachers are one of the most important factors that play a role in both training self-confident students and in their academic and moral development. As stated by Kelchtermans (1996), in order to truly understand teachers, it is necessary to understand their vulnerabilities. When the relevant literature is reviewed, it is seen that there has not been any research in the national literature about teachers' organizational vulnerability. It is also seen that there are limited number of studies on this subject in the international literature (Blase, 1988; Bullough, 2005; Gao, 2008; Kelchtermans, 1996; Lasky, 2004; Song, 2016). In these studies, it was tried to reveal the vulnerability experiences of teachers by using a qualitative research design. No quantitative study has been found to determine the level of organizational vulnerability in both the national and international literature. It is clear that there is a gap in the literature on determining teachers' organizational vulnerability levels. Similarly, the studies on self-confidence in Turkey mostly focus on students (Çelik, 2014; Ezmeci, 2012; Otacıoğlu, 2008; Özcan, 1996; Yalçın and Özgen, 2017), and there are limited research on teachers' self-confidence (Cengiz, Arslan and Şahin, 2014; Koyuncu-Şahin, 2015). Therefore, this study is expected to contribute significantly to the relevant literature on teachers' organizational vulnerability and self-confidence. Moreover, identifying teachers' current vulnerability and self-confidence levels can be beneficial in increasing their awareness in these areas, leading to positive developments in the attitudes and behaviors of administrators, parents and policymakers towards teachers. It can also be effective for policymakers for developing policies and practices that support these issues. Thus, the main problem of the current study is worded as "What is the relationship between teachers' organizational vulnerability and self-confidence?" To this end, answers to the following questions are sought:

1. What are the organizational vulnerability levels of teachers working in public secondary schools in the city of Ankara; a) in the whole scale, b) in the defenselessness sub-dimension, c) in the sadness sub-dimension, d) in the incompetence sub-dimension and e) in the intolerance sub-dimension?
2. Do the organizational vulnerability levels of teachers working in public secondary schools in the city of Ankara in the whole scale and in the sub-dimensions of defenselessness, sadness, incompetence and intolerance vary significantly depending on the variables of; a) gender, b) professional experience, c) school type, d) branch and e) union membership?
3. What are the self-confidence levels of teachers working in public secondary schools in the city of Ankara; a) in the whole scale, b) in the intrinsic self-confidence sub-dimension and in the extrinsic self-confidence sub-dimension?
4. Do the self-confidence levels of teachers working in public secondary schools in the city of Ankara in the whole scale and in the sub-dimensions of intrinsic self-confidence and extrinsic self-confidence vary significantly depending on the variables of; a) gender, b) professional experience, c) school type, d) branch and e) union membership?
5. Is there a significant correlation between the organizational vulnerability and self-confidence levels of teachers working in public secondary schools in the city of Ankara?
6. Do the self-confidence levels of teachers working in public secondary schools in the city of Ankara significantly predict their organizational vulnerability levels?

Method

In this section, the information about the research model, population, sampling and study group, development of data collection tools, data collection and analysis was given.

Research Model

This study, which aimed to reveal the relationship between the organizational vulnerability and the self-confidence levels of teachers working in public secondary schools in the city of Ankara, was designed using the relational survey and causal comparative models. Survey or descriptive designs are used to systematically define the characteristics and realities (conditions) related to the researched phenomenon or the relationships between phenomena and events, focusing on quantitative data (Merriam, 2009). In survey studies, the relevant situation, event, individual or object is described as it exists in its own conditions. In relational survey studies, it is tried to determine the existence, direction and magnitude of the co-variance of two or more variables (Karasar, 2009). Causal comparison, on the other hand, is a model that is used in social and educational research, which is relatively similar to experimental

research, and reveals the reason for the difference as a result of the comparison of those who have a characteristic with those who do not (Balcı, 2015).

Population and Sample

The population of the study consisted of the teachers working in the public secondary schools in nine central districts of the city of Ankara. The population of the study consisted of 16171 teachers working in the public secondary schools. The sample size that can represent this population should be at least 375 according to Cohran's (1962 as cited in Balcı, 2015) sample size calculation formula, based on $\alpha = .05$ significance and 5% margin of error. Considering that data loss might occur due to missing data and outliers, the sample size was determined to be 400. And, after missing data and outlier analyses, the required statistical analyses were conducted on a data set of 377 people.

In order to ensure that the population was represented thoroughly in the sample, the "stratified sampling" technique was used. In stratified sampling, the population was divided into related sub-strata and each stratum was included in the sample proportional to its ratio in the population (Balcı, 2015; Karasar, 2009). In this connection, first, the population was divided into nine strata representing the districts and the number of teachers to be included in the sample from each district was determined. Then, each district was stratified according to school types and the number of teachers to be included in the sample was calculated for each school type. Teachers who would participate in the study were randomly determined. The distribution and percentages of the teachers participating in the study in relation to different variables were shown in Table 1.

Table 1.

Distribution and Percentages of the Participating Teachers in Relation to Different Variables

Variable	Group	n	%
District	Altındağ	40	10.7
	Çankaya	76	20.2
	Etimesgut	34	9.0
	Gölbaşı	15	3.9
	Keçiören	52	13.8
	Mamak	43	11.4
	Pursaklar	12	3.2
	Sincan	39	10.3
	Yenimahalle	66	17.5
	Total	377	100.00
School Type	Anatolian High School	148	39.3
	Vocational High School	180	47.7
	İmam Hatip High School	49	13.0
	Total	377	100.0
Branch	Mathematics	63	16.7
	Literature	55	14.6
	Foreign Language	38	10.1
	Science	55	14.6
	Social Sciences	72	19.1
	Vocational Courses	59	15.6
	Sports and Arts	35	9.3
	Total	377	100.0
Gender	Female	266	70.6
	Male	111	29.4
	Total	377	100.0
Education Level	Undergraduate	272	72.1
	Graduate	105	27.9
	Total	377	100.0
Professional Experience	1-9 years	53	14.1
	10-19 years	123	32.6
	20-29 years	158	41.9
	30 years and more	43	11.4
	Total	377	100.0
Union Membership	Member	199	52.8
	Not Member	178	47.2
	Total	377	100.0

As seen in Table 1, 10.7% of the teachers work in schools located in the Altındağ district, 20.2% in the Çankaya district, 9.0% in the Etimesgut district, 3.9% in the Gölbaşı district, 13.8% in the Keçiören district, 11.4% in the Mamak district, 3.2% in the Pursaklar district, 10.3% in the Sincan district and 17.5% in the Yenimahalle district.

Data Collection Tools

In order to determine the teachers' organizational vulnerability levels, The Organizational Vulnerability Scale was developed by the researchers. In addition, the Self-Confidence Scale developed by Akın (2007) was administered after conducting its validity and reliability studies again to determine the teachers' self-confidence levels.

Organizational Vulnerability Scale: The Organizational Vulnerability Scale consists of 4 sub-dimensions and 25 items. The sub-dimensions are defencelessness, incompetence, sadness and intolerance. In order to test the construct validity of the scale, the results of the exploratory factor analysis and reliability analysis performed with the data set of 230 teachers are given in Table 2.

Table 2.
Results of the Exploratory Factor Analysis and Reliability Analysis for the Organizational Vulnerability Scale

Factor	Number of Items	Variance Explained	Cronbach's Alpha Coefficient	Factor Loading Values	Item Total Correlation
Defencelessness	8	14.32%	.82	.48-.74	.35-.59
Incompetence	6	13.19%	.79	.53-.77	.35-.51
Sadness	5	11.84%	.82	.42-.77	.45-.64
Intolerance	6	15.34%	.88	.68-.80	.53-.67
Whole Scale	25	54.70%	.91	.42-.80	.35-.67
KMO = .88		Barlett's Test of Sphericity = p=.001<.05			

As can be seen from Table 2, the factor loading values of the scale items, item-total correlations, Cronbach's Alpha values and the total explained variance value were sufficient (Büyüköztürk, 2014; Kline, 1994; Pallant; 2001; Tavşancıl, 2010).

The validity of the four-factor Organizational Vulnerability Scale, which was formed as a result of the exploratory factor analysis, was tested with a confirmatory factor analysis. The main fit indices used in a confirmatory factor analysis and various evaluation criteria for these indices and the values obtained as a result of the analysis are shown in Table 3.

Table 3.
Values of Acceptance for Fit Indices in the Confirmatory Factor Analysis Model

Fit Indices	Perfect Fit	Acceptable Fit	Values Obtained in the Study
x^2 /sd	$0 \leq \chi 2$ /sd ≤ 2.00	$2.00 \leq \chi 2$ /sd ≤ 3.00	1.83
RMSEA	$0 \leq$ RMSEA $\leq .05$	.05 <RMSEA $\leq .08$	.06
SRMR	0$\leq$ SRMR $\leq .05$	.05<SRMR <.10	.06
NFI	$.95 \leq$ NFI ≤ 1.00	$.90 \leq$ NFI <.95	.93
NNFI	$.97 \leq$ NNFI ≤ 1.00	$.95 \leq$ NNFI < .97	.96
GFI	$.95 \leq$ GFI ≤ 1.00	$.90 \leq$ GFI < .95	.85
AGFI	$.90 \leq$ AGFI ≤ 1.00	$.85 \leq$ AGFI < .90	.82
CFI	$.95 \leq$ CFI ≤ 1.00	$.90 \leq$ CFI< .95	.96

Source: Schermelleh-Engel and Moosbrugger, 2003, 52.

As can be seen in Table 3, the x^2/sd (1.97) and CFI (.96) values obtained in this study indicated a perfect fit. RMSEA (.06), SRMR (.06), NFI (.93), NNFI (.96) values were within the acceptable range. Although the GFI (.85), AGFI (.82) values were outside the acceptable limits, they were quite close to the limit. In addition, as stated by their authors, the threshold values in Table 3 indicated a rather strict classification (Schermelleh-Engel and Moosbrugger, 2003). The GFI value is very sensitive to the sample size, as the sample size increases, the GFI value also increases. For this reason, it is

recommended that the limit value for fit indices be flexible and this value should be .80 in partially small samples of around 200 and in models with 24 or more items (Sharma, Mukherjee, Kumar and Dillon, 2005). The AGFI index, on the other hand, is the corrected version of the GFI, and the commonly used limit value for this index is .80 (Sharma, 1996). Therefore, the GFI and AGFI values are also acceptable. As a result, it is understood that the model is confirmed when all the indices are taken into account.

Self-Confidence Scale: The Self-Confidence Scale developed by Akın (2007) was used to determine the teachers' self-confidence levels. The Self-Confidence Scale was created as a result of a scale development study conducted on 796 high school students. The scale consists of 33 items and two sub-dimensions, "intrinsic self-confidence" and "extrinsic self-confidence". The Cronbach' Alpha coefficient is .91 for the whole scale, .83 for the sub-dimension of intrinsic self-confidence, and .85 for the sub-dimension of extrinsic self-confidence. In the current study, to test whether the scale was a valid and reliable scale for teachers, exploratory and confirmatory factor analyses were performed, item-total correlation and Cronbach's Alpa coefficients were calculated. As a result of the exploratory factor analysis, 13 items were removed from the scale and a 21-item Self-Confidence Scale was obtained. The results of the exploratory factor analysis and reliability analysis are shown in Table 4.

Table 4.
Results of the Exploratory Factor Analysis and Reliability Analysis for the Self-Confidence Scale

Factor	Number of Items	Explained Variance	Cronbach's Alpha Coefficient	Factor Loading Values	Item Total Correlation
Intrinsic Self-confidence	9	% 27.91	.84	.44-.79	.36-.68
Extrinsic Self-confidence	12	% 20.12	.90	.51-.74	.46-.73
Whole Scale	21	% 48.03	.92	.44-.79	.36-.73
	KMO = .93		Barlett's Test of Sphericity = p=.001<.05		

As shown in Table 4, the factor loading values of the scale items, item-total correlations, Cronbach's Alpha values and the total explained variance value were sufficient (Büyüköztürk, 2014; Kline, 1994; Pallant; 2001; Tavşancıl, 2010).

The validity of the two-factor Self-Confidence Scale, which was formed as a result of the exploratory factor analysis, was tested with a confirmatory factor analysis. The main fit indices and evaluation criteria for a confirmatory factor analysis and the index values obtained in this study are shown in Table 5.

Table 5.
Values of Acceptance for Fit Indices in the Confirmatory Factor Analysis Model

Fit Indices	Perfect Fit	Acceptable Fit	Values Obtained in the Study
x^2 /sd	$0 \leq \chi 2$ /sd ≤ 2.00	$2.00 \leq \chi 2$ /sd ≤ 3.00	1.72
RMSEA	$0 \leq$ RMSEA $\leq .05$	.05 <RMSEA $\leq .08$	.06
SRMR	0$\leq$ SRMR $\leq .05$	.05<SRMR <.10	.05
NFI	$.95 \leq$ NFI ≤ 1.00	$.90 \leq$ NFI <.95	.95
NNFI	$.97 \leq$ NNFI ≤ 1.00	$.95 \leq$ NNFI < .97	.97
GFI	$.95 \leq$ GFI ≤ 1.00	$.90 \leq$ GFI < .95	.87
AGFI	$.90 \leq$ AGFI ≤ 1.00	$.85 \leq$ AGFI < .90	.84
CFI	$.95 \leq$ CFI ≤ 1.00	$.90 \leq$ CFI< .95	.98

Source: Schermelleh-Engel and Moosbrugger, 2003, 52.

As can be seen in Table 5, the x^2/sd (1.72), NFI (.95), NNFI (.97) and CFI (.96) values obtained in this study indicated a perfect fit. RMSEA (.06) and SRMR (.05) values were within the acceptable fit range. Although the values of GFI (.87), AGFI (.84) were outside the acceptable limits, they were quite close to the limit. Moreover, the threshold values presented in Table 5 were deemed to represent a rather strict classification (Schermelleh-Engel and Moosbrugger, 2003), and as previously discussed, in relatively small samples, the threshold value could be .80 (Sharma, 1996; Sharma et al., 2005). Therefore, these GFI and AGFI values are also considered acceptable.

Data Collection

Permission was obtained from the Ankara Provincial Directorate of National Education and approval was obtained from the Ankara University Ethics Committee to administer the scales to the teachers working in public secondary schools in Ankara province. Then, the Organizational Vulnerability Scale and the Self-Confidence Scale were administered to 400 teachers. The scales were administered face to face to 186 of the teachers and due to the ongoing pandemic, data were collected from 214 teachers online. In this context, first, personal information and scale items were transferred to the online environment via Google Forms, and the form including the Organizational Vulnerability Scale and Self-Confidence Scale and the link for the participants to complete in this form were created. In order to reach the teachers, the schools in the central districts in the sample were called one by one, and the school administrators were informed about the research request. The administrators accepting this request gave their personal phone numbers or e-mail addresses to the researcher. Thus, the permission document obtained from the Ankara Provincial Directorate of National Education and the link to the form were shared with school administrators by the researcher. The administrators, in turn, shared them with teacher groups via WhatsApp or email.

Data Analysis

In the analysis of the data collected in the quantitative part of the study, SPSS (Statistical Package Program for Social Sciences) was used. Before starting the analysis, missing data and outlier analyses were conducted on the data set. In this context, the scores were converted to z scores and the observation units remaining outside the +3 and -3 critical values (Stevens, 2009) were removed from the data set. Since the missing data were less than 5% and random, they were filled in by assigning the mean value of the relevant series (Çokluk et al., 2014). As a result, analyses were started with the data set of 377 people and the following statistical analyses were made:

1. Percentage and frequency calculations were made in the description of the personal information (gender, branch, professional experience, education level, union membership, school type) of the teachers participating in the study.
2. In order to determine the organizational vulnerability and self-confidence levels of the teachers, arithmetic mean and standard deviation values were calculated. The following evaluation intervals were used for the arithmetic mean scores of the answers given by the teachers to the scale items: "1.00-1.79=Never", "1.80-2.59=Rarely", "2.60-3.39=Sometimes, "3.40-4.19=Frequently", "4.20-5.00=Always".
3. T-test was used to determine whether the teachers' levels of organizational vulnerability and self-confidence vary significantly depending on the variables of gender, education level and union membership and one-way analysis of variance (f-test) was conducted to determine whether the teachers' levels of organizational vulnerability and self-confidence varied significantly depending on the variables of professional experience, branch and school type.
4. Pearson correlation coefficient (Simple correlation) was calculated in order to determine whether there was a significant correlation between the teachers' levels of organizational vulnerability and self-confidence.
5. Multiple regression analysis was conducted to determine whether the teachers' self-confidence levels significantly predicted their organizational vulnerability levels.

Findings

In this section, the findings obtained by analyzing the data collected from the teachers working in public secondary schools in the city of Ankara in relation to the concepts of organizational vulnerability and self-confidence were given.

Findings Related to Organizational Vulnerability

This section presented the results of the study on the organizational vulnerability levels of the participating teachers and whether the variables of gender, professional experience, branch, type of school, education level, and union membership had a significant impact on those levels.

Findings about the organizational vulnerability level. The arithmetic mean and standard deviation values were calculated to determine the organizational vulnerability levels of the participating teachers for the whole scale and its sub-dimensions. The results obtained in this context are presented in Table 6.

Table 6.
Arithmetic Means and Standard Deviations Regarding the Teachers' Level of Organizational Vulnerability

	No	Item	$\bar{x}$	*sd*	Order of Importance
Defencelessness	4	I am concerned about legal regulations not aligning with the realities of the school.	3.16	1.22	1
	1	I am concerned about the changes in the curriculum.	3.10	1.06	2
	7	I feel uncomfortable with the evaluation of my professional competence based on non-educational factors.	3.04	1.28	3
	2	I feel restricted by the obligation to comply with the curriculum during the educational process.	2.90	1.05	4
	6	I do not feel confident when implementing a new teaching method.	2.42	1.03	5
	23	I feel disappointed when I compare the status I hoped to have in my profession with my current status.	2.41	1.28	6
	9	I feel vulnerable in the face of authoritarian attitudes during the inspection process.	2.40	1.15	7
	10	I feel uneasy when students complain about negative situations at school/in class to parents, administration, or relevant institutions.	2.35	1.15	8
		Mean of the Sub-dimension	2.72	.80	
Incompetence	3	I feel uneasy about the expectation of being a role model as a teacher.	1.85	.99	1
	19	I feel incompetent when using new educational technologies	1.83	.83	2
	20	I feel concerned about which values I should impart to students.	1.62	.78	3
	18	I have difficulty communicating with my students due to the generation gap between us.	1.54	.77	4
	17	I feel incompetent in imparting the behaviours specified in the curriculum to my students.	1.48	.72	5
	21	I feel uneasy when students ask questions about a subject in which I am inadequate.	1.43	.61	6
		Mean of the Sub-dimension	1.63	.54	
Sadness	25	Not receiving appreciation from my superiors when I do good work hurts me.	2.60	1.30	1
	12	It saddens me when my colleagues gossip about me.	2.59	1.34	2
	15	I feel worthless when my administrators do not involve me in decision-making processes.	2.48	1.25	3
	22	The inadequate socialization environment at school saddens me.	2.30	1.13	4
	16	I feel sad when my colleagues ignore me.	2.19	1.21	5
		Mean of the Sub-dimension	2.43	.94	
Intolerance	11	Parents' interference in instructional activities annoys me.	2.98	1.23	1
	13	I cannot tolerate unfair criticisms from my colleagues about my instructional activities.	2.37	1.24	2
	5	I am uncomfortable with my administrators constantly monitoring me.	2.36	1.18	3
	8	It makes me angry when my administrators assign too many administrative tasks.	2.30	1.20	4
	14	I feel uncomfortable with my administrators questioning my professional competence	2.19	1.21	5
	24	Parents' requests to change my behaviour towards students make me angry.	2.13	1.15	6
		Mean of the Sub-dimension	2.39	.87	
		Mean of the Scale	2.32	.66	

As seen in Table 6, the teachers' level of defencelessness ($\overline{X}$=2.72) was higher than their levels of sadness ($\overline{X}$=2.43), incompetence ($\overline{X}$=1.43) and intolerance ($\overline{X}$=2.39). While the teachers' levels of intolerance ($\overline{X}$=2.39) and sadness ($\overline{X}$=2.43) were close to each other, their level of incompetence is relatively lower ($\overline{X}$=1.43). In addition, when the criteria for evaluation the mean value are taken into consideration, it is understood that the teachers adopted the expressions in the defenselessness sub-dimension "sometimes", the expressions in the incompetence sub-dimension "never", and the expressions in the intolerance and sadness sub-dimensions "rarely".

When the whole Organizational Vulnerability Scale is considered, the teachers agreed the most with the item “I am concerned about legal regulations not aligning with the realities of the school." ($\overline{X}$=3.16) and agree the least with the item “I feel uneasy when students ask questions about a subject in which I am inadequate.” ($\overline{X}$=1.43).

Findings about whether organizational vulnerability levels vary significantly depending on different variables. T-test was used to determine whether the teachers’ organizational vulnerability levels varied significantly depending on the variables of gender, education level and union membership and one-way analysis of variance was used to determine whether the teachers’ organizational vulnerability levels varied significantly depending on the variables of branch, professional experience and school type and the findings are presented under the relevant headings.

Findings regarding the effect of gender on organizational vulnerability. T-test was used to determine whether the teachers’ organizational vulnerability levels varied significantly depending on gender and the results of the analysis are presented in Table 7.

Table 7.
Results of the T-test Conducted to Determine Whether the Teachers’ Organizational Vulnerability Levels Vary Significantly Depending on Gender

Variable	Group	*N*	$\bar{x}$	*sd*	*t*	*df*	*p*	Significant Difference
Defencelessness	Female	266	21.84	6.65	.12	375	.90	-
	Male	111	21.75	5.92				
Sadness	Female	266	12.16	4.82	-.16	375	.86	-
	Male	111	12.25	4.52				
Incompetence	Female	266	9.77	3.33	-.08	375	.93	-
	Male	111	9.80	3.09				
Intolerance	Female	266	14.11	5.36	-1.46	375	.14	-
	Male	111	14.98	4.86				
General Organizational Vulnerability	Female	266	57.89	17.37	-.47	375	.63	-
	Male	111	58.79	14.95				

As can be seen in Table 7, the vulnerability levels of the female teachers ($\overline{X}$=21.84) and the male teachers ($\overline{X}$=21.75) were quite close to each other, and there was no significant difference in vulnerability levels based on gender ($t_{(375)}$ = 12; p>.05). Similarly, there was no significant difference between the mean scores of the female and the male teachers taken from the sub-dimensions of sadness ($t_{(375)}$ = -.16; p > .05), incompetence ($t_{(375)}$ = -.08; p > .05) and intolerance ($t_{(375)}$ = -1.46; p > .05). When the mean scores taken from the whole scale were examined, it is seen that the male teachers ($\overline{X}$=58.79) had higher levels of organizational vulnerability compared to the female teachers ($\overline{X}$=57.89), but this difference was not statistically significant.

Findings regarding the effect of education level on organizational vulnerability. T-test was used to determine whether the teachers’ organizational vulnerability levels varied significantly depending on education level and the results of the analysis are presented in Table 8.

As seen in Table 8, the mean scores taken from the sub-dimension of defenselessness varied significantly depending on their education level ($t_{(375)}$ =-3.27 12; p<.05). The mean score taken from this sub-dimension by the teachers having graduate education ($\overline{X}$=23.54) was significantly higher than that of the teachers having undergraduate education ($\overline{X}$=21.14). Similarly, mean score taken from the sub-dimension of sadness by the teachers having graduate education ($\overline{X}$=13.01) was significantly higher than that of the teachers having undergraduate education ($\overline{X}$=11.86) ($t_{(375)}$ =-2.12; p<.05). The mean scores taken from the sub-dimension of the incompetence by the teachers having undergraduate education ($\overline{X}$=9.77) and the teachers having graduate education ($\overline{X}$=9.67) were highly close to each other and the difference between them was not significant ($t_{(374)}$ =.28; p>.05). Similarly, the mean scores taken from the sub-dimension of intolerance by the teachers having undergraduate education ($\overline{X}$=14.39) and by the teachers having graduate education ($\overline{X}$=14.83) were not significantly different from each other ($t_{(375)}$ =-2.12; p>.05). When the teachers’ general organizational vulnerability levels were examined, it is seen

that the mean score of the teachers having graduate education ($\overline{X}$=61.20) was significantly higher ($t_{(375)}$ =-2.02; p<.05) than that of the teachers having undergraduate education ($\overline{X}$=56.98).

Table 8.
Results of the T-test Conducted to Determine Whether the Teachers' Organizational Vulnerability Levels Vary Significantly Depending on Education Level

Variable	Group	*N*	$\bar{x}$	*sd*	*t*	*df*	*p*	Significant Difference
Defencelessness	Undergraduate	272	21.14	6.40	-3.27	375	.001	Yes
	Graduate	105	23.54	6.22				
Sadness	Undergraduate	272	11.86	4.75	-2.12	375	.03	Yes
	Graduate	105	13.01	4.58				
Incompetence	Undergraduate	272	9.77	3.26	.28	374	.77	-
	Graduate	104	9.67	3.01				
Intolerance	Undergraduate	272	14.19	5.39	-1.07	375	.28	-
	Graduate	105	14.83	4.78				
General Organizational Vulnerability	Undergraduate	272	56.98	17.03	-2.20	375	.02	Yes
	Graduate	105	61.20	15.40				

Findings regarding the effect of union membership on organizational vulnerability. T-test was used to determine whether the teachers' organizational vulnerability levels varied significantly depending on union membership and the results of the analysis are presented in Table 9.

Table 9.
Results of the T-test Conducted to Determine Whether the Teachers' Organizational Vulnerability Levels Vary Significantly Depending on Union Membership

Variable	Group	*N*	$\bar{x}$	*sd*	*t*	*df*	*p*	Significance Difference
Defencelessness	Union Member	199	21.21	6.27	-1.93	375	.053	-
	Not Union Member	178	22.49	6.57				
Sadness	Union Member	199	11.89	4.52	-1.27	375	.20	-
	Not Union Member	178	12.51	4.94				
Incompetence	Union Member	199	9.68	3.15	-.23	373	.81	-
	Not Union Member	176	9.75	3.14				
Intolerance	Union Member	199	14.18	5.21	-.71	375	.47	-
	Not Union Member	178	14.57	5.25				
General Organizational Vulnerability	Union Member	199	56.97	16.45	-1.45	375	.14	-
	Not Union Member	178	59.48	16.88				

As seen in Table 9, the mean score of the teachers who are not union members ($\overline{X}$=22.49) is higher than that of the teachers who are union members ($\overline{X}$=21.21) but this difference is not statistically significant ($t_{(375)}$ =-2.12; p>.05). Similarly, the mean scores taken by the teachers from the sub-dimensions of sadness ($t_{(375)}$ =-1.27; p>.05), incompetence ($t_{(373)}$ =-.23; p>.05) and intolerance ($t_{(375)}$ =-.71; p>.05) did not vary significantly depending on union membership. While the mean score taken by the teachers who are not union members from the whole scale ($\overline{X}$=59.48) is higher than that of the teachers who are union members ($\overline{X}$=56.97), this difference is not statistically significant ($t_{(375)}$ =-1.45; p>.05). As being a union member is expected to create a significant difference at least in the sub-dimension of defenselessness, the finding that it did not create a significant difference can be considered as a surprising finding.

Findings regarding the effect of branch on organizational vulnerability. One-way analysis of variance was conducted to determine whether the teachers' organizational vulnerability levels varied significantly depending on branch and the results of the analysis are presented in Table 10.

Table 10.
Results of the One-Way Analysis of Variance Conducted to Determine Whether the Teachers' Organizational Vulnerability Levels Vary Significantly Depending on Branch

	Branch	*N*	$\bar{x}$	*sd*	Source of the Variance	Sum of Squares	*df*	Mean Square	*F*	*p*	S. D.
Defencelessness	1.Mathematics	63	22.61	6.40	Between-Groups	470.19	6	78.36	1.93	.07	-
	2.Literature	55	23.08	6.11	Within-Groups	14770.15	364	40.57			
	3.Foreign Language	38	20.56	7.11	Total	15240.34	370				
	4.Science	49	21.01	6.31							
	5.Social Sciences	72	21.42	5.96							
	6.Vocational Courses	59	22.46	6.52							
	7.Spors and Arts	35	19.31	6.47							
Sadness	1.Mathematics	63	12.34	4.45	Between-Groups	168.52	6	28.08	1.26	.27	-
	2.Literature	55	11.94	4.25	Within-Groups	8164.38	367	22.24			
	3.Foreign Language	38	11.31	4.73	Total	8332.91	373				
	4.Science	52	11.42	4.93							
	5.Social Sciences	72	12.13	4.25							
	6.Vocational Courses	59	13.49	5.38							
	7.Spors and Arts	35	11.82	5.19							
Incompetence	1.Mathematics	63	9.71	2.90	Between-Groups	196.41	6	32.73	3.68	.001	**1-7**
	2.Literature	55	10.68	3.00	Within-Groups	3225.23	363	8.88			**2-4**
	3.Foreign Language	37	9.59	3.40	Total	3421.64	369				**2-7**
	4.Science	52	8.78	2.17							**5-7**
	5.Social Sciences	72	10.09	3.65							
	6.Vocational Courses	59	9.55	2.89							
	7.Spors and Arts	32	8.03	1.97							
Intolerance	1.Mathematics	63	14.45	4.93	Between-Groups	98.76	6	16.46	.62	.70	-
	2.Literature	54	14.12	4.42	Within-Groups	9587.71	365	26.26			
	3.Foreign Language	38	14.28	5.69	Total	9686.47	371				
	4.Science	52	13.32	5.50							
	5.Social Sciences	72	14.55	5.10							
	6.Vocational Courses	59	14.93	5.12							
	7.Spors and Arts	34	13.54	5.26							
General Organizational Vulnerability	1.Mathematics	63	59.13	15.75	Between-Groups	2524.45	6	420.74	1.57	.15	-
	2.Literature	55	60.13	14.56	Within-Groups	97568.49	364	268.04			
	3.Foreign Language	38	56.11	19.28	Total	100092.94	370				
	4.Science	49	53.17	15.66							
	5.Social Sciences	72	58.20	15.61							
	6.Vocational Courses	59	60.44	17.36							
	7.Spors and Arts	35	53.89	17.48							

Note: When determining the source of the significant difference between the groups in the sub-dimension of incompetence, the Dunnett's C test was used as a relevant post hoc test due to the non-homogeneous distribution of variances ($p = 0.001 < 0.05$) as indicated by the Levene test. Dunnett's C test was preferred because it is one of the frequently used post hoc tests in cases where variances and group sizes are not equal (Büyüköztürk, 2014; Kayri, 2009).

As seen in Table 10, the mean scores taken by the teachers from the sub-dimensions of defenselessness ($F_{(6, 364)=}$=1.93; p>.05), sadness ($F_{(6, 367)}$=1.26; p>.05), intolerance ($F_{(6, 365)}$= .62; p>.05) and the whole scale ($F_{(6, 364)}$=1.57; p>.05) did not vary significantly depending on their branches. On the other hand, the mean scores taken from the sub-dimension of incompetence vary significantly depending on branch ($F_{(6, 363)=3.68}$; p<.05). According to the results of the Dunnetts'C post hoc test, the mean score taken by the mathematics teachers from the sub-dimension of incompetence ($\overline{X}$=9.71) is higher than the mean score taken by the sports and arts teachers ($\overline{X}$=8.03). The mean score taken by the literature teachers from the sub-dimension of incompetence ($\overline{X}$=10.68) is significantly higher than those of the science ($\overline{X}$=8.78) and sports and arts teachers ($\overline{X}$=8.03). Similarly, the mean score taken by the social sciences teachers ($\overline{X}$=10.09) is significantly higher than that of the sports and arts teachers ($\overline{X}$=8.03).

Findings regarding the effect of school type on organizational vulnerability. One-way analysis of variance was conducted to determine whether the teachers' organizational vulnerability levels varied significantly depending on school type and the results of the analysis are presented in Table 11.

Table 11.
Results of the One-Way Analysis of Variance Conducted to Determine Whether the Teachers' Organizational Vulnerability Levels Vary Significantly Depending on School Type

	School Type	*N*	$\bar{x}$	*sd*	Source of the Variance	Sum of Squares	*df*	Mean Square	*F*	*p*	S. D.
Defencelessness	1. Anatolian High School	148	21.53	6.08	Between-Groups	22.78	2	11.39	.27	.76	-
	2. Vocational High School	180	21.92	6.61	Within-Groups	15569.82	374	41.63			
	3.İmam Hatip High School	49	22.24	6.89	Total	15592.60	376				
Sadness	1. Anatolian High School	148	12.00	4.31	Between-Groups	8.97	2	4.48	.20	.81	-
	2. Vocational High School	180	12.27	5.01	Within-Groups	8408.65	374	22.48			
	3.İmam Hatip High School	49	12.42	4.91	Total	8417.62	376				
Incompetence	1. Anatolian High School	148	9.91	3.42	Between-Groups	14.69	2	7.34	.76	.46	-
	2. Vocational High School	177	9.58	2.88	Within-Groups	3581.63	371	9.65			
	3.İmam Hatip High School	49	9.36	2.84	Total	3596.32	373				
Intolerance	1. Anatolian High School	148	14.6	5.22	Between-Groups	27.87	2	13.93	.50	.60	-
	2. Vocational High School	180	14.08	5.15	Within-Groups	10274.21	374	27.47			
	3.İmam Hatip High School	49	14.60	5.58	Total	10302.08	376				
Organizational Vulnerability	1. Anatolian High School	148	58.10	16.01	Between-Groups	12.983	2	6.49	.02	.97	-
	2. Vocational High School	180	58.07	17.30	Within-Groups	104622.79	374	279.74			
	3.İmam Hatip High School	49	58.64	16.65	Total	104635.77	376				

As seen in Table 11, the mean scores taken from the sub-dimensions of defencelessness ($F_{(2, 374)}$=.27; p>.05), sadness ($F_{(2, 374)}$=.20; p>.05), incompetence ($F_{(2, 374)}$=.76; p>.05), intolerance ($F_{(2, 374)}$=.50; p>.05) and from the whole scale ($F_{(2, 374)}$=.02; p>.05) did not vary significantly depending on school type.

Findings regarding the effect of professional experience on organizational vulnerability. One-way analysis of variance was conducted to determine whether the teachers' organizational vulnerability levels varied significantly depending on professional experience and the results of the analysis are presented in Table 12.

Table 12.
Results of the One-Way Analysis of Variance Conducted to Determine Whether the Teachers' Organizational Vulnerability Levels Vary Significantly Depending on Professional Experience

	Prof. Ex.	*N*	$\bar{x}$	*sd*	Source of the Variance	Sum of Squares	*df*	Mean Square	*F*	*p*	S. D.
Defencelessness	1-9 years	53	20.40	6.46	Between-Groups	150.02	3	50.00	1.20	.30	-
	10-19 years	123	22.02	5.99	Within-Groups	15442.57	373	41.40			
	20-29 years	158	22.25	6.74	Total	15592.60	376				
	30 years and more	43	21.34	6.44							
Sadness	1-9 years	53	11.60	4.86	Between-Groups	70.46	3	23.48	1.05	.37	-
	10-19 years	123	11.89	4.27	Within-Groups	8347.16	373	22.37			
	20-29 years	158	12.36	4.90	Total	8417.62	376				
	30 years and more	43	13.11	5.14							
Incompetence	1-9 years	51	9.17	2.77	Between-Groups	31.93	3	10.64	1.17	.32	-
	10-19 years	123	9.84	2.97	Within-Groups	3337.86	367	9.09			
	20-29 years	156	9.74	3.24	Total	3369.79	370				
	30 years and more	41	9.04	2.47							
Intolerance	1-9 years	53	14.01	6.03	Between-Groups	50.12	3	16.70	.60	.61	-
	10-19 years	123	14.00	4.38	Within-Groups	10251.96	373	27.48			
	20-29 years	158	14.78	5.62	Total	10302.08	376				
	30 years and more	43	14.34	4.98							
Organizational Vulnerability	1-9 years	53	55.61	17.58	Between-Groups	563.48	3	187.82	.67	.56	-
	10-19 years	123	57.77	14.62	Within-Groups	104072.29	373	279.01			
	20-29 years	158	59.28	17.93	Total	104635.77	376				
	30 years and more	43	58.27	16.49							

As seen in Table 12, the mean scores taken by the teachers from the sub-dimensions of defencelessness ($F_{(3, 373)}$=1.20; p>.05), sadness ($F_{(3, 373)}$=1.05; p>.05), incompetence ($F_{(3, 373)}$=1.17; p>.05), intolerance ($F_{(3, 373)}$=.60; p>.05) and from the whole scale ($F_{(3, 373)}$=.67; p>.05) do not vary significantly depending on professional experience.

Findings Related to Self-Confidence

Under this heading, there are findings about the self-confidence levels of the participating teachers and whether their self-confidence levels vary significantly depending on the variables of gender, professional experience, branch, school type, education level and union membership.

Findings about self-confidence level: The arithmetic mean and standard deviation values were calculated to determine the self-confidence levels of the participating teachers for the whole scale and its sub-dimensions. The results obtained in this context are presented in Table 13.

Table 13.
Arithmetic Means and Standard Deviation for the Teachers' Self-Confidence Levels

Dimension	No	Item	$\bar{x}$	sd	Order of Importance
Intrinsic Self-Confidence	5	I believe that I can overcome my problems.	4.24	.70	1
	3	I can cope with difficulties in life.	4.22	.75	2
	10	I love myself.	4.19	.79	3
	7	I believe that I am self-sufficient.	4.17	.81	4
	17	I believe that I am a valuable person.	4.13	.82	5
	1	I see myself as a successful person.	3.85	.80	6
	2	I am not dependent on others in my choices.	3.77	.97	7
	21	There is no insurmountable problem for me.	3.63	.90	8
	19	I can decide easily.	3.59	.91	9
		Mean of the Sub-dimension	3.98	.62	
Extrinsic Self-Confidence	4	I respect the opinions of others.	4.42	.69	1
	8	I can ask others questions about things that I do not understand.	4.34	.79	2
	13	I accept myself and others as I am/they are.	4.20	.77	3
	16	I can easily communicate with other people.	4.08	.82	4
	12	I can express myself easily.	4.06	.87	5
	9	I adapt to new environments.	4.05	.81	6
	11	I stand up for my rights when necessary.	4.04	.89	7
	14	I can accept criticism from others with understanding.	3.92	.81	8
	18	I express my thoughts without hesitation when communicating with others.	3.89	.87	9
	20	I believe that I am a social person.	3.87	.87	10
	6	I do not hesitate to participate in social events.	3.81	.94	11
	15	I'm not afraid to stand out.	3.63	.95	12
		Mean of the Sub-dimension	4.03	.62	
		Mean of the Scale	4.00	.59	

When Table 13 is examined, it is seen that the teachers' extrinsic self-confidence level ($\overline{X}$=4.03) is relatively higher than their intrinsic self-confidence level ($\overline{X}$=3.98). In addition, from the mean values, it is understood that teachers "frequently" agree with the items in the sub-dimensions of intrinsic self-confidence and extrinsic self-confidence.

When the Self-Confidence Scale is generally evaluated, it is seen that the item the teachers agree with the most is "I believe that I can overcome my problems." ($\overline{X}$=4.24) while the item they agree the least is "I can decide easily." ($\overline{X}$=3.59).

Findings about whether self-confidence levels vary significantly depending on different variables. It was tested whether the teachers' self-confidence levels varied significantly depending on the variables of gender, education level, union membership, branch, professional experience and school type and the results are presented under the relevant headings.

Findings regarding the effect of gender on self-confidence. T-test was used to determine whether the teachers' self-confidence levels varied significantly depending on gender and the results of the analysis are presented in Table 14.

As seen in Table 14, the mean scores taken from the sub-dimensions of intrinsic self-confidence ($t_{(375)}$ =.16 p>.05) and extrinsic self-confidence ($t_{(375)}$ =.40; p>.05) did not vary significantly depending on gender. While the mean score taken from the whole scale by the female teachers ($\overline{X}$=84.32) is higher than that of the male teachers ($\overline{X}$=83.88), this difference is not statistically significant.

Table 14.
Results of the T-test Conducted to Determine Whether the Teachers' Self-Confidence Levels Vary Significantly Depending on Gender

Variable	Group	*N*	$\bar{x}$	*sd*	*t*	*df*	*p*	Sig. Dif.
Intrinsic Self-Confidence	Female	266	35.86	5.69	.16	375	.87	-
	Male	111	35.76	5.35				
Extrinsic Self-Confidence	Female	266	48.46	7.56	.40	375	.68	-
	Male	111	48.12	7.25				
General Self-Confidence	Female	266	84.32	12.70	.30	375	.75	-
	Male	111	83.88	12.17				

Findings regarding the effect of education level on self-confidence. T-test was used to determine whether the teachers' self-confidence levels varied significantly depending on education level and the results of the analysis are presented in Table 15.

Table 15.
Results of the T-test Conducted to Determine Whether the Teachers' Self-Confidence Levels Vary Significantly Depending on Education Level

Variable	Group	*N*	$\bar{x}$	*sd*	*t*	*df*	*p*	Sig. Dif.
Intrinsic Self-Confidence	Undergraduate	272	35.94	5.67	.62	375	.53	-
	Graduate	105	35.54	5.37				
Extrinsic Self-Confidence	Undergraduate	272	48.75	7.41	1.63	375	.10	-
	Graduate	105	47.35	7.54				
General Self-Confidence	Undergraduate	272	84.70	12.58	1.25	375	.21	
	Graduate	105	82.89	12.37				

As seen in Table 15, the mean scores taken from the sub-dimension of intrinsic self-confidence by the teachers having undergraduate education ($\overline{X}$=35.94) and the teachers having graduate education ($\overline{X}$=35.54) were close to each other and there was no significant difference between their levels of self-confidence based on education level ($t_{(375)}$ =.62; p>.05) in this sub-dimension. There was no significant difference ($t_{(375)}$=1.63; p>.05) between the mean score taken by the teachers having undergraduate education from the sub-dimension of extrinsic self-confidence ($\overline{X}$=48.75) and that of the teachers having graduate education ($\overline{X}$=48.35). Moreover, the teachers' general self-confidence levels also did not vary significantly depending on education level ($t_{(375)}$=.21; p>.05).

Findings regarding the effect of union membership on self-confidence. T-test was used to determine whether the teachers' self-confidence levels varied significantly depending on union membership and the results of the analysis are presented in Table 16.

Table 16.
Results of the T-test Conducted to Determine Whether the Teachers' Self-Confidence Levels Vary Significantly Depending on Education Level

Variable	Group	*N*	$\bar{x}$	*sd*	*t*	*df*	*p*	Significant Difference
Intrinsic Self-Confidence	Union Member	199	35.44	5.84	-1.43	375	.15	-
	Not Union Member	178	36.26	5.27				
Extrinsic Self-Confidence	Union Member	199	47.88	7.86	-1.32	375	.18	-
	Not Union Member	178	48.90	6.97				
General Self-Confidence	Union Member	199	83.33	13.36	-1.42	375	.15	-
	Not Union Member	178	85.17	11.49				

As seen in Table 16, there was no significant difference ($t_{(375)}$ =-1.43; p>.05) between the intrinsic self-confidence levels of the teachers who are union members ($\overline{X}$=35.44) and the teachers who are not union members ($\overline{X}$=36.26). There was also no significant difference ($t_{(375)}$ =-1.32; p>.05) between the extrinsic

self-confidence levels of the teachers who are union members ($\overline{X}$=47.88) and the teachers who are not union members ($\overline{X}$=48.90). Similarly, there was no significant difference between the general self-confidence levels of the teachers based on union membership ($t_{(375)}$ =-1.42; p>.05).

Findings regarding the effect of branch on self-confidence. One-way analysis of variance was used to determine whether the teachers' self-confidence levels varied significantly depending on branch and the results of the analysis are presented in Table 17.

Table 17.
Results of the One-way Analysis of Variance Conducted to Determine Whether the Teachers' Self-Confidence Levels Vary Significantly Depending on Branch

	Branch	*N*	$\bar{x}$	*sd*	Source of the Variance	Sum of Squares	*df*	Mean Square	*F*	*p*	Sig. Dif.
Intrinsic Self-Confidence	1.Mathematics	63	34.81	5.00	Between-Groups	321.82	6	53.63	1.73	.11	-
	2.Literature	55	36.01	5.62	Within-Groups	11422.85	370	30.87			
	3.Foreign Language	38	36.31	5.92	Total	11744.67	376				
	4.Science	55	36.03	6.03							
	5.Social Sciences	72	34.69	5.38							
	6.Vocational C.	59	37.28	5.02							
	7.Sports and Arts	35	36.54	6.34							
Extrinsic Self-Confidence	1.Mathematics	62	46.03	6.01	Between-Groups	1426.61	6	237.76	4.68	.000	**1-3**
	2.Literature	55	48.58	7.24	Within-Groups	18415.22	363	50.73			**1-6**
	3.Foreign L.	32	53.47	4.34	Total	19841.83	369				**2-3**
	4.Science	55	47.72	8.72							**3-4**
	5.Social Sciences	72	47.59	7.19							**5-3**
	6.Vocational C.	59	50.03	6.14							
	7.Sports and Arts	35	49.40	9.101							
General Self-Confidence	1.Mathematics	63	80.96	10.50	Between-Groups	3150.75	6	525.12	3.63	.002	**1-3**
	2.Literature	55	84.60	12.49	Within-Groups	52733.79	365	144.47			**1-6**
	3.Foreign L.	33	91.06	8.20	Total	55884.54	371				**3-5**
	4.Science	55	83.76	14.13							
	5.Social Sciences	72	82.23	11.99							
	6.Vocational C.	59	87.31	10.60							
	7.Sports and Arts	35	85.94	15.12							

When determining the source of the significant difference between the groups in the sub-dimension of extrinsic self-confidence, the Dunnett's C test was used as a relevant post hoc test due to the non-homogeneous distribution of variances (p = 0.001 < 0.05) as indicated by the Levene test. Similarly, Dunnetts'C test was used in general self-confidence analyses since variance homogeneity could not be achieved (p=.001<.05).

As seen in Table 17, the teachers' intrinsic self-confidence levels did not vary significantly depending on branch ($F_{(6, 370)}$=1.73; p>.05). On the other hand, the teachers' extrinsic self-confidence levels ($F_{(6, 363)}$=4.68; p<.05) and general self-confidence levels ($F_{(6, 365)}$=3.63; p<.05) varied significantly depending on their branch. As a result of the Dunnetts'C test, it was found that the extrinsic self-confidence level of the foreign language teachers ($\overline{X}$=53.47) is significantly higher than those of the mathematics teachers ($\overline{X}$=46.03), literature teachers ($\overline{X}$=48.58), science teachers ($\overline{X}$=47.72) and social sciences teachers ($\overline{X}$=47.59). The extrinsic self-confidence level of the mathematics teachers ($\overline{X}$=46.03) is significantly lower than that of the teachers teaching vocational courses ($\overline{X}$=50.03). The general self-confidence level of the foreign language teachers ($\overline{X}$=91.06) is significantly higher than those of the mathematics teachers ($\overline{X}$=80.96) and social sciences teachers ($\overline{X}$=82.23). The general self-confidence level of the mathematics

teachers ($\overline{X}$=80.96) is significantly lower than those of the foreign language teachers ($\overline{X}$=91.06) and social sciences teachers ($\overline{X}$=82.23).

Findings regarding the effect of school type on self-confidence. One-way analysis of variance was used to determine whether the teachers' self-confidence levels varied significantly depending on school type and the results of the analysis are presented in Table 18.

Table 18.
Results of the One-way Analysis of Variance Conducted to Determine Whether the Teachers' Self-Confidence Levels Vary Significantly Depending on School Type

Var.	School Type	*N*	$\bar{x}$	*sd*	Source of the Variance	Sum of Squares	*df*	Mean Square	*F*	*p*	Sig. Dif.
Intrinsic Self-Confidence	1. Anatolian High School	148	35.89	5.53	Between-Groups	34.37	2	17.18	.54	.57	-
	2. Vocational High School	180	35.99	5.57	Within-Groups	11710.30	374	31.31			
	3.İmam Hatip High School	49	35.06	5.86	Total	11744.67	376				
Extrinsic Self-Confidence	1. Anatolian High School	148	48.16	7.33	Between-Groups	66.13	2	33.06	.59	.55	-
	2. Vocational High School	180	48.75	7.22	Within-Groups	20904.51	374	55.89			
	3.İmam Hatip High School	49	47.55	8.71	Total	20970.65	376				
General Self-Confidence	1. Anatolian High School	148	84.05	12.28	Between-Groups	180.79	2	90.39	.57	.56	-
	2. Vocational High School	180	84.74	12.33	Within-Groups	58891.50	374	157.46			
	3.İmam Hatip High School	49	82.61	14.05	Total	59072.30	376				

As seen in Table 18, the intrinsic self-confidence level ($F_{(2, 374)}$=.54; p>.05) and extrinsic self-confidence level ($F_{(2, 374)}$=.59; p>.05) of the teachers do not vary significantly depending on school type. Moreover, the teachers' general self-confidence levels were also found to not vary depending on school type ($F_{(2, 374)}$=.57; p>.05).

Findings regarding the effect of professional experience on self-confidence. One-way analysis of variance was used to determine whether the teachers' self-confidence levels varied significantly depending on professional experience and the results of the analysis are presented in Table 19.

Table 19.
Results of the One-way Analysis of Variance Conducted to Determine Whether the Teachers' Self-Confidence Levels Vary Significantly Depending on Professional Experience

Var.	Professional Experience	*N*	$\bar{x}$	*sd*	Source of the Variance	Sum of Squares	*df*	Mean Square	*F*	*p*	Sig. Dif.
Intrinsic Self-Confidence	1)1-9 years	52	36.26	4.96	Between-Groups	321.88	3	107.29	3.74	.01	**2-4**
	2)10-19 years	123	35.01	5.33	Within-Groups	10581.15	369	28.67			
	3)20-29 years	158	36.08	5.66	Total	10903.04	372				
	4)30 years and more	40	38.22	4.51							
Extrinsic Self-Confidence	1)1-9 years	52	49.36	7.11	Between-Groups	137.16	3	45.72	.85	.46	
	2)10-19 years	121	47.90	7.05	Within-Groups	19845.45	370	53.63			
	3)20-29 years	158	48.39	7.45	Total	19982.62	373				
	4)30 years and more	43	49.61	7.80							
General Self-Confidence	1)1-9 years	53	84.98	12.18	Between-Groups	1302.91	3	434.30	2.96	.03	**2-4**
	2)10-19 years	123	82.61	12.16	Within-Groups	54062.15	369	146.51			
	3)20-29 years	157	84.69	12.38	Total	55365.06	372				
	4)30 years and more	40	89.10	10.57							

Note: While determining the source of the significant difference between the groups in General Self-Confidence, Scheffe test, one of the related post hoc tests, was used as the homogeneity of variances was ensured (p=.77>.05 in Levene test). The Scheffe test was preferred because it is a strict test that gives reliable results even when the number of groups is not equal (Kayri, 2009). Since p=.15>.05 in the Levene test of internal self-confidence, Scheffe test was used.

Findings on the Relationship between Organizational Vulnerability and Self-Confidence

In order to determine whether there was a significant correlation between the teachers' organizational vulnerability and self-confidence levels, Pearson correlation coefficients were calculated both on the basis of the sub-dimensions and on the basis of the whole scales. Results of the Pearson correlation analysis are given in Table 20.

Table 20.
Results of the Pearson Correlation Analysis regarding the Relationship between Organizational Vulnerability and Self-Confidence

Variables	Defencelessness	Sadness	Incompetence	Intolerance	Intrinsic Self-Confidence	Extrinsic Self-Confidence
Defencelessness	1					
Sadness	.65**	1				
Incompetence	.49**	.39**	1			
Intolerance	.74**	.75**	.44**	1		
Intrinsic Self-Confidence	.04	.08	-.23**	.06	1	
Extrinsic Self-Confidence	.01	.03	-.24**	.02	.82**	1

** denotes a significant correlation at the level of p<.01.

As seen in Table 20, there is a high, positive and significant correlation between the sub-dimensions of intolerance and defencelessness (r =.74, p<.01), between the sub-dimensions of intolerance and sadness (r= .75, p<.01) and between the sub-dimensions of defenselessness and sadness (r=.65, p<.01). There is a medium, positive and significant correlation between the sub-dimensions of incompetence and defencelessness (r=.49, p<.01), between the sub-dimensions of incompetence and sadness (r=.39, p<.01) and between the sub-dimensions of incompetence and intolerance (r=.44, p<.01).

There is a high, positive and significant correlation between the sub-dimensions of extrinsic self-confidence and intrinsic self-confidence (r=.82, p<.01). When the correlations between the sub-dimensions of organizational vulnerability and self-confidence are examined, it is seen that there are low and insignificant correlations between intrinsic self-confidence and defenselessness (r=.04, p>.01), between intrinsic self-confidence and sadness (r=.08, p>.01) and between intrinsic self-confidence and intolerance (r=.06, p>.01). Similarly, there are no significant correlations between extrinsic self-confidence and defenselessness (r=.01, p>.01), sadness (r=.03, p>.01) and intolerance (r=.02, p>.01). On the other hand, there is a negative, low and significant correlation between intrinsic self-confidence and incompetence (r=-.23, p<.01) and between extrinsic self-confidence and incompetence (r=-.24, p<.01).

Findings on the Prediction of Organizational Vulnerability by Self-Confidence

Multiple regression analyses was conducted to determine whether self-confidence predicted organizational vulnerability. Before conducting the multiple regression analysis, the assumptions of normal distribution, linearity, homogeneity of variances and the assumption of absence of autocorrelation and multicollinearity were tested. In order to avoid multicollinearity, the correlation between the independent variables should be less than .90 and VIF should be ≤10, tolerance value should be >0.10 and CI should be <30 (Çokluk et al., 2014; Field, 2013). Since r=.82<.90, VIF=3.41/3.41<10, CI=14/28<30 in the current study, there is no multicollinearity problem. Durbin Watson value must be 1<d>3 to avoid autocorrelation (Field, 2013). Since d=1.67 in the current study, it was decided that there was no autocorrelation between the independent variables. In order to meet the assumptions of multivariate normality, linearity and homogeneity, standardized estimated values drawn for the predictor and predicted variables, pp-plot and scatter plots for standardized error values, and mahalanobis and cook values were examined (Büyüköztürk, 2014). Since the PP plot was linear, the scatter plot was elliptical, and the mahalanobis values (.013-12.96) sd=2 were less than the critical value of 13.82 at the .001 significance level, and Cook values (.00-.027) were less than 1, multivariate normality, linearity

and homogeneity assumptions were also met. The results of the multiple regression analysis conducted to test whether self-confidence predicts organizational vulnerability are shown in Table 21.

Table 21.
Results of the Multiple Regression Analysis Regarding Organizational Vulnerability and Self-Confidence

Variable	*B*	Standard Error	*β*	*t*	*p*	Binary *r*	Partial *r*
Constant	59.13	6.26		9.44	.00		
Intrinsic Self-Confidence	.39	.29	.12	1.36	.17	.07	.07
Extrinsic Self-Confidence	-.31	.21	-.13	-1.43	.15	-.08	-,08
$R = 08$ $R^2 = .01$ $F_{(2, 366)} = 1.08$ $p = .34$							

As seen in Table 21, there is a low and insignificant correlation between intrinsic self-confidence and extrinsic self-confidence and organizational vulnerability (R = 08, p = .34). Intrinsic self-confidence explains only 1% of the total variance in organizational vulnerability. When the standardized regression coefficients was examined, it was seen that extrinsic self-confidence (β=.13) had a larger effect than intrinsic self-confidence (β=.12) on organizational vulnerability. However, when the t-test results regarding the regression coefficients were examined, it was understood that both intrinsic self-confidence (p=.17<.01) and extrinsic self-confidence (p=.15>.01) were not significant predictors of organizational vulnerability. For these variables, the regression equation is as follows:

ORGANIZATIONAL VULNERABILITY =59.13+0.39 INTRINSIC SELF-CONFIDENCE-0.31EXTRINSIC SELF-CONFIDENCE

Discussion and Results

The results of the current study related to organizational vulnerability and self-confidence and the discussions on these results are presented under the relevant headings.

Results and Discussion on Organizational Vulnerability

According to the current study, the teachers' level of defenselessness is relatively higher than their levels of sadness, incompetence and intolerance. In the sub-dimension of defencelessness, the fact that the legal regulations and the realities of the school do not match, the changes in the curriculum and the evaluation of professional competence according to non-educational factors are among the issues that teachers are most concerned about. Supporting these results, Blase (1988) also reveals that teachers are vulnerable to legal regulations because teachers think that the arrangements made especially on the curriculum, assessment and examination systems are useless and do not produce solutions to the real problems of the school (Blase, 1988). The fact that the legal regulations do not match the school realities and the concern about this may be due to the fact that teachers are not included in the decision-making processes while these regulations are being made.

It is a known fact that educational paradigms have changed with the changes in science and technology, and as a result, frequent changes have been made in education programs. Therefore, it is understandable that the changes made in education programs make teachers concerned. Assimilating the changes in the education program or trying to implement a new program is an important situation that can create vulnerability for the teacher (Lemelin, 2018). In fact, many studies in the literature (Dağlı and Han, 2017; Demir and Arı, 2013; Mellegard and Pettersen, 2016) emphasize teachers' discomfort and anxiety about changes in the education program.

The vulnerability created by the evaluation of teachers' professional competences according to non-educational factors was also expressed by Blase (1988). In this context, especially the administrators have a tendency to directly or indirectly control and evaluate teachers in matters such as hair style, clothing, speaking style or non-governmental organizations of which they are members (Blase, 1988).

According to the results of the current study, in the sub-dimension of incompetence, teachers are most worried about the expectation of being a role-model and feel incompetent when using new educational technologies. In the organizational vulnerability literature, the expectation of the teacher to be a role-

model has been widely addressed and is seen as a means of putting great pressure on teachers. Teachers question their own professional identities and experience incompetence in terms of contributing to the academic and personality development of students while trying to fulfill the expectation of being a good role model to their students. Teachers fall into self-doubt and put the responsibility on themselves, even if the inadequacies of students in terms of academic and personality development are caused by their families or students themselves (Blase, 1988; Gao, 2008; Kelchtermans, 1996).

According to the results of the current study, in the sub-dimension of sadness, teachers are most vulnerable to not being appreciated by the administrators when they do good work and to the gossip of their colleagues. Supporting this result, the organizational vulnerability literature argues that teachers experience sadness and vulnerability when they are not appreciated by their administrators when they deserve it (Blase, 1988). Being appreciated is one of the main factors that foster the teacher's self-respect. Since teachers know that the government, society and media will not be aware of what they are doing and their efforts within the school, they expect to be appreciated by their administrators with whom they interact more one-on-one (Hargreaves, Cunningham, Hansen, McIntyre and Oliver, 2018). In addition, colleague gossip persists widely in educational organizations and causes vulnerability among teachers (Blase, 1987, 1988; Kelchtermans, 1996) and harms collaborative school culture (Hargreaves, 2002).

In the study, it was determined that in the sub-dimension of intolerance, the teachers are most disturbed by the parents' intervention in the educational and instructional activities and the unfair criticism of their colleagues about their teaching activities. According to the studies conducted by Blase (1988) and Kelchtermans (1996), parents' intervention in teaching activities is perceived as a criticism of teachers' professional identities and causes vulnerability. On the other hand, unfair criticism of colleagues is among the issues that teachers are very uncomfortable with and causes teachers' relationships with their colleagues to weaken (Hargreaves, 2002).

According to the results of the current study, the teachers' levels of vulnerability, sadness, incompetence and intolerance and general organizational vulnerability levels do not vary significantly depending on gender. When the literature is reviewed, it is seen that there is no study using any organizational vulnerability scale; thus, the results of the current study cannot be compared with any study in the literature. However, one of the dimensions of the Job Insecurity Scale used in research on employee recruitment is vulnerability, referring to vulnerability to unfair, threatening, oppressive and authoritarian attitudes (Vives et al., 2013) Therefore, it is possible to compare this dimension with the sub-dimension of defencelessness in the current study. In this context, in the study of Daly, Schenker Ronda-Perez, and Reid (2020), women's defencelessness level was found to be higher than that of men, contradicting the findings of the current study.

The sub-dimension of incompetence in the Organizational Vulnerability Scale reflects the teacher's feeling of incompetence regarding his/her profession and instructional activities. Although there is no direct study on teacher incompetence in the literature, it is possible to indirectly associate the sub-dimension of incompetence with teacher self-efficacy. In the current study, it was determined that there is no significant gender based difference in the sub-dimension of incompetence. Similarly, studies have also identified that the perceived self-efficacy of teachers towards their profession does not vary significantly by gender (Aydın, 2020; Benzer, 2011; Taşkın and Hacıömeroğlu, 2010). However, there are also studies indicating that teacher self-efficacy varies significantly depending on gender in favor of male teachers (Demirtaş, Cömert and Özer, 2011; Klassen and Chiu, 2010) or in favour of female teachers (Gürbüztürk and Şad 2009; Şubaş, 2018). As can be seen, there is no consistency in the literature on whether the perception of incompetence varies significantly depending on gender.

As stated before, no scales have been found in the literature that will directly compare the Organizational Vulnerability Scale or its sub-dimensions. However, there are measurement tools developed to measure teacher emotions in recent years, and although they do not fully correspond to the dimensions of the Organizational Vulnerability Scale, they allow a comparison. For example, Teacher Emotions Scale developed by Frenzel et al. (2016) measures teachers' anxiety, anger and pleasure in instructional activities. The Teacher Emotion Inventory, developed by Chen (2016), consists of subscales of pleasure, love, anger, fear and sadness. While the teachers' intolerance levels were found to not vary significantly

depending on gender in the current study, it was also seen that teachers' anger levels did not vary significantly depending on gender in the studies conducted by Köse (2019) and Adams (2020). On the other hand, while the level of sadness was found to not vary depending on gender in the current study, Kırmızı and Sarıçoban (2020) stated that female teachers tend to experience more sadness than male teachers.

According to the results of the current study, it is remarkable that both the general level of vulnerability and defenselessness and sadness levels of the teachers having graduate education are higher than those of the teachers with undergraduate education. This might indicate that as the level of education increases, teachers' organizational vulnerability also increases due to the increase in their awareness of and sensitivity towards the negativities in their profession and working conditions. The result that the level of incompetence does not vary significantly depending on education level is in line with the findings of many studies on teacher competence in the literature. For example, Parlak (2011) and Özata (2007) found that teachers' perceived competence does not vary significantly depending on education level.

According to the results of the current study, the organizational vulnerability of teachers teaching mathematics, literature and social sciences in the sub-dimension of incompetence is higher than those teaching sports and arts, which may be related to the centrally administered university entrance exam. As it is known, in this exam, most of the questions are asked in the fields of mathematics, literature and social sciences and thus these teachers are indirectly held responsible for the success or failure of students, and thus the expectation of the society from these teachers is naturally high. This may cause the teacher to feel under pressure and incompetent. On the other hand, the absence of questions in the field of sports and arts in this central exam and the fact that these courses are more practical due to their nature may be effective in the perception of relatively low level of incompetence of the teachers working in this field. Similarly, in the studies conducted by Demirtaş et al. (2011) and Gürbüztürk and Şad (2009), it was determined that the self-efficacy perceptions of pre-service mathematics teachers are relatively low. In addition, the finding that intolerance levels do not vary significantly depending on branch concurs with the studies conducted by Adams (2020) and Köse (2019) in which they found that anger levels do not vary significantly depending on branch.

In the current study, it was found that the teachers' level of incompetence did not vary significantly depending on school type. However, when the literature on teaching competence is examined, it is seen that there are conflicting studies as well as studies supporting this finding. For example, Benzer (2011) found that teacher competence does not vary significantly depending on school type. However, according to the research conducted by Üstüner, Demirtaş, Cömert and Özer (2009), teachers working in Anatolian high schools consider themselves more competent than teachers working in other types of high schools. On the other hand, the finding that the level of intolerance does not vary significantly depending on school type is parallel to Köse's (2019) finding that the level of anger does not vary significantly depending on school type.

In the study of Aydın (2020) and Üstüner et al. (2009), it was determined that the level of teacher competence does not vary significantly depending on professional experience, which supports the conclusion of the current study that the level of incompetence of the teachers does not vary significantly depending on professional experience. On the other hand, Klassen and Chiu (2010) found a nonlinear correlation between competence and professional experience. They concluded that with increasing professional experience up to 23 years, the level of competence also increases but with increasing professional experience after 23 years, the level of competence decreases. On the other hand, the finding that the level of intolerance does not vary significantly depending on professional experience is in line with Adams' (2020) finding that the level of anger does not vary significantly depending on professional experience.

In the current study, it was found that the teachers' organizational vulnerability levels do not vary significantly depending on union membership. This finding is surprising because at least in the sub-dimension of defenselessness, the level of the teachers who are union members is expected to be higher than that of the teachers who are not union members. This might be because the teachers believe that unions are political structures and that they do not do their job well enough; thus, they may not trust unions enough (Berkant and Gül, 2017; Gök and Bozbayındır, 2020; Taşdan, 2012).

Discussion and Results on Self-Confidence

According to the findings of the current study, the teachers' extrinsic self-confidence level is relatively higher than their intrinsic self-confidence level. In the sub-dimension of intrinsic self-confidence, items such as making easy decisions, no problems that cannot be overcome and not being dependent on others in choices are the items the least agreed with by the teachers. In particular, not being dependent on others and being able to make easy decisions are the items reflecting doing something on one's own will. The fact that the level of agreement with these items is relatively low may indicate that teachers have difficulties in making choices and decisions. Similar to the findings, Koyuncu-Şahin (2015) found in their study investigating the self-confidence levels of preschool teachers that the items "There is no insurmountable problem for me" and "I can make a decision easily" had with the lowest mean score in the scale. In the extrinsic self-confidence sub-dimension, the items "not being afraid to stand out" and "not hesitating to participate in social activities" are the items the least agreed with. This might indicate that teachers have deficiencies in social skills. Similarly, in the study by Koyuncu-Şahin (2015), the item "I am afraid of standing out" is among the items least agreed with by the teachers.

According to the findings of the current study, the teachers' intrinsic self-confidence, extrinsic self-confidence and general self-confidence levels did not vary significantly depending on gender. Many studies in the literature support this finding. For example, Çoknaz, Yıldız, Erbil and Altıntaş (2018) found that general self-confidence, intrinsic self-confidence and extrinsic self-confidence did not vary significantly depending on gender. Okyay (2012) conducted a study on administrators and concluded that intrinsic self-confidence and extrinsic self-confidence did not vary significantly depending on gender. Similarly, Çalıkuşu (2020) conducted a study on high school students and Yalçın and Özgen (2017) on pre-service teachers and they found that there was no significant correlation between gender and self-confidence. On the other hand, Toktaş (2017) conducted a study on students participating in sports competitions and found that extrinsic self-confidence did not vary significantly depending on gender; however, it was determined that the intrinsic self-confidence level of the male students was found to be higher than that of the female students. Similarly, Kalaian and Freeman (1994) found that the male pre-service teachers in a training program were more self-confident than the female pre-service teachers.

According to the findings of the current study, the teachers' self-confidence did not vary significantly depending on their education level. In fact, it was expected that graduate education would improve teachers' communication, self-expression and socialization skills, and therefore there would be a difference between the self-confidence levels of the teachers having graduate education and the teachers having undergraduate education. In the literature, there are studies also reporting that education level does not have a significant effect on self-confidence. For example, Gül and Hergüner (2019) in their study on school administrators revealed that the levels of intrinsic self-confidence and extrinsic self-confidence and general self-confidence did not vary significantly depending on education level. Similarly, Levent (2011) revealed that self-confidence, which is considered as a sub-dimension of personality traits, does not vary significantly depending on education level.

According to the findings of the current study, the teachers' extrinsic self-confidence and general self-confidence levels varied significantly depending on branch. While the foreign language teachers have the highest level of self-confidence, the mathematics teachers have the lowest level of self-confidence. Although there is no study in the literature that evaluates teachers' self-confidence in relation to their branch, Gül and Hergüner (2019) found that school administrators' self-confidence levels did not vary significantly depending on their branches. Dureja and Singh (2011) determined that the self-confidence level of physical education students was higher than that of psychology students in their study among pre-service teachers.

The findings of the current study revealed that the teachers' self-confidence levels did not vary significantly depending on school type. There is no study in the literature examining teacher self-confidence in relation to the school type variable. However, there are studies that examine the change in the self-confidence of students and administrators depending on school type. For example, Toktaş (2017) determined that both intrinsic and extrinsic self-confidence levels of vocational high school students participating in sports competitions are higher than students in other types of high schools. Toktaş attributes this situation to the sports success of the vocational high schools and states that as a

result, the students' self-confidence can be high. Gül and Hergüner (2019), on the other hand, classified the types of schools as primary, middle and high schools and found that extrinsic self-confidence does not vary depending on school type; however, primary school administrators' intrinsic self-confidence levels were found to be higher than those in high schools.

The findings of the current study revealed that the teachers' intrinsic self-confidence and general self-confidence levels vary significantly depending on their professional experience. The self-confidence level of the teachers with30 or more years of professional experience is relatively higher. The relatively higher self-confidence of the teachers with 30 or more years of professional experience may be due to the fact that these teachers get to know and accept themselves better and reflect themselves better in their environment, as their professional and life experiences increase. In many studies in the literature, it has been found that self-confidence levels did not vary significantly depending on professional experience. For example, Koyuncu-Şahin (2015) and Çoknaz et al. (2018) concluded that teachers' self-confidence did not vary significantly depending on their professional experience. Similarly, Gül and Hergüner (2018) found that administrators' self-confidence levels did not vary significantly depending on professional experience.

Discussion and Results about the Relationship between Organizational Vulnerability and Self-Confidence and whether Self-Confidence Predicts Organizational Vulnerability

In the current study, no significant correlation was found between extrinsic self-confidence and intrinsic self-confidence and the sub-dimensions of defenselessness, sadness and intolerance of organizational vulnerability. There is a low and significant correlation between intrinsic self-confidence and incompetence and between extrinsic self-confidence and incompetence. Thus, as teachers' intrinsic self-confidence and extrinsic self-confidence increase, their organizational vulnerability in the sub-dimension of incompetence decreases. This relationship is an expected result because people who see themselves competent in an area naturally have high self-confidence in this area (Ekinci, 2013). On the other hand, the sub-dimensions of self-confidence do not significantly predict organizational vulnerability.

Suggestions

In light of the results of the study, the following suggestions can be made:

- In order to reduce the vulnerability caused by discrepancies between legal regulations and the realities of schools, as well as changes in the education program, it is necessary to involve teachers in the decision-making processes both in the revision of legislation related to education and teaching, and in the structuring of the programs.
- In order to alleviate the vulnerability resulting from the lack of appreciation when teachers perform well and thus enhance their self-esteem, school administrators, in particular, should fairly and promptly reward the efforts of teachers.
- Training sessions should be organized to raise awareness among teachers about the vulnerabilities caused by gossip and unfair criticism from colleagues, as well as the potential negative school climate that may occur as a result.
- Activities focused on social skills should be increased with the aim of enhancing teachers' extrinsic self-confidence in terms of standing out and participating in social events.
- Qualitative research should be conducted to identify the underlying causes of teachers' organizational vulnerabilities, taking into account factors such as professional experience, educational background and branch as well as the potential variations in self-confidence based on professional experience and branch.
- Although the current study revealed a low-level significant relationship between extrinsic confidence and intrinsic confidence and the sub-dimension of incompetence, further studies should be conducted to fully comprehend this relationship.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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, N. K.; methodology, N.K.; validation, N. K.; analysis, N.K.; writing and review, N.K; editing, N.K and A.B.; supervision, A.B.; project administration, A.B.

Funding: This research received no funding directly. However, we would like to thank the Scientific and Technological Research Council of Turkey (TÜBİTAK) for its contributions to this study through the Scientist Support Program (BİDEP).

Institutional Review Board Statement: The approval was obtained from the Ankara University Ethics Committee. The date of the ethics committee approval: 23.09.2019, The number of the document: 324

Data Availability Statement: Data generated or analyzed during this study should be available from the authors on request.

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

References

Adams, J. B. (2020). *Teacher emotion skills and teaching styles of prospective teachers in Ghana* (Unpublished master's thesis). Fırat University, Elazığ.

Akın, A. (2007). Öz-güven Ölçeği'nin geliştirilmesi ve psikometrik özellikleri. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 7*(2), 167-176.

Aydın, T. (2020). *Sosyal bilgiler öğretmenlerinin mesleki tükenmişlik düzeylerinin ve öğretmen özyeterlik inançlarının incelenmesi* (Yayınlanmamış yüksek lisans tezi). Van Yüzüncü Yıl Üniversitesi, Van.

Bakırcıoğlu, R. (2012). *Anksiklopedik eğitim ve psikoloji sözlüğü.* Ankara: Anı Yayıncılık.

Balcı, A. (2015). *Sosyal bilimlerde araştırma: yöntem, teknik ve ilkeler* (11. Baskı). Ankara: Pegem Akademi.

Bennett, A. (1998). *Vulnerability, stress and adjustment: A study of affluent young adolescents* (Unpublished doctoral dissertation). McGill University, Montreal.

Benzer, F. (2011). İlköğretim ve ortaöğretim kurumlarında görev yapan öğretmenlerin öz yeterlik algılarının analizi (Yayınlanmamış yüksek lisans tezi). Selçuk Üniversitesi, Konya.

Berkant, H. G. ve Gül, M. (2017). Sendika üyesi öğretmenlerin sendikalara yönelik algıları ve sendikalardan beklentileri. *Itobiad: İnsan ve Toplum Bilimleri Araştırmaları Dergisi, 6*(1), 419-442.

Blase, J. J. (1987). Political interactions among teachers: Sociocultural context in the schools. *Urban Education, 22*(3), 286-309. doi: 10.1177/004208598702200302

Blase, J. J. (1988). The everyday political perspective of teachers: Vulnerability and conservatism. *International Journal of Qualitative Studies in Education, 1*(2), 125-142. doi: 10.1080/0951839880010202

Brown, B. (2012). *Daring greatly: How the courage to be vulnerable transforms the way we live, love, parent, and lead*. New York: Gotham Books.

Bullough, R. V.,Jr. (2005). Teacher vulnerability and teachability: A case study of a mentor and two interns. *Teacher Education Quarterly, 32*(2), 23-40.

Bunker, K. A. (1997). The power of vulnerability in contemporary leadership. *Consulting Psychology Journal: Practice and Research, 49*(2), 122-136. doi: 10.1037/1061-4087.49.2.122

Büyüköztürk. Ş. (2014). *Sosyal bilimler için veri analizi el kitabı* (17. Baskı). Ankara: Pegem Akademi Yayınları.

Cengiz, R., Arslan, F., ve Şahin, E. (2014). Beden eğitimi öğretmenlerinin öz-güven ve boyun eğici davranışlarının incelenmesi. *Turkish Journal of Education, 3*(3), 4-10. doi: 10.19128/turje.181083

Chen, J. (2016). Understanding teacher emotions: The development of a teacher emotion inventory. *Teaching and Teacher Education, 55*, 68-77. doi: 10.1016/j.tate.2016.01.001

Çalıkuşu, H. (2020). *Ergenlerde özgüven ile olumsuz otomatik düşünceler arasındaki ilişkinin incelenmesi* (Yayınlanmamış yüksek lisans tezi). Selçuk Üniversitesi, Konya.

Çelik, İ. (2014). *Ortaokul öğrencilerinin özgüven düzeyinin bazı değişkenler açısından değerlendirilmesi: afyonkarahisar örneği* (Yayınlanmamış yüksek lisans tezi). Türk Hava Kurumu Üniversitesi, Ankara.

Çokluk, Ö., Şekercioğlu. G. ve Büyüköztürk. Ş. (2014). *Çok değişkenli istatistik SPSS ve LISREL uygulamaları* (3. Baskı). Ankara: Pegem Akademi Yayınları.

Çoknaz, H., Yıldız, M., Erbil, E. ve Altıntaş, H. (2018). Lise öğrencilerinin öz güven düzeylerinin karşılaştırılması. *İstanbul Üniversitesi Spor Bilimleri Dergisi, 8*(1), 37-48.

Dağlı, A. ve Han, B. (2017). Öğretmen görüşlerine göre Diyarbakır ili eğitim sorunları ve çözüm önerileri. *Electronic Journal of Education Sciences, 6*(12), 108-124..

Daly, A., Schenker, M. B., Ronda-Perez, E. ve Reid, A. (2020). Examining the impact of two dimensions of precarious employment, vulnerability and insecurity on the self-reported health of men, women and migrants in Australia. *International Journal of Environmental Research and Public Health, 17*, 1-15. doi: 10.3390/ijerph17207540

Demir, K. ve Arı, M. E. (2013). Öğretmen sorunları-Çanakkale ili örneği. *On Dokuz Mayıs Üniversitesi Eğitim Fakültesi Dergisi, 32*(1), 107-126.

Demirtaş, H., Cömert, M. ve Özer, N. (2011). Öğretmen adaylarının özyeterlik inançları ve öğretmenlik mesleğine ilişkin tutumları. *Eğitim ve Bilim, 36*(159), 96-111.

Dureja, G. ve Singh. S. (2011). Self-confidence and decision making between psychology and physical education students: A comparative study. *Journal of Physical Education and Sports Management*, 2(6), 62-65.

Ekinci, H. (2013). Müzik öğretmeni adaylarının solo sahne performansına ilişkin özgüven algılarının bazı değişkenler bakımından incelenmesi. *Mehmet Akif Ersoy üniversitesi Eğitim Bilimleri Enstitüsü Dergisi*, *2*(2), 52-64.

Ezmeci, F. (2012). *İlköğretim 1. sınıf öğrencilerinin özgüvenleri* (Yayınlanmamış yüksek lisans tezi). Atatürk Üniversitesi, Erzurum.

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

Fineman, J. W. (2018). A vulnerability approach to private ordering of employment. In M. A., Fineman, & J. W. Fineman, (Eds.), *Vulnerability and the legal organization of work*, Newyork: Routledge.

Frenzel, A. C., Pekrun, R., Goetz, T., Daniels, L. M., Durksen, T. L., Becker-Kurz, B. ve Klassen, R. M. (2016). Measuring Teachers' enjoyment, anger, and anxiety: The Teacher Emotions Scales (TES). *Contemporary Educational Psychology, 46,* 148-163. doi: 10.1016/j.cedpsych.2016.05.003

Gao, X. (2008). Teachers' professional vulnerability and cultural tradition: A Chinese paradox. *Teaching and Teacher Education, 24*(1), 154-165. doi: 10.1016/j.tate.2006.11.011

Gök, A. ve Bozbayındır, F. (2020). Öğretmen Görüşlerine göre eğitim sendikaları mevcut durum ve beklentiler. *Anatolian Turk Education Journal, 2*(2), 101-127.

Gül, M. ve Hergüner, B. (2019). Okul yöneticilerinde özgüven düzeyini etkileyen faktörler: Trabzon örneği. *Academic Review of Humanities and Social Sciences*, *2*(1), 1-18.

Gürbüztürk, O. ve Şad, S. N. (2009). Student teachers' beliefs about teaching and their sense of self-efficacy: A descriptive and comparative analysis. *Inonu University Journal of the Faculty of Education, 10*(3), 201-226.

Hambly, K. (1997). *Özgüven*. (B. Bıçakçı, çev.). İstanbul: Alfa Yayınları.

Hamilton, M. L. ve Pinnegar, S. E., (2015). Vulnerability. In M. L. Hamilton & E. Pinegar, (Eds.), *Knowing, becoming, doing as teacher educators: Identity, intimate scholarship, inquiry*. (pp.121 – 128). UK: Emerald Group Publishing.

Hargreaves, A. (2002). Teaching and betrayal. *Teachers and Teaching, 8*(3), 393-407. doi:10.1080/135406002100000521

Hargreaves, Linda, H., Cunningham, M. Hansen, A. McIintyre, D. ve Oliver, C. (2018). *The status of teachers and the teaching profession in England: Views from inside and outside the profession: Synthesis report* Retrieved from https://www.researchgate.net/publication/329444007_the_status_of_teachers_and_the_teachıng_professıon_ın_england_vıews_from_ınsıde_and_outsıde_the_professıon_Synthesis_Report

Hesmondhalgh, T. (2011). *The Confident Teacher–how to appear confident… Even when you aren't.* Retrieved from https://www.creativeeducation.co.uk/the-confident-teacher-how-to-appear-confident-even-when-you-arent/

Karasar, N. (2009). *Bilimsel araştırma yöntemi*. (19. Baskı). Ankara: Nobel Yayın Dağıtım.

Kayri, M. (2009). Araştırmalarda gruplar arası farkın belirlenmesine yönelik çoklu karşılaştırma (Post-Hoc) teknikleri. *Fırat Üniversitesi Sosyal Bilimler Dergisi*, *19*(1), 51-64.

Kelchtermans, G. (1996). Teacher vulnerability: Understanding its moral and political roots. *Cambridge Journal of Education, 26*(3), 307-323. doi: 10.1080/0305764960260302

Kırmızı, Ö. ve Sarıçoban, A. (2020). An investigation of the relation between pre-service EFL teachers' emotions and their approaches to teaching. *Journal of Language and Linguistic Studies, 16*(4), 1968-1986. doi: 10.17263/jlls.851029

Klassen, R. M. ve Chiu, M. M. (2010). Effects on teachers' self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. *Journal of Educational Psychology*, *102*(3), 741-756. doi: 10.1037/a0019237

Kline, P. (1994). *An easy guide to factor analysis.* London: Routlege Publications.

Koyuncu-Şahin, M. (2015). *Okul öncesi öğretmenlerinin özgüvenleri ve mesleki tutumlarının incelenmesi* (Yayınlanmamış yüksek lisans tezi). Afyon Kocatepe Üniversitesi, Afyonkarahisar,

Köse, F. (2019). *Öğretmen adaylarının duygu ve kişilik özellikleri ile öğretim yeterlikleri arasındaki ilişkinin incelenmesi* (Yayınlanmamış yüksek lisans tezi). Kahramanmaraş Sütçü İmam Üniversitesi, Kahramanmaraş.

Lasky, S. (2004). *An exploration of teacher professional vulnerability in a context of large-scale reform* (Unpublished doctoral dissertation). University of Toronto, Toronto.

Lemelin, C. (2018). *Feeling naked in teaching: The vulnerability in teaching.* Retrieved from https://blog.ualberta.ca/feeling-naked-in-teaching-the-vulnerability-in-teaching-575d25da253

Levent, B. (2011). *Sınıf öğretmenlerinin kişilik özelliklerinin iletişim becerilerine etkisi* (Yayınlanmış yüksek lisans tezi). Selçuk Üniversitesi, Konya.

Lindenfield, G. (1997). *Kendine güvenen çocuk yetiştirme* (G. Tümer, çev.). Ankara: HYB Yayıncılık.

Maclellan, E. (2014). How might teachers enable learner self-confidence? A review study. *Educational Review, 66*(1), 59-74. doi: 10.1080/00131911.2013.768601

Mellegard, I. ve Pettersen, K. D. (2016). Teachers' response to curriculum change: Balancing external and internal change forces. *Teacher Development, 20*(2), 181-196. doi: 10.1080/13664530.2016.1143871

Merriam, S. B (2009). *Qualitative research: A guide to design and implementation*. San Francisco: John Wiley & Sons.

Otacıoğlu, S. G. (2008). Öğretmen adaylarının problem çözme becerileri ile öz güven düzeylerinin incelenmesi. *Kuram ve Uygulamada Eğitim Bilimleri, 8*(3), 893-923.

Özata, H. (2007). *Öğretmenlerin öz-yeterlik algılarının ve örgütsel yenileşmeye ilişkin görüşlerinin araştırılması* (Yayımlamamış yüksek lisans tezi). Kocaeli Üniversitesi, Kocaeli.

Özcan, H. (1996). *İlkokul öğrencilerinin özgüvenleri, akademik başarıları ve anne-baba tutumları arasındaki ilişkiler* (Yayınlanmamış yüksek lisans tezi). Marmara Üniversitesi, İstanbul.

Pallant, J. (2001). *SPSS survival manual: A step by step guide to data analysis using SPSS for windows (Version 10 and 11)*. Maidenhead: Open University Press.

Perry, P. (2011). Concept analysis: Confidence/self-confidence. *Nursing Forum, 46*(4), 218-230. doi: 10.1111/j.1744-6198.2011.00230.x

Richards, K. (2016). *How to be confident and improve your self-image*. South Carolina: CreateSpace Independent Publishing Platform.

Sadler, I. (2013). The role of self-confidence in learning to teach in higher education. *Innovations in Education and Teaching International, 50* (2), 157-166. doi: 10.1080/14703297.2012.760777

Schermelleh-Engel. K., Moosbrugger. H. ve Muller. H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research-Online, 8*, 23-74.

Sellman, D. (2005). Towards an understanding of nursing as a response to human vulnerability. *Nursing Philosophy, 6*(1), 2-10. doi:10.1111/j.1466-769X.2004.00 202.x

Sharma, S. (1996). *Applied multivariate techniques.* New York: John Willey & Sons.

Sharma, S., Mukherjee, S., Kumar, A. ve Dillon, W. R. (2005). A simulation study to investigate the use of cutoff values for assessing model fit in covariance structure models. *Journal of Business Research, 58*(7), 935-943. doi: 10.1016/j.jbusres.2003.10.007.

Song, J. (2016). Emotions and language teacher identity: Conflicts, vulnerability, and transformation. *TESOL Quarterly, 50*(3), 631-654. doi: 10.1002/tesq.312

Stevens. J. P. (2009). *Applied multivariate statistics for the social sciences* (5th ed.). Newyork: Routledge.

Şubaş, R. (2018). *Okul öncesi öğretmen adaylarının öz-denetimleri ve öğretmen özyeterlik inançları arasındaki ilişkinin bazı değişkenlerle incelenmesi* (Yayınlanmamış yüksek lisans tezi). Dumlupınar Üniversitesi, Kütahya.

Taşdan, M. (2012). Eğitim işkolundaki sendikaların yaşadıkları sorunlar ve çözüm önerileri nitel bir çalışma. *İnönü Üniversitesi Eğitim Fakültesi Dergisi, 13*(2), 57-78.

Taşkın, Ç. ve Hacıömeroğlu, G. (2010). Öğretmen özyeterlik inanç ölçeğinin türkçeye uyarlanması ve sınıf öğretmeni adaylarının özyeterlik inançları. *Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi Dergisi,* (27), 63-75.

Tavşancıl, E. (2010). *Tutumların ölçülmesi ve veri analizi* (4. Baskı), Ankara: Nobel Yayın Dağıtım.

Toktaş, S. (2017). *Okul spor müsabakalarına katılan lise öğrencilerinin kaygı özgüven ve güdülemelerini arasındaki ilişkinin incelenmesi (Karadeniz Teknik Üniversitesi Beden Eğitimi ve Spor Anabilim Dalı* (Yayınlanmamış doktora tezi). Karadeniz Teknik Üniversitesi, Trabzon.

Tyler, J. K. (2016). *Self confidence: Your guide to developing self confidence, self esteem, irresistible charisma and overcoming anxiety!* Kindle-ebooks. Retrieved from https://www.amazon.com/Self-Confidence-Developing-IrresistibleOvercoming ebook/dp/B01EV0V9S6

Üstüner, M., Demirtaş, H., Cömert, M. ve Özer, N. (2009). Ortaöğretim öğretmenlerinin öz-yeterlik algıları. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, *9*(17), 1-16.

Vives, A., Amable, M., Ferrer, M., Moncada, S., Llorens, C., Muntaner, C., …ve Benach, J. (2013).Employment precariousness and poor mental health: Evidence from Spain on a new social determinant of health. *Journal of Environmental and Public, 2013, 1-10.* doi: 10.1155/2013/978656

Yalçın, O. M. ve Özgen, B. (2017). Okul öncesi öğretmenliği bölümü öğrencilerinin mesleğe yönelik tutumlarının ve öz güven düzeylerinin incelenmesi (KKTC). *Eğitim Kuram ve Uygulama Araştırmaları Dergisi*, (3), 63-80.

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

Investigation of the Relationship Between Mothers' Perceptions of Risky Play and Their Children's Self-Concepts[1]

Nezahat Hamiden Karaca[2] **Fatma Nur Çelik[3]** **Ümit Ünsal KAYA[4]**

To cite this article:
Hamiden Karaca, N., Çelik, F. N. & Kaya,Ü. Ü. (2022). Investigation of the relationship between mothers' perceptions of risky play and their children's self-concepts. *e-Kafkas Journal of Educational Research, 11,* 124-140. doi: 10.30900/kafkasegt.1312953

Research article **Received:**24.10.2023 **Accepted:**03.03.2024

Abstract

This study was conducted to determine the relationship between the perceptions of mothers of children attending preschool institutions about risky play and children's self-concept and the relationship between gender. In line with this purpose, it was conducted using the relational survey model, one of the quantitative research methods. The sample of the study was determined using the convenience sampling method. The sample of the study consisted of 257 volunteer children and the mothers of the same children. In the study, a general information form developed by the researcher was used to obtain information about the demographic characteristics of the children and their families. As a data collection tool, "Scale for the Attitudes Towards Risky Play at Early Childhood - Parent Form (SATRPEC-PF)" was used to evaluate mothers' perceptions about risky play, and Perception of Child Self-Concept (PCSC) was used to evaluate children's self-concept. The data obtained from the study were created using Spearman Rank Correlation analysis. When the scores obtained from SATRPEC-PF and PCSC were compared, a positive correlation was found between PCSC scores and Pro-beliefs scores from SATRPEC-PF sub-factors, and a negative correlation was found between Feeling Anxiety. No significant relationship was found between Distinguishing Risky Behaviors, Supporting Children, and Parental Support factors. While there was a significant relationship between girls' PCSC scores and SATRPEC-PF Pro-beliefs sub-factor, Distinguishing Risky Behaviors sub-factor, and Feeling Anxiety sub-factor, no significant relationship was found between the Supporting Children and Parental Support sub-factors. A significant relationship was found only between boys' PCSC scores and the Pro-beliefs sub-factor of SATRPEC-PF. Suggestions were presented in line with the findings obtained from the study.

Keywords: Play, risky play, self, self-concept, preschool.

---

[1] This study is a part of the thesis entitled “Examination of the relationship between the perceptions of risky play of mothers and their children’s self concepts” approved by Afyon Kocatepe University Graduate School of Social Sciences.

[2] Corresponding Author, nhamiden@gmail.com, Afyon Kocatepe University

[3] Author, Turkish Ministry of National Education

[4] Author, Afyon Kocatepe University

Introduction

In general, young children actively seek out risk and challenge during their play, as it is recognized as a crucial avenue for them to explore their bodies, their environment, and their own abilities (Edgington, 2007; Heppel, 2013; Little, 2010; Little & Eager, 2010; Sandseter & Kennair, 2011; Stephenson, 2003; Tovey, 2007). Engaging in risk management strategies, these children develop specific skills and learn to safeguard themselves against potential injuries (Liu & Birkeland, 2022).

Understanding the broader context of risk-taking is crucial when considering its specific application in children's play. The way individuals perceive risk-taking shapes their attitudes towards engaging in such activities, including risky play. Engaging in risk-taking means making choices about actions with uncertain outcomes, possibly involving adverse effects, as noted by Adams (2001), Boyer (2006), and Little (2010). This activity can yield both beneficial and detrimental outcomes. Therefore, in evaluating risks, it's important to weigh the potential dangers and the severity of consequences associated with any given activity, as highlighted by Willoughby (2012). In scholarly research on children's play in early childhood education settings, eight distinct categories of risky play have been systematically identified (Kleppe et al., 2017; Sandsetter, 2007; Sandsetter, 2009). These categories, derived from comprehensive observations and interviews, include activities like engaging in play at significant heights and high speeds, using potentially dangerous tools, playing near hazardous elements, rough-and-tumble interactions, solo exploration adventures, play involving physical impacts, and experiencing vicarious risk through observation of others' risky behaviors. Each category encapsulates a unique aspect of risk that children may encounter in their play environments.

Sandseter (2010) highlights that children's engagement in risky play contributes significantly to various areas of their development. For instance, it promotes psychological growth by enabling children to navigate and balance their emotions of fear and joy (Sandseter, 2010). Through engaging in risky behaviors during play, children also develop coping mechanisms for their fears and gain an understanding of what is safe and unsafe (Sandseter & Kennair, 2011). Additionally, risky play presents children with valuable opportunities such as decision-making, self-assessment of abilities and limits, enhancing risk management skills, and learning to protect themselves from injuries (Little & Eager, 2010; Little & Wyver, 2008). Moreover, risky play fosters the development of self-confidence, self-awareness, perseverance, and independence in children (Gill, 2010; Gleave and Cole-Hamilton, 2012; Knight, 2012; Tovey, 2007). In the past few decades, there has been an escalation in scholarly interest regarding children's engagement in risk-taking during play. This burgeoning research area encompasses a variety of topics: defining the nature of risky play (Kleppe et al., 2017; Sandsetter, 2007), evaluating its potential positive or negative consequences on children's development, learning, and health (Brussoni et al., 2015; Sandsetter & Kennair, 2011; Sando et al., 2021), and examining its role in enhancing children's skills in risk assessment and management (Brussoni et al., 2015; Lavrysen et al., 2017). The impetus for this focus in the literature is linked to increasingly stringent standards and regulations that may negatively affect children's play environments (Herrington & Nicholls, 2007; Spiegal et al., 2014), coupled with a heightened societal emphasis on ensuring safety in children's lives and activities (Ball, 2002; Sandsetter et al., 2017; Sandsetter et al., 2020; Tremblay et al., 2015).

Early childhood is a critical period for the cultivation of self-confidence, self-awareness, and the self, particularly through interactions with the environment (Li, 2022). The significance of games that involve risk and encompass multiple areas of development cannot be overstated in this context. Risky play, as previously discussed, not only facilitates physical and emotional development but also lays the foundation for the evolving self-concept of a child. The process of self-concept development is intrinsically linked to the experiences and challenges encountered in play. As Erşan (2006), Kandır (2000), and Erden (2001) note, it is through these interactions and opportunities that a child’s self-concept begins to take form, influenced by their environment and the choices they make during play, including risk-taking activities.

Transitioning to the concept of self is understood as the subjective aspect of an individual's personality, encompassing self-perceptions, interpretations, and evaluations of oneself, as defined by Aydın (2005). As children grow, they receive messages from their family and surroundings, and their behaviors start to be evaluated by their environment. This feedback leads to the construction of a mental image or schema of themselves, initiating the process of self-consciousness in the early years.

By the age of four or five, a child develops positive or negative thoughts about themselves, influenced by their experiences, including those in play, as outlined by Cüceloğlu (1997).

The self-concept of children in early childhood is greatly influenced by the attitudes exhibited by their parents, who represent their external world during this developmental stage (Yavuzer, 2007; Cevher & Buluş, 2007). The multitude of experiences and opportunities provided to children during this period significantly impacts their self-concept. A positive self-perception enables a child to develop a sense of self and effectively navigate their life (Bee & Boyd, 2009). It is important to note that the concept of self is not innate but rather constructed through a culmination of various experiences (Cevher & Buluş, 2006).

Risky play, along with the supervision and involvement of parents in playground environments, contributes to enriching children's experiences. By creating appropriate environments that allow their children to take risks without adopting an overprotective stance, parents can support the holistic development of their children (Bulut & Kılıçaslan, 2009). The central thrust of this investigation is to explore the interplay between mothers' perceptions of risky play and the self-concept of children in preschool settings. This inquiry is pivotal as it addresses a notable gap in current scholarly discourse, particularly concerning the intricate relationship between parental attitudes towards risky play and the resultant developmental outcomes in children. By delving into this underexplored area, the study aims to augment existing knowledge and offer nuanced insights into parental education strategies during the formative kindergarten years. Furthermore, the findings of this research could inform social responsibility initiatives and guide policymakers in shaping environments conducive to holistic child development. The study underscores the necessity for parents to balance their protective instincts with the provision of opportunities for their children to engage in risky play. This balance is crucial in fostering children's problem-solving abilities, resilience, and positive self-perception, as evidenced by Banko et al. (2018) and Morali (2019). In contrast, an overprotective approach, as highlighted by Sicim Sevim & Bapoğlu Dümenci (2019), may inadvertently impede the acquisition of these essential skills.

The implications of this research extend beyond the immediate family unit to the broader educational context. It is imperative to consider how children's evolving self-concept, shaped by their experiences in risky play, influences teacher behaviors and classroom dynamics. By providing empirical evidence on these aspects, the study aims to contribute meaningfully to the discourse on child development and education. The novelty of this research lies in its specific focus on the perspectives of mothers of preschool children regarding risky play, a facet scarcely examined in prior studies. Thus, this study not only fills a critical gap in the literature but also paves the way for future inquiries into the multifaceted aspects of early childhood development and parental involvement.

In pursuit of the study's aims, The central research question asks: 'Is there a significant relationship between mothers' perceptions of risky play among children attending preschool and the self-concept perception of these children?' Subsequently, the research delves into specific sub-dimensions of mothers' perceptions with the following sub-questions:

- How does the 'Pro Beliefs' sub-dimension relate to children's self-concept?
- What is the relationship between the 'Distinguishing Risky Behaviors' sub-dimension and children's self-concept?
- How does the 'Supporting Children' sub-dimension correlate with the self-concept of children?
- Is there a link between the 'Feeling Anxiety' sub-dimension and children's self-concept?
- Does the 'Parental Support' sub-dimension significantly relate to children's self-concept?
- Finally, is there a gender-based difference in mothers' perceptions of risky play and children's self-concept?"

These questions aim to dissect the multifaceted nature of mothers' perceptions and their impact on the development of self-concept among preschool children.

Method

The principal aim of this research is to investigate the relationship between mothers' perceptions of risky play and the self-concept of children attending preschool. This objective is pursued to address a gap in existing literature, offering insights into how parental attitudes towards risk in play environments impact the development of children's self-concept. In this part of the study; the data collection method, population and sample of the study, and data analysis method are given respectively.

Design

This quantitative study employed a relational (correlational) screening model to investigate the relationship between mothers' perceptions of risky play among children attending preschool institutions and children's self-concept. Correlational methods are commonly used to examine the associations and predictive abilities between variables, enabling researchers to gain insights into the relationships between different factors (Büyüköztürk et al., 2018). Unlike experimental studies, correlational methods do not involve manipulating variables; instead, they focus on determining the relationships between scores obtained from individuals using statistical analyses such as correlations and regressions (Creswell, 2005). Therefore, this study aimed to explore the relationship between mothers' perceptions of risky play, children's self-concept, and the gender of children attending preschool institutions.

Data Collection Tools

The data for this study were collected using three main instruments: the General Information Form, the Scale for the Attitudes Towards Risky Play at Early Childhood - Parent Form (SATRPEC-PF), and the Perception of Child Self-Concept (PCSC).

The *General Information Form* was designed by the researcher to gather demographic information about the children, their families, and their mothers. It included items about the child's gender, the number of siblings, the mother's age, and the mother's marital status. The General Information Form was filled out by those parents who consented to participate in behalf of their children.

The *Scale for the Attitudes Towards Risky Play at Early Childhood - Parent Form (SATRPEC-PF)* was developed by Karaca and Uzun (2020). This Likert-type scale consisted of 28 items, and respondents were asked to indicate their level of agreement on a scale from 1 (Disagree) to 5 (Agree). The scale underwent factor analysis, resulting in five factors: Pro-beliefs, Distinguishing Risky Behaviors, Supporting Children, Feeling Anxiety, and Parental Support. The scale demonstrated good internal consistency, with a reliability coefficient (Cronbach's alpha) of $\alpha = .919$. The reliability coefficients for the sub-factors were $\alpha = .953$ for Pro-beliefs, $\alpha = .878$ for Distinguishing Risky Behaviors, $\alpha = 1.000$ for Supporting Children, $\alpha = 1.000$ for Feeling Anxiety, and $\alpha = 1.000$ for Parental Support. Confirmatory factor analysis confirmed the five-factor structure, with goodness-of-fit indices indicating a good fit. The maximum and minimum scores for the Distinguishing Risky Behaviors and Supporting Children factors of SATRPEC-PF were 101 and 25 points, respectively (with reverse scoring applied to question 18), reflecting positive or negative opinions about risky play. The Feeling Anxiety and Parental Support factors had maximum scores of 35 and minimum scores of 7, indicating positive or negative opinions about risky play. Overall, the scale demonstrated good reliability and acceptable psychometric properties. For this study, data were collected from 257 mothers, resulting in an alpha value of .83.

The Perception of Child Self-Concept (PCSC) is a scale developed by Villa and Auzmendi (1992) to assess the self-concept of five- to six-year-old children. Karaca and Aral (2017) adapted the scale into Turkish for this study. The PCSC is a simple and cost-effective tool used to identify children with positive or negative self-concepts. It consists of 34 items, each accompanied by a corresponding picture. The administration of the scale takes approximately 15-20 minutes for each child. To establish the validity and reliability of the PCSC, the study included 170 children attending kindergartens and exhibiting normal development. To ascertain that these children were developing typically, observational developmental records maintained by their teachers were taken into account. Each item in the instrument is scored on a scale from 1 to 4, with higher scores indicating a higher self-concept.

However, in the 13th item, reverse scoring is applied, where 1 point is considered as 4 and 4 points as 1. Expert opinions were sought to assess the content validity of the PCSC application guideline and evaluation criteria in the context of Turkish culture. The content validity index (CVI) was determined to be 0.93, indicating good content validity. Reliability analysis, including item-total correlations and Cronbach's alpha, was conducted for the PCSC assessment criteria (n=170). The overall reliability coefficient was found to be .69, indicating acceptable internal consistency. Most of the item-total correlations were at a sufficient level. The difference in mean scores between the upper 27% and lower 27% groups, formed based on the PCSC scores ($t = -19$, $p < .01$), was found to be significant, suggesting that the PCSC items effectively discriminate between different levels of self-concept. The test-retest reliability coefficients of the PCSC (n=40) indicated a positive, high, and significant relationship between the two test results, demonstrating the scale's stability over time. For this study, data were collected from 257 children, resulting in an alpha value of .82, indicating good internal consistency for the PCSC.

Data Collection Process

The data collection process for this study involved obtaining necessary permissions and approvals, including Ethics Committee Approval (decision no: 2020/277) and permissions from the Directorate of National Education. The researcher initiated the application of the scales at the beginning of the Spring Semester of the 2020-2021 academic year.

Prior to the data collection phase, the researcher informed the school principal, teachers, children in the study group, and their mothers about the study. At an information meeting, the mothers were informed that participation in the research was voluntary and that the identities of the participants would be kept confidential. The data collection tools were then administered to the children and mothers who volunteered to participate.

Since the data collection tool specifically targeted preschool children, individual administration was necessary. To establish rapport and trust with the children, the researcher conducted play activities in each class before starting the application process. This allowed the children to become familiar with the researcher and feel more comfortable. Following the play activities, the data collection was carried out in a designated area determined in collaboration with the school administrators. The environment was arranged to ensure that the children could engage with the researcher on a one-on-one basis without distractions.

Population and Sampling

The population of this study consists of children attending preschool institutions affiliated with the Directorate of National Education in the Halfeti district of Şanlıurfa province, as well as their mothers. The sample for the study was determined using the convenience sampling method, which is a non-random sampling technique. It should be noted that convenience sampling is considered a weaker method compared to other sampling techniques in research (Christensen et al., 2015). However, due to limitations such as financial constraints, time constraints, and the ongoing effects of the pandemic during the 2020-2021 academic year, it was necessary to use this sampling method. The convenience sampling method aims to reach a group that is easily accessible and convenient, allowing for efficient data collection in terms of time and resources (Cohen & Manion, 1998). Therefore, in this study, the sample group consisted of 257 children and their mothers, aiming to examine the relationship between the perceptions of mothers of children attending preschool institutions regarding risky play and children's self-concept.

In this study, the data collection tools were administered by the researcher himself. Prior to the implementation, necessary permissions were obtained for the use of the data collection tools. The researcher conducted an informative meeting with the school administrators and teachers where the study would be conducted, explaining the purpose and significance of the research as well as the data collection tools to be used. A pre-application was conducted in the researcher's own school to determine the comprehensibility of the data collection tools. Subsequently, the scales and questionnaires were administered to children in other schools selected by the researcher based on volunteerism and adherence to ethical principles. The personal information of the children and their

mothers included in the study group was examined. Table 1 provides the demographic characteristics of the children included in the study.

Table 1.
Distribution of demographic characteristics of the children included in the study and their mothers

Variables	**Category**	***F***	**%**
Gender of the Child	Girl	139	54.1
	Boy	118	45.9
	Total	257	100
Age of the child	48-60 months	103	40.1
	61-72 months	154	59.9
	Total	257	100
Age of mother	30 Years and under	109	42.4
	31-45 Years	135	52.5
	46 years and over	13	5.1
	Total	257	100
Mother's Level of Education	Primary School	102	39.7
	Middle School	75	29.2
	High School	48	18.7
	University	32	12.5
	Total	257	100
Number of Children in the Family	1 Child	11	4.3
	2 Children	56	21.8
	3 Children	84	32.7
	4 Children	63	24.5
	5 Children and over	43	16.7
	Total	257	100

Table 1 presents the distribution of demographic characteristics among the children included in the study. Of the participants, 54.1% were girls, while 45.9% were boys. In terms of age, 40.1% of the children fell within the range of 48-60 months, while the majority, 59.9%, were between 61-72 months. The number of children per family varied, with 4.3% having one child, 21.8% having two children, 32.7% having three children, 24.5% having four children, and 16.7% having five or more children.

Turning to the demographic characteristics of the participating mothers, it was observed that 42.4% of them were 30 years old or younger, while 52.5% fell within the age range of 31-45 years. A small proportion, 5.1%, were 46 years old or older. In terms of educational background, 39.7% of the mothers had completed primary school, 29.2% had attained a middle school education, 18.7% were high school graduates, and 12.5% held a university degree. Notably, all of the mothers identified themselves as housewives.

Data Analysis

The data collected through the General Information Form, SATRPEC-PF, and PCSC tools were entered into a computer environment and subjected to appropriate statistical analyses. Descriptive statistics, including frequency and percentage distributions, were utilized to examine the demographic characteristics of the children and their families.

Regarding the analysis of the data obtained from SATRPEC-PF and PCSC, the normality of the scores was assessed using the Kolmogorov-Smirnov (K-S) Test. As the obtained values indicated a non-normal distribution (Bütüner, 2008), Spearman's Rank Correlation Coefficient was employed to determine the relationships between variables.

Spearman's Rank Correlation Coefficient was utilized to assess the relationship between the scores obtained from the SATRPEC-PF and PCSC measurement tools. Furthermore, it was employed to explore whether there existed a relationship between SATRPEC-PF scores and PCSC scores based on the gender variable. By calculating Spearman's Rank Correlation Coefficient, information regarding the strength and direction of the linear relationship between the measured variables was obtained (Alpar, 2012).

Limitations

This research, while comprehensive in its approach, is subject to several limitations which need to be acknowledged. First, the use of a correlational study design precludes the establishment of causal relationships between mothers' perceptions of risky play and children's self-concept. As the study does not involve the manipulation of variables, it can only indicate associations rather than causation. Secondly, the convenience sampling method, though necessary due to constraints such as financial limitations, time, and the pandemic, is a non-random technique. This approach may limit the generalizability of the findings. The sample, drawn from a specific geographical area and demographic, might not reflect the broader population's perspectives and experiences. Additionally, the reliance on self-reported data, particularly from the Scale for the Attitudes Towards Risky Play at Early Childhood - Parent Form (SATRPEC-PF) and the Perception of Child Self-Concept (PCSC), may introduce bias. The mothers' perceptions and responses might be influenced by social desirability or personal beliefs, which could affect the accuracy of the data. The study's determination of children's 'normal development' based on observational developmental records maintained by teachers also presents a limitation. These records are subjective and may not comprehensively capture the nuances of each child's developmental status. Moreover, the absence of a standardized, objective measure to confirm typical development means that this aspect relies heavily on teachers' subjective evaluations. Finally, the internal consistency of the PCSC, with a reliability coefficient of .69, while acceptable, indicates that there may be room for improvement in the instrument's reliability. This factor should be considered when interpreting the results and their implications. These limitations, inherent in the study's design and methodology, suggest that while the findings contribute valuable insights, they should be interpreted with an understanding of the aforementioned constraints. Future research could address these limitations by employing different study designs, broader and more diverse samples, and more objective measures of child development.

Findings

This section presents the results of the relationship between SATRPEC-PF and PCSC and the relationship between gender variables.

Table 2.
Descriptive statistics of SATRPEC-PF scores

Scale	N	Mean	Lowest	Highest	SD	Level
SATRPEC-PF	257	78.84	30	121	17.913	2.81 Medium level

Table 2 in the study details the descriptive statistics for the SATRPEC-PF scores among 257 participants. The mean score is 78.84, with scores ranging from 30 to 121. The standard deviation is 17.913. This mean score, positioned roughly at the midpoint of the scale's potential range, is considered to represent a 'medium level' of attitudes towards risky play. This categorization is based on the standard practice in scale analysis where the mean score's position relative to the total possible range helps classify the collective attitude level. In this case, the mean score aligns closely with the middle of the SATRPEC-PF's scoring range, hence the classification as medium.

Table 3.
Descriptive statistics of PCSC scores

	N	*M*	Lowest	Highest	sd	Level
PCSC	257	111.02	69	132	11.781	3.26 Medium level

Table 3 presents the descriptive statistics of the PCSC scores. The analysis included a sample size (N) of 257 participants. The mean score for the PCSC was 111.02, with the lowest score being 69 and the highest score being 132. The standard deviation (SD) was calculated as 11.781. Based on these statistics, the overall level of children's self-concept, as measured by the PCSC, can be classified as medium.

Table 4.
Spearman correlation values between SATRPEC-PF and PCSC total scores

	SATRPEC-PF	PCSC	
SATRPEC-PF	r =1	r =.119 *	p= .058
PCSC	R =.119 * p=.058	r =1	

*p<.05

Table 4 displays the Spearman correlation values between SATRPEC-PF and PCSC total scores. The correlation coefficient between SATRPEC-PF and PCSC total scores was found to be r = 0.119 with a p-value of p = 0.058. There was a positive but non-significant relationship between the two variables. The correlation coefficient for PCSC and SATRPEC-PF scores was also r = 0.119 with a p-value of p = 0.058. The results indicate a similar positive but non-significant correlation. It should be noted that p-values are close to the significance level ($p < 0.05$), suggesting a marginal association between the two variables. Further research with a larger sample size may provide additional insights into the relationship between risky play perceptions and children's self-concept.

Table 5.
Spearman correlation analysis results for the relationship between SATRPEC-PF Sub-factors and PCSC scores

Scale	SATRPEC-PF Sub-Factors	N	r	p
PCSC	Pro Beliefs	257	.143	.022*
	Distinguish Risky Behaviors	257	.069	.272
	Supporting Children	257	.071	.254
	Feeling Anxiety	257	-.135	.030*
	Parental Support	257	.009	.885

*p<.05

The results of the Spearman correlation analysis, presented in Table 5, revealed the relationships between the SATRPEC-PF sub-factors and PCSC scores. Among the sub-factors of SATRPEC-PF, a significant positive correlation was found between Pro Beliefs and children's self-concept scores ($r = 0.143$, $p < 0.05$), suggesting that mothers' positive beliefs about risky play were associated with higher self-concept scores in children. However, no significant correlations were observed between Distinguishing Risky Behaviors, Supporting Children, and Parental Support sub-factors of SATRPEC-PF and children's self-concept scores ($r = 0.069$, $p > 0.05$; $r = 0.071$, $p > 0.05$; $r = 0.009$, $p > 0.05$, respectively). Interestingly, the Feeling Anxiety sub-factor exhibited a significant negative correlation with children's self-concept scores ($r = -0.135$, $p < 0.05$), indicating that higher levels of maternal anxiety were associated with lower self-concept scores in children. These findings suggest that mothers' beliefs and anxiety related to risky play may play a role in shaping children's self-concept during the preschool years.

Table 6.
Spearman correlation analysis results for the relationship between SATRPEC-PF Pro-beliefs sub-factor and PCSC scores by gender variable

Scale	Gender	Pro-beliefs	
PCSC	Girl	r	.180
		p	.034*
		N	139
	Boy	r	.107
		p	.249
		N	118

*p<.05

Table 6 presents the results of the Spearman correlation analysis examining the relationship between the SATRPEC-PF Pro-beliefs sub-factor and PCSC scores based on the gender variable. Among girls, a significant positive correlation was found between Pro-beliefs and PCSC scores ($r = 0.180$, $p < 0.05$), indicating that higher levels of positive beliefs about risky play in mothers were associated with higher self-concept scores in girls. However, for boys, no significant correlation was observed between Pro-beliefs and PCSC scores ($r = 0.107$, $p > 0.05$), suggesting that the relationship between maternal beliefs and children's self-concept may differ based on gender. The findings highlight the potential gender-specific influence of maternal beliefs on children's self-concept in the context of risky play.

Table 7.
Spearman correlation analysis results for the relationships between the Distinguishing Risky Behaviors sub-factor of SATRPEC-PF and PCSC scores by gender variable

Scale	Gender	Distinguishing Risky Behaviors	
PCSC	Girl	r	.198
		p	.019*
		N	139
	Boy	r	-.062
		p	.506
		N	118

*p<.05

Table 7 displays the results of the Spearman correlation analysis examining the relationships between the Distinguishing Risky Behaviors sub-factor of SATRPEC-PF and PCSC scores based on the gender variable. Among girls, a significant positive correlation was found between Distinguishing Risky Behaviors and PCSC scores ($r = 0.198$, $p < .05$), indicating that a greater ability to differentiate risky behaviors in mothers was associated with higher self-concept scores in girls. However, for boys, no significant correlation was observed between Distinguishing Risky Behaviors and PCSC scores ($r = -0.062$, $p > .05$), suggesting that the association between maternal ability to distinguish risky behaviors and children's self-concept may differ based on gender. These findings suggest a potential gender-specific influence of maternal perceptions of risky behaviors on children's self-concept.

Table 8.
Spearman correlation analysis results for the relationship between SATRPEC-PF Supporting Children sub-factor and PCSC scores by gender variable

Scale	Gender	Supporting Children	
PCSC	Girl	r	.035
		p	.679
		N	139
	Boy	r	.117
		p	.206
		N	118

*p<.05

Table 8 presents the results of the Spearman correlation analysis examining the relationship between the Supporting Children sub-factor of SATRPEC-PF and PCSC scores based on the gender variable. The analysis revealed that there was no significant correlation between Supporting Children and PCSC scores for both girls ($r = 0.035$, $p > .05$) and boys ($r = 0.117$, $p > .05$). These findings suggest that the extent of maternal support for children's engagement in risky play does not appear to have a significant association with their self-concept, regardless of gender. Therefore, in this study, the perceived support from mothers regarding risky play did not show a strong relationship with children's self-concept scores.

Table 9.
Spearman correlation analysis results for the relationships between SATRPEC-PF Feeling Anxiety Sub-factor and PCSC scores by gender variable

Scale	Gender	Feeling Anxiety	
PCSC	Girl	r	-.241
		p	.004*
		N	139
	Boy	r	-.025
		p	.790
		N	118

*p<.05

Table 9 displays the results of the Spearman correlation analysis investigating the relationship between the Feeling Anxiety sub-factor of SATRPEC-PF and PCSC scores based on the gender variable. The analysis revealed a significant negative correlation between Feeling Anxiety and PCSC scores among girls ($r = -0.241$, $p < .05$), indicating that higher levels of maternal anxiety about risky play were associated with lower self-concept scores in girls. However, for boys, there was no significant correlation between Feeling Anxiety and PCSC scores ($r = -0.025$, $p > .05$). These findings suggest that maternal anxiety regarding risky play might have a more pronounced impact on the self-concept of girls compared to boys. It implies that higher levels of maternal anxiety about risky play may contribute to lower self-concept scores in girls, highlighting the importance of addressing parental anxiety in relation to children's engagement in risky play.

Table 10.
Spearman correlation analysis results for the relationship between SATRPEC-PF Parental Support Sub-factor and PCSC scores by gender variable

Scale	**Gender**	**Parental Support**	
PCSC	Girl	r	,000
		p	,999
		N	139
	Boy	r	,015
		p	,873
		N	118

*p<.05

Table 10 presents the results of the Spearman correlation analysis examining the relationship between the Parental Support sub-factor of SATRPEC-PF and PCSC scores based on the gender variable. The analysis revealed that there was no significant correlation between Parental Support and PCSC scores for both girls ($r = 0.000$, $p > .05$) and boys ($r = 0.015$, $p > .05$). These findings indicate that the level of parental support in relation to risky play did not show a significant association with children's self-concept scores, regardless of their gender. It suggests that other factors beyond parental support might be more influential in shaping children's self-concept. Further research is needed to explore additional variables that may contribute to children's self-concept in the context of risky play.

Discussion, Conclusion and Suggestions

This study builds upon foundational theories of child development by Piaget (1962), Erikson (1985), Rubin et al. (1983), Oktay (1999), Hampton et al. (1999), and Gagnon and Nagle (2004), affirming the significant impact of play on cognitive, language, social-emotional, and motor skills development. It

introduces a nuanced exploration of risky play, an evolving concept in developmental psychology (Güler & Demir, 2016). Characterized by activities like climbing, jumping, and navigating uneven terrains, risky play is essential for children's holistic growth. It echoes the insights of Greenfield (2004) and Little (2006) on the critical role of environmental exploration in nurturing child development, suggesting that engaging in calculated risks is indispensable for fostering resilience, problem-solving skills, and adaptive behaviors in children. This study thereby extends traditional understandings of play, positioning risky play as an integral component of a child's developmental journey.

In the face of declining opportunities for outdoor play due to changing social and environmental conditions (Karaca & Uzun, 2020; Bundy et al., 2009), the importance of risky play has been underscored. Research has revealed a significant correlation between risky play and the development of self-awareness, self-confidence, and positive self-perception in children. This finding presents a contrast to the apprehensions regarding outdoor play identified in the studies by Erbay and Saltalı (2012) and Cevher-Kalburan and Yurt (2011). It highlights a discrepancy between parental perceptions and the actual benefits of risky play, suggesting a need for a more informed parental understanding of the developmental importance of such activities.

As a result of the study, when the scores obtained from SATRPEC-PF and PCSC were compared, a significant positive relationship was found between PCSC scores and Pro-beliefs, one of the sub-factors of SATRPEC-PF. The reason for this situation is that children's social skills, problem-solving situations, and emotions that they can control during risky play moments increase their self-confidence and courage. This will contribute to the child's self-concept and affect self-development positively. Early childhood is an important point in terms of self-concept. The risky playgrounds offered to the child not only develop the child's personality development and imagination but also allow the child to produce solutions to many problem situations encountered in daily life. As a result, the child's perceptions of desires, abilities, and self-concept will also develop positively (Baran, 1999; Demoulin, 2000). When the scores obtained from SATRPEC-PF and PCSC were compared, a significant negative correlation was found between PCSC scores and Feeling Anxiety, a sub-factor of SATRPEC-PF. This may be due to parents' overprotective attitudes and worries about their children's risky play. In addition, parents who have disagreements with their spouses and are afraid of being characterized as bad parents by the environment also keep their children away from risky playgrounds. In this direction, it can be said that when the child is not provided with opportunities and possibilities to manage risks and when the level of anxiety and fear is high, the child's self-development will also progress negatively (Alisinanoğlu, 2003; Sicim Sevim & Bapoğlu Dümenci, 2019). No significant relationship was found between PCSC scores and SATRPEC-PF sub-factors Distinguishing Risky Behaviors, Supporting Children, and Parental Support. From this point of view, it can be said that as the PCSC scores of children attending preschool education institutions increase, the Pro-beliefs scores of the SATRPEC-PF sub-factors increase, but the Feeling Anxiety sub-factor scores decrease while Distinguishing Risky Behaviors, Supporting Children, and Parental Support factors are not affected.

Another finding of the study was that the relationship between PCSC scores and SATRPEC-PF sub-factors varied in terms of gender. While there was a significant relationship between girls' self-concept and SATRPEC-PF's Pro-beliefs sub-factor, Distinguishing the Risky Behaviors sub-factor and the Feeling Anxiety sub-factor, no significant relationship was found between Supporting Children and Parental Support sub-factors. In boys, no significant relationship was found in all sub-factors. The main reason why there is a significant difference between PCSC scores and SATRPEC-PF Pro-beliefs, Distinguishing Risky Behaviors, and Feeling Anxiety sub-factors for girls but not for boys may be the differences in society's approaches to boys and girls. In some societies, due to the patriarchal understanding, most of the boys have freedom in line with their wishes, while girls are thought to be less likely to be allowed by their parents because they grow up in an environment where they are overprotective and their wishes are met at a lower level than boys (Bahtiyar Saygan & Pekel Uludağlı, 2021; Uğurlu, 2022). At the same time, boys are more willing to take risks than girls (Ginsburg & Miller, 1982), and girls prefer to play with the guidance of their parents (Morrongiello & Lasenby, 2011). Sandseter, 2007; Sandseter & Kennair, 2011), and that girls prefer to play with the guidance of their parents (Morrongiello & Lasenby-Lessard, 2007). Girls raised in families that provide equal

opportunities and support to both male and female children tend to exhibit more positive development in their self-identity. This balanced approach, eschewing traditional gender biases, fosters an environment where girls are encouraged to explore their capabilities and interests freely. Such family dynamics contribute significantly to the nurturing of a well-rounded self-concept in girls, enabling them to cultivate their self-esteem and personal identity in a manner uninhibited by gender stereotypes (Li et al., 2022). However, since the number of such families is small, significant differences may emerge among girls (Kanyılmaz, 2016). According to the studies conducted by Bencik, 2006; Bosacki, 2007; Marsh et al., 2002; Wilgenbusch & Merrell, 1999, it is seen that children's self-perceptions differ in favor of girls according to gender, while there is no differentiation in boys. According to the result of the related study, the assumption that the attitudes of the parents in the region where the studies were conducted according to the meaning they attribute to male and female gender may be effective on children's self-perception is similar to the result of this study. Yukay Yüksel and Yıldırım Kurtuluş (2016), Algünerhan (2017), and Evirgen Geniş (2017) found that gender did not make a significant difference in self-concept in their studies. In their studies on the subject, Şeremet (2006) and Körükçü (2004) found that children's self-concept scores did not change significantly according to gender. Karaca and Aral (2017), as a result of their research, stated that children's self-concept did not differ according to gender. Again, Türkmen and Özbey (2018) revealed in their study that children's self-perceptions did not differ according to gender variable. The results of the related studies are similar to some of the findings in this study. However, it was concluded that there were significant differences in favor of girls in terms of gender in SATRPEC-PF Pro-beliefs, Distinguishing Risky Behaviors, and Feeling Anxiety sub-factors.

It is obvious that play is an important factor for all developmental areas of the child. It is an undeniable fact that games that contain risk at a level that does not cause security concerns can contribute positively to the child's feelings of curiosity, discovery, and self-confidence. As a result of the contributions provided by risky games, a positive self-concept will develop in the child. In this case, the role of parents is of great importance. Parents should provide the necessary opportunities and facilities to encourage risky play by aiming to develop a positive self-concept in their children (Cevher Kalburan, 2014).

Based on the study's findings, which explore the relationship between children's perceptions of risky play (SATRPEC-PF) and their self-concept (PCSC), along with gender considerations, several recommendations emerge. These include organizing educational initiatives like TV programs and courses to raise awareness among parents and teachers about the nuances of risky play. It's crucial to inform them about both the advantages and potential drawbacks of such activities to foster positive development in children. Moreover, the research indicates a need to explore further the impact of parental attitudes on children's self-concept, particularly in relation to risky play. This could involve a deeper investigation into how mothers' perceptions, especially their anxieties and beliefs about risky play, influence children's self-esteem and self-awareness. The study highlights that maternal anxiety about risky play significantly affects girls' self-concept, pointing to the importance of addressing parental concerns to support healthy child development. In light of the study's insights on children's perceptions of risky play, their self-concept, and gender dynamics, future research can delve into several key areas. This includes exploring how different cultural and socioeconomic contexts influence children’s attitudes toward risky play and their self-development. A longitudinal approach to studying the lasting effects of parental attitudes and support on children’s growth would be valuable. Further, examining the role of educational environments in shaping these perceptions and investigating gender-specific strategies to enhance children's self-concept in relation to risky play could offer critical insights for educators and policymakers.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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: The study was conceptualized by F.N.Ç. and N.H.K., with Ü.Ü.K. developing the methodology. Validation was collaboratively performed by F.N.Ç., N.H.K. and Ü.Ü.K. Analysis was conducted by N.H.K and F.N.Ç. The manuscript was reviewed and edited by Ü.Ü.K while N.H.K. provided overall supervision.

Funding: This research received no funding.

Institutional Review Board Statement: The data collection process for this study involved obtaining necessary permissions and approvals, including Ethics Committee Approval (decision no: 2020/277) of Afyon Kocatepe University and permissions from the Directorate of National Education. The researchers initiated the application of the scales at the beginning of the Spring Semester of the 2020-2021 academic year.

Data Availability Statement: Data generated or analyzed during this study are available from the authors on request.

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

References

Adams, J. (2001). Risk. London: Routledge.

Algünerhan, R. (2017). 12-14 *Yaşındaki ergenlerde algılanan anne baba tutumları benlik algısı ve psikolojik sağlamlık.* (Yayımlanmamış Yüksek Lisans Tezi). Nişantaşı Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul.

Alisinanoğlu, F. (2003). Çocukların denetim odağı ile algıladıkları anne tutumları arasındaki ilişkinin incelenmesi. *Türk Eğitim Bilimleri*, *1*(1).

Alpar, R. (2012). *Uygulamalı istatistik ve geçerlilik-güvenirlik.* Ankara: Detay Yayıncılık.

Aydın, B. (2005). Çocuk ve ergen psikolojisi. Ankara: Nobel Yayıncılık.

Banko, Ç., Akdemir, K., Gemici-Koşar, M. ve Sevimli-Çelik, S. (2018). Çocuk oyun alanlarının risk içeren oyunları desteklemesi açısından incelenmesi. *İnönü Üniversitesi Eğitim Fakültesi Dergisi*, *19*(3), 406-417.

Bahtiyar Saygan, B., & Pekel Uludağlı, N. (2021). Yaşam boyu toplumsal cinsiyet rollerinin gelişimi. *Psikiyatride Güncel Yaklaşımlar - Current Approaches in Psychiatry*, *13*(2), 354-382. https://doi.org/10.18863/pgy.789615

Ball, D. J. (2002). Playgrounds–risks, benefits and choices. health and safety executive (hse) contract research report. Middlesex University, London, UK. https://www.hse.gov.uk/research/crr_pdf/2002/crr02426.pdf

Baran, G. (1999). *Korunmaya muhtaç çocuk ve benlik kavramı*. Ankara: Yaysan Matbaacılık.

Bee, H. & Boyd, D. (2009). Çocuk Gelişim Psikolojisi (Gündüz, O, Çev.). İstanbul: Kaknüs Yayınları.

Bencik, S. (2006). *Üstün yetenekli çocuklarda mükemmeliyetçilik ve benlik algısı arasındaki ilişkinin incelenmesi*. (Yayımlanmamış Yüksek Lisans Tezi). Hacettepe Üniversitesi Sağlık Bilimleri Enstitüsü, Ankara.

Bosackı, L. S. (2007). Children‘s understandings of emotions and self: are there gender differences? *Journal Research in Childhood Education, 22*(2), 155-172.

Boyer, T. W. (2006). The development of risk-taking: A multi-perspective review. *Developmental review*, *26*(3), 291-345.

Brussoni, M., Gibbons, R., Gray, C., Ishikawa, T., Sandseter, E., Bienenstock, A., Chabot, G., Fuselli, P., Herrington, S., Janssen, I., ... & Tremblay, M. S. (2015). What is the relationship between risky outdoor play and health in children? a systematic review. *International Journal of Environmental Research and Public Health, 12*(6), 6423–6454.

Bulut, Z. ve Kılıçaslan, Ç. (2009). Çocuğa öz güven kazandırmada önemli bir ilke; çocuk oyun alanlarında güvenlik. *Artvin Çoruh Üniversitesi Orman Fakültesi Dergisi,* 10(1), 78-85.

Bundy, A. C., Luckett, T., Tranter, P. J., Naughton, G. A., Wyver, S. R., Ragen, J. & Spies, G. (2009). The risk is that there is no risk: a simple, innovative intervention to increase children‘s activity levels. *International Journal of Early Years Education*, *17*(1), 33-45.

Büyüközturk, Ş, Kılıc Cakmak, E., Akgun, O. E., Karadeniz, Ş, & Demirel, F. (2018). *Bilimsel araştırma yöntemleri*. Pegem.

Bütüner, S. O. (2008). Kitap incelemesi sosyal bilimler için veri analizi el Kitabi. *İlköğretim Online, 7*(1), 6-8.

Cevher, F. N. ve Buluş, M. (2006). Okul Öncesi eğitim kurumlarına devam eden 5-6 yaş çocuklarında akademik benlik saygısı. *Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi Dergisi*, (20), 28-39.

Cevher-Kalburan, N., & Yurt, Ö. (2011). *School playgrounds as learning environ- ments: early childhood teachers‘ beliefs and practices*. Paper Presented at the 7th Interna- Tional Conference on Education, INEAG, Samos-Greece.

Cevher-Kalburan, N. (2014). Okul öncesi dönem çocuklarının dış mekânda oyun fırsatları ve ebeveyn görüşleri. *Sosyal Politika Çalışmaları Dergisi, 32,* 113-135.

Christensen, L. B., Johnson, R. B. & Turner, L. A. (2015). *Araştırma yöntemleri desen ve analiz* (Aypay, A, Çev.). Ankara: Anı Yayıncılık.

Cohen, L., & Manion, L. (1998). *Research methods in education*. London: Routledge.

Creswell, J. W. (2005). *Educational research: planning, conducting, and evaluating quantitative and qualitative research.* New Jersey: Pearson Prentice Hall.

Cüceloğlu, D. (1997). *İçimizdeki çocuk.* İstanbul: Remzi Kitapevi.

Demoulin, D. F. (2000). I like me: enchancing self concept in kindergarten age children through active school / business partnerships. *NASP Communique, 27*(8), 14-26.

Edgington, M. (2007). *Supporting young children to engage with risk and challenge*. Early Years Update, May. http:// www.Teaching expertise .com/articles/supporting- young- children-toengage- with- risk- and- challenge- 2089.

Erbay, F. ve Saltalı, N. (2012). Altı yaş çocuklarının günlük yaġantılarında oyunun yeri ve annelerin oyun algısı. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi, 13*(2), 249-264.

Erden, Ş. (2001). *Anaokullarına devam eden çocukların ebeveyn ve öğretmenlerin çocuk oyun ve oyuncakları hakkındaki görüşlerinin incelenmesi*. (YayımlanmamıĢ Yüksek Lisans Tezi). Ankara Üniversitesi Sosyal Bilimler Enstitüsü, Ankara.

Erikson, E. H. (1985). *The life cycle completed*. New York: Norton.

Erşan, Ş. (2006). *Okul öncesi eğitim kurumlarına devam eden altı yaş grubundaki çocukların oyun ve çalışma (iş) ile ilgili algılarının incelenmesi*. (Yayımlanmamış Yüksek Lisans Tezi). Gazi Üniversitesi Sosyal Bilimler Enstitüsü, Ankara.

Evirgen Geniş, N. (2017). *Okul öncesi dönem çocuklarında bağlanma ve benlik algısı arasındaki ilişkinin incelenmesi*. (Yayımlanmamış Yüksek Lisans Tezi). Karabük Üniversitesi Sağlık Bilimleri Enstitüsü, Karabük.

Gagnon, S. G. & Nagle, R. J. (2004). Relationships between peer interactive play and social competence in at-risk preschool children. *Psychology in the Schools, 41*(2), 173-189.

Gill, T. (2010). *Putting risk in perspectives. Early years update*. http://www.teachingexpertise.com/articles/putting-risk-perspective-10522

Ginsburg, H. J., & Miller, S. M. (1982). Sex differences in children's risk-taking behavior. *Child Development, 53*(2), 426–428. https://doi.org/10.2307/1128985

Gleave, J. & Cole-Hamilton, I. (2012). A world without play: a literatüre review. http://www.playengland.org.uk/media/371031/a-world-without playliterature- review-2012.pdf

Greenfield, C. (2004). _Can run, play on bikes, jujump thezoom slide, and play on the swings‘: exploring the value of outdoor play. *Australian Journal of Early Childhood 29*(2), 1–5.

Güler, B. Ş. ve Demir, E. (2016). Okul Öncesi Öğretmenlerinin Riskli Oyunlara Yönelik Görüş ve Algıları. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Özel Eğitim Dergisi, 17*(2), 97-116.

Hampton, V. R., Fantuzzo, J. W. & Manz, P. H. (1999). ―Assessing interactive play in early childhood: penn interactive peer play scale. Nhsa Dialog: A Research-to- practice. *Journal for the Early Intervention Field, 3*(1), 70-72.

Heppel, G. (2013). Risk assessment not risk-aversion. *Belonging Early Years Journal*, 14–17.

Herrington, S., & Nicholls, J. (2007). Outdoor play spaces in Canada: The safety dance of standards as policy. *Critical Social Policy, 27*, 128–138.

Kandır, A. (2000). Okul öncesi dönemde oyun ve oyuncaklar. *Gazi Üniversitesi Mesleki Eğitim Dergisi*, (4), 77-80.

Kanyılmaz, E. S. (2016). *Riskli oyuna izin verme ölçeğinin geliştirilmesi ve annelerin riskli oyuna izin verme düzeylerinin incelenmesi*. (Yayımlanmamış Yüksek Lisans Tezi). Mehmet Akif Ersoy Üniversitesi Eğitim Bilimleri Enstitüsü, Burdur.

Karaca, N. H., & Aral, N. (2017). Yaratıcı rahatlama çalışmalarının anaokuluna devam eden çocukların benlik kavramı ve motor yaratıcılığına etkisinin incelenmesi. *Kuramsal Eğitimbilim Dergisi*, *10*(1), 146-169.

Karaca, N. H., & Uzun, H. (2020). Okul öncesi öğretmenleri için erken çocukluk riskli oyun değerlendirme aracı-öğretmen formunun geliştirilmesi. *Fırat Üniversitesi Sosyal Bilimler Dergisi, 30(*2), 247-258.

Kleppe, R., Melhuish, E., & Sandseter, E. B. H. (2017). Identifying and characterizing risky play in the age one-to-three years. *European Early Childhood Education Research Journal, 25*, 370–385.

Knight, S. (2012). Why adventure and why risk in the early years. *Child Links*, *3*, 15-18.

Körükçü Ö. S. (2004). *6 yaş grubundaki çocukların öz saygı düzeyleri ile anne empatik becerilerinin incelenmesi*. (Yayımlanmamış Yüksek Lisans Tezi). Ankara Üniversitesi Fen Bilimleri Enstitüsü, Ankara.

Lavrysen, A., Bertrands, E., Leyssen, L., Smets, L., Vanderspikken, A., & De Graef, P. (2017). Risky-play at school. Facilitating risk perception and competence in young children. *European Early Childhood Education Research Journal, 25*, 89–105.

Li, H. (2022). Self-identity development for young children in the high scope curriculum-based on a case study of j kindergarten in shenyang. *Applied & Educational Psychology, 3*(4), 53-60.

Li, Y., Zuo, M., Peng, Y., Zhang, J., Chen, Y., Tao, Y., Ye, B., & Zhang, J. (2022) Gender differences influence gender equality awareness, self-esteem, and subjective well-being among school-age children in China. *Front. Psychol.* 12,671785. https://doi.org/10.3389/fpsyg.2021.671785

Little, H. (2006) Children‘s risk-taking behaviour: implications for early childhood policy and practice. *International Journal of Early Years Education, 14*(2), 141-154.

Little, H. & Wyver, S. (2008). Outdoor play: does avoiding the risks reduce the benefits? *Australian Journal of Early Childhood*, 33(2), 33-40.

Little, H. & Eager, D. (2010). Risk, challenge and safety: implications for play quality and playground design. *European Early Childhood Education Research Journal*, 18(4), 497-513.

Little, H. (2010). *Finding the balance: early childhood practitioners‘ views on risk, challenge and safety in outdoor play settings.* Australian Association for Research in Education Conference Proceeding, Howard : Deakin, ACT: AARE.

Liu, J., & Birkeland, Å. (2022). Perceptions of risky play among kindergarten teachers in Norway and China. *International Journal of Early Childhood, 54*(3), 339-360.

Marsh, H. W., Ellıs, L. A. & Craven, R. G. (2002). How do preschool children feel about themselves? unraveling measurement and multidimensional self-concept structure. *Developmental Psychology, 38*(3), 376-393.

Moralı, D. Ş. (2019). *Anaokullarında sunulan riskli oyun fırsatlarının fiziksel özellikler ve yetişkin yaklaşımları bağlamında incelenmesi*. (Yayımlanmamış Yüksek Lisans Tezi). Pamukkale Üniversitesi Eğitim Bilimleri Enstitüsü, Denizli.

Morrongiello, B. A. & Lasenby-Lessard, J. (2007). Psychological determinants of risk taking by children: an integrative model and implications for interventions. *Injury Prevention, 13*(1), 20-25.

Oktay, A. (1999). *Yaşamın sihirli yılları: okul öncesi dönem*. İstanbul: Epsilon Yayınları.

Piaget, J. (1962). *Play, dreams, and imitation in childhood*. New York: Norton.

Rubin, K., Fein, G. & Vandenberg, B. (1983). Play. In Mussin, P. (Ed), pp. 694-774. *Handbook of Child Psychology*, New York: John Wiley and Sons.

Sandseter, E. B. (2007). Categorising risky play—how can we identify risk- taking in children's play?. *European Early Childhood Education Research Journal, 15*(2), 237-252.

Sandseter, E.B.H. (2009). Characteristics of risky play. *J. Adventure Educ. Outdoor Learn, 9*, 3–21.

Sandseter, E. B. H. (2010). *Scaryfunny: A qualitative study of risky play among preschool children.* (Philosophiae Doctor), Norwegian University of Science and Technology, Trondheim.

Sandseter, E. B. H. & Kennair, L. E. O. (2011). Children's risky play from an evolutionary perspective: the anti-phobic effects of thrilling experiences. *Evolutionary Psychology, 9*(2), 257-284.

Sandseter, E. B. H., Ball, D. J., Brussoni, M., Little, H., & Eager, D. (2017). *Risk and safety in outdoor play*. In The SAGE Handbook of Outdoor Play and Learning. SAGE: London, UK.

Sandseter, E. B. H., Cordovil, R., Hagen, T. L., & Lopes, F. (2020). Barriers for outdoor play in early childhood education and care (ECEC) institutions: Perception of risk in children’s play among european parents and ECEC practitioners. *Child Care in Practice, 26*, 111–129.

Sando, O. J., Kleppe, R., & Sandseter, E. B. H. (2021). Risky play and children’s well-being, involvement and physical activity. *Child Indicators Research, 14*, 1435–1451.

Sicim Sevim B., & Bapoğlu Dümenci S. S. (2019). Çocukların riskli oyunla ilgili algıları ile ebeveyn tutumları arasındaki ilişkinin incelenmesi. *Uluslararası Erken Çocukluk Eğitimi Çalışmaları Dergisi, 5*(1), 1-15.

Spiegal, B., Gill, T. R., Harbottle, H., & Ball, D. J. (2014). Children’s play space and safety management: Rethinking the role of play equipment standards. *SAGE Open*, *4*(1), 2158244014522075.

Stephenson, A. (2003). Physical risk-taking: dangerous or endangered? *Early Years, 23*(1), 35-43.

Şeremet, Ö. E. (2006). *Okul öncesi dönemi çocuklarının (5-6 yaş) kendilik algılarının çeşitli değişkenlere göre incelenmesi.* Yayınlanmamış Yüksek Lisans Tezi, Marmara Üniversitesi, Eğitim Bilimleri Enstitüsü, İstanbul

Tovey, H. (2007). *Playing outdoors: spaces and places, risk and challenge*. Maidenhead: Open University Press.

Tremblay, M. S., Gray, C., Babcock, S., Barnes, J., Bradstreet, C., Carr, D., Chabot, G., Choquette, L., Chorney, D., Collyer, C., et al. (2015). Position statement on active outdoor play. *International Journal of Environmental Research and Public Health, 12*(6), 6475–6505.

Türkmen, S. ve Özbey, S. (2018). 60-72 aylık okul öncesi dönem çocuklarının benlik algılarının bazı değişkenler ve motivasyon düzeyi ile ilişkisinin incelenmesi. *Social, Mentality And Researcher Thinkers Journal, 4(*12), 606-620.

Uğurlu, Z. (2022). Toplumsal cinsiyete dayalı şiddetin çocuğa yansıması: çocuk istismarı. *Türkiye Sosyal Hizmet Araştırmaları Dergisi, 6*(2), 160-174. https://doi.org/10.55109/tushad.1220677

Villa, A., & Auzmendi, E. (1992). *Medicion del autoconcepto en la edad infantil 5-6 anos (Measuring self-concept in early childhood 5-6 years)*. Bilbao: Mensajero.

Wılgenbusch, T. & Merrell, K. W. (1999). Gender Differences in self concept among children and adolescent: a meta analysis of multidimensional studies. *School Psychology Quarterly, 14*(2), 101-120.

Willoughby, M. (2012). The value of providing for risky play in early childhood settings. *Childlinks*, 3, 7-10.

Yavuzer, H. (2007). *Çocuğu tanımak ve anlamak* (6. Baskı). İstanbul: Remzi Yayınları.

Yukay Yüksel, M. ve Yıldırım Kurtuluş, H. (2016). Okul öncesi dönemdeki 4-5 yaş grubu öğrencilerin benlik kavramı ve bağlanma stillerinin anne davranışları açısından güncellenmesi. *Eğitim ve Öğretim Araştırmaları Dergisi, 5*(2), 182-195.

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

A Comprehensive Review of Technological Pedagogical Content Knowledge (TPACK)

Tuğçe Karaduman[1] Berrin Akman[2]

To cite this article:
Karaduman, T. & Akman, B. (2024). A Comprehensive review of technological pedagogical content knowledge (TPACK)**.** *e-Kafkas Journal of Educational Research*, *11*, 141-159. doi:10.30900/kafkasegt.1282126

Research article **Received: 12.04.2023** **Accepted: 22.04.2024**

Abstract

This systematic review, encompassing 36 studies, investigates the Technological Pedagogical Content Knowledge (TPACK) framework within diverse educational settings. A PRISMA method was followed to carry out the systematic review. The majority of the reviewed studies focus on pre-service and in-service teachers, highlighting the multifaceted nature of TPACK research. A comprehensive analysis considers demographic variables, technology-related elements, and methodological approaches, revealing a spectrum of methodologies, characteristics, and emerging patterns. Predominantly, non-probability sampling methods were featured in the reviewed studies, indicating a call for standardized sampling techniques to facilitate cohesive comparisons and comprehensive synthesis of findings. The findings suggest that future research should prioritize developing well-defined research questions and data management practices to ensure the accuracy and reliability of the findings. Furthermore, future studies should continue to explore the complex relationships between TPACK and various aspects of instructional practices, as well as the potential impact of TPACK on student learning outcomes. By building on these findings and employing rigorous research methods, future studies can continue to advance our understanding of the role of TPACK in shaping effective instructional practices, ultimately contributing to the improvement of teaching and learning in the digital age. However, the study's focus on articles published in journals hosted by ULAKBIM and conducted in Turkey, as well as the exclusion of non-empirical research, may have limited the generalizability of the findings to other contexts and populations. Additionally, the lack of explicit information on data cleaning procedures and the presence of missing data from the studies reviewed might affect the accuracy and reliability of the findings.

Keywords: TPACK, Education, Teacher Education, Systematic Review.

[1] Corresponding Author, tskaraduman@gmail.com, Hacettepe University

[2] Author, Hacettepe University

Introduction

Technological Pedagogical Content Knowledge (TPACK) stands as a critical framework within the realm of educational research, profoundly impacting instructional practices across diverse educational contexts. This systematic review embarks on a comprehensive exploration of TPACK's multifaceted nature, aiming to dissect its implications for both pre-service and in-service educators. The purpose of this review is to demonstrate insights from empirical studies delving into the complex intersections of technology, pedagogy, and content knowledge. Drawing from these studies, our endeavor is to summarize the effects of TPACK on instructional practices and educational outcomes. This introduction aims to provide a summarized overview of the text, emphasizing the comprehensive nature of the review and the focus on empirical studies. Throughout this exploration, particular emphasis will be placed on the empirical studies' backgrounds, targeted to offer a nuanced understanding of the contextual factors shaping TPACK's implementation and impact within different educational environments. By grounding this review in empirical evidence, it aims to outline the intricate connections between TPACK and effective instructional methodologies, showing the way for informed advancements in teaching and learning paradigms.

In today's fast-developing technology, daily life is affecting every field, including education. Technology has become an important aspect of enhancing learning for today's students (Horne, 2010). In this age of information, not only the availability but also the necessity of various technologies must be taken very seriously. Despite the potential risks of technology for young children, educators believe that by crafting developmentally appropriate activities within technology-driven environments, they can offer a diverse range of positive learning opportunities for young learners (Keengwe & Onchwari, 2009). Wang and Hoot (2006) observe a shift among early childhood educators, noting that educators have moved beyond the basic inquiry of whether technology suits young children's development. Instead, their focus has shifted towards exploring how information and communication technology can be optimally utilized to support and enhance children's learning and growth. The potential impact of educational technology on early education can be substantial, yet its actual realization hinges on the specific choice of technology and the manner in which it is employed (Saracho, 2019). In light of these, the studies suggesting the positive effects of technology use in early childhood on cognitive development, as well as social learning shows that the issue is needed to be addressed at younger ages (Clements, 1994; Clements & Sarama, 2002, 2003). Furthermore, it is claimed that the technology usage in education creates a more productive learning environment than the traditional methods (Morrison & Lowther, 2010). To provide children with the opportunity to achieve their greatest potential, teachers can leverage various technologies. By captivating student interest and organizing learning within a technology-rich environment, students can benefit from a developmentally appropriate learning style. However, simply introducing technology into the classroom isn't sufficient to encourage learning by and with the technology.

The goal of educators might be to include existing technologies in education for a more productive way of learning. A theory in instructional design and technology that specifically underscores the importance of establishing connections between elements of a new concept and linking that concept with students' prior knowledge is generative learning theory (Grabowski, 2003). Generative learning theory emphasizes the students' active role in the process of constructing knowledge. Although, teachers are expected to use educational technology effectively, for the improvement of learning and teaching; technology must be used effectively (Fisher & Waller, 2013). From an instructional design perspective, activities that promote generative learning offer principles for educators to create learning environments that consider both learning and instructional strategies (Wang & Hoot, 2006). There are studies that show teachers are aware of technological advancements and their use in the classroom. Wang (2020) says that the use of technology in the classroom has increased by 363% from 2010 to 2017. In 2010, the number of technological devices used in class was 3 million, while in 2017 it has risen up to 14 million (Bushweller, 2017). In addition to this, it is founded that teachers are aware of technological progress and classroom necessity. It is claimed that 74% of the teachers participating in the study used technology to support teaching-learning processes and knowledge transfer and to increase learning motivation (Murray, 2017). Although it is said that teachers use technology mainly to prepare lesson plans and web-based games, it is understood that teachers accept technology as a supportive element.

It is expectable teachers can see technology as a facilitator tool. However, there may also be some negative consequences of technology use. In this context, teachers are required to be careful not to let the time spent in front of screens reach a level that threatens the health of students (Scoggin & Vander Ark, 2018). This requires a certain amount of technological "pre-knowledge" for a teacher to integrate the technology successfully in the educational process. This pre-knowledge, as expected, does not provide an effective result for the technology usage in education alone. Technological competence includes practical, conceptual (Wilson et al., 2020) and technological knowledge necessary to effectively teach a subject, concept or theme. This corresponds to the term of technological pedagogical content knowledge (TPACK). Due to the increase in the use of technology in education, the role of technological, pedagogical and content knowledge (TPACK) in supporting effective teaching and learning has attracted interest of the researchers. However, it's proposed that teachers' proficiency in TPACK may not fully account for effective technology-integrated instruction. The TPACK model has undergone recent updates to incorporate research-supported findings, now including XK (Contextual Knowledge) to highlight the importance of contextual elements within the framework (Mishra, 2019).

The field of Technological Pedagogical Content Knowledge (TPACK) encompasses three main areas: content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK). The interactions between these three areas result in Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), and Technological Pedagogical Knowledge (TPK). The concept of TPACK is formed by the integration of these three concepts (Mishra & Koehler, 2006). Technological knowledge refers to understanding the capabilities and limitations of different technologies, as well as how to use them effectively. Pedagogical knowledge refers to understanding teaching and learning theories and practices, including how to design and implement effective instruction strategies. Content knowledge refers to understanding the concepts, facts, and skills related to a specific subject area (Shulman, 1986; 1987). Technological content knowledge directs to an understanding how technology can be used to support and enhance teaching and learning within a specific subject area. TPACK knowledge refers to understanding how technology might be used to generally support and enhance teaching and learning. Pedagogical content knowledge links to understanding how to effectively teach and assess content within a specific subject area. Technological Pedagogical Content Knowledge (TPACK) represents the integration of all of these components and represents the knowledge and skills needed to effectively use technology to support teaching and learning (Koehler & Mishra, 2008).

In general terms, TPACK provides a useful framework for teachers to understand how technology, instruction, and content knowledge can be integrated to support the complex and interconnected nature of teaching and learning. TPACK is an important concept in education, particularly in the context of early childhood education. TPACK represents the knowledge and skills that teachers require to effectively integrate technology into their teaching and learning practices. It includes understanding how to use technology to support the learning goals and objectives of the curriculum, as well as how to use technology to effectively teach and engage students. Studies that attempt to explain TPACK suggest that it is the interaction of these components that make it important for teacher education and professional development.

There are several reasons why TPACK is important in education. Technology has increasingly become prevalent in society and a part of daily life (Schwab, 2017). Especially, there has been an increased inclination towards technology, exacerbated by the Covid-19 pandemic that affected the entire world (Venkatesh, 2020). As children are growing up in a digital world, so it is important to support them in using technology in a conscious, controlled, and effective way. A recent OECD report highlighting the aftermath and effects of Covid-19 on education and learning found that most students feel adept at utilizing educational technologies. Around 75% expressed confidence in using systems like online learning platforms and video conferencing tools across the OECD member countries. Yet excessive technology used for leisure may negatively impact academic performance. Specifically, the data shows that students concentrating on devices during math lessons scored 15 points lower than those less distracted by technology, while one hour daily of technology usage for learning related activities resulted in 14 points increase in math scores (OECD, 2023). By teaching children how to use technology as a learning and communication tool, they can develop the skills they need to be successful in the modern world (Bulger et al., 2018; CDW, 2022). It is also claimed that TPACK can make contributions to the

education process from different angles (Koehler & Mishra, 2009). When children have chance to practice and access to technology in their learning, they can become more motivated and engaged in the learning process. Teachers can help students learn and develop in meaningful and engaging ways by using technology. To support the education of young children and integrate technology into teaching practices effectively, educators should develop their TPACK skills (Benson & Ward, 2020).

Furthermore, a significant trend involves the integration of artificial intelligence (AI) and adaptive learning technologies. This tendency reshapes traditional teaching methods, offering personalized and effective learning experiences by taking the pressure away from teachers to possess exhaustive knowledge, enabling them to dedicate more time to supporting students (Akgün & Greenhow, 2022). Wang et al. (2021) explored the implications of AI-driven adaptive learning revealing that educators incorporating these technologies reported a deeper understanding of student needs and refined instructional strategies. Adaptive learning tools facilitated real-time data analysis, empowering teachers to make informed decisions about content delivery and student interventions (Wang & Zhao, 2020). Another study emphasizes the significance of teachers possessing not only technological knowledge (TK) but also a deep understanding of the pedagogical benefits and ethical implications associated with AI integration in education. It advocates for a more holistic approach, proposing an evolved framework named Intelligent-TPACK, which integrates ethical considerations into the existing TPACK model to guide ethical integration of AI-based tools in education (Celik, 2023). As the integration of AI and adaptive learning technologies in TPACK studies represents a significant shift in educational paradigms, emphasizing the role of technology in personalizing learning experiences gains more importance. By analyzing AI curricula and resources, the findings emphasize that K-12 teachers teaching AI necessitate TPACK for constructing, preparing environments, and facilitating project-based classes centered on problem-solving with AI technologies.

Regarding the rising numbers of research carried out about TPACK in literature, TPACK has its place in Turkish research in the scope of education. This particular study would provide an in-depth analysis off existing research on the framework, its impact on both teacher education and teaching practices, learning outcomes of the students. The article would synthesize the existing literature on TPACK to identify the gaps in the literature. This would allow us to suggest recommendations for future studies and practices about TPACK.

Theoretical Background

The growing focus on incorporating technology into education has spurred the creation of the Technological Pedagogical Content Knowledge (TPACK) framework. This framework aims to address the intersection of technological, pedagogical, and content knowledge, and their interplay in the educational context. It focuses on supporting effective teaching and learning practices. This framework highlights the importance of teachers' understanding of how to seamlessly incorporate technology into their instruction. However, possessing TPACK alone does not guarantee successful teaching; self-efficacy also plays a vital role in enhancing a teacher's ability to use technology effectively and improve student outcomes (Mishra & Koehler, 2006).

Self-efficacy, as theorized by Albert Bandura (1986), refers to an individual's confidence in their capabilities to successfully complete a task or achieve a goal. It is a primary driver of motivation and behavior and can influence an individual's perceived control over their environment and available resources. High self-efficacy has been associated with greater persistence in overcoming challenges and achieving objectives (Bandura, 1997). In the context of teaching, a teacher's belief in their capacity to effectively use technology is an example of self-efficacy.

Bandura's social cognitive theory (1986; 1997) posits that individuals actively shape their own learning by engaging with or ignoring the situations they encounter. This approach differs from behaviorism, which emphasizes only environmental influences on learning. Bandura (1997) contends that individuals also contribute to their environment and the learning experiences of others.

TPACK has become a popular and effective framework for describing technology integration in education since its introduction by Mishra and Koehler (2006). While some researchers have criticized the framework (Cox & Graham, 2009; Bowers & Stephens, 2011), others have explored its application in specific subject areas, such as science education (Sheffield et al., 2015). The practical implications of

TPACK remain a topic of interest, especially given the increased reliance on distance education during the pandemic (Harris & Hofer, 2011; Yeh et al., 2021).

Recent studies have investigated various aspects of TPACK, including its relationship with teacher performance (Tosuntas et al., 2021), the impact of microteaching practices on TPACK development (Mutlu et al., 2019), and its relevance to early childhood education (Altun, 2019). However, systematic analyses of TPACK research have highlighted areas that require further investigation, such as the need for longitudinal studies on teachers' actual application of TPACK in practice (Moreno et al., 2019) and the development of more diverse measurement techniques for assessing TPACK (Yigit, 2014). Additionally, some studies have explored the assessment of TPACK (Abbitt, 2011; Archambault, 2010; Chai et al., 2013), while others have employed case studies to gain deeper insights into the TPACK framework and its implementation (Mouza & Krachmer-Klein, 2013; Tai & Crawford, 2014).

In conclusion, the TPACK framework, self-efficacy, and social cognitive theory provide valuable perspectives on the integration of technology in education. Further research on these topics, particularly on the practical implications and assessment of TPACK, will contribute to a deeper understanding of how to effectively use technology to enhance teaching and learning.

Significance of the Research

The significance of this partial replication and systematic review study lies in its potential to provide an updated, comprehensive, and unbiased understanding of the current state of knowledge on the specific topic under investigation. By extending the analysis to more recent publications and employing supplementary tools for a thorough assessment, this research offers valuable insights that can inform decision-making processes and guide future research. Furthermore, the study's methodological adaptations not only validate the robustness of the initial results but also contribute new perspectives and insights to the existing body of knowledge. Ultimately, the findings of this study will serve as a solid foundation for researchers, practitioners, and policymakers seeking to advance the field and address emerging challenges and opportunities.

Moreover, utilizing journal review rubrics and concentrating on empirical research with primary data will reinforce the study's findings' rigor and strength. The implementation of random sampling in this study will help to ensure that the conclusions are representative of the broader population of pertinent articles, thus enhancing the applicability of the results.

This research will provide helpful insights for educators, policymakers, and researchers by summarizing the current state of knowledge on TPACK and identifying potential avenues for future exploration. By building upon the work of the original authors and integrating novel methodological approaches, this study holds the potential to significantly enrich our knowledge of TPACK and its practical implementations in the continuously evolving educational environment.

Method

This research is a partial replication and systematic review study that aims to systematically and comprehensively define, evaluate, and synthesize existing research on TPACK. Systematic reviews are designed to minimize bias and provide a detailed overview of evidence on a specific topic (Petticrew & Roberts, 2006). They offer a comprehensive summary of information that serves as a valuable resource for decision-making. To conduct a systematic review, researchers implemented the PRISMA methodology which involves: defining inclusion and exclusion criteria for study selection, conducting a comprehensive search of literature, assessing quality and relevance of identified studies, extracting and synthesizing findings, and discussing the evidence-based results (Moher et al, 2009). This research utilizes the framework from Baran and Canbazoğlu-Bilici (2015) as a foundation while incorporating modifications and additions to further explore and build upon their initial work.

This research is a partial replication and systematic review study that aims to systematically and comprehensively define, evaluate, and synthesize existing research on TPACK or research question while building upon the methodology outlined in Baran and Canbazoğlu-Bilici (2015). The rationale for this approach is to validate and expand upon the original findings by adapting certain aspects of the initial work. This allows for contributing new insights to the existing body of knowledge while assessing the robustness of the original results.

Our study differs from the original work (Baran & Canbazoğlu-Bilici, 2015) in several ways including selection criteria:

1. Due to the increased number of publications, we employed a random sampling technique to select a subset of articles for analysis, unlike the original authors who worked with the entire population of relevant articles.
2. Our research does not emphasize distinction of transformative and integrative models of TPACK.
3. The analysis focuses on journal articles published between 2014 and 2022, as opposed to the original study, which examined articles published from 2005 to 2013.
4. The population includes only the articles published in journals hosted by ULAKBIM and those conducted in Turkey.
5. The study includes only empirical research that utilizes primary data.

These methodological differences have been carefully considered and implemented to offer a fresh perspective on the original findings while acknowledging the contributions of the original authors. By incorporating these adaptations and refining the methodology, this research is expected to provide a more robust evaluation of the current state of knowledge on the topic and contribute valuable insights for future research.

Study Inclusion and Exclusion Criteria

Screening process was carried out by two researchers and study eligibility were determined through three stages (See Table 1; Moher et al., 2009).

Table 1.

Article Screening Process.

Screening Stage	Frequency of Articles (f)	Percentage of Screened Articles (%)
Title	228	100%
Title & Abstract	172	75%
Full Text	36	16%

The initial stage was to query ULAKBIM database. It has been reviewed several TPACK review studies to determine search terms (Baran & Canbazoğlu-Bilici, 2015; Voogt et al. 2013; Yeh et al., 2021; Yılmaz & Bal, 2022). The final searching keywords were "technological pedagogical content", "technological pedagogical content knowledge", "teknolojik pedagojik", "teknolojik pedagojik alan", "tpab", "tpack", and "tpck". The results were limited to the articles whose abstracts include above mentioned search terms. The year range was between 2014 and 2022. All the search results were joined and in total 810 articles have been founded. After removing duplicates 228 articles remained. Of these, 203 articles were within the scope of education and/or teaching. Then the authors created selection criteria:

1. Data source was in Turkey.
2. It was an empirical study using primary data. All kinds of review studies were excluded.
3. The focus was on in-service and/or pre-service teachers.
4. The purpose of the study was related to TPACK.

Selection criteria yielded 172 results. The abstracts of all of these articles screened by two researchers and the researchers arrived on a consensus to determine to select 159 articles. In order to examine all of the articles comprehensively, the researchers decided to decrease the number of the screened articles. For that purpose, the researchers randomly select 36 articles for systematic review. In statistics, a common percentage used for random sampling is 5% (Cochran, 1977). In the case of selecting only five percent of the population, it's possible that this sample may not be large enough to accurately capture the variability of the population. For instance, in similar studies 30-40 articles are included. To be relevant to existing literature, nearly 20% of the articles are included in the study (See Figure 1).

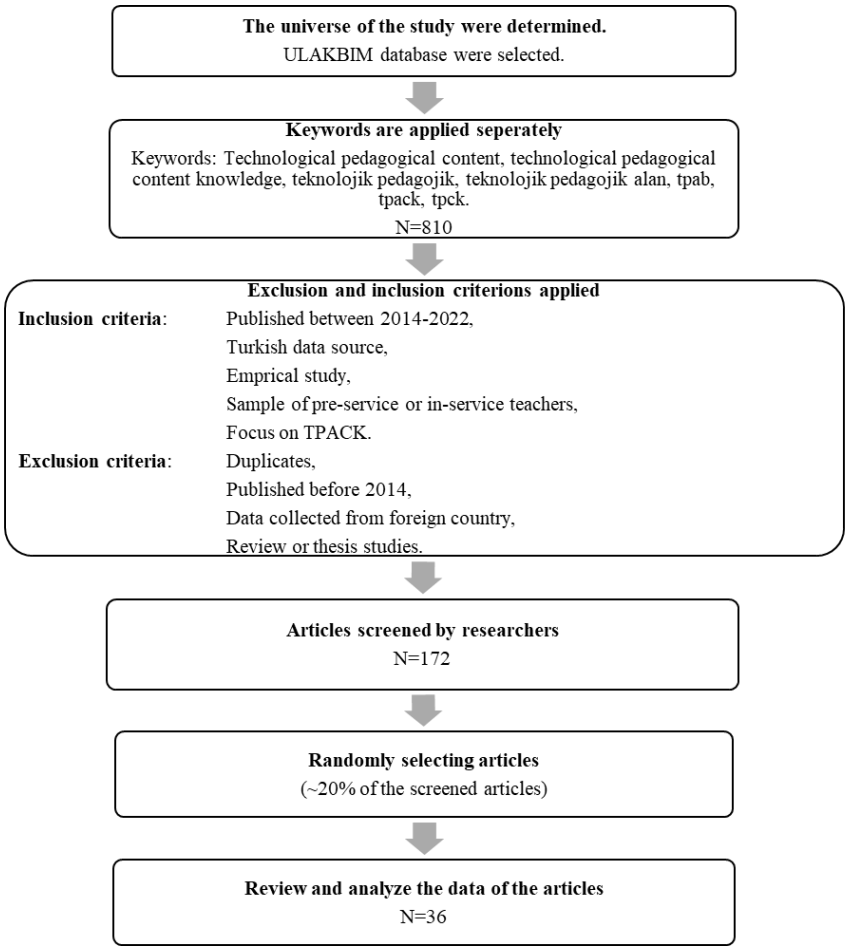


Figure 1. Article Selection Process

Literature Analysis

The articles were analyzed using content analysis method which was determined to be suitable for the study criteria. A classification method was prepared by examining the relevant research in the field (Petticrew & Roberts, 2006). After this classification, a descriptive analysis was conducted. Descriptive content analysis is a type of literature review that systematically evaluates research in a research field in order to describe tendencies and results (Suri & Clarke, 2009).

The researchers developed an analytical framework for analyzing articles. Then, the researchers read all articles and created a preliminary coding scheme, which was refined by another researcher after reviewing two articles to ensure trustworthiness. The coding finalized by negotiating until reaching a complete consensus. The contents were summarized according to the categories and subcategories as shown in the Table 2.

Table 2.

Article Analysis Categories

Sampling	Method	Data Analysis
Study group	Research questions	Demographic variables
Sample size	Research design	Data cleaning
Sampling method	Data collection tools	Outcome measure
	Explanation of measurement tools	

After examining each article thoroughly, the details were entered into an MS Excel spreadsheet. The researchers merged their examinations and conducted cross-comparisons between examined similarities

and differences. Data reporting was completed by using tables and figures to present findings rather than any statistical analysis due to the nature of research methodology employed for the study.

Research Questions

1. What are the characteristics of the study groups in the existing literature on TPACK and instructional practices across different subject areas and educational contexts?
2. How do the research methodologies, tools, and scales employed in the studies on TPACK and instructional practices differ, and what are the trends and patterns observed in the use of these methods and tools?
3. How do demographic factors and technology-related variables feature in the studies on TPACK and instructional practices, and what is the extent of their consideration and analysis in these studies?
4. What are the sampling techniques and sample sizes used in the studies on TPACK and instructional practices, and how do they influence the outcomes and generalizability of the findings?
5. How do the studies on TPACK and instructional practices address missing data and data cleaning procedures, and what are the implications for the accuracy and reliability of their findings?
6. What are the study contexts and outcomes investigated in the existing literature on TPACK and instructional practices?

Findings

This section presents the findings from a comprehensive review of 36 studies focusing on the Technological Pedagogical Content Knowledge (TPACK) framework and instructional practices in different educational contexts. The findings provide insights into the various study groups, research methodologies, tools and scales employed, as well as the handling of missing data, study contexts, and outcomes. The objective of this chapter is to shed light on the different approaches, characteristics, and trends observed in the reviewed studies, offering a detailed understanding of the current state of research on TPACK and instructional practices.

Study Group

Table 3.

Distribution of study groups by subject area

Study Group	Frequency (f)	Percentage (%)
In service	17	47.22%
Multiple Groups	6	16.67%
Math	2	5.56%
ECE	2	5.56%
Elementary	2	5.56%
Science	2	5.56%
Physical Ed.	1	2.78%
Geography	1	2.78%
Chemistry	1	2.78%
Pre-service	18	50.00%
Science	6	16.67%
Multiple Groups	4	11.11%
Elementary	3	8.33%
Math	2	5.56%
ELT	1	2.78%
Geography	1	2.78%
Administrators	1	2.78%

As shown in Table 3, a total of 36 studies were examined. Among these studies, 18 collected data from pre-service teachers, 17 from in-service teachers, and 1 from school leaders. The majority of the in-service studies (n=6) gathered data from teachers across various subject areas, while the majority of the studies (n=6) conducted with pre-service teachers collected data specifically from science education teachers.

In the reviewed studies, various demographic factors were considered or mentioned. Approximately 61% of the studies focused on gender, while age was addressed in 22% of the studies, and experience was discussed in 14% of the studies. However, there were also 25% of the studies where demographic information was not provided or analyzed.

In addition to demographics, some studies explored internet usage (25%), computer use (33%), technology ownership (36%), and educational technology usage (8%). Many of these studies considered multiple factors together, such as internet usage, computer use, and technology ownership. However, it is worth noting that 25% of the studies did not delve into any of these aspects.

Overall, the demographic factors and technology-related variables in the reviewed studies varied, with some studies providing a more comprehensive view of the participants, while others were more limited in scope.

Study Design

The breakdown of the research methods, tools, and scales used in 36 studies is as follows: 16.67% (6 studies) used mixed methods, 13.89% (5 studies) were qualitative, and 66.67% (24 studies) were quantitative. Various tools and scales were employed, with some studies using multiple methods or tools. Graham et al. (2009) was referenced in 8 studies, while Sahin (2011) was used in 6 quantitative studies. Notably, 11.11% (4 studies) used semi-structured interviews. Some specific tools and scales, such as TPACK self-efficacy scale by Schmidt et al, (2009; 5 studies), TPACK SES scale by Horzum, Akgün, and Öztürk (2014; 2 studies), TPACK-EFL Survey, TPACK DEEP by Kabakci Yurdakul et al. (2012), and TSES by Tschannen-Moran and Woolfolk Hoy (2001) were also referenced by some studies. Furthermore, semi-structured interviews were employed as a secondary data collection tool in several studies, demonstrating its versatility in complementing other research methods. In addition to semi-structured interviews, other qualitative tools were employed, such as peer reflective discussion forums, focus group interviews, coding the class assignments and presentations and lesson plans.

Table 4.

Distribution of Referenced TPACK Scales

Scale Name	Year	Developer	Frequency (f)
TPACK Self Confidence Scale	2009	Graham et al.	8
TPACK Scale	2011	Sahin	6
TPACK Self-efficacy Scale (SES)	2009	Schmidt	5
TPACK DEEP	2012	Kabakci et al.	2
TPAB-ÖDÖ	2016	Kartal, Kartal, & Uluay	2
TPACK SES	2014	Horzum, Akgün, & Öztürk	2
IWB-based TPACK Questionnaire	2012	Jang & Tsai	1
TPACK-EFL	2015	Baser, Kopcha & Ozden	1
Technology in Education SES	2014	Dogru	1
TPAB Özyeterlik Ölçeği	2016	Balcin & Ergun	1
TPACK-SES	2013	Canbazoğlu-Bilici et al.	1

In the reviewed studies, 58.33% of the articles provided explanations of the measures employed, while 8.33% gave information on both the original scale and the current study's reliability scores. However, 8.33% of the studies did not offer sufficient information on the measures used. In 2.78% of the articles, the measures were not provided, whereas in 5.56% of the cases, the current study's measures were given, but not the original scale. Additionally, 2.78% of the studies only provided the original scale, without mentioning the current study's measures. Lastly, 13.89% of the articles employed qualitative measures.

Out of the 36 studies, a majority (77.78%) employed a convenience sampling method, which is a non-probability sampling technique. In addition, purposive sampling, another non-probability sampling method, was utilized in 19.44% of the studies. Only one study (2.78%) used cluster sampling, a probability sampling approach. Overall, non-probability sampling methods were predominantly favored in the reviewed studies.

The reviewed studies display a variety of sample sizes (See Table 5). For the mixed-methods studies (16.67% of the total), sample sizes ranged from 24 to 436 participants. In the qualitative studies (13.89%), the sample sizes were smaller, with a range of 5 to 80 participants. Quantitative studies, representing 66.67% of the total, had a wider range of sample sizes, from 25 to 1,169 participants. Lastly, there was a single quantitative quasi-experimental study (2.78%) with a sample size of 35 participants. This indicates a diverse array of sample sizes across the different research methodologies employed in the reviewed studies.

Missing data details were addressed to varying degrees. For missing values, it was found that 25% (n=7) of the studies mentioned missing values, while the majority, 69.4% (n=24), did not mention them. In addition, 5.6% (n=5) of the studies were qualitative and, thus, did not specifically discuss missing values. None of the articles examined in this review provided explicit information on their data cleaning procedures.

In the analysis of the studies, it was found that 77.78% (n=28) of them explicitly provided research questions, while 22.22% (n=8) did not clearly mention research questions or hypothesis of the study. This indicates that a majority of the studies included clear research questions, whereas a smaller proportion lacked this important element in their research design.

Table 5.

Distribution of Sample Sizes by Research Methodology

Research Methodology	Frequency of Studies (f)	Percentage (%)
Mixed methods	6	16.67%
0-49	2	5.56%
50-99	1	2.78%
More than 100	3	8.33%
Qualitative	5	13.89%
0-49	4	11.11%
50-99	1	2.78%
Quantitative	24	66.67%
Less than 100	3	8.33%
100-199	6	16.67%
200-299	6	16.67%
300-399	2	5.56%
400-499	2	5.56%
More than 500	6	16.67%
Quantitative (quasi-exp.)	1	2.78%
0-49	1	2.78%

Study Context and Outcomes

The review study analyzed various aspects related to TPACK and instructional practices. This comprehensive systematic review synthesized findings from 36 studies that analyzed various aspects related to technological pedagogical content knowledge (TPACK) and instructional practices across educational contexts. The predominant focus was on TPACK scores (n=27, 75%) as a key measurable outcome for assessing TPACK development, with a subset also investigating impacts on instructional practices (n=5, 13.9%) and educator opinions, needs assessments, and attitudes related to effective technology integration (n=4, 11.1%).

The majority of studies were situated in teacher training environments (n=22, 61.1%), including both pre-service teacher preparation coursework as well as in-service professional development workshops. This context allowed for analysis of how foundational knowledge of TPACK is initially developed by educators in training, as well as how seasoned teachers further enhance skills. The remaining studies (n=14, 38.9%) collected data in active K-12 or postsecondary educational settings, providing additional insights into how cultivated TPACK translates into daily teaching practices, student impacts, and institutional technology integration challenges.

Regarding specific data collection methodology, an overwhelming majority leveraged likert-scale questionnaires (n=31 studies, 86.1%) to gather wide-ranging perceptual data on educators' self-assessed TPACK abilities and growth areas. Open-ended interviews offered qualitative insights (n=8 studies, 22.2%) into participant experiences developing technological knowledge situated in content-driven pedagogy. A limited number of studies employed focus groups for group discussion dynamics and direct analysis of class assignments or lesson plans (n=2, 5.6%) for revealed artifacts of TPACK in practice. A subset combined closed and open-ended questionnaires with interviews or focus groups for mixed-methods approaches (n=8 studies, 22.2%) and data triangulation.

In summary, while predominantly focusing on teacher training contexts, the reviewed body of scholarship featured diverse research designs and data collection methods to rigorously explore various facets of TPACK cultivation alongside translations to daily instructional practices across educational settings. This provides a robust evidence base for synthesis. Further targeted analysis of trends across findings is warranted to determine high-potential directions for both research and practice.

Discussion, Conclusion, and Suggestions

This comprehensive review of 36 studies investigating the Technological Pedagogical Content Knowledge (TPACK) framework and instructional practices in various educational contexts has provided valuable insights into the current state of research on this topic. The findings of this review reveal diverse approaches, characteristics, and trends, offering a detailed understanding of the ways researchers have explored TPACK and its impact on instructional practices.

The majority of the reviewed studies focused on pre-service and in-service teachers, with a few investigating school administrators. Considering that Baran and Canbazoğlu-Bilici's (2015) study only included 6 studies conducted with in-service teachers (20%), we can see that our data shows that almost 50% of the studies in our review were conducted with in-service teachers. The studies examined various demographic factors, including gender, age, and experience, as well as technology-related variables, such as internet usage, computer use, technology ownership, and educational technology usage. This diversity in the study groups and the factors considered highlights the multifaceted nature of TPACK research, which requires attention to the complex interplay between teacher characteristics, technology, and instructional implementations.

In a recent TPACK review study Yeh et al. (2021) discusses the limitations of using self-reported surveys to determine individual teachers' TPACK levels. The authors suggest that relying solely on self-reported TPACK data may not provide an accurate reflection of a teacher’s instructional quality. Similarly, while self-reported data can provide some insights, it may not be sufficient to accurately measure teachers’ TPACK proficiency (Koehler et al., 2012). While collaborative discourse has shown promise in enhancing collective TPACK, getting data regarding teachers’ personal TPACK development is crucial. It is suggested that future studies should emphasize more experience-based perspective and identify effective strategies.

Accordingly, the reviewed studies in this particular research employed a range of approaches in terms of methodology, with the majority using quantitative methods, followed by mixed-methods and qualitative approaches. This finding is relatively consistent with another review study where the majority of the studies utilized empirical research with quantitative methods as their systematic process and qualitative studies were also commonly used, while mixed methods were used to a lesser extent (Moreno et al, 2019). This indicates a growing recognition of the need to combine various research methods to gain a comprehensive understanding of TPACK and instructional practices. The studies employed various tools and scales to assess TPACK, including some widely-used measures such as the TPACK self-efficacy scale and TPACK Scale. This highlights the importance of establishing reliable and valid

measures to assess TPACK and its various components, which can facilitate the comparison of findings across different studies and contexts.

This study also investigated how reliability levels were reported in TPACK studies, and found that detailed information was given in majority studies, while small number of studies did not provide such information. Another review study similarly found that 64 studies provided detailed information on reliability levels, 24 studies only gave superficial information, and 11 studies did not provide any information at all (Yolcu et al., 2022).

A majority of the reviewed studies utilized non-probability sampling techniques, such as convenience and purposive sampling, which may limit the generalizability of the findings. Future research could benefit from employing probability sampling techniques to enhance the representativeness and generalizability of the study samples. Additionally, the sample sizes varied greatly across the studies, indicating a need for more consistency in sampling procedures to facilitate comparison and synthesis of findings.

The analysis of the studies revealed that a significant proportion did not explicitly address missing data or data cleaning procedures. This suggests that future research should pay greater attention to data management practices to ensure the accuracy and reliability of the findings. Furthermore, some studies lacked clear research questions or hypotheses, indicating that future research should prioritize developing well-defined research questions to guide the investigation of TPACK and instructional practices.

The reviewed studies predominantly focused on TPACK scores as an outcome measure, with some investigating instructional practices, opinions, needs assessments, and attitudes. This suggests that future research should continue to explore the complex relationships between TPACK and various aspects of instructional practices, as well as the potential impact of TPACK on student learning outcomes. A notable recommendation arising from this review involves conducting further data analysis to gather additional insights. While the reviewed studies provided valuable insights, a deeper analysis of the interplay between specific TPACK components and their effects on student achievement could offer a more nuanced understanding. Additionally, findings presented in the reviewed studies were often contextualized within specific educational settings, limiting their broader applicability. To enhance the informativeness of findings, future research should aim for more generalizable and transferable conclusions, facilitating their relevance across diverse educational landscapes.

In conclusion, this review has provided a comprehensive overview of the current research landscape concerning the TPACK framework and instructional practices across diverse educational contexts. The findings illuminate various approaches, methodologies, and trends, underscoring the imperative for future research to address the identified gaps and inconsistencies. By leveraging these findings and employing rigorous research methods, forthcoming studies can further enhance our comprehension of the role of TPACK in shaping effective instructional practices, ultimately contributing to the improvement of teaching and learning in the digital age.

Limitations

Systematic reviews possess inherent limitations. When the prescribed stages are not meticulously followed, ensuring fairness and reliability in research findings becomes challenging. Hence, the decisions made by researchers regarding research methodologies, such as PRISMA, are crucial. To overcome mistakes such as inadequate keyword selection or incorrect data sources that might exclude essential studies, researchers follow the path outlined in the methodology section and manually eliminate irrelevant studies. In social sciences, there's a risk of subjective interpretation, potentially impacting impartiality. Although synthesizing a limited number of studies can yield a comprehensive overview, it might compromise the robustness of conclusions due to the restricted scope of synthesized research. Addressing these risks and proposing solutions is imperative in systematic literature analysis. Despite efforts to transparently evaluate search system capabilities based on evidence-based criteria, the study's boundaries inevitably constrain its comprehensiveness. It's vital to highlight both strengths and weaknesses, as it provides a valuable evaluation, recognizing that the researchers' experience can be shaped by various technical and situational factors.

The present study has several limitations that should be taken into consideration when interpreting the findings. The study's focus on articles published in journals hosted by ULAKBIM and conducted in Turkey may have resulted in a biased sample, limiting the generalizability of the findings to other contexts and populations. As a systematic review, this study relied on the data collection and reporting from the original 36 source studies rather than gathering any primary data first-hand. As such, it is limited by any issues with how the source studies were conducted or by the accuracy of their documented findings. Secondly, the study's exclusion of non-empirical research, such as literature reviews and theoretical papers, may have excluded valuable insights from the analysis. Thirdly, the use of a random sampling technique to select a subset of articles for analysis may have resulted in a sample that is not representative of the entire population of relevant articles. Furthermore, the use of a single database for article selection may have resulted in the exclusion of relevant studies published in other databases. Additionally, the lack of explicit information on data cleaning procedures and missing data of the studies reviewed might affect the accuracy and reliability of the findings.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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: The authors contributed to the article equally, with both involved in conceptualization and validation. Corresponding author handled the methodology and analysis. Additionally, both authors participated in writing, reviewing, and editing. Berrin Akman provided supervision and project administration.

Funding: This research received no funding.

Institutional Review Board Statement: Ethical approval was not sought for this systematic review as it involves analyzing previously published research and does not involve the collection of new data from human subjects.

Data Availability Statement: Data generated or analyzed during this study are available from the authors upon request.

Conflict of Interest: The authors declare that they have no conflicts of interest to disclose.

References

Akgün, S. & Greenhow, C. (2022). Artificial intelligence in education: Addressing ethical challenges in K-12 settings. AI Ethics, 2, 431–440 (2022). https://doi.org/10.1007/s43681-021-00096-7

Altun, D. (2019). Investigating Pre-Service Early Childhood Education Teachers' Technological Pedagogical Content Knowledge (TPACK) Competencies Regarding Digital Literacy Skills and Their Technology Attitudes and Usage. *Journal of Education and Learning, 8*(1), 249-263. doi:10.5539/jel.v8n1p249

Archambault, L. M. & Barnett, J. H. (2010). Revisiting technological pedagogical content knowledge: Exploring the TPACK framework. *Computers & Education. 55,* 1656-1662.

Abbitt, J. T. (2011). Measuring Technological Pedagogical Content Knowledge in Preservice Teacher Education. *Journal of Research on Technology in Education, 43*(4), 281-300. doi:10.1080/15391523.2011.10782573

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, New Jersey: Prentice Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* W. H. Freeman & Company: New York

Baran, E. & Canbazoğlu Bilici S. (2015). Teknolojik Pedagojik Alan Bilgisi (TPAB) Üzerine Alanyazın İncelemesi: Türkiye Örneği. [in Turkish]. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 30*(1), 15-32.

Benson, V. & Ward, S. (2020). Teachers' readiness to use technology in the classroom. *Technology, Pedagogy and Education, 30*(1), pp.137-156. https://doi.org/10.1080/1475939X.2020.1851752

Bowers, J. S. & Stephens, B. (2011). Using technology to explore mathematical relationships: A framework for orienting mathematics courses for prospective teachers. *Journal of Mathematics Teacher Education, 14*, 285-304.

Bulger, M., Mayer, R., Metzger, M., & Blumenfeld, P. (2018). Knowledge and processes that predict proficiency in digital literacy. *Reading and Writing, 31*(7), 1531–1553. https://doi.org/10.1007/s11145-017-9752-2

Bushweller, K. C. (2017). Classroom technology: Where schools stand. Technology counts. *Education Week, 36*(35)

Chai, C. -S. Koh J. H. -L., & Tsai C. -C. (2013). A Review of Technological Pedagogical Content Knowledge. *Educational Technology & Society, 16*(2), 31-51.

Clements, D. H. (1994). "The Uniqueness of the Computer as a Learning Tool: Insights from Research and Practice." In June L. Wright and Daniel D. Shade (Eds), Young Children. Active Learners in a Technological Age. National Association for the Education of Young Children.

Clements, D. H. & Sarama, J. (Eds.). (2002). Early Childhood Corner: The Role of Technology in Early Childhood Learning. *Teaching children mathematics, 8*(6), 340-343.

Clements, D. H. & J. Sarama. (2003). Strip mining for gold: Research and policy in educational technology - A response to "Fool's Gold." *Educational Technology Review, 11*(1).

Cochran, W. G. (1977). *Sampling Techniques.* 3rd Edition, John Wiley & Sons, New York.

Cox, S. & Graham C. R. (2009) Diagramming TPACK in practice: using and elaborated model of the TPACK framework to analyze and depict teacher knowledge. *TechTrends, 53*, 60–69.

CDW (2022). The COVID-19 Pandemic and the Transformation of Education. CDW. Retrieved from https://www.cdw.com/content/cdw/en/research/covid-19-pandemic-transformation-of-education.html

Celik, I. (2023). Towards Intelligent-TPACK: An empirical study on teachers' professional knowledge to ethically integrate artificial intelligence (AI)-based tools into education. *Computers in Human* Behavior, 138. https://doi.org/10.1016/j.chb.2022.107468

Fisher, D. M. & Waller, L. R. (2013). The 21st century principal: A study of technology leadership and technology integration in Texas K-12 schools. The Global eLearning Journal, 2(4), 1-44.

Grabowski, B. L. (2003). Generative learning contributions to the design of instruction and learning. In D. H. Jonassen (Ed.), Handbook of research for educational communications and technology. 2nd edition. 719-743. Hillsdale, NJ: Lawrence Erlbaum Associates.

Graham, R. C., Burgoyne, N., Cantrell, P., Smith, L., St. Clair, L., & Harris, R. (2009). TPACK Development in Science Teaching: Measuring the TPACK Confidence of In-service Science Teachers. *Tech-Trends, 53*(5), 70-79. doi: 10.1007/s11528-009-0328-0.

Harris, C. B. & Hofer, M. (2011). Technological Pedagogical Content Knowledge (TPACK) in Action. Journal of Research on Technology in Education. doi: 10.1080/15391523.2011.10782570

Horne, M. (2010). A new role for CTE. Techniques: Connecting Education and Careers, *85*(4), 10–11.

Horzum, M. B., Akgün, Ö. E., & Öztürk, E. (2014). The psychometric properties of the technological pedagogical content knowledge scale. *International Online Journal of Educational Sciences, 6*(3). https://doi.org/10.15345/iojes.2014.03.004

Keengwe, J. & Onchwari, G. (2009). Technology and Early Childhood Education: A Technology Integration Professional Development Model for Practicing Teachers. *Early Childhood Education Journal*, *37*, 209–218. https://doi.org/10.1007/s10643-009-0341-0

Mishra, P. (2019). Considering Contextual Knowledge: The TPACK Diagram Gets an Upgrade. *Journal of Digital Learning in Teacher Education, 35*, 76-78. https://doi.org/10.1080/21532974.2019.1588611

Mishra, P. & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. Teachers College Record, 108(6), 1017–1054.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group, (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. Annals of internal medicine, 151(4), 264-269.

Morrison, G. R. & Lowther, D. L. (2010). Educational technology research past and present: Balancing rigor and relevance to impact school learning. *Contemporary educational technology*, *1*(1), 17-35.

Kabakci Yurdakul, I., Odabasi, H.F., Kilicer, K, Coklar, A. N., Birinci, G., & Kurt, A.A. (2012). The development, validity and reliability of TPCK-deep: A technological pedagogical content knowledge scale. *Computers & Education, 58*(3), 964-977. doi: 10.1016/j.compedu.2011.10.012

Koehler, M. J. & Mishra, P. (2008). Introducing TPCK. AACTE Committee on Innovation and Technology. The handbook of technological pedagogical content knowledge (TPCK) for educators (pp. 3–29). Mahwah, NJ: Lawrence Erlbaum Associates.

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

Koehler, M. J., Shin, T. S., & Mishra, P. (2012). How do we measure TPACK? Let me count the ways. In R. N. Ronau, C. R. Rakes, & M. L. Niess (Eds.), Educational technology, teacher knowledge, and classroom impact: A research handbook on frameworks and approaches (pp. 16–31). Hershey, PA, USA: IGI Global.

Moreno, J. R., Montoro, M. A., & Ortiz Colón, A. M. (2019). Changes in teacher training within the TPACK model framework: A Systematic Review. *Sustainability, 11*, 1870; doi:10.3390/su11071870

Mouza, C. & Karchmer-Klein, R. (2013). Promoting and assessing pre-service teachers' technological pedagogical content knowledge (TPACK) in the context of case development. *Journal of Educational Computing Research, 48*(2),127-152

Murray, C. (2017, Dec 13) 74 percent of educators support the use of technology in schools. EdTech Magazine online. https://edtechmagazine.com/k12/article/2013/02/survey-74-percent-educators-support-use-technology-schools

Mutlu, Y., Polat, S., & Alan, S. (2019). Development of preservice mathematics teachers' TPACK through micro teaching: Teaching the VuStat program. *International Journal of Technology in Education and Science (IJTES), 3*(2), 107-118.

OECD (2023), *PISA 2022 Results (Volume I): The State of Learning and Equity in Education*, PISA, OECD Publishing, Paris, https://doi.org/10.1787/53f23881-en.

Petticrew, M. & Roberts, H. (2006). *Systematic reviews in the social sciences: A practical guide.* Malden USA: Blackwell Publishing.

Sahin, I. (2011). Development of survey of technological pedagogical and content knowledge (TPACK). *Turkish Online Journal of Educational Technology, 10*(1), 97-105.

Saracho, O. N. (2019). *Handbook of Research on the Education of Young Children*. 4th Edition. Routledge, NY. https://doi.org/10.4324/9780429442827

Schmidt, D., Baran, E., Thompson, A., Mishra, P., Koehler, M.J., & Shin, T. (2009). Technological Pedagogical Content Knowledge (TPACK): The development and validation of an assessment instrument for preservice teachers. Paper presented at the *2009 Annual Meeting of the American Educational Research Association*. April 13-17, San Diego, California.

Shulman, L. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4–14.

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*(1), 1–22.

Scoggin, D. & Vander Ark, T. (2018). Should we limit 'Screen Time' in school? Education Next, 18(1), 54-63.

Sheffield, R., Dobozy, E., Gibson, D., Mullaney, J., & Campbell, C. (2015). Teacher education students using TPACK in science: a case study, *Educational Media International.* doi: 10.1080/09523987.2015.1075104

Suri, H. & Clarke, D. (2009). Advancements in research systhesis methods: From a methodologically inclusive perspective. *Review of Educational Research, 79*(1), 395-430.

Schwab, K. (2017). *The fourth industrial revolution.* Crown Publishing Group.

Tai, S. D. J. & Crawford, D. (2014). Conducting classroom observations to understanding TPACK: Moving beyond self-reported data.

Tosuntas, Ş. B., Cubukcu, Z., & Beauchamp, G. (2021). A new model for the factors that affect interactive whiteboard usage of teachers and its effect on performance. *Education and Information Technologies, 26*(3), 3575–3592. doi:10.1007/s10639-021-10428-z

Tschannen-Moran, M., & Woolfolk, H. A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*, 783-805.

Venkatesh, V. (2020). Impacts of COVID-19: A research agenda to support people in their fight. International Journal of Information Management, 55. https://doi.org/10.1016/j.ijinfomgt.2020.102197

Voogt, J., Fisser, P., Roblin, N. P., Tondeur, J., & Van Braak, J. (2013), Technological pedagogical content knowledge–a review of the literature. J. Comput. Assist. Learn. 29, 109–121.

Wang, J. G. H. (2020). Developing teachers technological, pedagogical, and content knowledge (TPACK) through design thinking and community of practice. Dissertations. 43. Retrieved from https://scholarworks.sjsu.edu/etd_dissertations/43

Wang, Y., Liu, C., & Tu, Y. F. (2021). Factors affecting the adoption of AI-based applications in higher education. Educational Technology & Society, 24(3), 116–129.

Wang, Y., & Zhao, P. (2020). A probe into spoken English recognition in English education based on computer-aided comprehensive analysis. International Journal of Emerging Technologies in Learning (iJET), 15(3), 223–233.

Wang, X. C., & Hoot, J. L. (2006). Information and communication technology in early childhood education. Early Education and Development, 17(3), 317–322.

Wilson, M. L., Ritzhaupt, A. D., & Cheng, L. (2020). The impact of teacher education courses for technology integration on pre-service teacher knowledge: A meta-analysis study. *Computers & Education, 156*, 1–16. https://doi.org/10.1016/j.compedu.2020.103941

Yeh, Y., HoChan, K. K., & Hsu, Y.-S. (2021). Toward a framework that connects individual TPACK and collective TPACK: A systematic review of TPACK studies investigating teacher collaborative discourse in the learning by design process. *Computers and Education, 171*. doi: 10.1016/j.compedu.2021.104238

Yılmaz, R., & Bal, A. P. (2022). Examination of the studies made on technological pedagogical content knowledge in the years of 2010-2021. *Gaziantep Üniversitesi Eğitim Bilimleri Dergisi, 6*(2), 54-70.

Yigit, M. (2014). A review of the literature: how pre-service mathematics teachers develop their technological, pedagogical, and content knowledge. *International Journal of Education in Mathematics, Science and Technology, 2*(1), 26-35.

Yolcu, H., Kaya Durna, D., Akan, A., & Uluçınar Sağır, Ş. (2022). Analysis of studies on pedagogical content knowledge and technological pedagogical content knowledge by meta-synthesis method. *Educational Academic Research, 46*, 106-121.

Appendix 1. Reviewed Studies

Açıkgül, K. & Aslaner, R. (2015). İlköğretim matematik öğretmen adaylarinin TPAB Güven algilarinin incelenmesi. *Erzincan Üniversitesi Eğitim Fakültesi Dergisi, 17*(1), 118-152. doi: 10.17556/jef.04990

Aksan, A. N. & Kutluca, A. Y. (2021). Investigation of preschool teachers' use of technology in teaching in terms of technology selfefficacy levels. *Kastamonu Eğitim Dergisi , 29* (3) , 611-626 . Retrieved from https://dergipark.org.tr/en/pub/kefdergi/issue/64754/738068

Akgündüz, D. & Bağdiken, P. (2018). Fen bilimleri öğretmenlerinin teknolojik pedagojik alan bilgisi özgüven düzeylerinin incelenmesi. *Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi, 38*(2), 535-566. doi: 10.17152/gefad.357224

Akyıldız, S. & Altun, T. (2018). Sınıf öğretmeni adaylarinin teknolojik pedagojik alan bilgilerinin (TPAB) bazi değişkenlere göre incelenmesi. *Trakya Üniversitesi Eğitim Fakültesi Dergisi, 8*(2), 318-333. doi: 10.24315/trkefd.322749

Akyüz, D. (2016). Farklı öğretim yöntemleri ve sınıf seviyesine göre öğretmen adaylarinin TPAB analizi. *Turkish Journal of Computer and Mathematics Education (TURCOMAT), 7*(1), 89-111. doi: 10.16949/turcomat.75768

Akyüz, H. İ., Pektaş, M., Kurnaz, M. A., & Memiş, E. K. (2014). Akıllı tahta kullanimli mikro öğretim uygulamalarinin fen bilgisi öğretmen adaylarinin TBAP'larına ve akilli tahta kullanima yönelik algilarina etkisi. *Cumhuriyet Uluslararası Eğitim Dergisi, 3*(1), 1-14. doi: 10.30703/cije.321331

Aşık, A., Eroğlu İnce, B. H., & Şarlanoğlu Vural, A. (2018). Investigating learning technology by design approach in pre-service language teacher education: Collaborative and reflective experiences. *Eğitimde Nitel Araştırmalar Dergisi, 6*(1), 37-53. Retrieved from https://dergipark.org.tr/tr/pub/enad/issue/36482/413836

Aydın Günbatar, S., Yerdelen Damar, S., & Boz, Y. (2017). Teknolojik pedagojik alan bilgisi (TPAB) kavraminin yakindan incelenmesi: İlköğretim fen bilgisi öğretmen adaylarinin TPAB'ının modellemesi. *İlköğretim Online, 16*(3), 917-934. DOI: 10.17051/ilkonline.2017.330232

Bahçivan, E., Aydın, F., & Yener, D. (2015). Fen bilgisi öğretmen adaylarinin teknolojik pedagojik alan bilgisi öz güvenleri ve benlik kurgulari arasindaki ilişkilerin incelenmesi: Abant Izzet Baysal Üniversitesi örneği. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 15*(2), 1-12. doi: 10.17240/aibuefd.2015.15.2-5000161310

Bakaç, E. & Özen, R. (2017). Öğretmen adaylarinin materyal tasarimi öz-yeterlik inanç düzeylerinin teknolojik pedagojik alan yeterlikleri bağlaminda incelenmesi. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi, 18*(2), 613-632. Retrieved from https://dergipark.org.tr/en/pub/kefad/issue/59416/853301

Balçın, M. & Ergün, A. (2018).Fen bilgisi öğretmen adaylarinin sahip olduklari teknolojik pedagojik alan bilgisi (TPAB) özyeterliklerinin belirlenmesi ve çeşitli değişkenlere göre incelenmesi. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi, 0*(45), 23-47. doi: 10.21764/maeuefd.311316

Bayrak, N. & Bayrak, G. (2021). Eğitimde teknoloji kullanimi içerikli hizmet içi eğitim kurslarinin öğretmenlerin teknolojik pedagojik alan bilgisi özgüvenine etkileri. *Van Yüzüncü Yıl Üniversitesi Eğitim Fakültesi Dergisi, 18*(1), 1009-1041. doi: 10.33711/yyuefd.957385

Çar, B. & Aydos, L. (2022). Beden eğitimi ve spor öğretmenlerinin teknolojik pedagojik alan bilgisi yeterliliklerinin sinif yönetimi davranişlari açisindan incelenmesi. *Beden Eğitimi ve Spor Bilimleri Dergisi, 24*(1), 1-9. Retrieved from https://dergipark.org.tr/tr/pub/ataunibesyo/issue/69207/910931

Çelik, İ., Hebebci, M. T., & Şahin, İ. (2016). Role of use of online case study library in technology integration: A study based on TPACK. *Gaziantep University Journal of Social Sciences, 15*(3), 739-754. doi: 10.21547/jss.256698

Cesur Özkara, E., Yavuz Konokman, G., & Yanpar Yelken, T. (2018). Eğitimde teknoloji kullanimi hizmetiçi eğitimine katilan öğretmenlerin TPAB özgüvenlerinin incelenmesi. *Amasya Üniversitesi Eğitim Fakültesi Dergisi, 7*(2), 371-412. Retrieved from https://dergipark.org.tr/en/pub/amauefd/issue/41157/416332

Çiftçi, T. & Dikmenli, Y. (2018). Coğrafya ve sosyal bilgiler öğretmen adaylarinin teknolojik pedagojik alan bilgisi özdeğerlendirme düzeylerinin farkli değişkenlere göre incelenmesi. *Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, (28), 1-30. doi: 10.14520/adyusbd.332816

Demir, T. & Fırat Durdukoca, Ş. (2018). Pedagojik formasyon eğitimi sertifika programina devam eden öğrencilerin teknolojik pedagojik alan bilgilerinin çeşitli değişkenlere göre incelenmesi. *Uluslararası Türkçe Edebiyat Kültür Eğitim (TEKE) Dergisi, 7*(2), 1253-1275. Retrieved from https://dergipark.org.tr/tr/pub/teke/issue/38234/442087

Demircioğlu, G., Yadigaroğlu, M., & Demircioğlu, H. (2016). Kimya öğretmenlerinin teknolojik pedagojik alan bilgisine (TPAB) yönelik hizmet içi eğitim (HİE) ihtiyaçlarinin belirlenmesi. *Necatibey Eğitim Fakültesi Elektronik Fen ve Matematik Eğitimi Dergisi, 10*(2), 156-185. doi: 10.17522/balikesirnef.277487

Dikmen, C. H. & Demirer, V. (2022). The role of technological pedagogical content knowledge and social cognitive variables in teachers' technology integration behaviors. *Participatory Educational Research, 9*(2), 398-415. doi: 10.17275/per.22.46.9.2

Doğan, A. & Doğan, İ. (2022). İlkokullarda Görev yapmakta olan okul yöneticilerinin teknolojik pedagojik alan bilgisi (TPAB) yeterliliklerinin farkli değişkenler açisindan değerlendirilmesi. *Journal of Multidisciplinary Studies in Education, 6*(2), 39-53. Retrieved from https://dergipark.org.tr/tr/pub/jmse/issue/70097/1119414

Doğru, E. & Aydın, F. (2018). Coğrafya öğretmenlerinin teknolojik pedagojik alan bilgisi (TPAB) hakkindaki düşünceleri ve bunu kullanma durumlari. *Eğitim Kuram ve Uygulama Araştırmaları Dergisi, 4*(2), 88-100. Retrieved from https://dergipark.org.tr/en/pub/ekuad/issue/38280/448918

Gökbulut, B. (2021). Öğretmenlerin teknostres ve teknopedagojik yeterlikleri arasindaki ilişki. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi, 22*(1), 472-496. Retrieved from https://dergipark.org.tr/en/pub/kefad/issue/60452/929603

Güler, Ç. & Bilici, S. (2016). Ortaöğretim öğretmenlerinin TPAB düzeylerinin öğretim teknolojilerini kullanma durumlarina göre incelenmesi. *İlköğretim Online, 15*(3), 0-0. doi: 10.17051/io.2016.05210

İnce Aka, E., Doğan, A., & Sert Çıbık, A. (2018). Öğretmen adaylarinin teknolojik pedagojik alan bilgisi öz güvenlerinin değişiminin incelenmesi. *e-Kafkas Journal of Educational Research, 5*(1), 1-9. doi: 10.30900/kafkasegt.341868

Karakuyu, Y. & Karakuyu, A. (2016). Motivasyon ve öz-yeterliğin sinif öğretmeni adaylarinin teknolojik pedagojik alan bilgilerine (TPAB) katkisi. *Uşak Üniversitesi Eğitim Araştırmaları Dergisi, 2*(1), 89-100. doi: 10.29065/usakead.232415

Karalar, H. & Altan, B. A. (2016). Sinif öğretmeni adaylarinin teknolojik pedagojik alan bilgisi yeterliklerin ve öğretmen özyeterliklerinin incelenmesi. *Cumhuriyet Uluslararası Eğitim Dergisi, 5*(5), 15-30. doi: 10.30703/cije.321422

Karatas, A. & Akgün, Ö. E. (2018). Lise öğretmenlerinin fatih projesi'ni uygulamaya yönelik teknolojik pedagojik alan bilgisi yeterliliklerinin incelenmesi. *Medeniyet Eğitim Araştırmaları Dergisi, 1*(4), 10-30.
Retrieved from https://dergipark.org.tr/en/pub/mead/issue/43089/516893

Kayaalp, F., Gökbulut, B., Meral, E., & Başcı Namlı, Z. (2022). The effect of digital material preparation training on technological pedagogical content knowledge self-confidence of pre-service social studies teachers. *Journal of Theoretical Educational Science, 15*(3), 475-503. doi: 10.30831/akukeg.1061527

Kose, F. (2021). TPAB modeli kapsaminda öğretmenlerin tpab becerilerinin geliştirilmesi: Bir çalişţay örneği. *İnönü Üniversitesi Eğitim Fakültesi Dergisi, 22*(3), 2509-2530. doi: 10.17679/inuefd.1016001

Mutluoğlu, A. & Erdoğan, A. (2016). Examining primary mathematics teachers' technological pedagogical content knowledge (TPACK) levels according to their preferred teaching styles. *OPUS International Journal of Society Researches, 6*(10), 102-126. Retrieved from https://dergipark.org.tr/en/pub/opus/issue/22701/242324

Özdurak Sıngın, R. H., & Gökbulut, B. (2020). Okul öncesi öğretmenlerinin teknopedagojik yeterliklerinin belirlenmesi. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 20*(1), 269-280. doi: 10.17240/aibuefd.2020.20.52925-556477

Sarıtepeci, M. & Durak, H. (2017). Examining different variables of TPACK level of teachers attending the FATIH Project interactive classroom management course. *Participatory Educational*

Research, Special Issue 2016(4), 161-170. Retrieved from https://dergipark.org.tr/tr/pub/per/issue/47596/601276

Sungur Alhan, S. (2020). Harmanlanmış öğrenme ortamina yönelik fen bilimleri öğretmen adaylarinin görüşleri. *Erzincan Üniversitesi Eğitim Fakültesi Dergisi, 22*(2), 397-414. Retrieved from https://dergipark.org.tr/en/pub/erziefd/issue/56611/633189

Topçu, E. & Masal, E. (2020). Matematik öğretmenlerinin teknolojik pedagojik alan bilgisi öz-değerlendirme algilarina bir bakiş. *Gazi Eğitim Bilimleri Dergisi, 6*(1), 147-167. Retrieved from https://dergipark.org.tr/tr/pub/gebd/issue/53429/692711

Üredi, L. & Ulum, H. (2020). Matematik eğitimi sürecinde sinif öğretmenlerinin teknolojik pedagojik alan bilgisine (TPAB) ilişkin görüşleri. *OPUS International Journal of Society Researches*, *16* (29 Ekim Özel Sayısı), 3642-3669. doi: 10.26466/opus.766702

Yağcı, M. (2016). Pedagojik formasyon eğitimi öğretmen adaylarinin teknopedagojik eğitim yeterliliklerinin çeşitli değişkenler açisindan incelenmesi. *Kastamonu Eğitim Dergisi, 24*(3), 1327-1342. Retrieved from https://dergipark.org.tr/en/pub/kefdergi/issue/22607/241625

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

Teachers' Opinions on Second Grade Language Skills of Students Who Learned Initial Literacy Through Distance Education

Mustafa Damar[1]

To cite this article:
Damar, M. (2024). Teachers' opinions on second grade language skills of students who learned initial literacy through distance education. *e-Kafkas Journal of Educational Research*, *11*, 160-177. doi: 10.30900/kafkasegt. 1295965

Research article **Received: 11.05.2023** **Accepted:30.04.2024**

Abstract

This study examines teachers' opinions on how the language skills in the second grade (listening, speaking, reading, writing) of students who learned initial literacy in the first grade of elementary school (2020-2021) through distance education due to the pandemic were affected. This study was conducted using a descriptive qualitative research model. The study group comprised 18 teachers who conducted first-grade initial literacy teaching via distance education in 2020-2021 academic year and worked in the second grade during 2021-2022 academic year. Each teacher had instructed first grade at least three times in their career. A semi-structured interview form served as the data collection tool, and thematic analysis was employed for data analysis. The data yielded four themes: listening skills, speaking skills, reading skills, and writing skills, with corresponding sub-themes identified and interpreted. Participants reported that the pandemic led to temporary school closures and a shift from face-to-face to distance learning for first-grade literacy. Consequently, students missed the opportunity to develop listening, speaking, reading, and writing skills through direct interaction in the classroom. They stated the limitations and conditions of distance education were cited as reasons for this shortfall. As a result, they stated that there are inadequacies in students' listening, speaking, reading and writing skills, and that these inadequacies have a negative impact on their listening skills in the second grade. This resulted in inadequacies in students' listening, speaking, reading, and writing skills, negatively impacting their second-grade. It was reported that there were lack of gains in the achievements of this group compared to the students of previous years, and that these were due to the fact that the initial literacy teaching was carried out through distance education.

Keywords: İnitial literacy, listening, speaking, reading, writing.

[1] Corresponding Author, mustafa.damar@sbu.edu.tr, University of Health Sciences, Gülhane Faculty of Health Sciences, Department of Child Development, Ankara, Türkiye

Introduction

The coronavirus (COVID-19) disease, which started in China in December 2019, spread rapidly, escalating into a global epidemic within just four months. On March 11, 2020, the Coronavirus disease was declared as a pandemic disease by the World Health Organization (WHO, 2020). When the pandemic began, education was suspended and, schools were closed in various countries where the cases were dense. The temporary closure of educational institutions has affected more than 90% of the student population around the world. According to UNESCO data, more than 1.6 billion students and young people worldwide have been affected by the closure of educational institutions due to the COVID-19 pandemic (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2020). For this purpose, alternative education strategies, including distance learning, were implemented. In Turkey, the Ministry of National Education initiated distance learning at all educational levels, from primary to higher education, to ensure educational continuity. Primary school marks the first stage of compulsory education in Turkey. Historically, initial literacy teaching in primary schools has always been conducted face-to-face. Until the pandemic, distance education for initial literacy had never been attempted in Turkey. However, the pandemic necessitated a shift to distance education for initial literacy. Due to the pandemic, conducting the initial literacy education through distance education became mandatory, and it was carried out in this way. Although there are difficulties at all levels of education due to the pandemic, the classes most negatively affected by this process have been the first grades of primary school. In addition, considering that students in the upper grades have already acquired some basic skills, it is natural that some situations that are relatively easy for them are quite difficult for first-grade primary school children who are just starting school. Because they are illiterate, they lack the ability to acquire knowledge on their own in initial literacy learning.

The pandemic conditions have made it mandatory for the initial literacy education to be taught by distance education. For this reason, it is important to examine the effects of this situation on the second-grade language skills (listening, speaking, reading, writing) of children who learn their initial literacy instruction by distance education in the first grade of elementary school as a requirement of pandemic conditions the following year. The National Council of Teachers of English (NCTE, 1996) also states that language skills and instruction traditionally rely on four foundations: listening, speaking, reading, and writing.

According to Kavcar, Oğuzkan, & Sever (1999), the main goal in language education is the acquisition and development of the four basic language skills of listening, speaking, reading and writing. These skills are not innate abilities; they are acquired and developed directly through education and experience. This requires a favorable environment, practice and trials, and special efforts. According to Özbay and Melanlıoğlu (2012), these skills need to be addressed and developed in a systematic way, and the place for this is educational institutions, but children acquire these skills randomly until they reach school age. Among these four language skills, reading and listening constitute comprehension skills, while speaking and writing constitute expression skills. According to Özkan (2008), narration is the process of expressing what children understand from what they see, hear, think, read and listen to in accordance with the rules of grammar. This is realized in written and oral forms. Speaking, which is a sub-dimension of narration skill, is the verbal transfer of feelings, thoughts, wishes, information and designs (Sever, 2004). Speaking is the process of expressing observations, thoughts, feelings and information through language. It is a basic skill used at home, at school and in social relationships. With this skill, feelings and thoughts are conveyed and knowledge and experiences are shared (Öz, 2006). Speaking is a skill that is frequently used both in education and social life. Speaking, along with listening, constitutes an important part of an individual's daily life. Another basic language skill is comprehension, which consists of listening and reading skills. It is the most used language skill in daily life and we acquire most of our learning through listening. Akyol (2006) states that approximately 80% of the information that individuals have is obtained by listening. Güneş (2013), Bulut (2013) listening, which is one of the basic language skills, forms the basis for other skill areas. Maden and Durukan, (2011) the acquisition and development of listening skill, which is an innate skill, requires an educational process. Kurudayıoğlu and Kana, (2013) listening skill starts in the family where the child receives his/her first education, and then it is tried to be developed in a planned and programmed manner with formal education. Until the pandemic process, teaching, reading, and writing in the first grade of primary school

were done face-to-face and interactively; teachers were trained according to face-to-face education; and programs were prepared to be carried out face-to-face. However, the pandemic process prevented face-to-face education. For this reason, due to the importance of the subject, it is important to know how the pandemic process affects the teaching of listening, speaking, reading, and writing skills, which have an important place in teaching initial literacy in the first grade of primary school, and accordingly, to examine the language skills of children in the second grade. Moreover, distance education is becoming increasingly widespread around the world. It is thought that the findings obtained in this context will offer important contributions to future applications and research.

In this study, the opinions of second grade teachers regarding the reflections of children who learned their initial literacy learning by distance education in the first grade of elementary school due to the pandemic in the 2020-2021 academic year on their language skills (listening, speaking, reading, writing) in the second grade were examined. Within the scope of the purpose of the research, answers to the following questions were sought:

1. What are the opinions of teachers about the effect of the education received by students who receive initial literacy education through distance education on their listening skills in the second grade?

2. What are the opinions of teachers about the effect of the education received by students who receive initial literacy education through distance education on their speaking skills in the second grade?

3. What are the opinions of teachers about the effect of the education received by students who receive initial literacy education through distance education on their reading skills in the second grade?

4. What are the opinions of teachers about the effect of the education received by students who receive initial literacy education through distance education on their writing skills in the second grade?

Method

Research Model

This study was conducted using a descriptive qualitative research model. In this context, teachers' opinions were taken about the language skills of students who learned initial literacy in the first grade of primary school through distance education in the second grade. According to the teachers' opinions, this model was preferred in order to examine the language skills of the students, to reveal their qualities, to understand and explain them. Thus, it was tried to reveal the details, characteristics and qualities of the subject related to the effect of learning initial reading and writing by distance education on the language skills of students in the second grade of primary school. In the study, direct opinions were emphasized without adding too much meaning and depth to the teachers' opinions. Lambert and Lambert (2012) descriptive qualitative research; It is an approach that is very useful when researchers want to know, regarding events, who were involved, what was involved, and where did things take place. The goal of qualitative descriptive studies is a comprehensive summarization, in everyday terms, of specific events experienced by individuals or groups of individuals. Qualitative descriptive research: should be seen as a categorical, as opposed to a non-categorical, alternative for inquiry; is less interpretive than an "interpretive description" approach because it does not require the researcher to move as far from or into the data; and, does not require a conceptual Qualitative descriptive studies are the least "theoretical" of all of the qualitative approaches to research. Qualitative descriptive studies tend to draw from naturalistic inquiry, which purports a commitment to studying something in its natural state to the extent that is possible within the context of the research arena.

Study Group

Purposive, convenience and criterion sampling methods were used in this study. Purposive sampling is a non-probability based sampling approach. It enables in-depth research by selecting information-rich situations depending on the purpose of the research. It is preferred when it is desired to study one or more specific situations that meet certain criteria or have certain characteristics. In the context of the selected situations, natural and social events or phenomena are tried to be understood and the relationships between them are tried to be discovered and explained (Büyüköztürk et al., 2013). The purpose of convenience sampling is to select participants from individuals who are easy to reach, suitable for the research and volunteer (Gravetter & Forzano, 2012). Criterion sampling, on the other

hand, is used when the researcher wants to determine the types of sample cases in order to examine a situation in depth. These sampling methods provide speed and practicality to the research (Yıldırım & Şimşek, 2018)

The following criteria were sought in determining the teachers to participate in the study: 1. teaching initial literacy in the first grade of primary school with distance education in the 2020-2021 academic year, 2. continuing to the second grade with the same students in the 2021-2022 academic year, 3. teaching initial literacy in first grades at least three times during the service period. This criterion was deemed important to enable teachers to compare their previous in-person teaching experiences with their current distance education experiences. The study was conducted by interviewing 18 easily accessible classroom teachers working in public primary schools affiliated to the Ministry of National Education in the Gölbaşı district of Ankara province in the 2021-2022 academic year, who were determined by appropriate criteria and sampling method and who volunteered to participate in the study. Demographic and professional information about the teachers who participated in the study are given in Table 1.

Table 1.
The Demographic and Professional Information of Participating Teachers

Participants	Gender	Age	Service Period	Bachelor's Degree
1. Teacher	M	37	12	Primary School Teaching
2. Teacher	F	42	18	Primary School Teaching
3. Teacher	F	55	30	Philology
4. Teacher	M	35	8	Primary School Teaching
5. Teacher	F	50	25	Primary School Teaching
6. Teacher	F	44	18	Anthropology
7. Teacher	F	46	21	Primary School Teaching
8. Teacher	F	43	20	Primary School Teaching
9. Teacher	M	54	31	Media and Journalism
10. Teacher	F	42	16	Primary School Teaching
11. Teacher	M	45	20	Biology
12. Teacher	F	48	25	Primary School Teaching
13. Teacher	F	39	15	Primary School Teaching
14. Teacher	F	52	27	Primary School Teaching
15. Teacher	M	40	15	Primary School Teaching
16. Teacher	F	34	9	Primary School Teaching
17. Teacher	M	46	22	Philology
18. Teacher	F	38	14	Primary School Teaching

Data Collection Tool

During the pandemic, a semi-structured interview form with open-ended questions was developed by the researcher. This aimed to assess the impact on listening, speaking, reading, and writing skills in second grade for children who initially learned to read and write through distance education in the first grade. The draft interview form was examined by three experts and the necessary corrections were made in accordance with the recommendations of the experts. In terms of validity and reliability of the interview form, a pilot study was carried out with three classroom teachers who have similar characteristics to the study group.Sample questions from the interview form consisting of 17 open-ended questions such as “How are students' listening skills when the teacher or their friends are talking?”, “How are the students' speaking skills about a given topic appropriate to their grade level?”

Data Collection

The finalized semi-structured interview form, developed with expert input, was administered to the participating teachers, and data were collected through these interviews. The interviews with the teachers were conducted by the researcher over the Zoom platform or by telephone at their convenience. The interviews were recorded by informing the teachers and the interviews lasted an average of fifty

minutes. According to Yıldırım and Şimşek (2018), semi-structured interview technique is a communication process based on asking questions and getting answers in the interview held within the scope of predetermined purposes. In a semi-structured interview, the researcher learns in depth the opinions of the interviewee about the research topic by focusing on the information provided by the interviewee. The semi-structured interview technique provides convenience because it is performed depending on the pre-prepared interview form. Before starting the meeting with the classroom teachers, information was given about the content of the "Voluntary Participation Form".

Validity and Reliability

The semi-structured interview form used in the interviews with the teachers was developed according to the opinions of three experts from the field. Thus, the interviews were conducted in a comprehensive and detailed manner. The study group selected for the research was determined according to criteria such as having taught initial literacy in first grades at least three times, being teaching second grade at the time of the research and having taught initial literacy through distance education. Thus, volunteer teachers who would give the most comprehensive and detailed opinions on the subject to be examined were selected and in-depth detailed interviews were conducted. In this respect, validity was tried to be ensured in the research. The interviews were recorded to prevent any data loss in the research, and then all of the interviews were transcribed into written text and carefully analyzed. Raw data were checked and validated to avoid any data loss during the analysis and findings. Although the initial coding was done by the researcher, support was received from a field expert in both coding and subsequent processes to avoid any errors. Thus, it is thought to contribute to the reliability of the research.The coding made by the researcher was checked by the field expert, and necessary corrections were made in line with the suggestions.

Data Analysis

Thematic analysis was used to analyze the data. Thematic analysis is the qualitative classification of the data set in terms of recurring themes. It is a method in which certain patterns are sought throughout the entire data set and these recurring patterns are thoroughly defined (Braun & Clarke, 2012). Thematic analysis is the systematic examination of a large amount of text to create codes, categories and themes, and transform them into a concise summary (Erlingsson & Brysiewicz, 2017). Coding enables the identification of interconnected themes in the later stages of the research and the transformation of raw data into usable data. Coding is the attribution of interpreted meanings to each data (Saldana, 2019). In this study, firstly, the audio recordings of the interviews with the participants were analyzed and the conversations were converted into written text. Each interview was transcribed separately, but teacher names were not specified. The teacher names were coded as T1, T2, ..., and the interviews were converted into a data set and made ready for analysis. The transcripts were then reviewed again. The entire interview text with each participant was preferred as the coding unit. Such a preference was made due to the presence of expressions in the interview texts that do not show a complete and regular sentence feature. Thus, it was tried to prevent data loss. The data, which were divided into parts through coding, were then transformed into meaningful wholes through categories and themes. In the analysis of the research, the thematic analysis process steps created by Braun and Clarke (2012) were followed and the final themes were reached. In this context, all interview texts in the data set were read repeatedly and familiarity with the data was gained. Codes were created, the relationships between the coded data and the codes were examined and it was evaluated whether the codes were gathered around a theme. Final themes were created and codes, categories and themes were finalized. In this study, the first coding was done by the researcher and support was received from a Turkish teacher with a PhD in the following stages. Since the Turkish teacher is a teacher and conducts academic studies on language skills, his opinion was consulted while creating themes, categories and sub-themes.

Research Ethics

Firstly, an ethical approval certificate numbered 2022/47811 was obtained from the Social and Humanities Research and Scientific Publication Ethics Committee of the Ankara University of Social Sciences Rectorate (Social Sciences University Of Ankara Institute of Ethics Committee Of Social Sciences And Humanities Research And Publication-Certificate Of Ethics Approval) regarding the study to be conducted. In accordance with the Decision of the Ethics Committee, the teachers who will

participate voluntarily in the study have been informed, permissions have been obtained and no personal data has been requested from them.

Findings

This chapter presents the findings on teachers' views regarding the impact of distance education on initial literacy and its subsequent effects on second-grade language skills (listening, speaking, reading, writing). The themes and sub-themes obtained in relation to the teachers' opinions on the language skills of their students in the second grade are given in Table 2.

Table 2
Themes and Subthemes of the Research

Theme	Subthemes
Listening skill	Willingness to listening
	Time of listening
	Monitoring the speaker
	Attention to listening
	Understanding what they are listening to
Speaking skill	Obedience to the rules of speech
	Speaking level
	Speech content
	Vocabulary
Reading skill	Speed of reading
	Reading comprehension
	Answering questions
	Obedience the rules of reading
Writing skill	Writing failure
	Writing down your feelings and thoughts
	Willingness to writing
	Dictation

Theme 1: Participants' Opinions about Students' Listening Skills

Teacher opinions about the effects of this situation of students who learned their initial literacy by distance education in the first grade of elementary school during the pandemic period on their listening skills when the students are in the second grade are presented in Table 3.

Table 3 documents participant teachers' opinions about students' listening skills. Some teachers who participated in the study stated that there were problems with students' second-grade listening skills at the beginning of the second grade, but these problems disappeared over time. As follows; We had a little difficulty in listening in the second grade while teaching reading and writing with distance education in the first grade there was definitely someone with the children they were warning the children because there was someone with them, so there was no big problem in listening in that process. In the second grade, the students pushed me a little, and after a month or two of training, they reached a certain maturity in listening (T13). As for listening, we had problems like a first-grader in the first three months of the second grade, but then gradually these problems disappeared. For the first three months, I treated the students like a first-grader, completed our deficiencies (T15). The findings made by the teachers who participated in the study outside of T13 and T15 show that children cannot apply listening strategies. From these strategies; listening without interrupting, asking permission for speaking, watching the speaker, making eye contact, and focusing their attention on what they are listening to, it is understood that although there are achievements that second-graders should acquire, they are not gained at an adequate level. They do not understand anything from what they listen to (T1), they do not understand because they do not listen not only to me but also to each other (T4, T7). They do not listen to each other, no one understands anything from anyone's speech (T1). They do not understand anything from what they listen to, they cannot focus on the speaker and the subject (T10), when I say "let's talk about the subject on the board" after the subject is read, they cannot explain because they do not listen (T12). These findings show that students do not listen to the speaker, they cannot follow what they are listening to, as a result of this, they cannot predict the development and outcome of the events, they cannot tell because they are not listening, they cannot answer the questions asked. One teacher noted, 'When I raise my voice and say "Listen to me", they respond "Okay" but then quickly become distracted'

(T1). Others mention frequently issuing reminders (T4) and extensively explaining classroom rules (T7). These findings show that students do not apply verbal instructions in relation to listening skills. There are also teacher opinions that students themselves are aware of their shortcomings and the negatives experienced with listening skills, that students sometimes express them, and that they sometimes react to these negatives: “The interesting thing is; they realize that they are not listening to each other, they react to each other; the child shouts, 'Will you please shut up, I can't hear the teacher, I don't understand' " (T4).

Table 3

Participants' Opinions about Students' Listening Skills

Listening skill	Willingness to listening	*- Students have serious problems with their listening skills, they can't listen to my speech and their friends' speeches, they want to talk themselves instead of listening to the speaker (T8)* *- Students don't want to sit in class because they didn't go to kindergarten because of the pandemic, they don't want to listen to the teacher and their friends (T3)* *- they get bored very quickly (T6)*
	Time of listening	*- some of them listen for a short time, then they stop listening (T2, T15),* *students can't follow the speaker for even a minute, they immediately break off from the speaker (T11)* *- children's listening time is shortened when there is something literally related to the lesson (T18),* *- while listening, the child breaks off from the conversation, talking to his friend who is next to him (T9),* *- usually he looks towards the window and breaks off from class, wants to paint, works with other materials, takes something out of his bag, wants to drink water, I understand that the attention is over (T17).*
	Monitoring the speaker	*- there is a disconnect in their listening, they can't follow the speaker, they can't focus on the speaker and the topic, you make eye contact, they can't maintain it, and they immediately break off. When I raise my voice and say "listen to me", they say "ok", but soon they immediately stop listening (T1)* *- when someone is talking, they can't follow not only the teacher, but also each other (T10),* *- from time to time they do not listen to each other and interrupt their words (T6),* *- unlike my previous students, there is a decrease in listening and monitoring (T17)* *- they can't follow, they start talking to their friends or moving away from the topic, they play with their pencils, they look at their friends, they look behind, they are constantly distracted (T16),* *- they can't completely watch the speaker (T9),*
	Understanding what they are listening to	*- they don't understand anything from what they're listening to (T10, T1)* *- he does not understand his teacher and friends because he does not listen carefully (T5)* *- Not listening to the other person(T4, T7)* *- they don't listen to each other, no one understands anything from anyone's conversation (T1),* *- they don't understand anything from what they're listening to (T10),* *- after the topic has been read, when I say, “come on to the blackboard, tell me about the topic,” he can't tell because he's not listening (T12).*
	Attention to listening	*- they are constantly squirming, they are constantly busy with something else instead of listening (T11),* *- they can't focus on the speaker, the topic (T10),* *- they don't pay attention to the speaker and are busy with something else (T4),* *- They get distracted to something else, their attention is quickly distracted (T4, T6),* *- they tend to be constantly busy in other things instead of listening (T5),* *- he's not paying attention to the speaker, he's doing something else. They listen to their friends' conversations in the same way, they get distracted quickly (T4)* *- they can't pay attention (T13)* *- they can't focus on the speaker, the topic (T10),*

Theme 2: Participant Opinions about Students' Speaking Skills

Teacher opinions about the effects of this situation of students who learned their initial literacy by distance education in the first grade of elementary school during the pandemic period on their speaking skills when the students are in the second grade are presented in Table 4.

Table 4
Participant Opinions about Students' Speaking Skills

Speaking Skill	Obedience to the rules of speech	*- they don't follow the rules of speech (T1, T7),* *- when one is talking, the other is talking too, they are talking at the same time (T1, T4, T5),* *- while one is talking, the other interrupts the conversation without permission, does not wait for his friend to finish talking (T1, T3, T4, T7),* *- there are constant wants to speak without raising therir hands to speak (T1, T2, T4, T5, T7, T9),* *- they don't wait for the speaker to finish his speech, when someone raises his hand and speaks, one speaks from one side and the other from the other side (T10),* *- when one is talking, the other interrupts without listening and says, "It's not like that," and they start to fight among themselves (T17),* *- children do not listen to the speaker, they cannot be patient, they necessarily want to talk (T3),* *- there are some students whose voice is not heard at all (T1),* *- since they do not gain the habit of raising their hands, getting permission, they constantly jump into conversation, they try to join the conversation immediately before their friend finishes his word (T11).* *- they talk among themselves in a non-stop gabbling way (T2, T4),* *- they go next to each other as if the teacher is not in the classroom, they talk, there is a constant gabble in the classroom (T3, T6, T7),* *- at the beginning of the second grade, for the first month, they had conversations among themselves, and there was noise (T6),* *- they talk to each other a lot during the class, there is a lot of gabble in the classroom, I changed their places to prevent conversations, they continued to talk. The child is talking to himself, suddenly he start to sing, They continued the same habit in the classroom by thinking that the teacher does not hear when the computer is turned down, as they do in distance education, we could not prevent (T10).*
	Speaking level	*- there are also those who speak at the second grade level and those who cannot speak, but the majority cannot speak at an adequate level (T13),* *- there are students who have difficulty speaking, but they are able to carry out meaningful speech, for example, they can ask question sentences in accordance with the meaning (T14),* *- Children of families with a good socio-cultural status are able to speak by paying attention to intonation and emphasis, these are caused by the family (T17),* *- because they are very familiar with computers, television and current technologies, they can sometimes have a very nice conversation and talk about a topic in a way that surprises me without breaking off from the context of the topic (T11),* *- they can't tell what they want to tell (T13),* *- there was a problem with their speech, their ability to explain themselves (T9).*
	Speech content	*-They have a constant desire to talk that is not related to the topic (T9),* *- they wander from the subject because no one is listening to anyone, no one understands anything from anyone's conversation (T18),* *- they express unrelated, outside the agenda issues without listening to each other (T1),* *-there are students who are independent of the subject, independent of the environment, trying to speak what comes into their mind, they bring up a topic that is not realted at all (T2),* *- they say something that is not related to the subject by saying, ”this is also like that. When I ask “Does it related to the subject, why did you say that?”, he says, “it came into my mind and, I told you.” (T8).*
	Vocabulary	*- They don’t have extensive vocabulary, because they don’t read books (T1),* *- from time to time the word does not come to his mind, he wants to explain, but the word he wants to use does not come to his mind, he says, “I forgot, teacher.” (T2),* *- there are unnecessary words in the speech content (T4),* *- they perform a very plain statement (T5),* *- they can't form sentences, they can't answer a question in a text properly (T7),*

Table 4 provides participant teachers’ opinions about students' speaking skills. Participants noted that some students created disorder and discomfort in the classroom by not adhering to speaking rules, with other students expressing complaints about this behavior. The opinions are as follows: I have a student, who does not speak without having a say, does not interrupt someone else. They constantly complain to other students, "Teacher, they talk too much, it gives me a headache" (T15), they realize that they do

not listen to each other, and they react to each other; The child shouts, "Please shut up, I can't hear the teacher, I don't understand" (T4). Contrary to the above negatives, some participants expressed positive opinions about the speaking skills of students in the second grade: Students want to talk constantly, nowadays children can make statements that even I listen to with admiration (T9), there are students who have difficulty speaking, but they can perform meaningful speeches, for example, they can give the meaning of a question sentence (T14), children of well-off families can speak meaningfully to the content of speech, because of their family (T17), these children can chat and talk very nicely about a topic that sometimes surprises me because they are very familiar with computers, television and current technologies, they know (T11), students' conversations, the second the first two or three months of the class were very bad, it started to improve a little towards the end of the year (T7). There were also participants who compared the speaking skills of students studying in the second grade in the 2021-2022 academic year with the speaking skills of students from previous years. The opinions of these participants are as follows: Compared to previous years, there is general backwardness in this group's speech (T6), compared to former students, each new generation has a little more difficulty listening, empathy, silence or speaking (T12), these students have more opportunities, they are in social media a lot, they watch documentaries a lot, they are reading scientific journals, their horizons are a little more open, there is no problem in that sense. However, their social relations are bad, communication is bad, there is no respect for each other, one does not listen when the other speaks (T1), and they cannot tell what they want, according to previous students (T13). The participants' opinions of the students regarding their vocabulary, using words according to their meanings, answering questions and narrating are as follows: Their vocabulary is not so rich because they don't read books, their vocabulary is too narrow for them (T1), sometimes the word doesn't come to their mind, they want to explain, but the word they want to use doesn't come to mind, they say “I forgot, teacher” (T2), there are unnecessary words in the speech content (T4), they make very simple expressions (T5), children lack sentence formation, they can't answer a question in a text literally (T7), there were problems with their speech, their ability to explain themselves (T9). These findings show that students cannot use words in accordance with their meanings and place. They cannot talk about a certain topic at an adequate level, and they cannot make impromptu speeches in this way. There have also been participants who have expressed opinions about the reasons for the negativity and inadequacies experienced concerning the students' speaking skills, the opinions of these participants are as follows: “The source of the inadequacy and negativities in the speaking skills of the students is that they may have carried their behaviours that were at home during the distance education process in the first grade to the second grade this year. In distance education, parents and grandparents were sitting opposite or next to them, talking to each other during the lesson, and the child may think that this behavior is normal in the classroom. During the distance education lesson, the child talked to those around him, so they may think that I can behave the same way in the second grade, the habit may have formed like this, it's very difficult to unlearn (T15), I attribute the inadequacies in their speech to the lack of face-to-face education, I attribute them to casual conversations with their parents without rules (T3), When I ask the children about the classroom rules, they raise their fingers and say; we'll be quiet when the lesson starts, we won't talk to each other during the lesson, they know the rules, but when it's time to practice, not all of them can obey the rules (T16), they can't tell what they want to tell according to previous students, this is because of the pandemic, it may be because they only communicated with their families (T13), gestures are important in speech, nothing can replace face-to-face education (T13), if the pandemic had continued, the situation would have been worse and we would have lost the chance to teach them (T16), they did not understand the school rules very much, they were like first graders when they were in the second grade, they did not know the rules, if there had been face-to-face education, these negatives would not have happened, they would have known the rules (T6)”. The findings of the participants related to the reflections of this situation of the students who learned their initial literacy education by distance education in the first grade of elementary school on the speaking skills of the students in the second grade; they stated that the students could not apply the speech strategies, in this context, the students did not follow the rules of politeness in speech, did not speak in an audible tone, could not talk about a certain topic, went out of the subject, the level was backward in terms of speaking skills compared to the students of the previous years.

Theme 3: Participants' Opinions about Students' Reading Skills

Teacher opinions about the effects of this situation of students who learned their initial literacy by distance education in the first grade of elementary school during the pandemic period on their reading skills when the students are in the second grade are presented in Table 5.

Table 5
Participants' Opinions about Students' Reading Skills

Reading skill	Speed of reading	*- their reading rate are not enough (T1, T3, T8, T16),* *- at the beginning of the second grade, except for some, their reading rates was slow, quite slow. The child could not combine letters, he was reading slowly. Even a few of them could not learn to read and write (T8),* *- we don't push to read fast, when he reads fast, he does not read words, paragoge, it becomes even more meaningless, it is not important that reading fast, it is important that he understands what he's reading, but he doesn't read to understand what he's reading (T13).* *- their reading rates are too slow (T6, T7),* *- Their reading rates are good (T15, T17, T11)*
	Reading comprehension	*- reading comprehension is very inadequate (T1, T5, T8, T4, T17),* *- they are not reading to understand what they are reading, he says "I did not understand this question,", I say "read it again," and, he says "I understood this time" (T4),* *- we study the reading text according to their level, I ask the question that has the answer in the reading text, the child says, "I can't think, teacher," he doesn't even try, everything should be ready for the child to answer (T1),* *- it is very difficult for a child to find the main idea and interpret it. He can't find the main idea, and the he can't understand what's being told in the case because he can't understand. He can't even answer a few questions, he gives short answers about the text he's reading. For example; he says "beautiful", you ask "what is beautiful", there is no answer. "Is that true?" you're asking "is it true"" he replies but when you ask "why is it ture?", there no answer (T3),* *- some children cannot understand what they are reading, they cannot read well and understand. The child can't read and understand on his own, but he can understand when I read and gives the answer to the question (T4),* *-they can explain short texts (T12),* *- our biggest problem is to understand what they are reading, there is a lot of difficulty in understanding what they are reading, when understanding is insufficient, explaining is also insufficient (T10),* *- they are not good at understanding and explaining a text they are reading (T2),* *- they had no problem understanding what they were reading (T11),* *--they're good at understanding what they're reading (T15),*
	Answering questions	*- if he can't answer when you ask a question, he can't do other skills either (T10),* *--i stop the child in the middle of the text while he is reading and I ask a question, he can't answer even though he read it a second ago (T10),* *- they were very bad at answering questions in the first semester (T2),* *-When they are given a few questions about the text, they can easily find the answer to these questions, there is no problem (T18),*
	Obedience the rules of reading	*- They cannot read the sentence meaningfully while reading (T3, T5, T8, T10, T13, T14, T16),* *- They only vocalize when reading, and they want to read as quietly as possible, because then you won't see their mistakes. They don't want to read aloud because their mistakes show up (T13),* *- Very few children read texts in a meaningful way (T12),* *- they cannot read meaningfully in accordance with the text, half of the class cannot read by including their feelings and thoughts (T5),* *- they started to be able to do meaningful reading in the second semester (T9),* *- they can't stop the dot and comma long enough when reading (T5),* *- we couldn't control reading books much in the first grade. We focused on it more in the second year and we got a result in one semester, they got better towards the second period (T16),* *- they never read at home, they have not acquired the habit of reading books (T14),* *- they have just started reading by paying attention to punctuation marks (T17),* *- they set the tone of voice well while they are reading towards classroom (T9),*

Table 5 gives participant teachers' opinions about students' reading skills. Participants also shared insights into the underlying causes of the observed difficulties and inadequacies in students' reading skills. The opinions of the participants in question are as follows: "Our biggest problem in understanding what they read became an even bigger problem after distance education. While the child is reading, I stop them in the middle of the text, I ask a question, and they cannot answer it even though they read it a second ago. There is also a very big problem with reading comprehension, and when comprehension is insufficient, telling becomes insufficient. If they can't answer when you ask a question, they can't do other skills either (T10), we can't get book reading habits they never read at home. We couldn't do reading and writing collectively with distance education in the first grade, we didn't have enough time, they entered one group lesson for 3 hours a day, the other group entered the lesson for 3 hours (T14), and there was no reading study as a whole, only sentences, words and sounds were dealt with, the text was given, the text was read, but no silent reading and a complete reading study were done with that text, no reading was done properly, we focused only on teaching the initial literacy (T1)."

There were also participants who compared the reading skills of students studying in the second grade in the 2021-2022 academic year with the reading skills of students in previous years. The opinions of these participants are as follows: "I find their reading good, when I compare them with the other children, their reading is fast. I had no problems switching to reading and understanding what they were reading (T11), there was not much difference in finding the main idea of the piece they were reading, but again there were some negatives, reading speeds were very slow and slower than the previous ones, like seventy-five percent eighty percent (Ö6), understanding what they were reading towards the end of the second grade was the same as previous students, understanding and explaining a text they were reading, answering questions was very negative in the first semester (T2), compared to the old classes, reading speeds were quite slow (T7)." In contrast to these challenges, several participants shared positive observations about the second graders' reading skills: "Their reading speed, reading comprehension is good (T15), they set the tone of voice well for classroom reading there is no problem, ninety percent can do it (T9), I didn't think it would be that much, students' reading speed is very good, they have trouble understanding, but they just started reading by paying attention to punctuation marks (T17), I find their reading good (T2), there is not much difficulty in finding the main idea, they can do it. When 3-5 questions are given about the text, they can easily find the answers to these questions (T18)".

Participants related to the effects of this situation on the reading skills of students in the second grade of primary school students who learned writing instructions in primary school by distance education; students could not read fluently and were unable to understand reading, could not describe reading in outline, the order of events, could not adequately answer questions about the text they were reading, could not apply reading strategies, could not read paying attention to punctuation, could not read paying attention to emphasis, intonation and pronunciation, negativity and inadequacies in students' reading skills were caused by distance education and their levels were backward in terms of reading skills.

Theme 4: Participants' Opinions about Students' Writing Skills

Teacher opinions about the effects of this situation of students who learned their initial literacy by distance education in the first grade of elementary school during the pandemic period on their writing skills when the students are in the second grade are presented in Table 6.

Table 6 provides participant teachers' opinions about students' writing skills Several participants also shared insights into the underlying causes of the observed difficulties and inadequacies in students' writing skills. The opinions of them are as follows: While writing, there are letter deficiencies in the words, there is a misspellings, the number of children who do not write numbers and letters in accordance with the rules and write them backwards is too high. The effect of this distance education, because the child was not in the classroom, these negatives were experienced, if they were in the classroom, we would help them write, we could not do this in distance education, so there are reverse writings and misspellings (T17), they write words in sentences, letters and syllables are missing when they write words, they had their mother with them in distance education. But their mother couldn't act like their teacher, if they were in school I would check and help them write, but the parents couldn't (T12), they can't use punctuation marks even though we put a lot of emphasis on it, I think it's because

of distance education (T13), we still haven't been able to get the writing skills down. If it wasn't for the pandemic, if the children were at school, I would hold their hand and fix it (T16), they are doing the rounds upside down, it has not been corrected, and it is difficult to correct. Even though I repeat so many times, they still make mistakes, even though I write in the notebook, they are used to distance education and it continues like this (T11), there was no writing in distance education, it didn't happen, I'm in a lot of trouble right now, two or three of them are doing the tail of the nine above zero (T9), they continued the way they learned the writing aspects of the letters in distance education, I had them repeated in distance education, I printed them on the screen, but it was not like in the classroom (T16), there are letters written backwards, we struggled a little at the beginning of the second grade, but it does not work, it does not work as they learned first, it is difficult to correct the mistake, this is the effect of distance education (T18), they could not learn to read and write at a normal speed in distance education (T10), they do not want to write, this may be because a lot of writing is written in distance education in the first year (T9)." Contrasting with the previously mentioned challenges, some participants shared positive views on second graders' writing skills. These include correctly writing proper names and separating the initial letter from the ending suffix (T1, T14), effective dictation skills with fewer sound and letter omissions (T8), accurate transcription of spoken words, with substantial dictation practice during distance education (T10), and no missing words, sounds, or letters in their texts, with alternative uses of time allocated for other subjects in distance learning (T13). Towards the end of the second grade, improvements in letter omissions (T18) and punctuation, as well as proper noun spelling appropriate for their grade level, were observed, although some children initially struggled (T15). Regarding the second graders who received their initial literacy education through distance learning in first grade, participants noted significant deficiencies in writing. These included frequent typographical errors, such as letter and syllable omissions, non-standard writing of letters and numbers, incorrect use of capital letters and punctuation marks, and a general inability to write meaningful and coherent sentences suitable for second-grade level. They observed that students expressed their thoughts and feelings in a very limited manner and often wrote by repeatedly looking at each word during dictation and writing exercises. The participants attributed these challenges and deficiencies in writing skills to the impact of distance education, noting an overall low proficiency in writing.

Table 6

Participants' Opinions about Students' Writing Skills

Writing skill	Writing failure	*- they write the directions of letters and numbers wrong, they can't make the rounds correctly, they write from the bottom up when the lines should be from the top down (T1, T2, T4, T5, T6, T7, T12, T13, T15, T17, T8, T9, T11, T16, T18),* *- they can't write letters according to the rule, they spell most words incorrectly (T16),* *- they are missing letters or spelling them incorrectly (T1, T2, T3, T4, T6, T7, T18, T15, T13),* *- they have mistakes in writing, for example; they forget the letter "g" when writing "kaplumbağa", the letter "ı" when writing "patlıcan" (T11),* *- they cannot use punctuation marks suitable and correctly (T1, T3, T6, T13)* *- Some of them put a dot at the end of the sentence, do not start with a capital letter after the dot (T16),* *- when I ask about meanings of punctuation marks, they give answer correctly what should be done, but they can't apply it when writing, because they don't read comprehensively (T17),* *- they don't leave a space between words (T3),* *- they can't adjust the size of the upper-case letter and the lower-case letter (T10),* *- they write from the middle of the notebook, starting from the middle of the page (T3, T5),* *- they write the letters above the baseline, three of the six or seven students have corrected it, but there are still those who cannot correct it (T14),* *- their writing styles are still terrible (T17, T16)* *- they miswrite words in sentences, there is incorrect spelling, the number of children who do not write numbers and letters in accordance with the rule, who write the directions of letters wrong is too many (T17),* *- they miswrite words in sentences, letters and syllables in words (T12),* *- they couldn't serialize the writing (T10),*

Table 6 continuing

Writing down your feelings and thoughts	*- They write one-sentence sentences that are incompatible with the subject (T3, T18),* *- they can write their feelings and thoughts limited to a few sentences (T5, T6, T7, T14),* *- they have difficulty writing their own thoughts (T1, T12, T3),* *- they don't want to write long, so they write short answers (T11, T2, T3),* *- they cannot do what they want to say in writing at the desired level (T12),* *- there is a big problem in writing about completing the story and imagination, they can't write, they can't go beyond two sentences (T14),* *- they can write their feelings and thoughts limited to 3-5 sentences, they can't write any more (T15),* *- they did not know what to write when writing their feelings and thoughts consisting of a few sentences, they improved a little towards the end of the second grade (T13),* *- they respond verbally, but the written answer is short, they don't want to write (T9),* *- Their writing levels are at insufficient level (T18)*
Willingness to writing	*- they don't want to write, writing is a nightmare for them, it was very difficult for us (T9, T17, T11)*
Dictation	*- I write two short sentences on the blackboard, they try for almost an hour to write it in their notebooks, they can't read, understand, keep in mind and write the sentence (T11),* *- they can't keep in mind the sentence they read from the book and put it in the notebook, they can read it word by word and put it in the notebook that way (T12, T8, T1, T2, T3, T4, T5, T7, T15),* *- they read and write each word separately, they forget the other word while they write another word in the notebook, they read it again and again, they can write like that (T13),* *- at the beginning of the second grade, when they were writing something from the blackboard, they looked at the blackboard word by word and wrote like a child at the firs grades (T12),* *-I tell them to write the sentence in the notebook, they can't write it, they say" "say it again, teacher." (T8),* *- at the beginning of the second grade, there were very few students who wrote sentence by sentence in the notebook by looking at the blackboard, towards the end of the second grade, keeping the sentence in their mind and writing it in the notebook improved, but not at the desired level (T18),*

Discussion, Conclusion and Suggestions

Participants stated that the initial literacy teaching, which could not be done face-to-face due to the pandemic, had multidimensional negative effects on students' listening, speaking, reading, and writing skills in the second grade, and that there were deficiencies in students' language skills. Regarding the language skills in topic, the initial literacy teaching was carried out in the classroom within the possibilities of distance education, which could not be acquired and developed through various activities in which students were active. Güleryüz (2004) stated that for a successful initial literacy teaching to be realized, mother tongue education can be realized through learning and teaching experiences organized in the classroom environment. According to the findings obtained in this study, the participants stated that schools were temporarily closed due to the pandemic and that the initial literacy teaching in the first grades of elementary school was not carried out face-to-face. For this reason, students could not experience listening, speaking, reading and writing skills in the initial literacy teaching by doing and living in the classroom environment. They stated that distance education could not provide this due to the conditions and possibilities. As a result, they stated that there are inadequacies in students' listening, speaking, reading and writing skills, and that these inadequacies have a negative impact on their listening skills in the second grade. Listening education is given less importance than speaking, reading and writing. Although there are many people who think that listening is not a school subject like other skill areas and that it develops spontaneously, Yangın (1999) shows that listening is also a subject of education and listening comprehension skills of students who are trained in this subject can be improved. The Mother tongue lesson focuses more on skill and habit acquisition than mere information dissemination. The basic principle of the process of acquiring listening skills for students starting from the first grade of elementary school is that this skill should be acquired by integrating activities in which speaking, reading, and writing skills are acquired (Sever, 2004). In the research conducted by Steil on

listening, it has also been found that people write in 9% of the time they devote to communication every day, read in 16%, talk in 30% and listen in 45% (Arı, 2013). These results necessitate paying the necessary attention to listening education and taking the necessary steps to develop this skill, especially in the initial literacy teaching. Brownell (2016) listening skill is the most used skill in daily life and educational environments, but at the same time, it is the skill that is taught the latest.

According to participant opinions, the initial literacy teaching, which could not be carried out face-to-face due to the pandemic, had negative effects on the students' second-grade speaking skills. Speaking is an area of skill that is at the center of the skill areas that are in the initial literacy teaching. It is in relation with every skill area, such as being able to tell what they are reading, answer questions, enrich their vocabulary, and use what they have learned. The lack of speaking skills can also directly affect the lack of other skill areas. Without speaking, we can neither express our feelings and thoughts to others nor participate in social events as we wish. The ability to speak has an important role in the life of every individual. Speaking ability is an area of skill that should be continuous in the initial literacy teaching process. It is not possible for the student to express their feelings and thoughts to others without speech, and they also experience problems in their participation in the classroom, school and social life. In this regard, the ability to speak has an important role in the educational life of every student and afterwards. MEB (2009) The ability to speak is directly related to the ability to listen. Children learn to listen first and then talk. The ability of speaking is important for students to express themselves, communicate, learn and improve their mental skills. Students convey what they know, see, think and feel by speaking. The second graders who made up the target group of the study stated the fact that they could not fully attend the preschool education institution in the 2019-2020 academic year due to the pandemic and associated the disadvantages in writing skills with the lack of face-to-face education. Other research results also support this situation. Kesik and Baş (2021) found that considering the crowded class sizes in distance education and other problems that arise due to students and teachers staying in front of the screen for a long time, it was not possible to evaluate all students' writings and give the necessary feedback. Güler (2016), Topçu (2012) and Duran (2009) stated that in their studies, they reached the conclusion that the writing skills of students who received preschool education were more successful than those of students who did not receive preschool education. Consistent with these findings, the students participating in the study have deficiencies in their writing skills because they were not able to fully attend pre-school education due to the pandemic before starting the first grade and did not do writing exercises to prepare for reading and writing sufficiently. Arslan and Ilgın (2010) stated that students and teachers who have an unwilling perspective towards writing do not do writing studies unless they need to. Gurol and Yıldız (2015) state that computer-assisted initial literacy education has a positive effect on the development of children's reading skills and reading speeds, but it does not have a positive effect on the development of writing skills. As a result of this research, it has been determined that the students participating in the study have deficiencies in their writing skills because they did not do enough writing practice.

There are various ways to increase students' writing speed; writing a short text on a blackboard or printing it from a book can improve students' writing speed, but the fact that face-to-face training cannot be performed has caused the inability to do these kinds of activities that will increase writing speed. Kadıoğlu (2012) stated in his study that the writing speed of students who started primary school at a late age is ahead compared to others. These findings are consistent with the research results. In this study, participants stated that conditions such as inadequacies in writing speed, prevalence of writing errors, unwillingness to write in students, and inability in written expression have a negative impact on second-grade writing skills because students do not start school late, but are deprived of face-to-face education. Students who started school later had more developed fine motor skills. Therefore, their writing speed is positively affected. In this study, it is evaluated that the students did not practice writing sufficiently, which negatively affected the development of their fine motor skills and caused inadequacies in their writing skills.. The inadequacies of the participants regarding their reading skills are also consistent with various research results. On this subject; Kesik and Baş (2021) stated that the use of EBA and educational portals in initial literacy teaching is effective in teaching reading, but it is not very effective in acquiring a reading habit and is not the primary tool for providing reading motivation. It is important for first-graders in elementary school, where the foundations of initial literacy teaching were laid, to improve both their reading comprehension and reading speed. The ability to read

comprehension can be achieved with both audible reading and silent reading. The main purpose of reading is to read what is written in a meaningful way, along with accurate and fluent reading. Reutzel and Cooter (1996) state that a student who reads fluently is also one who understands what he is reading. These research results are consistent with various research results. In their study, Gürbüz and Yılmaz (2021) identified the problems encountered in the initial literacy teaching in the distance education process during the pandemic period as connection problems, lack of school-classroom culture, parent apathy or parent intervention, difficulties in following the activities of students, lack of devices, low participation in the lesson, and lack of materials, respectively. Students who could not continue face-to-face education in the first grade due to the pandemic in the 2020-2021 academic year were also unable to attend preschool education institutions due to the pandemic for most of the 2019-2020 academic year. This situation negatively affected the process of getting to know an educational institution and getting used to the institution, as the participants stated, the students did not have a classroom, school culture, although they were in the second grade, they exhibited behaviours as if they were coming to school for the first time, which negatively affected their listening, speaking, reading and writing skills. Yalman (2007) starting primary school is one of the most important transition points in children's lives, and it can be said that children who have received preschool education cope with these problems more easily when they start primary school first grade.

It is the quality that is important in the initial literacy education that the students will use throughout their life; listening, speaking, reading and writing skills will be acquired. The belief that it does not matter how initial literacy is taught is incorrect. In fact, the main purpose of initial literacy teaching is to provide the child with the basic skills of reading and writing that they will use throughout his life. In Güler's (2016) research, students who received preschool education scored higher on the literacy skill scale than students who did not receive preschool education and significantly differed. When the effect of the student's school adaptation levels on their literacy skills was examined, it was seen that the literacy skills of the student who adapted better to school were better. Göçer (2014) states that students who receive preschool education come to the first grade of elementary school by acquiring basic skills such as asking permission, holding a pen and sitting, and are more successful in literacy studies. As the socio-cultural environment of the schools improves, the literacy skills of the students also improve (Obalar, 2009). Ramos-Morcillo et al. (2020) stated that one of the disadvantages of distance education is the conditions that students have and that students do not have equal rights due to this situation. In this regard, the home environment must be socially, economically and pedagogically suitable for the Balcı (2020) school program to be sustained, even to some extent. There are many findings in the literature that home environments are not suitable for distance education (Moreno and Gortazar, 2020; Amorim and Junior, 2020; Saavedra, 2020). Gürbüz and Yılmaz (2021) in their study; during the pandemic period, 60% of the first-grade teachers stated that they had problems with teacher-family cooperation in the process of performing the initial literacy education with distance education. This situation means that students who cannot receive face-to-face teacher assistance are expected to receive face-to-face assistance from their families and that assistance has not been realized in the desired way. Gürol and Yıldız (2015) state that computer-assisted primary literacy education has a positive effect on the development of children's reading skills and reading speeds, but it does not have a positive effect on the development of writing skills. These results show consistency with the research results.

According to the opinions of the participants in the study;

Students' listening skills; listening without interrupting, watching the speaker, making eye contact, applying verbal instructions, focusing their attention on what they are listening to are not at an adequate level,

In their speaking skills; they do not follow the rules of politeness, they do not speak in an audible tone of voice, they go out of the subject, they cannot use words in accordance with their meanings and in place, they cannot talk about a certain topic at an adequate level,

In their reading skills; they cannot read fluently, they are unable to understand and explain what they are reading, they cannot give adequate answers to questions about the text they are reading, they cannot read by paying attention to punctuation marks, they do not pay attention to accent, intonation and pronunciation,

In their writing skills; they make letter errors, lack of syllables, cannot write letters and numbers in accordance with the rules, cannot use capital letters and punctuation marks in appropriate places, cannot write meaningful and canonical sentences appropriate to class level, can write their feelings and thoughts in a very limited way, can write by looking at each word over and over again instead of a sentence in dictation and staring writing studies, results have been obtained.

Although distance education carried out during the pandemic process does not differ in terms of achievements, especially in initial literacy teaching, when evaluated from their point of view such as, the tools used in the initial literacy teaching process, the planning of the teaching process, the physical environments in which students participate in classes and student-teacher, student-student interaction, the efficiency of lessons, etc. when evaluated from their point of view, it is quite different from face-to-face training. According to the conditions of distance education, initial literacy teaching leads to deficiencies in the context of their achievements, students who learn initial literacy learning through distance education have negative repercussions on their second-grade listening, speaking, reading and writing skills, this may depend on the quality of electronic devices used in distance education, the Internet infrastructure that is used, teachers' adaptation to distance education features, it is possible that these reasons can be further diversified for primary school first grades. It will not be easy for teachers who teach initial literacy teaching face-to-face using classical methods to teach initial literacy teaching by distance education using the same methods, and it will not be possible to achieve the expected gains.

Considering the results obtained from the research, the following suggestions can be made: Necessary guidance services should be provided to the teachers and parents in order to develop and improve distance education and to encourage the active participation of students in the process. In-service training programs should be organized for teachers on teaching initial literacy through distance education. In the process of teaching initial literacy through distance education, teachers should develop and use different tools and methods by using the opportunities provided by technology. Teachers should be provided with the skills of preparing/presenting course materials in digital environments. In order to ensure the active participation of students in the initial literacy teaching, rich and interactive distance education materials suitable for their individual differences and levels should be prepared.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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.

Funding: This research received no funding.

Institutional Review Board Statement: Ethics Approval Certificate No. 2022/47811 was obtained from the Social Sciences and Humanities Researches and Scientific Publication Ethics Committee of the TR Ankara Social Sciences University Rectorate (Social Sciences University Of Ankara Institute of Ethics Committee Of Social Sciences And Humanities Research And Publication-Certificate Of Ethics Approval).

Data Availability Statement: Data generated or analyzed during this study should be available from the authors on request.

References

Akyol, H. (2006). *Türkçe öğretim yöntemleri*. Ankara: Kök.

Arı, G. (2013). Dinleme/izleme öğretimi. In C. Yıldız (Ed). *Yeni öğretim programına göre kuramdan uygulamaya Türkçe öğretimi* (pp. 179-207). Ankara: Pegem Akademi.

Amorim, V., Piza, C., Lautharte, J., & Ildo, J. (2020). The effect of the H1N1 pandemic on learning. What to expect with Covid-19. Retrieved from http://meb.ai/t1vWnx

Arslan, D., & Ilgın, H. (2010). Öğretmen ve öğrencilerin bitişik yazı ile ilgili görüşleri. *İnönü Üniversitesi Eğitim Fakültesi Dergisi*, 11(2), 69–92.

Balcı, A. (2020). Covıd-19 özelinde salgınların eğitime etkileri. *Uluslararası Liderlik Çalışmaları Dergisi: Kuram ve Uygulama,* 3(3), 75 – 85.

Braun, V., & Clarke, V. (2012). Using Thematic Analysis in Psychology. *Qualitative Research in Psychology*, 3, 77-101.

Brownell, J. (2016). *Listening: attitudes, principles and skills*. New York: Routledge

Bulut, B. (2013). *Etkin dinleme eğitiminin dinlediğini anlama, okuduğunu anlama ve kelime hazinesi üzerine etkisi.* [Unpublished Master's Thesis]. Adnan Menderes Üniversitesi, Aydın.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2013). *Bilimsel araştırma yöntemleri* (14. Baskı). Ankara: Pegem Akademi.

Duran, E. (2009). *Bitişik eğik yazı öğretimi çalışmalarının çeşitli değişkenler açısından incelenmesi.* [Unpublished Doctoral Thesis]. Gazi Üniversitesi, Ankara

Erlingsson, C., & Brysiewicz, P. (2017). A hands-on guide to doing content analysis. *African Journal of Emergency Medicine*, 7, 93-99.

Göçer, A. (2014). *İlkokuma ve yazma öğretimi*. Ankara: Pegem Akademi.

Gravetter, F. J., & Forzano, L. B. (2012). *Research methods for the behavioral sciences* (4th ed.). Hampshire: Cengage Learning.

Güler, B. İ. (2016). Okul Öncesi öğretmenlerinin riskli oyunlara yönelik görüş ve algıları. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Özel Eğitim Dergisi*, 17(2), 97-118. Retrieved from https://doi.org/10.21565/ozelegitimdergisi.246484

Güleryüz, H. (2004). *Türkçe ilk okuma yazma öğretimi. Kuram ve uygulamaları*. Ankara: Pegem Akademi.

Güneş, F . (2013). Türkçe'de metin öğretimi yerine metinle öğrenme. *Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 11, 603-637.

Gürbüz, E., & Yılmaz, M. (2021). Pandemi döneminde ilk okuma yazma öğretimi sürecinde karşılaşılan sorunlara ilişkin sınıf öğretmenlerinin görüşleri. *Journal Of Social, Humanities and Administrative Sciences*, 7(40), 1088-1094.

Gürol, A., & Yıldız, E. (2015). İlk okuma yazma öğretiminde bilgisayar destekli eğitimin ilkokul birinci sınıf öğrencilerinin ilk okuma yazma becerilerine etkisi. *Uluslararası Alan Eğitimi Dergisi*, 1(1), 1-18.

Kadıoğlu, H. (2012). *İlköğretim birinci sınıf öğrencilerinin bitişik eğik yazma becerisi, hızı ve tutumlarının incelenmesi*. [Unpublished Doctoral Thesis]. Marmara Üniversitesi, İstanbul.

Kavcar, C., Oğuzkan, F., & Sever, S. (1999). *Türkçe öğretimi*. Ankara: Engin Publishing

Kesik, C., & Baş, Ö. (2021). Sınıf öğretmenlerinin perspektifinden Eba ve eğitim portalları ile ilk okuma ve yazma öğretimi. *Eğitim Teknolojisi Kuram ve Uygulama*, 11(1), 93-115.

Kurudayıoğlu M.,& Kana, F. (2013). Türkçe öğretmeni adaylarının dinleme becerisi ve dinleme eğitimi özyeterlik algıları. *Mersin Üniversitesi Eğitim Fakültesi Dergisi,* 9(2), 245-258

Lambert, V.A., & Lambert, C.E. (2012). Qualitative descriptive research: An acceptable design. *Pacific Rim International Journal of Nursing Research*, 16, 255–256.

Maden, S., Durukan, E. (2011). Türkçe öğretmeni adaylarının dinleme stillerinin çeşitli değişkenler açısından değerlendirilmesi. *e-Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, 3, 101-112.

Milli Eğitim Bakanlığı (MEB, 2009). *İlköğretim Türkçe dersi öğretim programı ve kılavuzu (1-5. Sınıflar*). Ankara: Milli Eğitim Bakanlığı.

Moreno, J. M., & Gortazar, L. (2020). An analysis from PISA 2018 and its implications for the COVID19 crisis response. Retrieved from http://meb.ai/E4Jxgf

National Council of Teachers of English (NCTE, 1996). NCTE / IRA Standards for the english language arts. Retrieved from http://www.ncte.org/standards/ncte-ira

Obalar, S. (2009). *İlköğretim birinci sınıf öğrencilerinin ilk okuma yazma becerileri ile sosyal duygusal uyum ve zeka düzeyleri arasındaki ilişkinin incelenmesi*. [Unpublished Doctoral Thesis] Marmara Üniversitesi, İstanbul.

Öz, F. (2006). *Uygulamalı Türkçe öğretimi* (3th Ed). Ankara: Anı.

Özbay, M., & Melanlıoğlu, D. (2012). Türkçe öğretim programlarının dinleme becerisi bakımından değerlendirilmesi. *Turkish Studies*, 7(1), 87-97.

Özkan, M. (2008). Dil-kültür bağlamında türkçe ve edebiyat öğretimi. *Türkçe Öğretimi Kongresi 2008*, İstanbul.

Ramos-Morcillo A. J, Leal-Costa, C., Moral-García J. E., & Ruzafa-Martínez, M. (2020). Experiences of nursing students during the abrupt change from face-to-face to e-learning education during the first month of confinement due to COVID-19. *Spain. International Journal of Environmental Research and Public Health*, 17(15).

Reutzel, D. R. & Cooter, R. B. (1996). *Teaching children to read: From basals to books.* Colombus: Merrill-Prentice Hall Publishing Company.

Saavedra, J. (2020). Educational challenges and opportunities of the coronavirus (COVID-19) pandemic. Retrieved from http://meb.ai/fSOKbt

Saldana , J. (2019). *Nitel araştırmacılar için kodlama el kitabı*. (A. Tüfekci Akca & S. N. Şad, Trans..). Ankara: Pegem Akademi.

Sever, S. (2004). *Türkçe öğretimi ve tam öğrenme*. Ankara: Anı.

Topçu, Z. (2012). *Okul öncesi eğitimin ilköğretim birinci sınıf öğrencilerinin okula uyum ve türkçe dil becerilerine etkisi*. [Unpublished Master's Thesis]. Hacettepe Üniversitesi, Ankara.

World Health Organization (WHO, 2020). Coronavirus disease 2019 (COVID-19). Retrieved from https://www.who.int/docs/default-source/coronaviruse/situa tion-reports/20200309-sitrep- 49-covid-19.pdf?sfvrsn=70dabe 61_

United Nations Educational, Scientific and Cultural Organization (UNESCO, 2020). School closures caused by coronavirus (Covid-19). Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000380398

Yalman, D. (2007). *İlköğretim okulu yöneticilerinin, birinci sınıf öğretmenlerinin, ana sınıfı öğretmenlerinin ve okul öncesi eğitim almış birinci sınıf öğrencilerinin okul öncesi eğitimden ilköğretime geçişte yaşanan uyum sorunlarıyla ilgili görüşleri*. [Unpublished Master's Thesis]. Marmara Üniversitesi, İstanbul.

Yangın, B. (1999). *İlköğretimde Türkçe öğretimi. İlköğretimde etkili öğretme ve öğrenme öğretmen el kitabı modül 4.* Ankara: Milli Eğitim Bakanlığı

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

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

We Read but How: Research on Reading and Reading Comprehension Skills

Mehmet Arif Bozan[1]

To cite this article:
Bozan, M. A. (2024). We read but how: research on reading and reading comprehension skills. *e-Kafkas Journal of Educational Research*, *11*, 178-192. doi: 10.30900/kafkasegt. 1370135

Research article **Received:02.10.2023** **Accepted:30.04.2024**

Abstract

Reading and reading comprehension skills are among the most basic language skills. Therefore, these skills should be acquired at an early age. Although there are studies in terms of reading in Türkiye, it was seen that reading comprehension skills are insufficient in the exams. This study investigated how reading and reading comprehension activities were carried out at the primary school level and how this situation reflected on students. This study was designed as a case study to reveal the subject to be examined in depth. The participant group of this study, which was carried out at the primary school level, consisted of 207 students and eight primary school teachers. Data were collected from students with a reading comprehension test and teachers with a semi-structured interview form. The data obtained from the achievement test are presented descriptively. The interviews with the teachers were analyzed by content analysis. According to the data obtained, it was seen that the teachers preferred the reward method in gaining the habit of reading, and they carried out activities that would improve the students' cognitive skills for their reading comprehension skills. The result that 70.53% of the students in the research made the profound understanding question wrong was also a remarkable situation.

Keywords: Turkish, reading, reading comprehension, primary school

[1] Corresponding Author, mehmetbozan@aydin.edu.tr, Istanbul Aydın University

Introduction

Mustafa Kemal Atatürk underlined the importance of reading as follows: *"I was poor as a child. When I had two dimes, I would buy a book with one dime. Otherwise, I would not be able to do any of these things."* (Granda, 1973, p. 267). As stated by Atatürk, reading is a vital instrument in a person's life and is one of the basic skills that must be acquired. This essential skill is helpful in both daily and academic situations. In addition to the importance of reading skills, Akyol (2005) defined this process as the person communicating with the author of the text they read based on their prior knowledge and making sense of it by reading in line with the target they have set. Therefore, individuals will encounter new and different resources in their readings, leading to varied circumstances and experiences (Özbay, 2007). These contacts with unfamiliar circumstances and experiences will untail the learning process and provide them with fresh perspectives. Hence, reading and comprehending what is read are essential determinants that impact an individual's everyday existence and educational endeavors. For this reason, reading is one of the skills children first aim to acquire when they start school.

Reading education begins in 1st grade and considerably affects a person's academic life. For example, The World Bank (2019) states that the child will suffer from "learning poverty" if his/her reading and comprehension proficiency is not at the desired level. This means that if a child is not proficient in reading and comprehension, he/she will be unable to understand other courses. For example, he/she has to understand instructions wholly and correctly so that a student can solve a problem in the mathematics class or experiment in the science class. Studies have revealed the positive effect of developed reading skills on mathematics and science (Akbaşlı, Şahin, & Yaykıran, 2016; Ding & Homer, 2020). Although reading is essential, national and international exams show that students' reading skills are insufficient. For example, according to the Monitoring and Evaluation of Academic Skills (2019) report, approximately 60% of 4th-grade students in Türkiye are at intermediate or lower levels regarding reading comprehension proficiencies. Therefore, it is critical to develop these skills.

According to research on reading comprehension skills, good readers do the following things during the reading process (Duke & Pearson, 2009).

- They are active readers.
- They set clear goals before starting and evaluating their progress throughout the reading process.
- Before reading, readers evaluate and take notes on essential parts of the book.
- They predict the future chapters while reading.
- They are conscious of how they should read (quickly, carefully, by repeating, etc.) and make their choices accordingly.
- They question the meanings they create about what they read.
- They learn words or concepts whose meaning they do not know.
- They research about the author of the text.
- They determine the value of the text they read and react to the text emotionally and intellectually.
- They read different types of texts.
- They analyze the plot and characters in the text well.

When we look at what good readers do in the reading process, it is seen that variables such as the characteristics of the reader, the characteristics of the text, and the goals that affect this process are influential (Lorch & van den Broek, 1997; van den Broek & Kremer, 1999). When it comes to reader characteristics, individual differences come into play. People's lives, vocabulary, correct reading, letter recognition, fluent reading, etc., affect reading comprehension proficiencies as individual differences (Akyol, 2005; Davey, 1998). In addition, to understand what the author wants to tell in the text, it is necessary to know some factors, such as the period in which the author lived and his/her perspective on life (Beydoğan, 2010). As a result, reading and reading comprehension skills are complex processes influenced by several variables. Therefore, to develop these skills properly, teachers must be competent in giving reading and comprehension skills to students.

Collins and Smith (1980) stated that monitoring comprehension, forming hypotheses, and evaluating points are essential for developing reading comprehension skills. Regarding monitoring comprehension, the teacher should follow the ongoing comprehension process while the student reads the text and guide the solution point when there is a problem. While the reading process continues, the student interprets what they have read and makes predictions about the following chapters based on the clues in the text. The teacher's guidance in these parts is essential for the student's reading comprehension. In schools, there are projects such as reading hours (Köksal & Değirmenci, 2015) or book reading hours determined at certain hours and days to help students gain reading habits. These activities are sometimes covered by national and local press as "reading days" or "reading festivals" (see. Erzincan Governship, 2023). Despite the activities performed, reading comprehension skills are not at the desired level at exams (E.g., Republic of Turkey Ministry of National Education [MoNE], 2019; OECD, 2023).

Research Questions

This study examines how primary school teachers perform reading activities, their activities related to reading comprehension skills, and how they reflect on students. For this purpose, answers to the following questions have been sought:

1. How do primary school teachers perform activities related to reading and comprehension skills in their classrooms?
2. How do the activities of primary school regarding reading and reading comprehension skills reflect on the reading comprehension skills of students?

Method

This study employed a qualitative case study approach. Yin (2008) describes a case study as empirical research that thoroughly investigates a current event, particularly when the distinction between phenomena and context is blurred. On the other hand, this study is designed by the descriptive case study elaborated by Yin (2008). A descriptive case study aims to define the phenomenon within the context in which it occurs (Yin, 2008). In this study, effort has been paid to reveal how reading activities at the primary school level were conducted and how they reflected on students' reading comprehension skills. Thus, the study examined the targeted phenomenon in its real-life context. In addition, how teachers develop reading and reading comprehension skills and measure students' reading comprehension skills constitute two separate units of analysis. Therefore, the current research is a single-case embedded design.

Study Group

The study group included 207 primary school students and eight primary school teachers. The research was carried out by approximately 5000 students and 144 teachers in the primary school. This study was carried out at the primary school level and aimed to provide diversity by including students and teachers from all grade levels. Therefore, the maximum diversification method was used to determine the participants in this study. The maximum diversification method is recommended to reveal better the situation examined in case studies (Creswell & Poth, 2018). Information about the participants in the study is presented in Table 1. Teachers were given code names.

Table 1.

Case Study Participant Characteristics

Grade Level	Number of students		Teacher's name	Gender	Professional seniority
	Girl	Boy			
Grade 1	25	29	Yasemin	Female	8
			Fatih	Male	25
Grade 2	24	20	Oğuz	Male	15
			Dilara	Female	18
Grade 3	26	26	Büşra	Female	11
			Cansu	Female	6
Grade 4	29	28	Beyza	Female	17
			Elif	Female	4
Total	104	103			

As shown in Table 1, 104 girls and 103 boys from all grades participated in the primary school study. In addition, interviews were conducted with the classroom teachers of the students who took the reading comprehension test. Six of the participating teachers were female, and two were male.

Data Management and Analysis

Multiple data collection tools were employed to display the research case in depth. First, the researcher developed a test to measure the reading comprehension competencies of primary school students. The texts in this test were taken from coursebooks approved by the Ministry of National Education, which the students had not seen before. After selecting texts from coursebooks at all grade levels, four simple comprehension and two deep comprehension questions were asked. After examining the questions, two academicians and two primary school teachers who are experts in the Turkish field gave suggestions for removing similar questions. Following these suggestions, four simple-meaning questions were reduced to two, and two deep-meaning questions were reduced to one. In addition, the students were asked, "Do you like reading books?" in writing. The students were asked to mark their answers as a) I like it because... or b) I don't like it because .... and explain why. Another data collection tool is a semi-structured teacher interview form. Following the literature research, a list of 12 topics was developed, and pilot interviews with two primary school teachers were done to see whether the interview questions were valid. After these interviews, the number of questions was reduced to 10.

The study used content analysis to obtain data from interviews with the teachers. Content analysis is a way to reach fundamental consistencies and meanings from the qualitative data obtained (Patton, 2002). The primary meanings reached by the content analysis method are called themes (Patton, 2002). The data collected in this research were conceptualized first, and then themes were formed by organizing the concepts. The themes obtained are presented in the findings section. The data obtained from the reading comprehension test were scored, and the results were reached. The results are presented descriptively.

Validity and Reliability

The texts in the tests created for the student's reading comprehension skills were selected from texts approved by the MoNE to be valid and reliable, taught in public schools, and which the students have not yet encountered. A Ph.D. level primary school teacher assessed ten randomly selected examinations to assess the dependability of the student's scores. It was observed that the scoring by the researcher and the teacher were similar. One of the methods used to ensure internal validity or credibility in qualitative research is member checks (Merriam, 2009). In this study, the results of the interview analysis were presented to the participants, and approval was obtained. Reporting the data obtained in qualitative research in detail and explaining how the results were reached is one of the criteria for validity. It is essential for validity to give direct quotations from the participants of the research and to explain the results based on these quotations (Yıldırım & Şimşek, 2013). In this study, direct quotations from the interviews with teachers are presented.

Findings

In the findings section, the data collected from the teachers were presented. When the interview data with the teachers were analyzed, the following themes emerged: "Students' reading habits, factors in acquiring reading habits, methods used to evaluate reading comprehension skill, reading comprehension skill."

Reading Habits of Students

In the interviews with the teachers about the reading habits of the students, it was determined that some students saw reading as their duty and read because of fulfilling the given task, whereas others read by enjoying it.

> *"Some students enjoy reading, while others read purely out of duty or do little reading."* (Yasemin)

It was stated that the reading habits of the students could improve somewhat with the influence of the primary school teacher and the school in the elementary school period but weakened in the post-elementary school stages.

> *"Although the rate of reading a book increases slightly during the primary school years with the influence of the school and the primary school teacher, it gradually decreases afterward."* (Fatih)

In support of Fatih, Oğuz stated that the children's reading habits weakened when they were away from school. For example, the reading habits of the students weakened during the pandemic:

> *"For the past two years, they have been away from school due to the pandemic. Therefore, I think that their reading habits have declined."*

Büşra stated that no matter how hard she tried, her students' reading habits were not sufficient, and accordingly, even if they read, the students' readings were not qualified. For example, she stated that students had difficulties expressing information about their reading.

> *"I make an effort for my students to develop the habit of reading. However, I can say that they are not at the level I desire. They cannot analyze exactly what the text they read wanted to tell them. They have difficulty expressing it."*

Beyza, on the other hand, stated that the students' readings are not qualified because reading activities are done as an obligation at school. For this reason, Beyza thinks that students see reading books as an obligation and cannot discover their desires for reading books.

> *"Reading is like an obligation for them throughout their school life. The number of students who voluntarily discover their style or read for a specific purpose is quite low. Therefore, they cannot do quality reading."*

It was stated by the teachers that the students with reading habits read the books with love and scrutiny, and they enjoyed talking about the book they read, whereas the students who did not have the habit of reading did it only as a duty. In addition, it was stated that the students who consider reading a book as a duty focus on finishing the book as soon as possible instead of understanding what they read.

> *"I think the readings of my students who enjoy reading are qualified. They examine what they read, think about what they want to be told in the book, and get excited about it. Students who do not have the habit of reading or do not like to read do not read to understand the book, but to finish the book as soon as possible."* (Yasemin)

When we look at the activities carried out by the teachers to help students gain reading habits, it is evident that they created a library in the classroom and took into account the characteristics of the students while creating the library. On the other hand, they mentioned that they also read during the reading activity to provide a role model in gaining reading habits and that they differentiated the reading environment.

> *"Yes, there is. First of all, we created a classroom library with the students in line with the age and interests of my students. We changed the books we read, and I gave interesting little clues about the book's content so that students were curious and excited about the events in the new books. While the children are reading, I do some reading as well".* (Yasemin)

> *"I'm talking about how much I enjoy reading. I try to make them enjoy this process and reading in the classroom, and sometimes by reading outdoors in the school's garden."* (Yasemin)

Fatih stated that he reads a book where the students can see it. He also stated that being a children's book writer, besides being a teacher, is effective in developing the habit of reading books in his students.

> *"First of all, I read a book in front of them in my spare time in the classroom. I think that being a writer also affects them considerably."*

Teachers try to be role models to develop the habit of reading books among students. In addition, they follow the books they read by making a list. It was stated that conversations were held among the students about the books they read to encourage them to read and observe their reading quality.

> *"We take notes on the books we read, so the student becomes more enthusiastic by seeing how many books they read in a semester. I want them to arrange small conversations between students reading the same book. I allow them to talk about the book in the garden."* (Yasemin)

Oğuz stated that he used words encouraging students to read books so that they could acquire the habit of reading. He stated that he was reading a book and provided some information about the book for encouragement. In addition, he used different reading methods in the classroom. For example, students act out a part of the book with drama.

> *"When I put a new book in the library, I say to encourage them: "Children, I read this book. I liked it very much. I recommend you read it, too. It is a fun book." I read aloud to them in class; sometimes, a student reads aloud to the whole class. I'm making a reading circle. We are turning a popular part of the book into a play."*

Dilara's teacher stated that they make weekly reading by having all the students buy a book set to gain the habit of reading. She stated that he evaluated the books read at the end of the week; thus, he tried to instill in the students a reading habit.

> *"I make all students in my class buy the same stories appropriate for their level. Then, we read one storybook every week. On Fridays, I make an assessment test on this storybook."*

In addition, Dilara stated that she also uses gamification to help students gain reading habits.

> *"I am giving you a map of Türkiye. We have provinces on this map. My students paint a province after each book they read. There is a competition among my students; I reward those who complete the map."*

Another method that teachers use to develop reading habits is the reward system. Teachers stated that they give awards to students with various activities according to the number of books they read.

> *"We are doing a Türkiye map painting activity to determine the number of books students read. We choose a "bookworm" of the month and post his/her photo in the corner of the classroom*." (Cansu)

Factors in Acquiring Reading Habits

Two of the reasons that will make the students develop the habit of reading are the structure of the books and the family. It has been stated that the fact that children's books are suitable for the level of the students that will attract their attention and appeal to them is an essential factor in encouraging the students to read. On the other hand, it was stated that the home environment and family members' attitudes towards reading also affect the child.

> *"Based on myself, I think that the most important factor is choosing a book that will attract the child's attention, arouse his curiosity, not tire him, and is suitable for his age. Another important factor is that the family is a model and encourages the child to read. No matter how effective the teacher seems to be in this regard, I believe that it will be difficult for the child to acquire the habit of reading when he sees a family that watches TV all the time when he goes home and a disinterested parent attitude that does not wonder what they have been reading."* (Yasemin)

It was stated that another factor that influences students' acquiring reading habits is the environment in which they live. It was customary for children to fail to acquire reading habits, considering the low reading rates in Türkiye. The teachers stated that not only should the environment understand the family, but every one the students see as an example should also be evaluated in this sense.

> *"People perceive the environment they live in as the normal of life. In other words, this action will be a normal and indispensable life routine for a student who reads a book at home. Considering that the rate of regular book reading in Türkiye is one in a thousand, it is easy to understand what kind of habitat our children grew up in."* (Fatih)

> *"Everyone who has a place in the child's life, brother, sister, neighbor, relative, even the bus driver, has importance. Because from time to time, there are people the child takes as a role model, that is a school. If that person is reading a book, the child will read a book."* (Oğuz)

Reading Comprehension Skill

Teachers stated that they do activities for creative thinking skills in order to improve students' reading comprehension skills. In this sense, they organize activities such as designing book covers and creating different endings for the texts read.

> *"Making them think of different endings to the book being read. Drawing different cover designs for the book they read."* (Fatih)

The teachers stated that students should have sufficient vocabulary to understand the books they read, make inferences from what they read, and express their inferences. Therefore, it is clear that students must have sufficient cognitive development and vocabulary to understand what they read. The importance of family support for the development of these skills was emphasized.

> *"The cognitive development of the child is significant. For the child to understand what he reads, he must have a certain vocabulary and be able to make inferences and summarize them. Activities with this purpose can support this process. I think it is important that the parents accompany the child's reading. It is essential to ask the child questions about the book and the family to practice with the child on this subject. In this way, the child will read more guided towards understanding."* (Fatih)

Oğuz stated that students' love of reading, being able to read fluently, and developing their cognitive skills are essential factors in improving their reading comprehension skills.

> *"Mind games, listening skills, fluent reading, and love for reading."*

Beyza stated that technology negatively affects reading comprehension skills. She stated that children are too busy with technological tools, negatively affecting their reading comprehension. She claimed that this negative effect of technology is more evident with the new generation.

> *"The potential for reading comprehension changes according to the reading rate. Children's comprehension skills have generally declined since they became immersed in technology. It is quite low compared to the previous 4th-grade students. In short, technology significantly affects reading rates."*

Teachers have stated that sound-based letter teaching in elementary schools negatively affects students' reading comprehension skills. As the reason for this situation, the teachers stated that the students missed the meaning of the text or sentence because they only focused on reading the letter or word.

> *"Children are quick to read using the sound-based letter method, but it takes time to see the whole as we move from part to whole. Reading comprehension is meaningful when we see the whole, so it affects children's reading comprehension and can prolong the process of acquiring reading habits."* (Yasemin)

> *"I think that the sound-based sentence method delays the development of reading comprehension skills. These skills are acquired later, especially considering sense-making issues and being aware of the content."* (Elif)

Methods Used to Evaluate Reading Comprehension Skill

It was stated that the most popular method in evaluating students' reading comprehension skills was short-answer question-answer activities. Availability of rooms and curriculum density were cited as reasons for doing this activity.

> *"Due to the crowdedness of the class and the high intensity of the courses, the method I use most for reading comprehension is the short question and answer activity."* (Yasemin)

Oğuz, on the other hand, stated that he used tests consisting of a small number of questions about the text to measure his students' reading comprehension skills. In addition, he tries to determine whether students understand what they read by conversing with students about the book.

> *"I give short texts to students and 2-3 questions to determine their reading comprehension skills. I make practices that enable them to talk and ask questions about enjoyable parts of the book."*

Büşra stated that in the assessment tool, she prepared to evaluate her students' reading comprehension skills, and she asked students questions that allowed them to comment with information instead of simple questions.

> *"The questions are not at the level of remembering, but rather in a way that supports their creativity. For example, what would you do if you were that character? Can you change the*

ending of the story and rewrite it? Can you draw a picture of your favorite part of the story? Shall we find a new title for the story?"

Dilara stated that she also uses peer learning in addition to exams to evaluate students' reading comprehension skills.

"Every student prepares a question about the text we read in Turkish lessons. He asks his friend to answer his question. Their motivation is higher through peer learning."

Student's Perspective on Reading

Student data were analyzed and presented in the second part of the findings. The form given to students consists of two stages. In the first stage, students were asked whether they liked reading, why/why not, and which family members read books. In the second stage, students were given a reading comprehension achievement test. The data collected from the students were described and presented. Firstly, findings regarding whether they liked reading were presented in Figure 1.

Figure 1. Word Cloud for Student Responses

Most of the students who participated in the research stated that the books gave information, and that's why they liked them.

"I am learning new things," "Informative and fun."

On the other hand, most students stated that they like to read books to improve their reading.

"I like it because my reading is improving," "To accelerate my reading."

Students said they liked to read books because they relaxed mentally, and reading books improved their imagination.

"Feels good," "I am distracted, "Relieves boredom," "It makes us dream."

A few of the students stated that they did not like to read books. This was because books took their time, and they were bored while reading them.

"I don't like it because I get bored reading it."

"I don't like it because it's boring."

The number of 1st-grade students who answered correctly and incorrectly to the test consisting of 2 simple comprehension and one profound comprehension question in the second part of the form is shown in Figure 2.

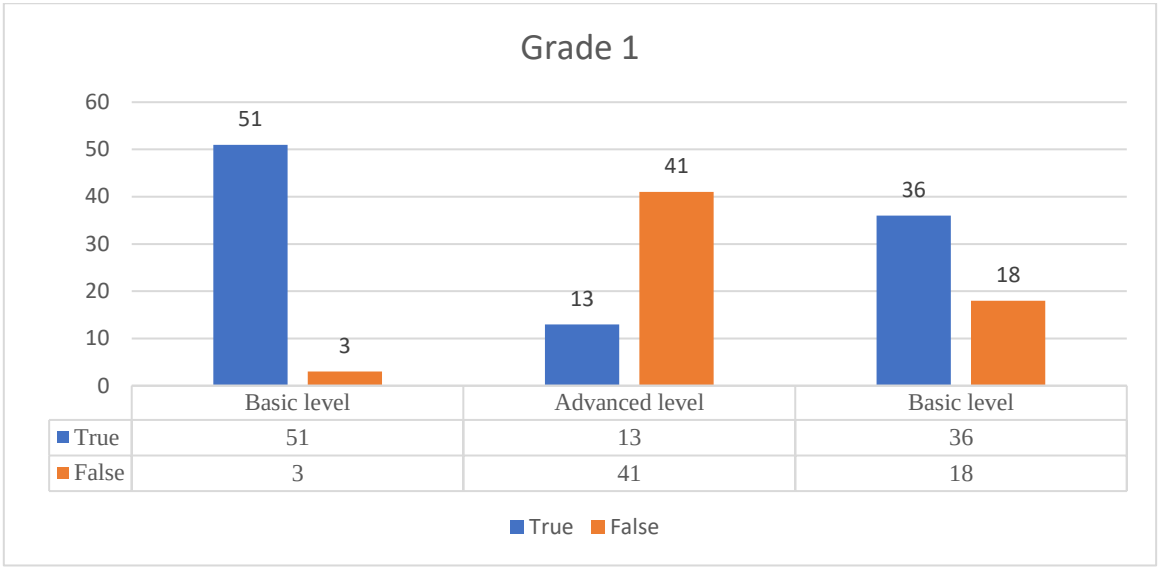


Figure 2. Number of First-Year Students Who Answered Correctly and Incorrectly

When Figure 2 is examined, it is seen that 51 of the 54 students gave correct answers to the superficial level 1st question, and 36 gave the correct answer to the superficial level 2nd question. Simple-level questions are questions that have direct answers in the given text. On the other hand, only 13 of 54 students answered the deep comprehension questions correctly. Finally, it was observed that the students did not add their comments to the simple-level questions, and they answered directly by writing their expressions in the text. For example, in response to the question, "Where did the workers take the tree?" many students answered, "They took me to the printing house," which was in the text. The answers given by the 2nd-grade students are shown in Figure 3.

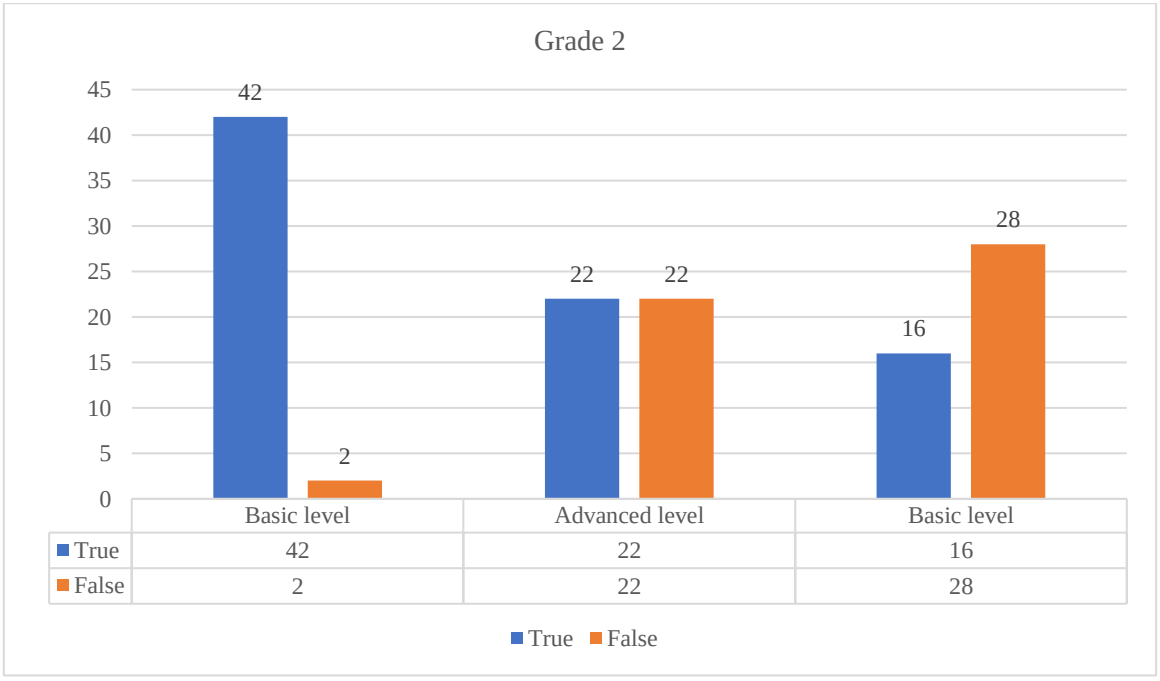


Figure 3. Number of 2nd Grade Students Who Answered Correctly and Incorrectly

When Figure 3 is examined, it is seen that while 42 of 44 students answered the superficial level 1st question correctly, 16 answered the simple level 2nd question correctly. On the other hand, 22 students

answered the profound understanding question. While examining the answers the students gave, it was seen that the 2nd-grade students gave answers to simple questions, like the 1st-grade students, by directly writing expressions in the text. For example, to the question, "What does the child compare the chicks he sees the next day?" they answered, "They looked like live balls with their pinky toes and white and black hairs." The number of 3rd-grade students who answered correctly and incorrectly is shown in Figure 4.

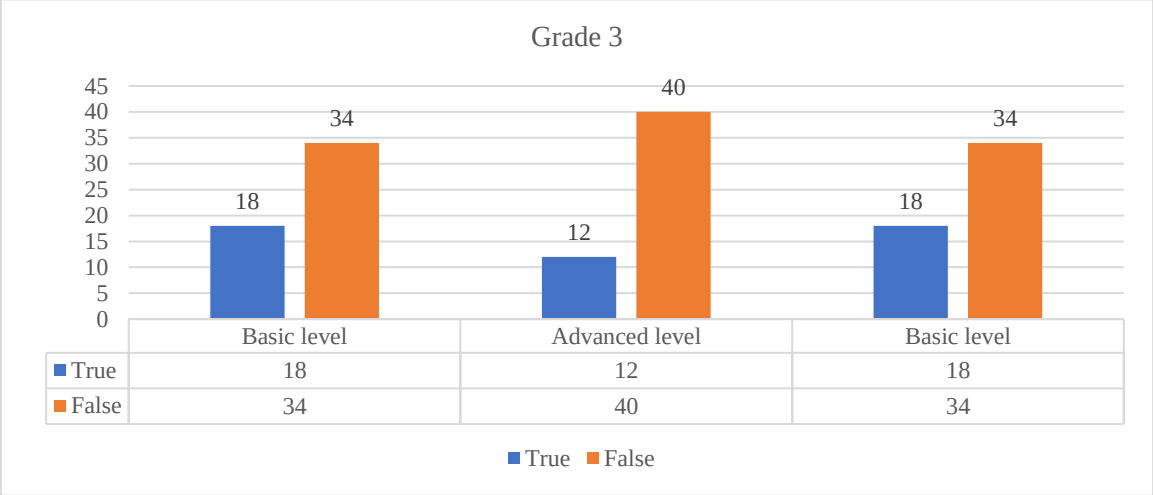


Figure 4. Number of 3rd Grade Students Who Answered Correctly and Incorrectly

When Figure 4 is examined, it is seen that 18 of 52 students answered the superficial level 1 and 2 questions correctly. On the other hand, it is seen that 12 students gave correct answers to the advanced question. Finally, a situation similar to that seen in the 1st and 2nd-grade students' responses was also seen in the 3rd-grade students' responses. They answered the superficial level question "What was Atatürk's source of strength?" by directly quoting the expression "the love of these pure hearts is my source of strength," which is in the text. The number of 4th-grade students who answered correctly and incorrectly is shown in Figure 5.

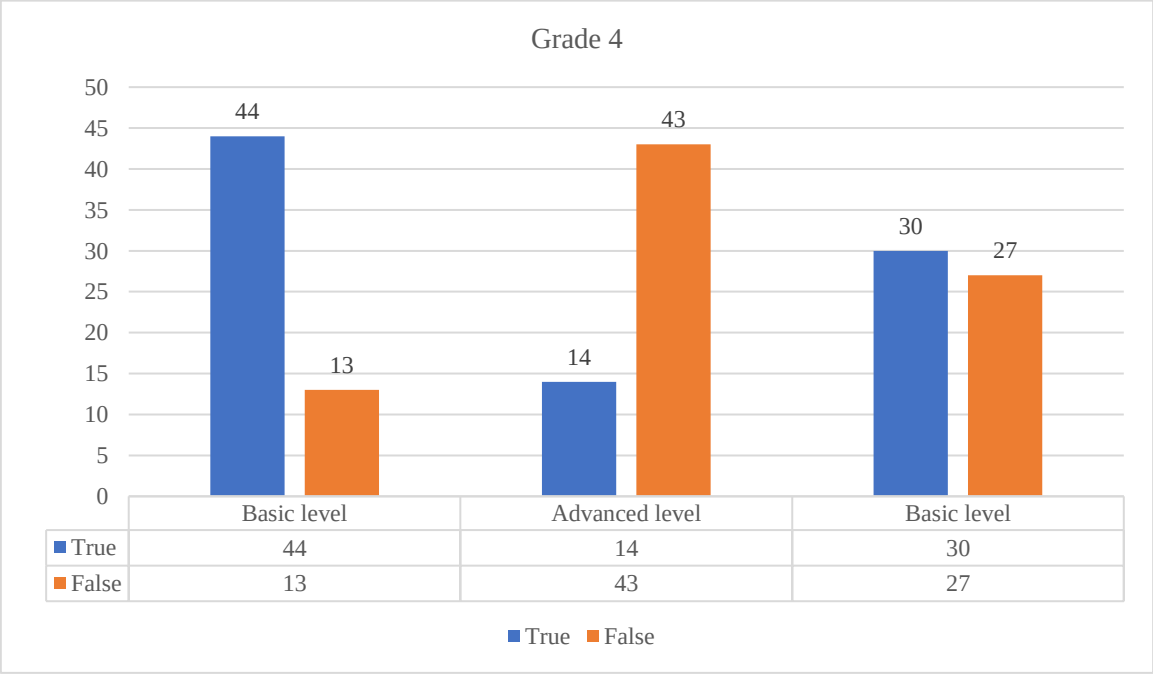


Figure 5. Number of 4th Grade Students Who Answered Correctly and Incorrectly

When Figure 5 is examined, it is seen that 44 of the 57 students answered the superficial level 1st question correctly, whereas 30 answered the superficial level 2nd question correctly. It was observed that only 14

students could answer the advanced-level question correctly. Finally, the phenomenon of directly quoting the expression in the text seen at other levels was also seen in the responses of the 4th-grade students. For example, the question "What kind of person was Koca Yusuf considered to be?" was answered by students by directly quoting the statement, "he is considered by many to be the most powerful person the world has ever known." The percentages of all students' answers to basic comprehension questions are shown in Figure 6.

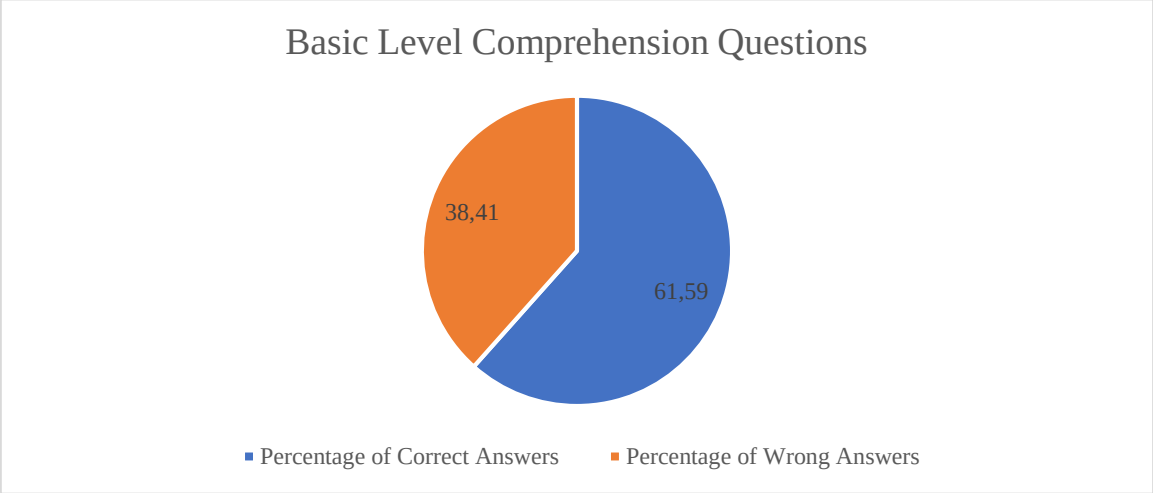


Figure 6. Percentages of Students' Answers

When Figure 6 is examined, it is seen that 38.41% of all students answered correctly to two simple-level reading comprehension questions. On the other hand, the percentages of student responses to the advanced reading comprehension question are shown in Figure 7.

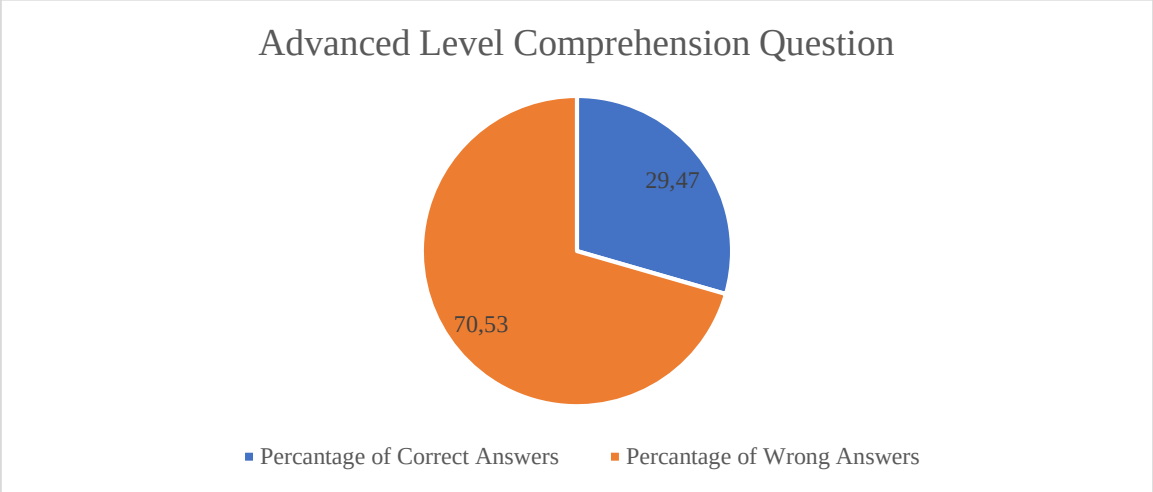


Figure 7. Percentages of Students' Answers

When Figure 7 is examined, 70.53% of the 207 students participating in the study answered the advanced reading comprehension question incorrectly.

Discussion, Conclusion, and Suggestions

There are many activities related to reading books in schools. Despite these activities, Türkiye is not at excellent levels in reading comprehension skills in international exams. From this point of view, the research concluded that a significant number of students saw reading as a duty. In addition, statements supporting this situation were found in the interviews with the teachers. To understand what you read, it is necessary to be a good reader; for this, it is necessary to read consciously and willingly (Duke & Pearson, 2009). Similarly, the OECD (2010) report mentions that motivation and personal characteristics are essential for students to perform quality reading. Rogiers, Van Keer, and Merchie (2020) stated that reading activities that students love to do positively affect their reading comprehension

skills. As a result, as in any activity, reading will be compelling when done with love and consciously. Therefore, in order to make students love to read and acquire reading habits, first of all, it is necessary to overcome the perceptions such as obligation and duty among them. According to Gambrell (2015), to help children acquire reading habits, reading activities should be organized by considering the principles of motivation, reading should be made meaningful by combining it with real life, and texts of medium difficulty should be used to stimulate their curiosity.

The study concluded that teachers used the reward system to develop reading habits among the students. It was observed that the students prepared a chart to follow their reading, and based on this chart, they rewarded the students with adjectives such as "bookworm" according to the number of books they read. Reward is an application that emerged with the behaviorism approach. Although it is stated that this concept, which is frequently used for behavior acquisition in education, is effective in helping students acquire certain behaviors (Landrum & Kauffman, 2014), this effect is temporary and short-lived (Wehe, Roedes & Seger, 2015). On the other hand, problems may arise, such as if the reward is perceived as a bribe for the behavior, and if the same people are winners all the time, negative attitudes towards them may arise (Ilegbusi, 2013). When we consider that a prize is awarded to one or three students, meaning to a small number of people in the classroom, it is clear that most students will be non-winners, which can negatively affect the classroom climate. However, rewards such as food or gifts conditioned to a behavior can eliminate students' intrinsic motivation for that behavior (Dollinger & Thelen, 1978). Therefore, it can be claimed that although rewards have a short-term effect, they are not very effective in acquiring reading behavior since they do not affect students' intrinsic motivation in the long run.

It has been concluded that the most critical factors in developing reading habits in students are the family, the teacher, and the structure of the children's books. The teachers stated that the most important factor among these factors is the family and that the children's reading habits decline, especially when they are away from school. In his social learning theory, Bandura (1977) suggested that the people around him influence the individual, and he learns by observing and imitating their behavior. Therefore, it seems unlikely that a child who receives education at the elementary school level will not be affected by his family and primary school teacher. Studies conducted in the literature argue that teachers (Çelik & Karakullukcu, 2019) and families (Aslan & Harput, 2017) are effective in helping students acquire reading habits.

One factor that negatively affects students' reading comprehension skills is that students spend a lot of time using technological tools. Other studies concluded that technological devices decreased reading habits (Bircan & Tekin, 1989; Yılmaz, 1989; Obaidullah & Rahman, 2018). With the developing technology, the attractiveness of technological devices, more advanced applications, and digital games distract children from traditional street games (Sapsağlam, 2018) and reading books (Çizmeci, 2017). As a result, although the decline in the habit of reading books may not be directly related to the use of technology, the correct use of technological tools can be an essential factor in acquiring the habit of reading.

It was concluded that the sound-based teaching method did not affect the reading comprehension skill of the students, especially at the 1st and 2nd-grade levels. In the sound-based teaching method, students ignore the meaning of what they read because they focus on vocalizing and combining letters and reading the words. In Türkiye, a sound-based teaching method was adopted in 2005. With the sound-based teaching method, students recognize the sounds corresponding to the letters, switching from syllables to words and words to sentences. In this process, they use all language skills, not just one language skill. When we review the literature, it is seen that there are studies indicating that there is no difference between the sound-based sentence method and the sentence analysis method in terms of reading comprehension skill (Vatansever, 2008) or that the sound-based sentence method is more effective (Akyol & Temur, 2008; Şahin, İnci, Turan & Apak, 2006).

Finally, when the reading comprehension skills of the students in this study were examined, it can be seen that six out of every ten students were able to answer the superficial level questions correctly. In comparison, 3 of every ten students answered the deep comprehension questions correctly. Therefore, within the scope of this research, it can be interpreted that 7 out of 10 students at the elementary school level do not understand what they read. In international studies, findings parallel to this result have been

reached. For example, OECD (2016) stated that forty percent of adults in Türkiye do not understand what they read. The Monitoring and Evaluation of Academic Skills (ABIDE) 2019 report prepared by the Ministry of National Education determined that forty percent of the students in the 4th grade cannot comprehend what they read in advanced questions (Parlak, 2019). On the other hand, according to the results of the PISA tests, approximately 50% of the students in Turkey answered the advanced reading comprehension questions incorrectly (OECD, 2019), and this situation was similar in the 2022 test, with 29% of Turkish test takers falling below the basic level (see. OECD, 2023). As a result, it can be said that we are not at a sufficient level of reading comprehension skills. Considering that reading comprehension skills are essential tools for individuals in daily and academic life, the insufficiency of this skill is a negative picture for our education system.

Although reading comprehension skills are so critical, international exams and studies show that this skill is insufficient. Instead of relying on external motivation sources such as rewards and homework, students should be motivated internally to acquire the habit of reading. Researchers can organize intervention studies on students' intrinsic motivation to read books. Therefore, it is necessary to organize training to increase teacher competencies and improve students' reading comprehension skills. Similarly, applied research can be conducted to improve their reading comprehension skill and ensure teachers' professional development. Finally, families are essential stakeholders in this process. Therefore, seminars can be organized to increase families' awareness of the importance of reading comprehension skills, and practical activities can be carried out with the participation of parents.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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.

Funding: This research received no funding.

Institutional Review Board Statement: Ethical approval was obtained from the ethics committee of Istanbul Aydın University Faculty of Education (2022/9).

Data Availability Statement: Data generated or analyzed during this study should be available from the authors on request.

References

Akbaşlı, S., Şahin, M., & Yaykıran, Z. (2016). The effect of reading comprehension on the performance in science and mathematics. *Journal of Education and Practice, 7*(16), 108-121.

Akyol, H. (2005). *Türkçe ilkokuma yazma öğretimi*. Ankara: Pegem A Yayıncılık.

Akyol, H., & Temur, T. (2014). Comparing reading skills of first-grade students who learn reading-writing with sound-based clause method and clause method *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 5*(9), 79-95.

Aslan, Y., & Harput, M. B. (2017). Çocuk eğitimi ve kitap okuma alışkanlığı üzerindeki aile etkisi: Susanna Tamaro "kitaplardan korkan çocuk" örneği. *Uluslararası Çocuk Edebiyatı ve Eğitim Araştırmaları Dergisi (ÇEDAR), 1*(1), 17-30.

Bandura, A. (1977). *Social learning theory*. New York: General Learning Press.

Beydoğan, H. Ö. (2010). Okuma ve anlamayı etkileyen stratejiler *Milli Eğitim Dergisi, 40*(185), 8-21.

Bircan, I., & Tekin, M. (1989). Türkiye'de okuma alışkanlığının azalması sorunu ve çözüm yolları. *Ankara Üniversitesi Eğitim Bilimleri Dergisi, 22*(1), 393–410

Collins, A., & Smith, E. E. (1980). *Teaching the process of reading comprehension.* Bolt Beranek and Newman Inc.

Creswell, J. W., & Poth, C.N. (2018). *Among five approaches, qualitative inquiry and research design are chosen* (4th Edition). Thousand Oaks: SAGE Publications

Çelik, Y., & Karakullukcu, N. (2020). İlkokul öğrencilerine kitap okuma alışkanlığı kazandırmada sınıf öğretmenlerinin rolü *Adnan Menderes Üniversitesi Eğitim Fakültesi Eğitim Bilimleri Dergisi,* 11(2), 1-14.

Çizmeci, E. (2017). No time for reading, addicted to scrolling: The relationship between smartphone addiction and reading attitudes of Turkish youth. *Intermedia International E-journal, 4*(7), 290-302. doi: 10.21645/intermedia.2017.37

Davey, B. (1988). Factors affecting the difficulty of reading comprehension items for successful and unsuccessful readers. *The Journal of Experimental Education, 56*(2), 67–76. doi: 10.1080/00220973.1988.10806468

Ding, H., & Homer, M. (2020). Interpreting mathematics performance in PISA: Taking account of reading performance. *International Journal of Educational Research, 102*. doi:10.1016/j.ijer.2020.101566

Dollinger, S. J., & Thelen, M. H. (1978) Overjustification and children's intrinsic motivation: Comparative effects of four rewards. *Personal and Social Psychology Bulletin, 36,* 1259-1269. doi: 10.1037/0022-3514.36.11.1259

Duke, N. K., & Pearson, P. D. (2009). Effective practices for developing reading comprehension. *Journal of Education, 189*(1–2), 107–122. doi: 10.1177/0022057409189001-208

Erzincan Governship (2023, 12 October). *Kitap candır can, hep birlikte okuyor Erzincan*. http://erzincan.gov.tr/kitap-candir-can-hep-birlikte-okuyor-erzincan#:~:text=Vali%20Aydo%C4%9Fdu%2C%20konu%C5%9Fmas%C4%B1n%C4%B1n%20devam%C4%B1nda%3B%20%E2%80%9C,bunu%2020%20dakika%20olarak%20planlam%C4%B1%C5%9Ft%C4%B1k.

Gambrell, L. B. (2015). Getting students hooked on the reading habit. *The Reading Teacher, 69*(3), 259-263. doi: 10.1002/trtr.1423.

Granda, C. (1973). *Atatürk'ün uşağı idim*. Hürriyet Yayınları.

Hill, M. H., & Beers, G. K. (1993). Teachers as readers: Survey of teacher personal reading habits and literacy activities in the classroom. Retrieved from https://files.eric.ed.gov/fulltext/ED364836.pdf

Ilegbusi, M. I. (2013). An analysis of the role of rewards and punishment in motivating school learning. *Computing, Information Systems & Development Informatics, 4*(1), 35-38.

Kendou, P., Van den Broek, P., Helder, A., & Karlsson, J. (2014). A cognitive view of reading comprehension: Implications for reading difficulties. *Learning Disabilities Research & Practice, 29*(1), 10-16. doi: 10.1111/ldrp.12025

Köksal, K., & Değirmenci, H. (2016). Teacher opinions for the evaluation of reading hours in elementary schools. *Türkiye Sosyal Araştırmalar Dergisi, 19*(2), 11-28. doi:10.20296/tsad.39094

Landrum T.J., & Kauffman J.M. (2014). *Behavioral approaches to classroom management, in Handbook of classroom management.* New York: Routledge.

Lorch R. F., & van den Broek P. (1997). Understanding reading comprehension: Current and future contributions of cognitive science. *Contemporary Educational Psychology*, 22(2), 213–246.

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation.* San Francisco, CA: Jossey-Bass.

OECD, (2010). *PISA 2009 assesment framework: Key competencies in reading, mathematics and science.* Paris: OECD Publishing

OECD, (2016), *The survey of adult skills: Reader's companion, second edition, OECD Skills Studies*.Paris: OECD Publishing., doi: 10.1787/9789264258075-en.

OECD, (2019). *PISA 2018 assessment and analytical framework.* Paris: OECD Publishing. doi: 10.1787/b25efab8-en

OECD (2023), *PISA 2022 results (Volume I): The state of learning and equity in education*. Paris: OECD Publishing, doi: 10.1787/53f23881-en.

Obaidullah, M., & Rahman M. A. (2018). The impact of internet and social media on the habit of reading books: A case study in the southern region of Bangladesh. *Studies in English Language and Education, 5*(1), 25-39. doi: 10.24815/siele.v5i1.8966

Özbay, M. (2007). *Türkçe özel öğretim yöntemleri II.* Ankara: Öncü Kitap

Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, CA: Sage Publications

Parlak, B. (2019). *Akademik becerilerin izlenmesi ve değerlendirilmesi 4. sınıflar raporu*. Millî Eğitim Bakanlığı

Rogiers, A., Van Keer, H., & Merchie, E. (2020). The profile of the skilled reader: An investigation into the role of reading enjoyment and student characteristics. *International Journal of Educational Research, 99*, 1-14. doi: 10.1016/j.ijer.2019.101512

Sapsağlam, Ö. (2018). Okul öncesi dönem çocuklarının değişen oyun tercihleri. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi, 19*(1), 1122-1135.

Şahin, İ., İnci, S., Turan, H., & Apak, Ö. (2006). İlk okuma öğretiminde ses temelli cümle yönetimiyle çözümleme yönteminin karşılaştırılması. *Milli Eğitim, 35*(171), 109-129.

The World Bank (2019). *Ending learning poverty: What will it take?* https://documents1.worldbank.org/curated/en/395151571251399043/pdf/Ending-Learning-Poverty-What-Will-It-Take.pdf

Wehe, H. S., Rhodes, M. G., & Seger, C. A. (2015). Evidence for the negative impact of reward on self-regulated learning. *Quarterly Journal of Experimental Psychology*, *68*(11), 2125–2130. https://doi.org/10.1080/17470218.2015.1061566

Vatansever, H. (2008). *Çözümleme (cümle) yöntemi ve ses temelli cümle yöntemine göre okuma yazma öğrenmiş çocukların okuduğunu anlamadaki başarı durumlarının değerlendirilmesi* [Unpublished master's thesis]. Marmara Üniversitesi, İstanbul.

van den Broek P., & Kremer K. (1999). The mind in action: What it means to comprehend. In Taylor B., Graves M., & van den Broek P. (Eds.), *Reading for meaning* (pp. 1–31). New York: Teacher's College Press.

Yıldırım, A., & Şimşek, H. (2013). *Sosyal bilimlerde nitel araştırma yöntemleri.* Ankara: Seçkin Yayıncılık.

Yılmaz, B. (1989). Okuryazarlık ve okuma alışkanlığı. *Turkish Librarianship, 3*(1), 48–53.

Yin, R. K. (2008). *Case study research: Design and methods* (4th ed.). Thousand Oaks, CA: Sage

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

The Mediating Role of Psychological Well-Being in the Relationship Between Motivation to Teach and Life Satisfaction

Zöhre Kaya[1] Ferdi Yağan[2] Gaye Zeynep Çenesiz[3] Arzu Taşdelen Karçkay[4]

To cite this article:
Kaya, N., Yağan, F., Çenesiz, G. Z. & Taşdelen Karçkay, A. (2022). The mediating role of psychological well-being in the relationship between motivation to teach and life satisfaction *e-Kafkas Journal of Educational Research, 11*, 193-210. doi: 10.30900/kafkasegt. 1370135

Research article **Received:15.08.2023** **Accepted:24.04.2024**

Abstract

Education is one of the fundamental elements shaping the future of societies, and teachers are key figures in undertaking this important task. However, the impact of psychological factors such as motivation to teach and life satisfaction of preservice teachers on the quality of education is often overlooked. In this context, this research aims to investigate the relationship between motivation to teach and life satisfaction among teacher candidates, as well as to test whether psychological well-being mediates these relationships. Participants were 618 volunteer teacher candidates (336 female, 54.4%). Data collection instruments included the Motivation to Teach Scale, the Satisfaction with Life Scale and the Psychological Well-Being Scale. The mediating relationship was tested using structural equation modeling and bootstrapping procedures. Results indicated significant positive correlations between motivation to teach, psychological well-being, and life satisfaction. Motivation to teach and psychological well-being were identified as significant predictors of life satisfaction. Furthermore, psychological well-being emerged as a partial mediating variable between motivation to teach and life satisfaction. Notably, motivation to teach and psychological well-being accounted for approximately 60% of the variance in life satisfaction. In conclusion, enhancing the psychological well-being of teacher candidates could strengthen the impact of motivation to teach on life satisfaction, supported by the findings.

Keywords: Motivation to teach, life satisfaction, psychological well-being, structural equation modeling, preservice teachers.

1 Yüzüncü Yıl University, Faculty of Education

2 Corresponding Author, yaganferdi20@gmail.com, Ministry of National Education

3 Yüzüncü Yıl University, Faculty of Education

4 Akdeniz University, Faculty of Education

Introduction

The teaching profession is regarded as one of the key elements of the education system (Demir et al., 2021; Güven, 2010). Even if the content and objectives of teaching activities are determined very well, the absence of a qualified teacher to carry these outmakes it difficult to obtain the desired results in educational activities. Teachers' ability to conduct a successful education process depends on their developing positive attitudes towards educational activities, the school and the students (Çapri & Çelikkaleli, 2008). Therefore, while training preservice teachers, teacher training institutions should also contribute to the development of positive attitudes towards the profession (Gökçe & Sezer, 2012). Creating a positive attitude towards the teaching profession also depends on keeping the candidate teacher's life satisfaction at a high level during the preparation process for the profession (Recepoğlu, 2013). Another means of developing a positive attitude towards the teaching profession is to maintain teachers' motivation to teach.

Literature Review

Motivation to teach refers to a complex structure that affects an individual's participation in the processes of learning and teaching (Dikmen, 2021), while life satisfaction indicates the overall level of satisfaction from an individual's life (Bergold & Steinmayr, 2023). The relationship between these two concepts represents an important are a for understanding an individual's psychological well-being. Psychological well-being is defined as an individual's emotional, social, and psychological state of well-being (Holman et al., 2018). This includes the individual enjoying life, feeling positive about themselves, and being able to establish healthy relationships with others. On the other hand, motivation to teach is a factor that shapes an individual's engagement in the learning process (Irnidayanti et al., 2020). Motivation to teach determines how willing and directive an individual is in their learning activities. Therefore, the relationship between these two concepts represents an important are a for understanding the connection between an individual's learning and teaching experiences and life satisfaction.

In this context, research in the literature suggests a positive relationship between motivation to teach and life satisfaction. For example, there are findings indicating that as teachers' teaching motivation increases, their job satisfaction and overall life satisfactional so increase (Sari & Yetkiner, 2020). Similarly, it is stated that individuals who actively participate in the learning process have higher levels of life satisfaction (Bergold & Steinmayr, 2023). However, deeper research is needed on the mediating effects of this relationship. In this context, the aim of this study is to examine the mediating role of psychological well-being in the relationship between motivation to teach and life satisfaction. In this scope, firstly, a general overview of life satisfaction and motivation to teach concepts is provided, and then the mediating role of psychological well-being and factors influencing this relationship are emphasized.

Life Satisfaction

From past to present, scientists and philosophers have tried to understand what the meaning of life is. To that end, concepts such as happiness (Diener, 2000; Lu, 2000; Ryff, 1989), satisfaction (Demir Güdül et al., 2019; Diener et al., 1985; Karaman & Watson, 2017), pleasure and well-being (Bradburn, 1969; Damasio, 2013; Kaya & Çenesiz, 2020; Keyes, 2002) began to be researched and various ideas were put forward on the subject. According to Aristotle and Epicurus, who laid the foundations of hedonistic thought, the ultimate purpose of life is the individual's own pleasure. Plato, on the other hand, opposed the hedonistic view and described all pleasures related to bodily desires as bad. According to Plato, the main purpose of life is to achieve the highest level of knowledge. Aristotle, however, expressed the ultimate purpose of life as being well (Çankaya, 2017; Tulunay Ateş, 2021). The science of psychology, which separated from philosophy and became a distinct science, also investigated the meaning of life. In this way, more importance began to be given to concepts such as life satisfaction, subjective well-being, optimism and happiness (Aliekberoğlu et al., 2018; Keyes et al., 2002).

Life satisfaction refers to the result obtained by comparing an individual's living conditions and expectations (Neugarten et al., 1961). In other words, life satisfaction is determined by the individual's expectations compared to reality (Özer & Karabulut, 2003). As Neugarten (1974) pointed out, enjoying daily life, having specific goals in life, believing in one's ability to achieve those goals, and having a positive outlook on life are determinants of life satisfaction. According to Kaba et al. (2018), life

satisfaction can increase or decrease over time because an individual's expectations and experiences can change during this process.

When the literature is examined, it can be seen that life satisfaction is associated with concepts such as happiness and subjective well-being (Alibekiroğlu et al., 2018; Lu, 2000), and that it positively affects the mental health of the individual (Gündoğar et al., 2007). It has been observed that numerous factors, such as enjoying life, achieving goals, feeling good physically (Othman, 2022), positive self-esteem (Yıldız & Baytemir, 2016) and social relationships (Bozoğlan, 2014; Kapıkıran, 2016) are related to life satisfaction. Although some studies (Kaçan et al., 2015; Myers & Diener, 1995) show that factors such as gender, race, and financial status do not have an effect on life satisfaction, it has been determined that life satisfaction is related to the welfare level, educational opportunities and health services in society, and that individuals who are satisfied with their life are happier and more productive within society (Diener, 2000). Based on these findings, it can be said that individuals' life satisfaction may vary depending on their skills, how they interpret events, and their expectations. It is expected that individuals who encourage others, have high motivation, are open to new ideas, and are sensitive will be more successful and have higher life satisfaction (Altun Dilek & Yılmaz, 2016).

Motivation to Teach and Life Satisfaction

It can be seen that the concept of motivation, which is one of the variables associated with life satisfaction (Tulunay Ateş, 2021; Çelenlioğlu, 2020; Demir Güdül et al., 2019; Karaman & Watson, 2017; Koç, 2018) is frequently examined, especially in the field of social sciences and educational psychology (Ayık et al., 2015). Although there is no general view on the definition of motivation, it can be defined as the effort made for any purpose (Robbins & Judge, 2012), the process of influence and incentive that activates an organism (Güney, 2020), and the force that urges the individual to act (Dikmen, 2021). Moreover, motivation can also be defined as both behavioral and emotional energy that moves the individual to achieve a goal (Irnidayanti et al., 2020). According to Argon and Cicioğlu (2017), motivation is a process that drives the individual towards a goal and motivates him/her to continue, in other words, that ensures continuity, rather than an instantaneous situation. The response given byan organism to internal impulses is called intrinsic motivation, while the response given to external impulses is known as extrinsic motivation (Akbaba, 2006). Factors such as curiosity, interest, understanding, knowledge, development and a sense of competence can be listed as sources of intrinsic motivation. Extrinsic motivation is based on punishment and reward (Ayık et al., 2015; Wu, 2003). An individual may be extrinsically motivated in order togain appreciation, receive encouragement, or avoid criticism. The main difference between intrinsic and extrinsic motivation is that in intrinsic motivation, control is in the hands of the individual, whereas in extrinsic motivation, control is dependent on environmental factors (Gün & Turabik, 2019).

The concept of motivation to teach can be defined as the wish and desire existing in the individual to be able to teach effectively (Dikmen, 2021). Examining the literature, it can be seen that motivation to teach is classified as intrinsic, extrinsic and altruistic motivation (Watt & Richardson, 2007). Altruistic motivation is the individual's belief that teaching is a noble and sacred profession and based on this belief, the desire to teach something to students (Thomson & Palermo, 2014). Being happy with teaching, spirituality, self-sacrifice and satisfaction are associated with intrinsic motivation, while factors such as salary, career and vacations are examples of sources of extrinsic motivation for teachers (Roness, 2011). Although it is known that extrinsic motivation is generally effective in choosing a profession, there are a number of opinions that intrinsic motivation plays a more decisive role in choosing the teaching profession (Ayık & Ataş, 2014; Richardson et al., 2014). Even if there is no reward as a result of their teaching activities, teachers with intrinsic motivation continue to perform their educational activities willingly and gladly (Kaufman et al., 2011). Teachers' motivation to teach is considered to be an important factor that affects the learning process at least as much as their teaching ability does (Neves de Jesus & Lens, 2005). In this respect, the continuity of teachers' professional success and performance is related to their level of motivation towards the profession (Butler, 2007). Therefore, motivation to teach also affects the effort teachers make towards professional development.

It is well known that the difficulties and obstacles encountered in life have a negative impact on an individual's life satisfaction (Aydoğdu, 2021). Teachers often encounter many obstacles while delivering instructional activities and must cope with these challengesin order to effectively teach

students. However, these obstacles can lead to a decrease in life satisfaction and adversely affect their motivation to teach. Discovering their own potentials and finding ways to overcome these challenges can provide teachers with a significant advantage in educational activities. Having a high level of motivation to teach can increase the effectiveness of educational activities and have a more positive impact on students (Robbins & Judge, 2012). Within the scope of these studies, in order to determine the relationship between teaching motivation and life satisfaction, the first hypothesis (H_1) of the research was determined as "H_1: Teaching motivation has a positive and significant effect on life satisfaction".

Motivation to Teach and Psychological Well Being

Psychological well-being, another crucial factor in individuals' satisfaction with life (Damasio et al., 2013; Demir et al., 2021; Kaya ve Çenesiz, 2020; Kermen et al., 2016), is closely intertwined with motivation to teach. Rooted in the predominance of positive emotions and the fulfillment of personal goals (Bradburn, 1969; Holman et al., 2018), psychological well-being encompasses various dimensions such as self-acceptance, autonomy, and personal growth (Deci & Ryan, 2004; Ryff, 1989).

According to Ryff (1989), who made the first important studies on the psychological well-being model, this model consists of the combination of six universal needs. These needs are identified as self-acceptance, positive relationships with others, autonomy, environmental mastery, purpose in life, and personal growth (Deci & Ryan, 2004; Ryff, 1989). These needs are accepted as the basic characteristics of mental health and functionality (Kaya & Yağan, 2021; Klapp et al., 2013). According to Seligman (2012), another researcher who has made important studies on psychological well-being, if the individual is connected to life and experiences more positive emotions, enjoys the things he/she does, derives satisfaction from the relationships he/she establishes, believes that his/her life is meaningful, and sees him/herself as a successful person, this means that his/her level of psychological well-being is also high.

High levels of psychological well-being not only contribute to life satisfaction but also play a pivotal role in professional settings, including the teaching environment (Gustems-Carnicer & Calderon, 2013). Teachers' psychological well-being fosters a positive teaching atmosphere, enhances interpersonal relationships, and indirectly influences student achievement (Jeon et al., 2018). Therefore, understanding the relationship between motivation to teach and psychological well-being is essential for promoting educators' overall well-being and creating conducive learning environments. Based on this point, the second hypothesis of the study (H_2) was determined as "H_2: Teaching motivation has a positive and significant effect on psychological well-being".

Psychological Well-Being and Life Satisfaction

Psychological well-being is intricately linked with life satisfaction, as evidenced by numerous studies (Demirci & Şar, 2017; Holman et al., 2018). Individuals with high psychological well-being tend to experience greater life satisfaction, derive meaning from their endeavors, and maintain positive relationships (Seligman, 2012). Moreover, psychological well-being positively impacts job satisfaction and engagement, further influencing overall life satisfaction (Holman et al., 2018). Conditions such as a healthy lifestyle, positive social relationships (Çelenlioğlu, 2020), increased success in working life, increased income (Kermen et al., 2016), and life goals (Doğan; 2018; İkiz et al., 2018) can be listed among the contributions of psychological well-being to human life. Therefore, understanding the relationship between psychological well-being and life satisfaction is crucial for promoting individuals' holistic well-being. In this context, to determine the relationship between psychological well-being and life satisfaction, the third hypothesis (H_3) of the research was determined as "H_3: Psychological well-being has a positive and significant effect on life satisfaction".

The Mediating Role of Psychological Well-Being

According to Berridge and Kringelbach (2011), if the individual works for self-realization and leads a life in harmony with his/her true self, he/she also has high psychological well-being. Therefore, it can be said that psychological well-being plays an important guiding role in working life. Considering the studies conducted in school environments, it can be seen that high psychological well-being in teachers contributes to the teaching environment (Gustems-Carnicer & Calderon, 2013), regulates the

relationships between teachers (Özen & Gülaçtı, 2012), and indirectly contributes to students'achievement (Jeon et al., 2018).

It has been stated that the teaching profession, which is one of the important building blocks of the education system (Demir et al., 2021; Güven, 2010), is entered for psychosocial development and life satisfaction rather than for financial gain (Yazıcı, 2009). In order to obtain job satisfaction, certain factors must exist that will motivate the individual. One of these factors is seen to be motivation to teach. For this reason, it is important for preservice teachers to be motivated in order to maintain their life satisfaction and provide quality education in the future. Since teachers with life satisfaction will perform their profession willingly and gladly, this will ultimately contribute to education and student achievement. Considering psychological well-being as another factor that will affect life satisfaction can be seen as a way to support the development of professional qualifications in preservice teachers. A high level of psychological well-being inpreservice teachers, who form the basis of the sample and who are expected to make significant contributions to raising new generations, will not only increase the quality of the education they provide, but is also important in terms of their being a significant role model both for students and in society. From this point of view, it is important to examine the variables that affect the life satisfaction of candidates who are to begin the teaching profession and to consider the importance of these variables in teacher education.

Looking at the literature, it can be seen that life satisfaction, motivation and psychological well-being are interrelated variables. There are studies that separately examine the relationships of life satisfaction with academic motivation (Demir Güdül et al., 2019; Özcan & Karaca, 2018), life satisfaction with psychological well-being (Martyr et al., 2018), and psychological well-being with motivation (Çelenlioğlu, 2020). However, the fact that no study can be found that examines the mediating role of psychological well-being in the relationship between motivation to teach and life satisfaction constitutes the main problem of this study. In this regard, it is thought that investigating life satisfaction in preservice teachers and revealing its relationship with the concepts of motivation to teach and psychological well-being will contribute to the literature. In addition, it is envisaged that the research results will help to find alternatives that will keep teachers' life satisfaction high, and thus help them to teach more effectively in educational activities. Based on the above mentioned objectives, the fourth hypothesis (H_4) of this research was determined as "H_4: Psychological well-being is a significant mediating variable in the relationship between motivation to teach and life satisfaction".

Theoretical Model

Within the scope of this study, it is hypothesized that motivation to teach may have a direct and indirect effect on life satisfaction and that psychological well-being may play a role as a mediating variable in this relationship. A correlational survey model was used to reveal the direct predictive power of the independent variable (motivation to teach) and mediating variable (psychological well-being) on the dependent variable (life satisfaction). The correlational survey model is defined as a model that aims to determine the existence or degree of change between two or more variables (Karasar, 2015). In structural models, predictive relationships between internal and external variables and implicit structures in factor analyses are tested together (Çokluk et al., 2021). In line with this purpose, first of all, the relationships between the aforementioned variables were examined, and then the hypothetical model for the indirect relationships between motivation to teach and life satisfaction through psychological well-being was tested. The model for the indirect relationship between motivation to teach and life satisfaction through psychological well-being is given in Figure 1.

Using the model shown in Figure 1, the following hypotheses were tested:

H_1: Motivation to teach positively predicts life satisfaction.

H_2: Psychological well-being positively predicts life satisfaction.

H_3: Motivation to teach positively predicts psychological well-being.

H_4: Psychological well-being plays a mediating role in the relationship between motivation to teach and life satisfaction.

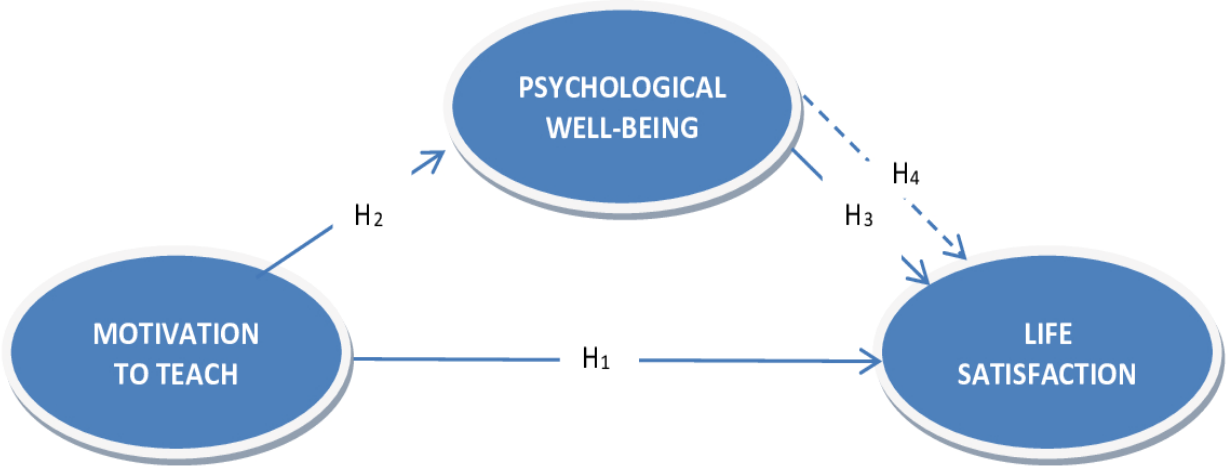


Figure 1. Theoretical Research Model

Method

Participants

The participants in the study consisted of 629 preservice teachers who were recruited according to the convenience sampling method. As 4 participants did not fill in the questionnaires completely, 5 participants were univariate outliers and 2 participants were multivariate outliers, they were excluded from the data set. Consequently, the findings were evaluated on the remaining 618 participants. Considering the distribution of the participants based on demographic variables, 54.4% (N=336) were female and 45.6% (N=282) were male. The mean age of the participants was 21.64 (SD=2.30). In terms of socio-economic level, 80.7% of the participants defined their economic status as medium, 15% as low and 3.1% as high. Seven people did not respond to this item.

Data Collection Tools

Motivation to Teach Scale (MTS)

This was developed by Kauffman et al. (2011) to measure the intrinsic and extrinsic motivation of teachers and prospective teachers for teaching, and was adapted to Turkish by Ayık et al. (2015). The scale has two sub-dimensions and a total of 12 items. Items are evaluated on a 5-point Likert-type scale ranging from 1= "completely disagree" to 5= "completely agree". High scores obtained from the scale indicate high motivation. When the Cronbach alpha internal consistency coefficients (α) were evaluated, they were found to be .70 for intrinsic motivation, .65 for extrinsic motivation and .79 for the whole scale, respectively. As a result of the confirmatory factor analysis performed to determine the construct validity of the MTS in the current study, the two-factor structure of the scale was confirmed, and it was seen that the model fit values demonstrated a good level of fit (x^2/df=4.22, RMSEA=.076, SRMR=.059, GFI=.94, AGFI=.91, CFI=.94, IFI=.95). In addition, as a result of the reliability analysis performed for the whole scale, the Cronbach alpha coefficient was calculated as .83.

Satisfaction with Life Scale (SWLS)

Developed by Diener et al. (1985), the Satisfaction with Life Scale was adapted to Turkish by Köker (1991). The scale consists of 5 items and is evaluated on a 7-point Likert-type scale ranging from 1= "strongly disagree" to 7= "strongly agree". Köker (1991) determined that the test-retest consistency coefficient of the scale administered at a three-week interval was r=.85, and that the item-test correlations ranged from r=.71 to r=.80. The Cronbach alpha internal consistency coefficient (α) of the scale was found to be .76. Scores obtained from the scale range from 5 to 35. High scores obtained from the scale mean that a person's life satisfaction is high. As a result of the confirmatory factor analysis carried out to determine the construct validity of the SWLS for the current study, the single-factor structure of the scale was confirmed and the model fit indices were found to be at a good level

(x^2/df=3.29, RMSEA=.064, SRMR=.023, GFI=.99, AGFI= .97, CFI=.99, IFI=.99). Moreover, as a result of the reliability analysis performed for the whole scale, it was determined that the Cronbach alpha coefficient was .76 and that the item-total correlations ranged from .34 to .58.

Psychological Well-Being Scale (PWBS)

The Turkish adaptation study of this scale, which was developed by Diener et al. (2010) to complement existing measures of well-being and to measure psychological well-being, was carried out by Telef (2013). As a result of the exploratory factor analysis, it was seen that the total explained variance was 42%. The Cronbach alpha internal consistency coefficient obtained in the reliability study of the scale was calculated as .80. The items of the Psychological Well-Being Scale are arranged as a 7-point Likert-type scale ranging from 1= "strongly disagree" to 7= "strongly agree". All items in the scale are positively worded and the scale scores range from 8 to 56. A high score indicates that the individual possesses high psychological resources and strength (Telef, 2013). As a result of the confirmatory factor analysis performed to determine the construct validity of the PWBS for the current study, the single-factor structure of the scale was confirmed, and it was seen that the model fit values showed a good level of fit (x^2/df=3.90, RMSEA=.073, SRMR=.039, GFI=.97, AGFI=.94, CFI=.97, IFI=.97). In addition, following the reliability analysis performed for the whole scale, the Cronbach alpha coefficient was calculated as .82 and the item-total correlation was found to range from .28 to .56.

Data Analysis

The data were analyzed using the SPSS 23.0 and LISREL 8.80 software packages. As the first step of the data analysis, the frequency values of the data set were checked. Then, the skewness and kurtosis values of all the scales were examined. As a result of the examination of normality values with additional variables, it was determined that the kurtosis and skewness coefficients met the normality assumption by taking values between -1 and +1 (Hair et al., 2014). After this, the descriptive statistics (minimum, maximum, mean and standard deviation values) were examined. The research examined whether there was multicollinearity issue in the data by analyzing correlation values between variables, as well as VIF and tolerance values. It was found that the correlation values ranged from .19 to .88. Tolerance values were between .21 and .90, and VIF (Variance Inflation Factor) values ranged from 1.10 to 4.68. Multicollinearity occurs when the correlation between variables is greater than 0.90, VIF values are greater than 10, and tolerance values are less than .10 (Büyüköztürk, 2019). The reliability, collinearity and covariance values of all measurement instruments used in the study were examined. The correlations between the variables required to establish the model were examined with Pearson product-moment correlation coefficients. After the measurement models of the measurement instruments were confirmed with confirmatory factor analysis, the hypothetical model was tested with the measurement model, and it was seen that the measurement values were within the acceptable limits.

In the last part of the study, the proposed model was tested with structural equation modeling and bootstrapping. The mediating effect of psychological well-being in the relationship between motivation to teach and life satisfaction was examined through structural equation modeling (SEM). To support the results of regression analysis, bootstrapping was performed with 5000 resampling iterations (Preacher & Hayes, 2018).

Findings

Before testing the structural equation modeling, the assumption of normal distribution of single variables, which is one of the model assumptions in multivariate data analysis, should be met (Kline, 2015). The two most important elements of normality are skewness and kurtosis. In normal distributions, skewness and kurtosis coefficients are expected to be in the range of ±1.5 (Büyüköztürk, 2019). Furthermore, it is stated that in order to use structural models, there should be significant relationships between dependent, independent and mediating variables (Baron & Kenny, 1986; Kline, 2015). For this reason, before examining the mediation relationships in the study, the normality values and correlation relationships of the data were examined. The correlation results forthe participants' life satisfaction, psychological well-being, and motivation to teachandits sub-dimensions, as well as the scale means, skewness and kurtosis values are given in Table 1.

Table 1.
Correlations between the Variables of the Theoretical Model

	1	2	3	4	5
1. Life Satisfaction	1				
2. Psychological Well-Being	.60**	1			
3. Motivation to Teach	.30**	.28**	1		
4. Intrinsic Motivation	.28**	.29**	.88**	1	
5. Extrinsic Motivation	.25**	.19**	.86**	.56**	1
$\bar{X}$	19.46	41.84	33.65	18.05	15.40
SD	6.98	8.45	8.85	5.12	4.74
Skewness	-.18	-.87	-.36	-.38	.10
Kurtosis	-.75	.62	-.18	-.38	-.45

N=618, **p< .01 *p<.05

As can be seen in Table 1, since the skewness and kurtosis values of all three scales and the sub-dimensions are within the range of ±1.5, it is accepted that the data are normally distributed (Büyüköztürk, 2019). Moreover, the findings in Table 1 show that there are positive and significant relationships between all variables. Accordingly, life satisfaction has positive and significant relationships with psychological well-being (r=.60, p<.01) and with motivation to teach (r=.30, p<.01). Moreover, there is a significant and positive correlation between psychological well-being and motivation to teach (r=.28, p<.01).

Measurement Model

Before moving on to the structural model, a measurement model was established with 3 latent variables and 15 observed variables. In the established measurement model, it was observed that the model fitted well. Accordingly, the ratio of Chi Square to Degrees of Freedom is (χ^2/df=3.20) (Kline, 2015); Root Mean Square Error of Approximation (RMSEA=.062), Standardized Root Mean Square Residual (SRMR=.048) (Meydan & Şeşen, 2015); Goodness of Fit Index (GFI=.96), Adjusted Goodness of Fit Index (AGFI = .94); Comparative Fit Index (CFI=.93); Incremental Fit Index (IFI=.94) (Seçer, 2017) were measured as.

Structural Model

To test the hypotheses, first of all, the direct model between motivation to teach and life satisfaction was examined (Table 2, Model 1). The standardized regression coefficients and t-values of the model were examined and no discrepancy was found. The results revealed that motivation to teach had a positive and significant effect on life satisfaction (β=.43, p<.01; t=7.90). Then, psychological well-being was added as a variable that may have a mediating relationship between motivation to teach and life satisfaction (Table 2, Model 2). With the inclusion of psychological well-being in the model, there was a significant decrease in the correlation between motivation to teach and life satisfaction (β=.14, p<.01; t=3.38). Figure 2 shows the mediating effect of psychological well-being between motivation to teach and life satisfaction.

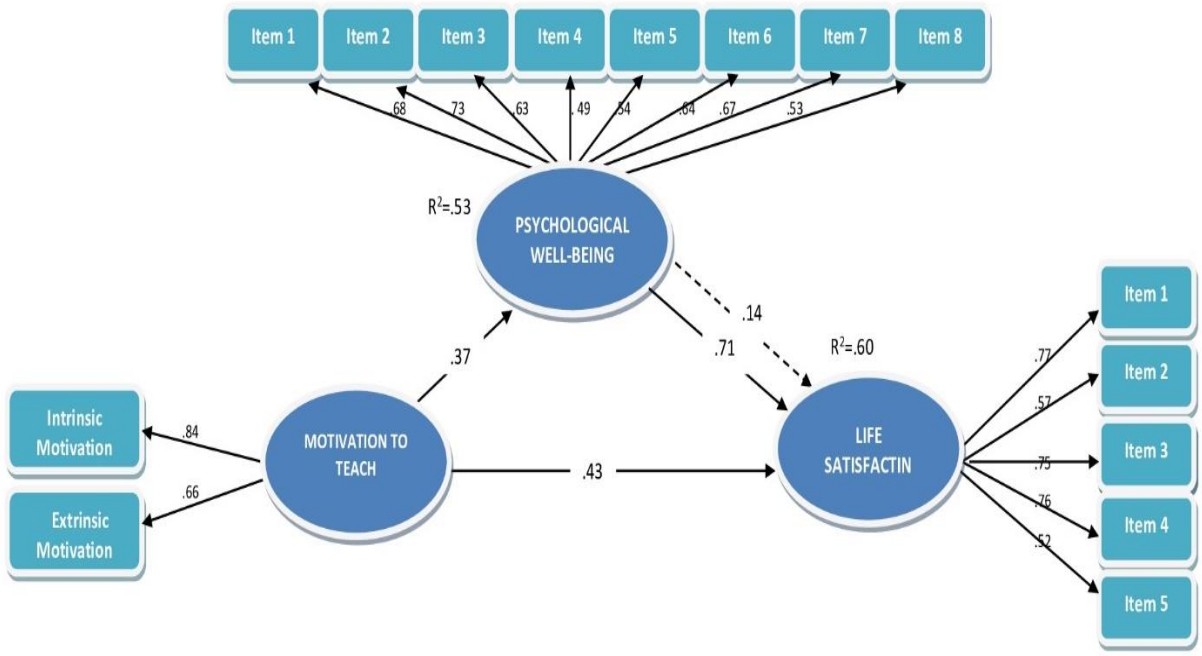


Figure 2. Analysis Model for the Mediating Role of Psychological Well-Being in the Relationship between Motivation to Teach and Life Satisfaction.

**p<.01, *p<.05, N:618

Table 2.
Model Fit Values of Measurement Model and Structural Model

	χ^2/df	RMSEA	SRMR	GFI	AGFI	CFI	IFI
Acceptable Fit	χ^2/df≤5	RMSEA≤.08	0<SRMR≤.05	.90≤GFI	.90≤AGFI	.90≤CFI	.95≤ IFI
Model 1	3.49	.066	.034	.98	.95	.97	.97
Model 2	3.35	.062	.048	.94	.91	.93	.96

The fit indices for the model fit values were evaluated based on the studies by Meydan and Şeşen (2015) and Seçer (2017). When the model fit values were examined, it was concluded that the measures of model fit were within the acceptable limits and that therefore, psychological well-being had a mediating role in the relationship between motivation to teach and life satisfaction. In other words, it can be stated that the results of the established hypothetical model are compatible. In addition, considering the R^2 values in the model, motivation to teach and psychological well-being together explain 60% of life satisfaction.

Bootstrapping Procedure

The bootstrapping procedure was used to test whether the mediating role of psychological well-being was significant in the relationship between motivation to teach and life satisfaction. To determine the direct and indirect effects in the structural model, the bootstrapping process was performed with 5.000 resamples. The results of the coefficients and confidence intervals for the direct and indirect effects are given in Table 3.

Table 3.
Bootstrapping Results for the Mediating Role of Psychological Well-Being in the Relationship between Motivation to Teach and Life Satisfaction

Direct Effects	Bootstrap Coefficient	At 95% Confidence Interval	
		Lower Limit	Upper Limit
Motivation to Teach→Life Satisfaction	.43	.071	.177
Motivation to Teach→Psychological Well-Being	.37	.205	.351
Psychological Well-Being→Life Satisfaction	.71	.405	.517
Indirect Effects			
Motivation to Teach→Psychological Well-Being→Life Satisfaction	.14	.086	.169

Discussion and Conclusion

This study examined the mediating role of psychological well-being in the relationship between preservice teachers' motivation to teach and their life satisfaction. Before testing the conceptual model established for this purpose, the correlations between the observed variables were examined with Pearson product-moment correlation. The proposed model was then tested with the measurement model and it was observed that the model fit values were within the acceptable limits. In the final stage of the research, by means of the mediation test and bootstrapping processes, the mediating role of psychological well-being between motivation to teach and life satisfaction was examined.

The results obtained in the study revealed positive and significant relationships between the variables of motivation to teach, life satisfaction and psychological well-being. Furthermore, it was concluded that psychological well-being had a partial mediating effect in the relationship between motivation to teach and life satisfaction. In other words, it was seen that motivation to teach explained life satisfaction both directly, and indirectly via psychological well-being. When the results of the study are evaluated as a whole, it was observed that the hypothetical model established to explain life satisfaction in preservice teachers fitted well and was confirmed. In this part of the study, the results of the developed and tested hypotheses are discussed within the framework of the literature. In the finalpart, the limitations of the study are mentioned and some inferences are made based on the findings.

Effect of Motivation to Teach on Life Satisfaction

Within the scope of the first (H_1) hypothesis of the study, a positive relationship was found between preservice teachers' motivation to teach and life satisfaction, and it was seen that motivation to teach positively significantly predicted life satisfaction. Therefore, it can be said that an increase in preservice teachers' motivation to teach increases their life satisfaction positively. In other words, it can be stated that preservice teachers with high motivation to teach enjoy life, have a positive outlook, and have a high level of life satisfaction. The fact that preservice teachers have motivation to teach can be an indicator that they will enjoy their careers and be successful in the profession. Throughout the studies in the literature that examine the relationship between life satisfaction and motivation (Demir Güdül et al., 2019; Tulunay Ateş, 2021) or academic motivation (Çelenlioğlu, 2020; Karaman & Watson, 2017; Koç, 2018), it is stated that these relationships are significant. Many studies have revealed that motivation is an important psychological forceenabling effective teaching (Ayık & Ataş, 2014; Dikmen, 2021; Ivanec & Defar, 2023; Ölçü Dinçer, 2020). It is known that certain psychological variables such as hope and optimism affect intrinsic motivation (Tulunay Ateş, 2021). It has been determined that hope and optimism also affect life satisfaction, that individuals with high levels of hope are good in their academic field and problem-solving skills, and that this in turn has a positive effect on their life satisfaction (Chang, 1998).

In recent years, the self-determination theory, which has garnered significant attention, offers a crucial framework for understanding and explaining individuals' intrinsic motivations (Tulunay Ateş, 2021). This theory evaluates individuals' motivations based fundamentally on the satisfaction of two primary psychological needs: competence and autonomy (Deci & Ryan, 2004). In other words, as individuals

feel competent and autonomous, they tend to enhance their intrinsic motivations. This phenomenon is closely associated with life satisfaction because fulfilling one's own feelings of competence and autonomy often contributes to finding meaning and satisfaction in life. Moreover, it is essential to consider the perspective of activity theorists, who view life satisfaction as satisfaction experienced during the process of an action (Bruni & Porta, 2007). This perspective suggests that when individuals feel satisfied while performing an action, it tends to enhance their life satisfaction. In other words, it perceives life satisfaction not only as an outcome but also as a reflection of the experiences individuals undergo during activities. In this context, when evaluating the relationship between motivation to teach and life satisfaction, it is crucial to consider the perspectives offered by self-determination theory and activity theory. As motivation to teach increases, individuals' probabilities of satisfying their intrinsic needs and consequently enhancing their life satisfaction also increase. This can contribute to individuals leading more fulfilling lives by strengthening their commitment to their professions.

Effect of Motivation to Teach on Life Satisfaction through Psychological Well-Being

In the context of the second (H_2) hypothesis of the study, it has been determined that motivation to teach positively significantly predicts psychological well-being. Studies conducted in this context demonstrate strong relationships between psychological well-being and motivation (Ozer & Schwartz, 2020; Özcan & Karaca, 2018). Additionally, in a study conducted by Yıldız (2019), a significant relationship between intrinsic motivation and psychological well-being was identified. It is argued that intrinsic motivation, as a positive emotion, influences an individual's positive thoughts about themselves and contributes to their progress towards life goals (Yıldız, 2019).

The third (H_3) hypothesis of the research demonstrates that psychological well-being positively significantly predicts life satisfaction, a finding supported by the literature. In numerous studies examining the relationship between psychological well-being and life satisfaction, strong and statistically significant relationships have been observed between these two concepts (Çelenlioğlu, 2020; Demir et al., 2021; Kaya & Çenesiz, 2020; Ozer & Schwartz, 2020; Ryff, 1989). The concept of psychological well-being indicates that positive emotions and thoughts prevail over negative ones in an individual's life (Myers & Diener, 1995). Emotion-based well-being is often associated with more frequent positive emotions, while thought-based well-being is more closely linked to overall life satisfaction (Demir et al., 2021). Therefore, high levels of psychological well-being are generally associated with positive life evaluations; conversely, low levels of psychological well-being are often associated with negative life evaluations.

The results obtained from the mediation test, which is the fourth (H_4) hypothesis of the research, show that psychological well-being has a partial mediating role in the relationship between motivation to teach and life satisfaction. In other words, it can be said that part of the relationship between motivation to teach and life satisfaction stems from psychological well-being. In the literature, no study has been found that examines the mediation relationship of these three variables. However, in the literature review, findings that support this network of relationships, albeit indirectly, were obtained (Aliekberoğluet al., 2018; Damasio et al., 2013; Demir et al., 2021; Doğu, 2016; Pavin Ivanec & Defar, 2023).

It can be seen that there is a common conclusion: preservice teachers with high life satisfaction also have high motivation to teach. The emergence of the partial mediating effect of psychological well-being reveals that it is an important factor that increases preservice teachers'motivation to teach. From this point of view, it can be said that in cases where direct intervention in preservice teachers' life satisfaction is difficult or not possible in order to contribute to their motivation to teach, contributing to their psychological well-being would be an alternative way. Teachers with high motivation to teach who embrace their jobs and fulfill them with sufficient effort and willingness (Argon & Cicioğlu, 2017) will indirectly positively influence the success of their students by enhancing the quality of education. Furthermore, it is believed that the life satisfaction and quality of life of teachers will have a positive impact on students, parents, and indirectly on society as well (Demir & Türk, 2020; Uğur et al., 2020).

Considering the results of the study as a whole, it will be important to take into account other factors that may affect life satisfaction. Baron and Kenny (1986) stated that instead of completely eliminating the relationship between dependent and independent variables, it would be more realistic to find mediating variables that significantly affect this relationship. Therefore, in order to increase life

satisfaction in preservice teachers, instead of focusing only on motivation to teach, emphasis can be placed on increasing psychological well-being, which has been found to significantly affect this relationship.

Limitations and and Suggestions

One of the first limitations to be discussed within the scope of this study is the limitation arising from the measurement instruments (satisfaction with life, psychological well-being and motivation to teach scales) used in the research. Since the participants in the research responded based on their own assessments of their behavior and goals in a certain area, this may have led the participants to be insufficiently objective. Another limitation of the study is that the study was conducted only with preservice teachers studying at one university. This limits the generalizability of the study. Therefore, in order to make more general inferences about the factors affecting life satisfaction, more generalizable findings can be obtained by conducting similar studies with data obtained from participants in different provinces.

Despite all these limitations, it is thought that the results of the current study will contribute significantly to the literature. The research results show that preservice teachers' motivation to teach and psychological well-being are each significant variables predicting life satisfaction. These results are regarded as an important finding especially for the Turkish education system, which is constantly being changed, but in which the desired results somehow cannot be achieved.In fact, the research results confirm that teachers' motivation to teach and psychological well-being should be kept high in order to keep their life satisfaction high and thus to contribute more to students' learning and achievement. Moreover, according to the research results, it was concluded that motivation to teach and psychological well-being together explained 60% of life satisfaction. Therefore, it can be thought that in future studies aimed at improving life satisfaction in preservice teachers,activities that will increase motivation to teach and psychological well-being should be discussed together.

Since motivation to teach and psychological well-being are important factors in increasing preservice teachers' life satisfaction, these predictive variables can be taken into account in increasing life satisfaction. A large part of preservice teachers' professional identities is shaped by their undergraduate education (Hong & Green, 2011). Therefore, in these periods when the formation of professional identity is important, emphasis can be placed on increasing preservice teachers' psychological well-being and improving their life satisfaction by conducting motivational activities.

It is thought that the research results will be of benefit to teachers, administrators and researchers who wish to work on this subject. It can be recommended to researchers wishing to conduct research on the subject that they carry out studies on other factors that may also have a mediating effect in the relationship between motivation to teach and life satisfaction. Moreover, to increase life satisfaction, group guidance or group counseling studies aimed at the development of psychological well-being can be recommended. Finally, in this study, in which a cross-sectional method was used, the average age of the participants was 21.64±2.3. It may be recommended to researchers who wish to conduct research on the subject that the variables be tested with longitudinal or experimental methods with different age and sample groups.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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, Z. K. and F. Y.; methodology, G. Z. Ç.; validation, Z. K.; analysis, F. Y.; writing; F. Y.; review and editing, A. T. K.; supervision, G. Z. Ç. and A. T. K; project administration; Z. K.

Funding: This research received no funding.

Institutional Review Board Statement: The research started with the decision of the Yüzüncü Yıl University Human Research and Ethics Committee dated 09/01/2023 and numbered 2023/01-19.

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.

References

Akbaba, S. (2006). Motivation in education. *Journal of Atatürk University Kazım Karabekir Faculty of Education, (13),* 343-361.

Alibekiroğlu, P. B., Akbaş, T., Bulut Ateş, F., & Kırdök, O. (2018). Mediator effect of self compassion in the relationship between life satisfaction and psychological resilience incollege students. *Journal of Çukurova University Social Sciences Institute, 27*(2), 1-17. https://dergipark.org.tr/tr/pub/cusosbil/issue/39773/471215

Altun Dilek, S., & Yılmaz, K. (2016). Teachers' work a holism tendencies and work-family balance. *E-Kafkas Journal of Educational Research, 3*(1), 36-55

Argon, T., & Cicioğlu, M. (2017). Vocational high school teachers' levels of belief ineducation and motivation to teach. *The Journal of Academic Social Science Studies,57*(1), 1-23. https://doi.org/10.9761/JASSS7108

Aydoğdu, F. (2021). Mediating role of dispositional hope and life satisfaction in the relationship between teachers' solution-focused thinking and happiness. *Current Approaches in Psychiatry, 13*(1), 337-360. https://doi.org/10.18863/pgy.983099

Ayık, A., & Ataş, Ö. (2014). The relationship between pre-service teachers' attitudes towards the teaching profession and their motivation to teach. *Journal of Educational Sciences Research, 4*(1), 25-43. https://doi.org/10.12973/jesr.2014.41.2

Ayık, A., Ataş Akdemir, Ö., & Seçer, İ. (2015). Adaptation of the motivation to teach scale into Turkish: The validity and reliability study. *Current Research in Education, 1*(1),33-45.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173. https://doi.org/10.1037/0022-3514.51.6.1173

Bergold, S., &Steinmayr, R. (2023). Teacherjudgmentspredictdevelopments in adolescents' schoolperformance, motivation, and life satisfaction. *Journal of educationalpsychology, 115*(4), 642-664.https://doi.org/10.1037/edu0000786

Berridge, K. C., & Kringelbach, M. L. (2011). Building a neuroscience of pleasure and well-being.Psychology of well-being: *Theory, Research and Practice, 1*(1), 1-26.https://doi.org/10.1186/2211-1522-1-3

Bozoğlan, B. (2014). Social support and life satisfaction as the predictor of conflict.*Kastamonu Education Journal, 2*(1), 161-175. https://dergipark.org.tr/en/pub/kefdergi/issue/22603/241533

Bradburn, N. M. (1969). *The structure of psychological well-being* (1st ed.). Adline.

Bruni, L., & Porta, P. L. (2007). *Handbook on the economics of happiness*. Edward Elgar Publishing.

Butler, R. (2007). Teachers' achievement goal orientations and associations with teachers'help-seeking: Examination of a novel approach to teacher motivation. *Journal of Educational Psychology, 99*(2), 241–252. http://dx.doi.org/10.1037/0022-0663.99.2.241

Büyüköztürk, Ş. (2019). *Data analysis handbook for the social sciences: Statistics, research design, SPSS applications and interpretation* (26th ed.). PegemAkademi.

Chang, E. C. (1998). Hope, problem-solvingability, and coping in a college studentpopulation: some implications for theory and practice. *Journal of Clinical Psychology, 54* (7), 953-962. https://doi.org/10.1002/10974679199811

Çankaya. A. (2017). The relation between pleasure and good in Aristotle's Ethics. *Kutadgubilig: Philosophy Science Studies, 34,* 505-517.

Çapri, B., &Çelikkaleli, Ö. (2008). Investigation of preservice teachers? Attitudes towardsteaching and professional self-efficacy beliefs according to their gender, programs andfaculties. *İnonu University Journal of the Faculty of Education, 9*(15), 33-53.https://dergipark.org.tr/en/pub/inuefd/issue/8708/108727

Çelenlioğlu, Ş. (2020). *Intermediary role of flow in the relationship between academic motivation and academic performance and their effect on satisfaction with life and psychological well-being.* (Publication No. 652896) [Master's thesis, Istanbul MedipolUniversity]. https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Çokluk, Ö. Şekercioğlu, G., &Büyüköztürk, S. (2021). *Multivariate statistics for social sciences: SPSS and LISREL applications* (9th ed.). Pegem Academy. http://dx.doi.org/10.14527/9786053186984

Damasio, B. F., Melo, R. L. P., & Silva, J. P. (2013). Meaning in life, psychological well-beingand quality of life in teachers. *Paidéia (Ribeirão Preto)*, *23*, 73-82. https://doi.org/10.1590/1982-43272354201309

Deci, E. L., & Ryan, R. M. (2004). *Handbook of self-determination research* (2nd ed.). University of Rochester.

Demir-Güdül, M., Can, G., & Ceyhan, A. A. (2019). University students' academic motivation profiles: Relationships with academic procrastination and life satisfaction.*7. International Self-Determination Theory Conference.* (21.05.2019). http://acikerisim.iku.edu.tr/handle/11413/5197.

Demir, R., Tanhan, A., Çiçek, İ., Yerlikaya, İ., Kurt, S. Ç., & Ünverdi, B. (2021). Psychological well-being and life satisfaction as predictors of quality of life. *Journal of Education for Life, 35*(1), 192-206. https://doi.org/10.33308/26674874.202135125619

Demir, R., & Türk, F. (2020). Positive psychology: history, basic concepts, therapeuticprocess, criticisms and contributions. *Humanistic Perspective*, *2*(2), 108-125.https://dergipark.org.tr/en/pub/hp/issue/54982/727363

Demirci, İ., &Şar, A. H. (2017). Examining the relationship between self-knowledge and psychological well-being. *Journal of Human and Social Sciences Research, 6*(5),2710-2728.

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for anational index. *American Psychologist*, *55*(1), 34–43. https://doi.org/10.1037/0003-066X.55.1.34

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with lifescale. *Journal of Personality Assessment*, *49*(1), 71–75. https://doi.org/10.1207/s15327752jpa4901_13

Diener, E.,Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., & Biswas-Diener, R.(2010). New well-being measures: Short scales to assess flourishing and positive andnegative feelings. *Social Indicators Research*, *97*(2), 143-156. https://doi.org/10.1007/s11205-009-9493-y

Dikmen, M. (2021). Pre-service teachers' motivation to teach: A mixed-method study. *e-Kafkas Journal of Educational Research*, *8*(2), 213-232. https://doi.org/10.30900/kafkasegt.951038

Doğan, U. (2016). Effects of social network use on happiness, psychological well-being, andlife satisfaction of high school students: Case of Facebook and Twitter. *Education and Science, 41*(183), 217-231. http://dx.doi.org/10.15390/EB.2016.4616

Gökçe, F., & Sezer, G. O. (2012). Attitudes of teacher candidates towards teaching profession (Uludağ University example). *Journal of Uludag University Faculty of Education, 25*(1), 1-23. https://dergipark.org.tr/en/pub/uefad/issue/16695/173534

Gustems-Carnicer, J., & Calderón, C. (2013). Coping strategies and psychological well-beingamong teacher education students. *European Journal of Psychology of Education*, *28*(4), 1127-1140. https://doi.org/10.1007/s10212-012-0158-x

Gün, F., & Turabik, T. (2019). The effects of possible selves of teacher candidates on theirteaching motivation. *Cumhuriyet International Journal of Education, 8*(1), 214-234. https://doi.org/10.30703/cije.46837

Gündoğar, D., Gül, S. S., Uskun, E., Demirci, S., & Keçeci, D. (2007). Investigation of the predictors of life satisfaction in university students. *Clinical Psychiatry*, *10*(1), 14-27.

Güney, S. (2020). *Organizational behavior* (5th ed.). Nobel Scholar

Güven, D. (2010). Teaching in Turkey as a professional profession. *Bogazici University Journal of Education*, *27*(2), 13-21. https://dergipark.org.tr/en/pub/buje/issue/3832/51438

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2014). *Multivariate data analysis.* (7th ed.). Pearson Education Limited Harlow.

Holman, D., Johnson, S., & O'Connor, E. (2018). Stress management interventions: Improving subjective psychological well-being in the work place. In E. Diener, S.Oishi, & L. Tay (Eds.), *Handbook of well-being.* DEF Publishers.

Hong, J., & Greene, B. (2011). Hopes and fears for science teaching: The possible selves ofpreservice teachers in a science education program. *Journal of Science Teacher Education*, *22*(6), 491-512. https://doi.org/10.1007/s10972-011-9247-y

İkiz, F. E., Asıcı, E., & Kaya, Z. (2018). The predictive roles of life goals and psychological well-being on attitudes towards teaching profession. *Journal of Bayburt Faculty of Education, 13*(25), 7-26. https://dergipark.org.tr/en/pub/befdergi/issue/38072/337606

Irnidayanti, Y., Maulana, R., Helms-Lorenz, M., & Fadhilah, N. (2020). Relationship between teaching motivation and teaching behavior of secondary education teachers in Indonesia. *Journal for the Study of Education and Development*, *43*(2), 271-308. https://doi.org/10.1080/02103702.2020.1722413

Jeon, L., Buettner, C. K., & Grant, A. A. (2018). Early childhood teachers' psychological well-being: Exploring potential predictors of depression, stress, and emotional exhaustion. *Early Education and Development, 29*(1), 53-69. https://doi.org/10.1080/10409289.2017.1341806

Kaba, İ., Erol, M., & Güç, K. (2018). Development of adult life satisfaction scale. *Journal of Anadolu University Social Sciences, 18*(1), 1-14. https://doi.org/10.18037/ausbd.550232

Kaçan Softa, H., Ulaş Karaahmetoğlu, G., Erdoğan, O., & Yavuz, S. (2015). A research onthe factors affecting the level of life satisfaction of the elderly people. *Elderly IssuesResearch Journal, 8 (1)*12-21. https://dergipark.org.tr/en/pub/yasad/issue/21800/234274

Kapıkıran, Ş. (2016). Relationship between life satisfaction and loneliness in the elderly: Examining the mediator role of social support. *Elderly Issues Research Journal, 9*(1),13-25. https://dergipark.org.tr/en/pub/yasad/issue/23911/254822

Karasar, N. (2015). *Scientific research methods* (28th ed.). Nobel Scholar.

Karaman, M. A., & Watson, J. C. (2017). Examining associations among achievement motivation, locus of control, academic stress, and life satisfaction: A comparison of U.S. and international undergraduate students. *Personality and Individual Differences, 111*(1), 106-10. https://doi.org/10.1016/j.paid.2017.02.006

Kaya, Z., & Çenesiz, G. Z. (2020). The predictor roles of life-satisfaction, and intrinsic-extrinsic motivation on the psychological well-being of pre-service teachers. *International Online Journal of Education and Teaching*, *7*(4), 1370-1387. http://iojet.org/index.php/IOJET/article/view/948

Kaya, Z., & Yağan, F. (2022). The mediating role of psychological resilience in the relationship between coping humor and psychological well-being. *Journal of Theoretical Educational Science, 15*(1), 146-168. https://doi.org/10.30831/akukeg.949736

Kauffman, D. F., Soylu, M. Y., & Duke, B. (2011).Validation of the motivation to teachscale. *Hacettepe University Journal of Education Faculty, 40*(40), 279-290. https://dergipark.org.tr/en/pub/hunefd/issue/7796/102075

Klapp, T., Klapp, A., & Gustafsson, J. E. (2023). Relations between students' well-being andacademic achievement: evidence from Swedish compulsory school. 1-22. *European Journal of Psychology of Education.* https://doi.org/10.1007/s10212-023-00690-9

Koç, K. (2018). Investigation of the relationship between life satisfaction levels and academic motivation levels of the students of the faculty of sport sciences. *The Journal of Turkish Sport Science, 1*(2), 58-65.https://dergipark.org.tr/en/pub/tsbd/issue/36534/470165

Kermen, U., İlçin Tosun, N., & Doğan, U. (2016). Social phobia as predictor of life satisfaction and psychological well-being. *Journal of Education Theory and Practical Research, 2*(1), 20-29. https://dergipark.org.tr/en/pub/ekuad/issue/25921/273151

Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). Optimizing well-being: The empirical encounter of two traditions. *Journal of Personality and Social Psychology, 82*(6),1007–1022. https://doi.org/10.1037/0022-3514.82.6.1007

Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.). Guilford Publications.

Köker S. (1991). *Comparison of life satisfaction levels of normal and problematic adolescents.* (Publication no: 16802) [Master's thesis, Ankara University]. https://tez.yok.gov.tr/UlusalTezMerkezi/tezDetay.jsp?id=hCZd2ZCwUfr1UUf132SIyw&no=hCZd2ZCwUfr1UUf132SIyw

Lu, L. (2000). Gender and conjugal differences in happiness. *The Journal of Social Psychology, 140*(1), 132-141. https://doi.org/10.1080/00224540009600451

Martyr, A., Nelis, S., Quinn, C., Wu, Y., Lamont, R., Henderson, C., . . . Clare, L. (2018). Living well with dementia: A systematic review and correlational meta-analysis offactors associated with quality of life, well-beingand life satisfaction inpeople with dementia. *Psychological Medicine, 48*(13), 2130-2139. https://doi.org/10.1017/S0033291718000405

Meydan, C. H., & Şeşen, H. (2015). *Structural equation modeling AMOS applications* (2nd ed.). Detail Publishing.

Myers, D. G., & Diener, E. (1995). Who is happy? *Psychological Science, 6*(1), 10-19. https://doi.org/10.1111/j.1467-9280.1995.tb00298.x

Neugarten, B. L. (1974). Age groups in American society and the rise of the young-old. *The Annals of the American Academy of Political and Social Science, 415*(1), 187-198. https://doi.org/10.1177/000271627441500114

Neugarten, B. L., Havighurst, R. J., & Tobin, S. S. (1961). The measurement of life satisfaction. *Journal of Gerontology, 16*, 134–143. https://doi.org/10.1093/geronj/16.2.134

Neves de Jesus, S., & Lens, W. (2005). An integrated model for the study of teacher motivation. *Applied Psychology, 54*(1), 119-134. https://doi.org/10.1111/j.1464-0597.2005.00199.x

Othman, N. (2022). Psychological well-being, work-family conflicts and life satisfaction among Malaysian women. *Malaysian Journal of Society and Space, 18*(1), 46-58. https://doi.org/10.17576/geo-2022-1801-04

Ozer, S., & Schwartz, S. J. (2020). Academic motivation, life exploration, and psychological well-being among emerging adults in Denmark. *Nordic Psychology, 72*(3), 199-221. https://doi.org/10.1080/19012276.2019.1675088

Ölçü Dinçer, Z. (2020). Preservice English teachers' motivation for teaching different gradelevels. *Journal of Mehmet Akif Ersoy University Faculty of Education, 1*(54), 133-155. https://doi.org/10.21764/maeuefd.616995

Özcan, Z. & Karaca, F. (2018). A study on relationship between academic motivation and psychological well-being in students of theology faculty. *Journal of Theological Studies, 2*(50), 321-34. https://doi.org/10.29288/ilted.447368

Özen, Y., & Gülaçtı, F. (2012). Examination of pre-service teachers' social skills and psychological well-being levels. *International Refereed Journal of Humanities andAcademic Sciences, 1*(1), 83-101.

Özer, M., & Karabulut, Ö. Ö. (2003). Life satisfaction in the elderly. *Geriatri, 6*(2), 72-74.

Pavin Ivanec, T., & Defar, A. (2023). Motivation for the choice of the teaching profession: The role of prospective teachers' personality traits, emotional competence, and life-satisfaction. *SAGE Open, 13*(2). https://doi.org/10.1177/2158244023118259 4

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879–891. https://doi.org/10.3758/BRM.40.3.87

Recepoğlu, E. (2013). Analyzing the relationship between prospective teachers' life satisfaction and attitudes concerning teaching profession. *Hacettepe University Journal of Education*, (1), 311-326.

Richardson, P. W., Karabenick, S. A., & Watt, H. M. (2014). *Teacher motivation* (1st ed.). Routledge.

Robbins, S. P., & Judge, T. A. (2012). *Organizational behavior* (Trans. Ed. İnci Erdem). Nobel Publication and Distribution.

Roness, D. (2011). Still motivated. The motivation for teaching during the second year in the profession. *Teaching and Teacher Education, 27*(3), 628- 638. https://doi.org/10.1016/j.tate.2010.10.016

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on themeaning of psychological well-being. *Journal of Personality and Social Psychology, 57*(6), 1069-1081. https://doi.org/10.1037/0022-3514.57.6.1069

Sari, H., & Yetkiner, A. (2020). Relationships between job satisfaction, motivation and life satisfaction in the teachers: A structural equation modeling study. *International Journal of Progressive Education, 16*(3), 211-222. https://doi.org/10.29329/ijpe.2020.248.16

Seçer, İ. (2017). *Practical data analysis with SPSS and LISREL* (3rd ed.). Moment Publishing.

Seligman, M. E. P. (2012). *Flouris.* (2nd ed.). Free Press.

Telef, B. B. (2013). The adaptation of psychological well-being into Turkish: A validity and reliability study. *Hacettepe University Journal Of Education, 28*(28-3), 374-384. https://dergipark.org.tr/en/pub/hunefd/issue/7791/101929

Thomson, M. M., & Palermo, C. (2014). Preservice teachers' understanding of their professional goals: Case studies from three different typologies. *Teaching and Teacher Education, 44*, 56-68. https://doi.org/10.1016/j.tate.2014.08.002

Tulunay Ateş, Ö. (2021). Relationship between motivation and life satisfaction: The mediating role of problem solving skills. *Gazi University Journal of Gazi Education Faculty, 41*(3), 1465-1487. https://dergipark.org.tr/en/pub/gefad/issue/67470/837812

Uğur, E., Kaya, Ç., & Tanhan, A. (2020). Psychological inflexibility mediates the relationship between fear of negative evaluation and psychological vulnerability. *Current Psychology.40*(9), 4265-4277. https://doi.org/10.1007/s12144-020-01074-8

Watt, H. M., & Richardson, P. W. (2007). Motivational factors influencing teaching as a career choice: Development and validation of the FIT-Choice scale. *The Journal of Experimental Education, 75*(3), 167-202. https://doi.org/10.3200/JEXE.75.3.167-202

Wu, X. (2003). Intrinsic motivation and young language learners: The impact of the classroom environment. *System, 31*(4), 501-517. https://doi.org/10.1016/j.system.2003.04.001

Yazıcı, H. (2009). Teaching profession sources of motivation and basic attitudes: a theoretical overview. *Kastamonu Education Journal, 17*(1), 33-46. https://dergipark.org.tr/en/pub/kefdergi/issue/49070/626125

Yıldız, F. N. (2019). *The relationship of self-efficacy, motivation, grit and resilience withwell-being in adolescents: A model test* (Publication no. 577847) [Master's thesis, Van Yüzüncü Yıl University]. https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Yıldız, M. A., & Baytemir, K. (2016). A mediation role of self-esteem in the relationship between marital satisfaction and life satisfaction in married individuals. *İnönü University Journal of the Faculty of Education, 17*(1), 68-80. https://doi.org/10.17679/iuefd.17181627

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

Augmented Reality in Early Childhood Education: The Effect of Quiver Application on Science Learning

Hale Altınkaynak[1] **Özge Özel**[2]

To cite this article:
Altınkaynak, H. & Özel, Ö. (2024). Augmented reality in early childhood education: The effect of quiver application on science learning. *e-Kafkas Journal of Educational Research*, *11*(1), 211-226. doi:10.30900/kafkasegt.1367709

Research article **Received:**28.09.2024 **Accepted:**30.04.2024

Abstract

This study aimed to investigate the effect of Quiver application on science learning in the preschool period. The study was designed as an experimental design from the nice research type. The sample of the study consisted of a total of 40 children in two kindergartens in the same school determined by random assignment. Five different checklists determined by the researchers were used as data collection tools. Pre-tests and post-tests were conducted just before and just after the interventions with the pre-prepared checklists. The data were analyzed using the nonparametric Mann-Whitney U test used in the analysis of quantitative data. As a general result of the research, it was concluded that the activity processes planned with augmented reality application created a significant difference compared to the activity processes planned with traditional methods and provided higher learning. Looking at the themes separately, there was a significant difference in favor of the experimental groups in the themes of the cycle of water and rain formation, the life cycle of plants, and the food chain, while there was no significant difference between the knowledge levels of the experimental and control groups in the themes of the life cycle of the frog and sea creatures.

Keywords: Augmented reality, science learning, preschool education, technology integration, Quiver

[1] This article was produced from the thesis of the first author.

[1] Author, Burdur Mehmet Akif Ersoy University
[2] Corresponding Author, ozgeozel@mehmetakif.edu.tr, Burdur Mehmet Akif Ersoy University

Introduction

In a world that changes and develops more and more every day, technological developments also affect life directly or indirectly (İçli, 2001). The effects of this developing and changing technology are also reflected in education and pave the way for the use of technology in education (Lawless & Pellegrino, 2007). The use of technology in education today is used in various ways at different levels and in different areas of education (Çaydere & Akgün, 2023). The various conveniences and benefits offered by technology make it attractive to use technology in education (Haleem et al., 2022). Studies have revealed that the use of technology in education has a positive effect on students' motivation, increases interest and allows learning to be more effective (Alpar et al., 2007; Balcı & Eşme, 2001; Huang et al., 2019).

Even if the main purpose of the development of technology is not education, educators try to make education suitable for the age by integrating technology into education with new ideas (Collins & Halverson, 2018). In developed countries abroad, economic budgets are increased every year for investments in technological equipment in education (Carlsen et al., 2016). Educational videos, projections, computer-aided applications and software, animations and educational games are among the first technological elements and equipment integrated into education that come to mind. In the following years, the latest technologies such as artificial intelligence, augmented reality, wearable technology, 3D printers, robots, virtual reality, nano devices, drone technologies, etc... are likely to lead to innovations by meeting with education (Hernandez-de-Menendez, Escobar Díaz & Morales-Menendez, 2020).

It is an important issue to determine how to achieve results by using different technological developments in education (West, 2012). In order to improve technology integration in education, new technologies should be adapted to education and their effectiveness should be measured (Ghavifekr & Rosdy, 2015). One of the new technological developments is augmented reality technology. Thanks to augmented reality, three-dimensional realistic images can be created in a virtual environment (Somyürek, 2014). Although augmented reality technology, which is one of the new technological developments, is a new development, it has started to be used in different branches such as health, military, art, engineering, etc. in the world and in our country (Keleş & Yavuz, 2022). Educational applications are among the leading studies that have been developed using augmented reality technology (Saidin & Halim, 2015). These applications can be used as educational materials for almost every age and field (İçten & Güngör, 2017).

Utilizing augmented reality in various subjects and activities in preschool education can provide more interesting and fun learning opportunities for children (Aydoğdu & Kelpsiene, 2021). In science education, which is an important part of preschool education content and aims to help children understand nature and the environment, gain scientific thinking skills, develop creative thinking skills, and develop their interest in science, augmented reality technology can contribute to children's learning by concretizing teaching with three-dimensional images (Kahriman Pamuk et al., 2020). Also, Wu et al. suggest that as abstract notions may be transformed into visualization structures, augmented reality (AR) can help teach science and mathematics.Piaget emphasizes that in the pre-processing period (2-7 years), which covers the preschool period, children have concrete thinking skills and learn information through concrete learning (Bliss, 1995). Concrete educational applications with augmented reality make it more attractive to integrate this technology into preschool education (Kahriman Pamuk et al., 2020).

Science education begins with the child's interaction with his/her natural environment; this process continues with curiosity, exploration and research (Spektor-Levy et al., 2013). Science teaching activities in the preschool period aim to develop a sense of curiosity in children, develop their research and investigation skills, and help them recognize nature and the environment through observation skills (Ünal & Akman, 2006). In preschool science education, it is aimed to provide children with information about events and phenomena that are effective in daily life, to understand and make sense of nature, and to create a basic level of recognition and foundation for science in children (Uyanık Balat & Önkol, 2011). Through science teaching and experiments, it is aimed to provide children with cognitive gains in the preschool education program such as making predictions about objects and events, establishing cause and effect relationships, paying attention, sorting and comparing skills. Science teaching in the

preschool period should be organized in a way that children can actively participate in order to be a science teaching suitable for children's development (Önal & Sarıbaş, 2019).

Technology should be integrated into preschool science teaching (Kewalramani & Havu-Nuutinen, 2019). Visual materials and explanations may not be sufficient in necessary science subjects. Especially in young age groups in the pre-processing period, teaching should be supported with concrete materials as much as possible (Usta, 2021). STEM activities that can enable concrete learning have started to be included in education from an early age and it is thought that augmented reality studies that will enable concrete learning will contribute to this field (Keleş & Yavuz, 2022). The difficulty of presenting most science subjects concretely to children causes problems in science teaching. Science teaching by utilizing augmented reality applications that can provide three-dimensional learning can be used as a new method in this regard (Özdamlı & Karagözlü, 2018).

There are only a few augmented reality applications with relevant content suitable for the preschool period. One of these applications, Quiver, can be used for this purpose. Quiver application is a special augmented reality application that can be run on smart mobile devices with coloring pages containing various topics and visuals, and after printing, the coloring pages are matched with the mobile device and the coloring colors are exactly the same color on the mobile device screen. Using this application, it is aimed to investigate how science learning activities will have an effect compared to traditional science learning activities and how the use of augmented reality technology in science learning will give results about the effects of learning on children compared to possible conventional science activities.

In order for the education given in the preschool period to be appropriate for the age, it is necessary to utilize technology in the right way (Ozel, 2019). The use of technologies based on new interaction paradigms to teach children is becoming more and more popular around the world because children are moving towards a new level of interaction with technology, so there is a need for educational content through the use of new, attractive technologies (Quesenberry et al., 2016). Instead of a computer program using traditional technological techniques (mouse, keyboard, computer, etc.), testing the use of augmented reality technology, which is a product of recent technological developments as a new idea for learning preschool topics, and revealing its effects can be an important issue for technology integration in preschool period (Aydoğdu & Kelpsiene, 2021).

The use of this augmented reality technology, which appeals to visual intelligence, in preschool education can be considered as a new idea. When the studies conducted in general are examined, it can be said that augmented reality technology has managed to attract a lot of attention in recent years in both the academic, educational and private sectors and promises a promising future (İçten & Güngör, 2017). Although the use of this field in our lives is currently low, it is predicted that it will have an important place in our daily lives in the future. When we look at the number of studies conducted abroad, it is slightly higher than the augmented reality research conducted in Türkiye (İçten & Güngör, 2017). When the related literature is examined, although there are a few studies on the use of augmented reality in preschool period in Türkiye, the related studies are almost non-existent especially for preschool period and there are not enough resources. In fact, when the literature was reviewed, even though there is a study about preschool teachers' opinions on the use of Augmented Reality application in preshool science education (Ozdamlı & Karagozlu) no research on the effect of using augmented reality on science learning in preschool period was found yet. This emerges as an original and new research subject area that is thought to contribute to the field and needs to be investigated.

For this reason, the aim of this study is to reveal the effects of using Quiver, an augmented reality application, in preschool science learning compared to traditional science learning methods. Within the scope of this research, the following questions were aimed to be answered.

- What is the effect of Quiver application on the learning of the theme of water cycle and rain formation?
- What is the effect of the Quiver application on the learning of the theme of the development of plants?
- What is the effect of the Quiver application on the learning of the theme of sea creatures?
- What is the effect of the Quiver application on the learning of the theme of frog development stages?

- What is the effect of the Quiver application on the learning of the food chain theme?

Method

Research Design

In this study, a quasi-experimental design with a pretest-posttest control group was used, which is one of the quantitative research methods. In the quasi-experimental design, research is conducted using two pre-existing groups and it is used in cases where random assignment cannot be made. Quasi-experimental designs are like an imitation of real experimental designs (Metin, 2014). In educational research, it is generally difficult for researchers to conduct real experimental studies, the most important reason being that there are obstacles to the unbiased distribution of people to groups in school and classroom environments (Metin, 2014). In the study, one of the randomly selected classes was the control group and the other was the experimental group. In both groups, pre-tests and post-tests were administered individually just before and just after the applications.

Study Group

In the 2022-2023 academic year, the study group consisted of the children of 2 kindergartens consisting of 60-72 month-old children with a similar socioeconomic level in a state primary school affiliated to the Ministry of National Education in Sultanbeyli district of Istanbul. The convenience sampling method was used to select the study group. In convenience sampling, the sample is determined by using readily available items (Baltacı, 2018). Experimental and control groups were selected randomly at the same school in Istanbul to prevent any potential infusion into the results. To protect children's educational rights, all data collection processes were completed after official school hours with permission from their parents.

The gender and age group information of the participants in the experimental and control groups are given in Table 1.

Table 1.
Age and gender of the children in the experimental and control groups

Age	Gender	Experimental Group (n)	Control grubu (n)
60-72 month	Female	12	10
60-72 month	Male	9	10

As seen in Table 1, a total of 40 preschool children participated in the study, 12 girls and 8 boys aged 60-72 in the experimental group and 10 girls and 10 boys aged 60-72 in the control group, 20 children in each group.

Data Collection Tools

The 5 science themes of the research 5 science education topics in the daily plans that teachers have not yet implemented in the content of the plans belonging to the curriculum implemented by the teachers in accordance with the achievements and indicators of the 2013 MEB preschool education program were selected as the themes of the research. While these 5 themes were selected both educational programsand the Quiver application's themes were compared, and since these 5 themes overlapped they were selected for this study.

The Quiver application is a special augmented reality application that can be run on smart mobile devices with coloring pages containing various topics and visuals, and after printing, the coloring pages are matched with the mobile device and the coloring colors are exactly the same color on the mobile device screen for three-dimensional animation.

Table 2.
Control list of water life cycle

Water Cycle and Rain Formation	Answer
Knows sunlight hits the water bodies on the surface of the earth and evaporates the water.	
Knows water turns into vapor with increasing tempature.	
Knows vapor is the gaseous state of water.	
Knows evaporated water rises to the sky.	

Table 2 continuing

Knows the vapor that rises to the sky turns back into water when it cools and turns into raindrops.
Knows the water that turns into water at high altidues forms raindrops and descends to the ground.

The checklists, which are data collection tools, were developed specifically for this study by two researchers who are experts in the field based on the content of the Quiver application and the 2013 MoNE preschool education program and reviewed related literature. Two different expert opinions were then obtained. The checklists consist of items that try to reveal whether the topic to be taught in the related theme has been learned or not. These lists were used by assigning 1 point for each item that children were able to learn and 0 points for those that they could not learn.

Data Collection Process

In order to collect the data of the study, ethical permission was obtained from Mehmet Akif Ersoy University Non-Interventional Clinical Research Ethics Committee with decision number 2023/230 on 05/04/2023. Then, two kindergartens within a public school affiliated with the Ministry of National Education in Istanbul Sultanbeyli district center were selected as the participants of the study. Permission was obtained from the parents of the participants with the necessary informed consent form. Five preschool science education topics in the content of the plans implemented by the teachers in accordance with the achievements and indicators of the MEB preschool education program were selected as the themes of the study. The study was planned to investigate one theme each week and a five-week implementation process was completed. In this process, the one-week program implemented in both the experimental and control groups is given in detail below.

The theme of the first week of the study, the cycle of water, was presented by the same researcher to the children in both the experimental and control groups by explaining the cycle of water with the same expressions. The expressions of the researcher's narration are as follows: 'Water heats up thanks to sunlight, evaporates and rises to the sky. The gas state of water is called vapor. When this vapor that rises to the sky meets cold air in the sky, it condenses and turns into water droplets again, and since these water droplets become heavier, they can no longer stay in the sky and descend to the ground as rain. In order to measure the knowledge levels of the experimental and control groups, pre-tests were administered before the research and post-tests were administered after the research to measure their knowledge levels and the data obtained were statistically calculated and tabulated.

Experimental Group

In the experimental group, the activity was carried out on the relevant worksheet of the Quiver application. The researcher explained the subject to the children with the narration technique through the visual on the Quiver worksheet. After the subject was explained, the children colored the relevant worksheet and the teacher asked each child to color in turn by animating it in 3D with the Quiver augmented reality application on the phone. No other work was done on the subject in the experimental group.

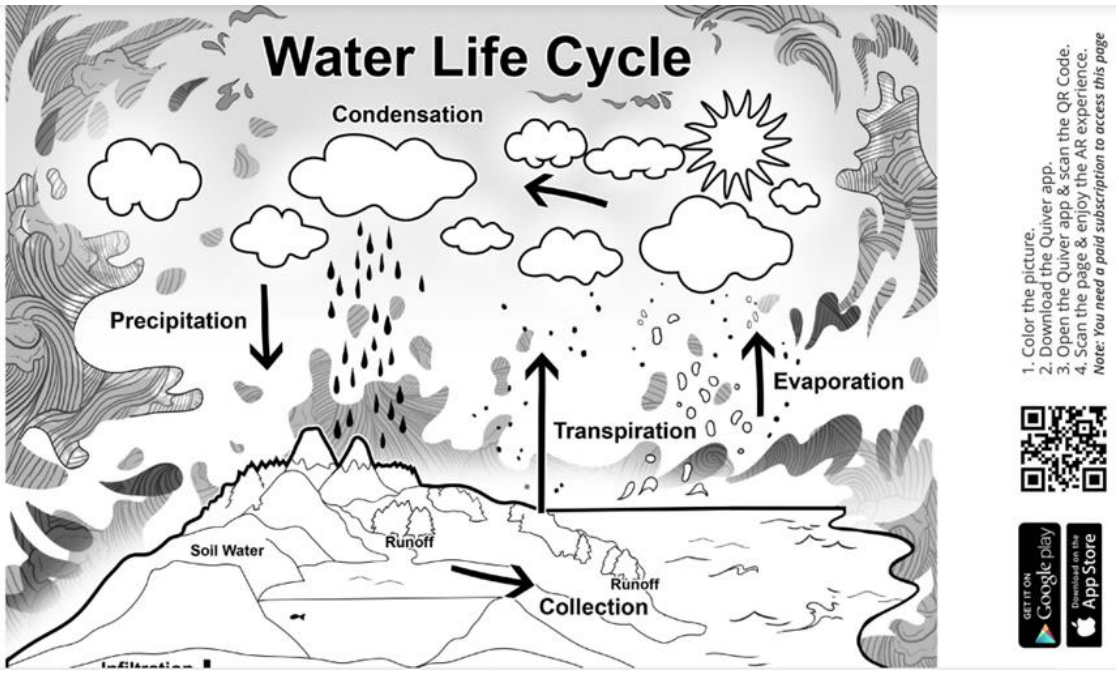


Figure 2. Quiver Coloring Page Example (Water Life Cycle)

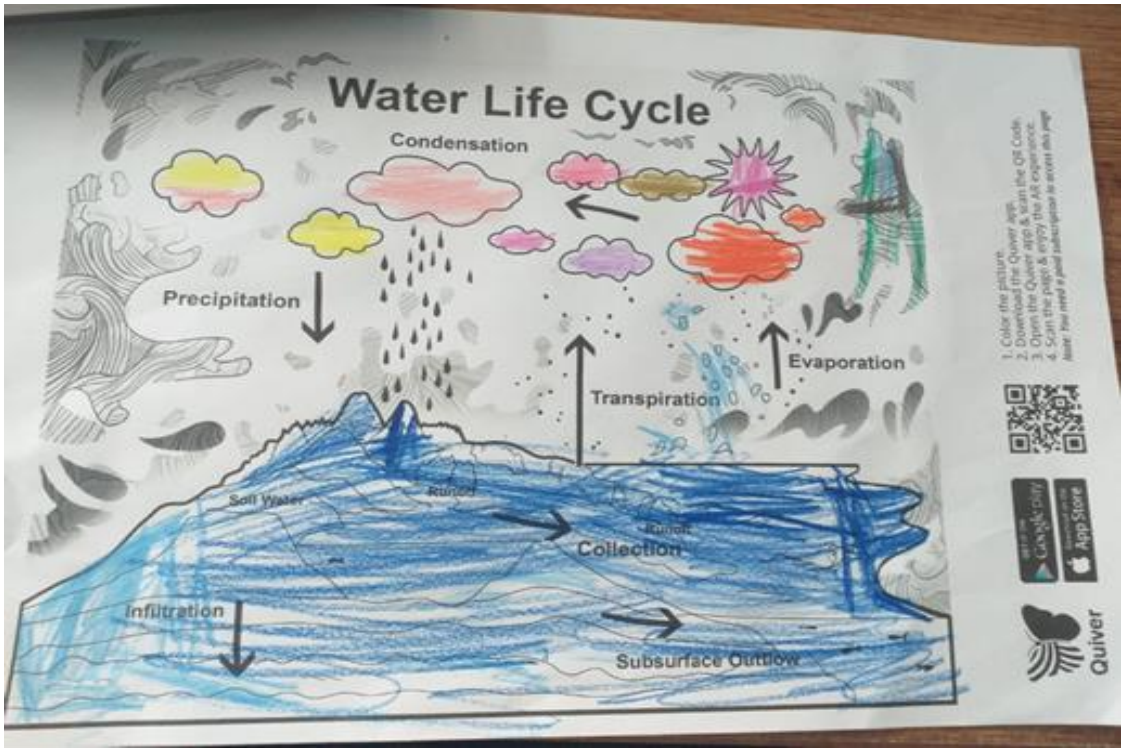


Figure 3. Painted Quiver Coloring Page (Water Life Cycle)

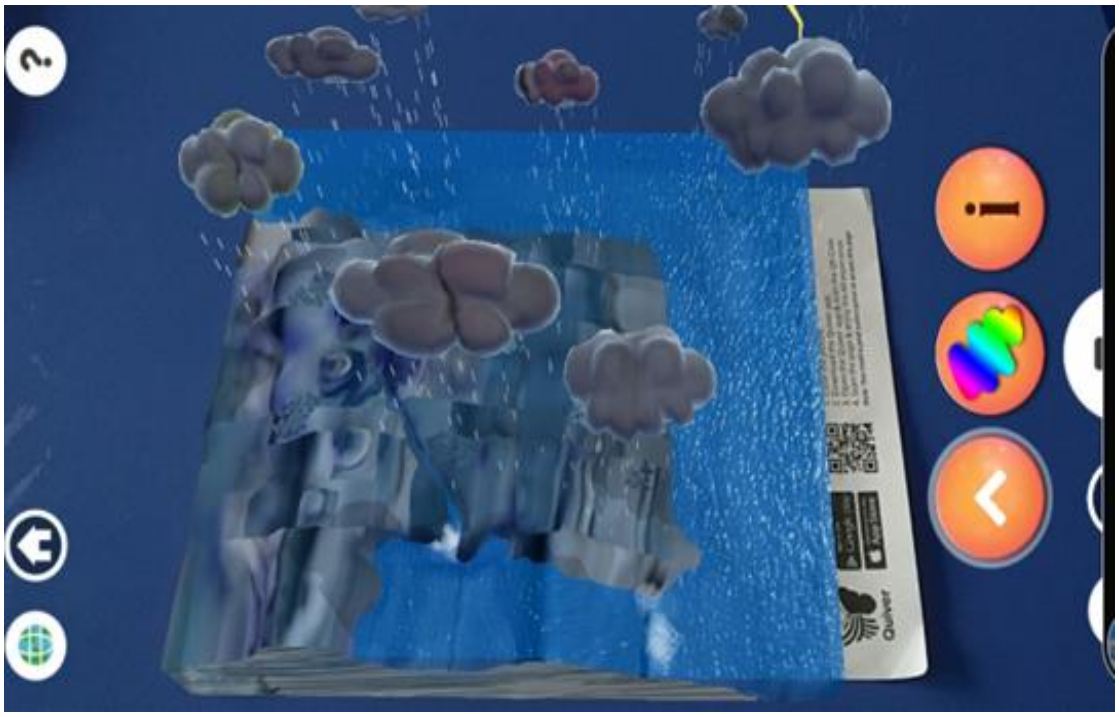


Figure 4. Applied Quiver Coloring Page (Water Life Cycle)

Control Group

In the control group, the researcher presented the water cycle graph that she had prepared beforehand to the children using the same verbal expressions as in the experimental group, and then conducted a rain formation experiment. A jar was filled with hot water, cling film was stretched over the jar and a saucer filled with ice was placed on top of the jar, and the setup was placed on the table and observed with the children. The hot water evaporated up to the surface of the cling film and turned into water droplets. After the experiment, a coloring page about the formation of rain was distributed to the children and coloring was done.

Figure 5. Control Group Rain Formation Visiualization

Figure 6. Control Group Rain Formation Experiement

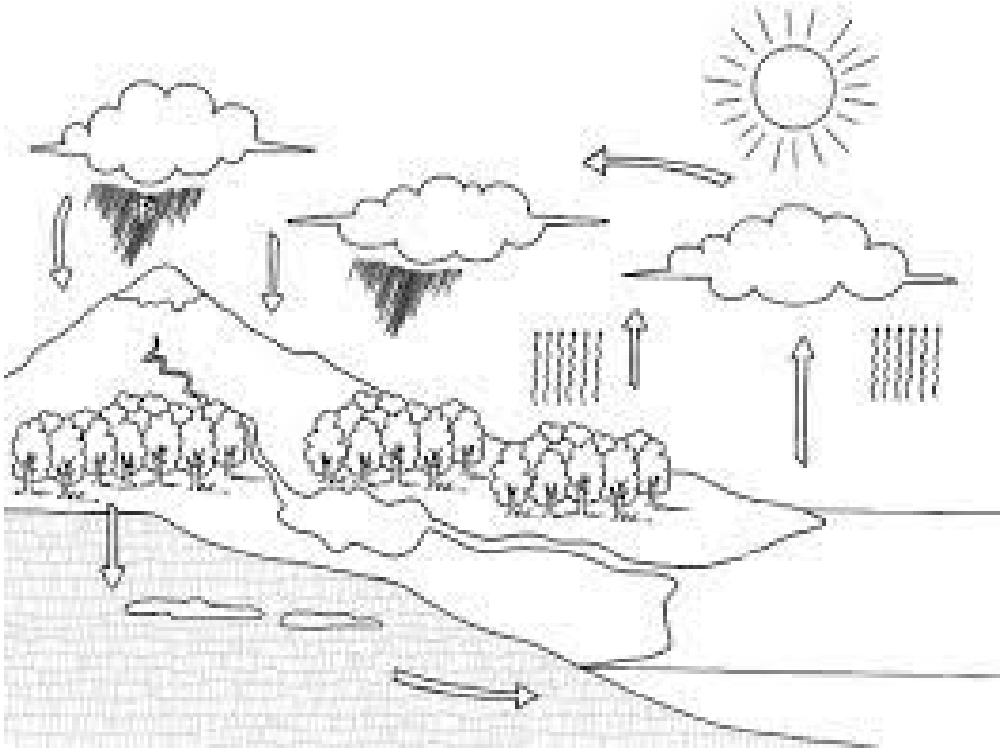


Figure 7. Control Group Rain Formation Coloring Page

Data Analysis

After the data were collected with the checklists, it was tested to see if the data were normally distributed. Since the data did not show normal distribution, which were shown in the Table 3 and Table 4, the data were analyzed using the nonparametric Mann Whitney test used in the analysis of quantitative data.

Table 3.
Descriptive statistics of experimental group

	n	Min	Max	Mean	Sd	Skewness		Kurtosis	
	Stat	Stat	Stat	Stat	Stat	Stat	Std. Error	Stat	Std. Error
Pre-test	99	,00	9,00	1,8600	2,55452	4,106	,243	25,828	,481
Post-test	100	,00	9,00	5,3400	2,31983	-,817	,241	,058	,478

Table 4.
Descriptive statistics of control group

	n	Min	Max	Mean	Sd	Skewness		Kurtosis	
	Stat	Stat	Stat	Stat	Stat	Stat	Std. Error	Stat	Std. Error
Pre-test	99	,00	7,00	2,2222	2,43670	,863	,243	-,720	,481
Post-test	99	,00	8,00	4,4951	2,95864	-,066	,243	-,697	,481

Validity and Reliability

Reliability is the consistency or reproducibility of measurements acquired from a given population or sample using a test or measuring tool (Bademci, 2019). In order to ensure reliability by creating a reusable checklist as a measurement tool, two separate expert opinions were utilized while creating the checklists as Yıldırım and Şimşek (2008) suggested. Furthermore, validity refers to how well theory and evidence support the suitability and adequacy of the usage and intended interpretation of measurements generated from a test or measurement instrument applied to a certain population or sample (Bademci, 2019). In order to ensure validity, the interventions were conducted in the same classroom environment, in classrooms implementing the same curriculum plan, with children of the same age group and with the same number of class members, for the same duration, by the same researcher, with the same verbal expressions and on the same days. Data were collected from the children immediately before the start of the study and immediately after the end of the study without intervening time. Finally, when the questions on the checklist were not understood by the children, they were explained by the researcher in a way that they could understand, and it was tried to reveal whether the child had the information in the most objective way since Streubert and Carpenter (2011) stated that to strengthen the objectivity of the research, it was required that there be no researcher biases.

Findings

Findings Obtained from Analyzing the Total Data of the Study

The total data of all themes were taken, statistically calculated and Mann Whitney U test was performed and the results were written in Table 5 and Table 6. When Table 5 is examined, the pre-test results of the control and experimental groups are given. It is concluded that there is no significant difference between the two groups.

Table 5.
Mann Whitney U analysis of the pretests of the data obtained from all themes

Groups	n	X	Mean	Sd	p	U
Experimental	20	1.86	94,59	2,55		
Control	20	2.22	106,41	2,44	0,122	4409,000

*p>.05

When the post-test results are compared with the pre-test results, it is seen that the arithmetic averages of both the control group and the experimental group increased. The arithmetic mean of the experimental group was 5.34, while the mean of the control group was 4.49. Although the arithmetic mean of the control group was higher than the experimental group at first, when the post-tests were analyzed, it was seen that the arithmetic mean of the control group was lower than the experimental group. In summary, when the results obtained from the tables are interpreted, it is seen that the class using the augmented reality application achieved significantly higher success than the class using traditional methods.

Table 6.
Mann-Whithey U analysis of the post-tests of the data obtained from all themes

Groups	n	X	Mean	Sd	p	U
Experimental	20	5.34	92.14	2.32		
Control	20	4.49	108.87	2.96	0.038	4163.500

*p<.05

Findings Obtained from Analyzing the Theme of Water Cycle and Rain Formation

When the data in Table 7 are examined, it is seen that there is no significant difference between the pre-test achievement scores of the students before the application started, and these results are suitable for the purpose in terms of determining the effectiveness of the teaching technique applied.

Table 7.
Pretest Mann Whitney U test results of the experimental and control groups on the theme of rain formation and water cycle

Groups	n	X	Mean	Sd	p	U
Experimental	20	0.6	20.90	1.42		
Control	20	0.5	20.10	1.14	0.84	192.000

*p>.05

Table 8 shows that there was a significant difference between the groups as a result of the studies. When the data are analyzed, it is concluded that the process applied with Quiver augmented reality application provides significantly higher learning.

Table 8.
Post-test Mann Whitney U test results for the experimental and control groups on the theme of rain formation and water cycle

Groups	n	X	Mean	Sd	p	U
Experimental	20	4.25	24.98	2.02		
Control	20	2.55	16.03	2.01	0.014	110.000

*p<.05

Findings Obtained from Analyzing the Theme of Life Cycle of Plants

Table 9 shows that there was a significant difference between the two groups at the beginning and this difference in knowledge level was in favor of the control group.

Table 9.
Pre-test Mann Whitney U test results for the life cycle of plants theme

Groups	n	X	Mean	Sd	p	U
Experimental	20	0.0	15.0	0.00		
Control	20	1.25	26.0	1.39	0.00	90.000

*p<.05

Table 10 shows that there is no longer a significant difference between the two groups. Although the initial knowledge level of the class in which the activity was carried out with the Quiver augmented reality application was lower, it is seen that the learning level increased to a higher level after the activity. Quiver augmented reality application increased the learning level compared to traditional methods.

Table 10.
Post-test Mann Whitney U test results for the life cycle of plants theme

Groups	n	X	Mean	Sd	p	U
Experimental	20	3.85	23.43	2.25		
Control	20	2.65	17.58	1.72	0.106	141.500

*p<.05

Findings Obtained from Analyzing the Theme of Sea Creatures

Table 11 shows that there was no significant difference between the two groups before the activities.

Table 11.
Pretest Mann Whitney U test results of the experimental and control groups for sea creatures theme

Groups	n	X	Mean	Sd	p	U
Experimental	20	6.05	21.80	0.99		
Control	20	6.30	19.20	0.80	0.45	174.000

*p>.05

When the post-test results are analyzed, it is concluded that there is no significant difference between the two groups as a result of the activities. It is understood from this table that augmented reality applications in the theme of sea creatures did not create a significant learning difference compared to traditional methods.

Table 12.
Post-test Mann Whitney U test results for the experimental and control groups on the theme of sea creatures

Groups	n	X	Mean	Sd	p	U
Experimental	20	7.85	19.98	0.48		
Control	20	7.95	21.03	0.22	0.53	189.500

*p>.05

Findings Obtained from Analyzing the Theme of the Frog's Life Cycle

When we look at Table 13, it is seen that there is no significant difference between the experimental and control groups when we look at the pre-test results of the experimental and control groups about the life of the frog, and even the arithmetic averages are close to each other. It is seen that the pre-test knowledge levels are similar.

Table 13.
Mann Whitney U pre-test results of the experimental and control groups for the frog life stages theme

Groups	n	X	Mean	Sd	p	U
Experimental	20	7.85	19.98	0.48		
Control	20	7.95	21.03	0.22	0.53	189.500

*p>.05

When the post-test results of the experimental and control groups are analyzed in Table 14, there is no significant difference between the two groups. It can be said that both the control group in which the traditional method was applied and the experimental group in which the Quiver application was used had similar levels of learning. In summary, there was no learning difference in this theme between the activities carried out with the traditional method and the activities carried out with the Quiver method.

Table 14.
Mann Whitney U post-test results for the experimental and control groups on the theme of frog life stages

Groups	n	X	Mean	Sd	p	U
Experimental	20	4.85	20.08	1.89		
Control	20	5.40	20.93	2.47	0.815	191.500

*p>.05

Findings Obtained from Analyzing the Theme of the Food Chain

When the pre-test statistical calculations of the food chain theme were examined, it was concluded that the arithmetic averages of the two groups were close and there was no significant difference between the two groups since the p value was greater than 0.05.

Table 15.
Mann Whitney U pre-test results of experimental and control groups for food chain theme

Groups	n	X	Mean	Sd	p	U
Experimental	20	0.30	19.55	0.80		
Control	20	0.45	20.45	0.88	0.462	181.00

*p>.05

When Table 16 is interpreted, it is seen that there is a significant difference between the two groups when the post-test statistical calculations of the food chain theme are analyzed. In this theme, the

experimental group, the class taught with the Quiver application, was significantly more successful than the control group.

Table 16.
Mann Whitney U post-test results of the experimental and control groups for the food chain theme

Groups	N	X	Mean	Sd	p	U
Experimental	20	5.90	24.40	2.07		
Control	20	3.90	16.60	3.37	0.032	122.00

*p<.05

Discussion, Conclusion, and Suggestions

In the developing and changing world, technology leads to new changes in human life every day. One of the changes that technology has made in human life is the change it has made in the field of education. Augmented reality technology emerged with the meeting of augmented reality technology with education has affected education through technology-based educational applications.

In this study, the effect of the use of augmented reality in science education in preschool period was aimed to be investigated and a 5-week application process was carried out. As a result of the research, it was concluded that the activity processes planned with augmented reality application created a significant difference compared to the educational practices planned with traditional methods and provided higher learning. When the literature is examined, most of the relevant research results show that augmented reality applications have a positive effect on achievement (Çevik et al., 2017; Doğan, 2016; Göçer & Kurt 2020.) The research conducted in the world on augmented reality, the number of which is increasing day by day, reveal that the use of augmented reality makes a positive difference in education compared to traditional methods (Yılmaz & Gözüm, 2023). In all of the themes of the research, it was concluded that the use of augmented reality application contributed to success and provided learning in children, but this result was not significant in every theme.

When the separate findings of the themes of the research are examined, it was revealed that augmented reality applications made a significant positive difference compared to traditional methods in the theme of the cycle of water and rain formation. In a study conducted, it was determined that compared to the organ models used within the scope of science course, lessons with augmented reality application increased achievement more than this traditional method (Akkiren, 2019).

The results of the theme of life cycle of plants showed that children in the control group had more learning outcome rather than children in the experimental group. However, two different planetarium software, Celestia and Stellarium, were examined in science education in preschool period and the use of both software accompanied by a guide was found to be beneficial for children's science learning. In particular, Stellarium software is more understandable to children than Celestia software in terms of astronomy concepts such as the formation of day and night, the shapes of the planets, and the phases of the moon (Yıldız, 2021).

In the sea creatures theme of the research, as a result, the achievements increased in the class where the application was made with augmented reality application and in the class where the application was made with the traditional method compared to the first situation, but the learning level of the class with augmented reality application did not differ significantly and highly compared to the class with the traditional method. In a study, there are studies that show that the learning of the lessons applied with augmented reality and the lessons applied with traditional methods increased significantly compared to the learning in the first situation, but the lessons taught with augmented reality were not effective enough to make a significant difference from the lessons taught according to traditional methods (Arslan & Elibol, 2015; Baysan & Uluyol, 2016).

In the theme of the life stages of the frog, the activity process applied with the traditional method and the activity processes with the augmented reality application revealed very close results and the positive effect of both applications on achievement was at a similar level. Some of the studies conducted were similar to these results. Some studies report that augmented reality applications do not have a significant effect on achievement, but still have a positive effect. In a study of 4th grade students, it was revealed that augmented reality applications had a positive effect on their math course achievement (Akın, 2022).

In a study conducted by Korucu, Gençtürk and Sezer (2016) to measure the effect of augmented reality on students' academic achievement, the results showed that the effect of augmented reality on academic achievement was positive. Research with similar results support the results in these themes. Studies show that the application of augmented reality technology in education gives positive results (Ateş & Garzon 2023; Güler, 2022; Somyürek, 2014).

For the theme of the food chain, the results showed that the experimental group, which was taught by Quiver application was more successful than the control group, which was taught by traditional methods. Similarly, Han, Jo Hyun, and So (2015) reported in a study that augmented reality increased concentration and attention skills in students. Another result of another study revealed that activities with augmented reality have a positive effect on children's cognitive gains (Cheng & Tsai, 2014). In a similar study, it was reported that the use of augmented reality in education increases attention and motivation and arouses curiosity in students (Di Serio, Ibáñez & Kloos, 2013).

In conclusion, the findings of this study showed that when augmented reality applications are used in the science learning of preschool children, more learning occurs compared to traditional methods.

The following recommendations were made within the scope of this research:

- The Ministry of National Education (MoNE) should encourage and educate in-service teachers to integrate AG into their teaching and learning process since the findings proved that augmented reality increases science learning.
- Further, investments should be made in augmented reality in education. For instance, this augmented reality application, which is understood to concretize abstract subjects in the preschool period, can be presented to children by turning them into games with different educational software.
- For educators, in this study, it was revealed that the use of augmented reality made a difference in learning. In this context, pre-service teachers should be trained and prepared to integrate augmented reality into the lesson to make learning permanent.
- Finally, for researchers, further studies can be conducted with different samples and/or different subjects such as AG effects on math learning etc. Also, qualitative research would expose the process of children's learning while they are using AG application in detail.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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 and Author 2; methodology, Author 1 and Author 2; validation, Author 1; analysis, Author 1; writing, Author 1 review and editing, Author 2; supervision, Author 2.

Funding: This research received no funding.

Institutional Review Board Statement: Ethical permission was obtained from Mehmet Akif Ersoy University Non-Interventional Clinical Research Ethics Committee with decision number 2023/230 on 05/04/2023

Data Availability Statement: Data generated or analyzed during this study should be available from the authors on request.

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

References

Akkiren, B. (2019). *The effect of augmented reality applications on sixth grade students' achievement on human circulatory system and attitudes towards science course* [Unpublished master's thesis]. Bülent Ecevit University, Zonguldak.

Aladağ, S. (2005). *The effect of project based learning approach in teaching mathematics to the academic achievements and attitudes in primary education* [Unpublished master's thesis]. Gazi University, Ankara.

Alpar, D., Batdal, G., & Avcı, Y. (2007). Educational technology applications in student-centered education. *HAYEF Journal of Education, 4*(1), 19-31.

Arslan, A., & Elibol, M. (2015). Analysis of educational augmented reality applications: The case of Android operating system. *Journal of Human Sciences, 12*(2), 1792-1817. https://doi:10.14687/ijhs.v12i2.3524

Ateş, H., & Garzón, J. (2023). An integrated model for examining teachers' intentions to use augmented reality in science courses. *Education and Information Technologies, 28*(2), 1299-1321. https://doi.org/10.1007/s10639-022-11239-6

Aydogdu, F., & Kelpšiene, M. (2021). Uses of augmented reality in preschool education. *International technology and education journal, 5*(1), 11-20. https://doi.org/10.1155/2023/4695759

Bademci, V. (2019). Validity: What is it? What is it not? *Journal of Research in Education and Society, 6*(2), 373-385.

Balcı, B., & Eşme, İ. (2001, September). *Technology education.* Symposium on Science Education in Turkey at the Beginning of the New Millennium (ss.214-220), Maltepe University, İstanbul.

Baltacı, A. (2018). A conceptual review of sampling methods and sample size problems in qualitative research. *Journal of Bitlis Eren University Institute of Social Sciences, 7*(1), 231-274.

Baysan, E., & Uluyol, Ç. (2016). The effect of augmented reality book (ar-book) on the students' academic achievements and the opinions of students about its use in educational environments. *Journal of Education and Humanities: Theory and Practice, 7*(14), 55-78.

Bliss, J. (1995). Piaget and after: The case of learning science. *Studies in Science Education,* 25, 139-172. https://doi.org/10.1080/03057269508560052

Carlsen, M., Erfjord, I., Hundeland, P. S., & Monaghan, J. (2016). Kindergarten teachers' orchestration of mathematical activities afforded by technology: agency and mediation. *Educational Studies in Mathematics, 93*, 1-17. https://doi.org/10.1007/s10649-016-9692-9

Cheng, K. H., & Tsai, C. C. (2014). Children and parents' reading of an augmented reality picture book: Analyses of behavioral patterns and cognitive attainment. *Computers & Education, 72*, 302-312. http://dx.doi.org/10.1016/j.compedu.2013.12.003

Collins, A., & Halverson, R. (2018). *Rethinking education in the age of technology: The digital revolution and schooling in America.* New York City: Teachers College Press.

Çaydere, O., & Akgün, N. (2023). Using innovative technologies in education and designing contemporary content. *Journal of Strategic and Social Research, 7*(2), 439-451. https://doi.org/10.30692/sisad.1254245

Çevik, G., Yılmaz, R. M., Goktaş, Y., & Gülcü, A. (2017). Learning English with augmented reality in preschool period. *Journal of Instructional Technologies and Teacher Education, 6*(2), 50-57.

Demirel, Ö. (1999). *Teacher handbook.* Ankara: Pegem Publishing.

Di Serio, Á., Ibáñez, M. B., ve Kloos, C. D. (2013). Impact of an augmented reality system on students' motivation for a visual art course. *Computers & Education, 68,* 586-596. https://doi.org/10.1016/j.compedu.2012.03.002

Doğan, A. (2016). Reading practice of storybook assisted by augmented reality. *Journal of Medeniyet Art, 2*(2), 121-137.

Ghavifekr, S. & Rosdy, W.A.W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. International Journal of Research in Education and Science (IJRES), 1(2), 175-191.

Göçer, A., ve Kurt, Akife (2020). Use of augmented reality application quiver in developing descriptive writing skills. *International Journal Of Field Education, 6*(2), 46-63.

Güler, O. (2022, July). *Augmented reality for aircraft engine structure training.* 3rd International Conference on Applied Engineering and Natural Sciences, Konya, 3, 1639-1645.

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, *3*, 275-285. https://doi.org/10.1016/j.susoc.2022.05.004

Han, J., Jo, M., Hyun, E., & So, H. J. (2015). Examining young children's perception toward augmented reality-infused dramatic play. *Educational Technology Research and Development*, *63*, 455-474. https://doi:10.1007/s11423-015-9374-9

Herbst-Damm, K. L. & Kulik, J. A (2005). Volunteer support, marital status, and the survival times of terminally ill patients. *Health Psychology*, *24*, 225-229. https://doi:10.1037/0278-6133.24.2.225

Hernandez-de-Menendez, M., Escobar Díaz, C., & Morales-Menendez, R. (2020). Technologies for the future of learning: state of the art. *International Journal on Interactive Design and Manufacturing (IJIDeM)*, *14*(2), 683-695. https://doi.org/10.1007/s12008-019-00640-0

Huang, F., Teo, T., Sánchez-Prieto, J. C., García-Peñalvo, F. J., & Olmos-Migueláñez, S. (2019). Cultural values and technology adoption: A model comparison with university teachers from china and spain. *Computers & Education*, *133*, 69-81. https://doi.org/10.1016/j.compedu.2019.01.012

İçli, G. (2001). Education, employment and technology. *Pamukkale University Journal of Education*, 9, 65-71.

Kahriman- Pamuk, D., Elmas, R., ve Pamuk, S. (2020). Augmented reality (AR) and science activities: the views of preschool pre- and inservice teachers. *Van Yüzüncü Yıl University Journal of Education Faculty*, *17*(1), 671-699. https://doi.org/10.33711/yyuefd.710054

Kapıkıran, A. N., Ivrendi, B. A., & Adak, A. (2006). Social skills in preschool children: A case study. *Pamukkale University Journal of Education 19*, 19-28.

Keleş, F., & Yavuz, S. A. (2022). Content analysis on research on augmented reality in education. *Anatolian Journal of Teacher*, *6*(2), 248-277. https://doi.org/10.35346/aod.1159848

Kewalramani, S., & Havu-Nuutinen, S. (2019). Preschool teachers' beliefs and pedagogical practices in the integration of technology: a case for engaging young children in scientific inquiry. *Eurasia Journal of Mathematics, Science and Technology Education*, *15*(12). https://doi.org/10.29333/ejmste/109949

Korucu, A. T., Gençtürk, T., & Sezer, C. (2016, March). *The effect of augmented reality applications on student achievement and attitudes.* XVIIIth Academic Informatics Conference, Necmettin Erbakan University, Konya.

Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of educational research*, *77*(4), 575-614. http://dx.doi.org/10.3102/0034654307309921

Metin, M. (2014). *Scientific research methods in education from theory to practice.* Ankara: Pegem Academy Publishing.

Ministry of National Education. (2013). *Pre-school education program.* Ankara: MEB.

Oğuzkan, Ş., & Oral, G. (2003). *Preschool education (12th ed).* İstanbul: MEB.

Ozdamli, F., & Karagozlu, D. (2018). Preschool Teachers' Opinions on the Use of Augmented Reality Application in Preschool Science Education. *Croatian Journal Educational/Hrvatski Casopis za Odgoj I Obrazovanje*, *20*(1). https://doi.org/ 10.15516/cje.v20i1.2626

Özel, Ö. (2019). An exploration of turkish kindergarten early career stage teachers' technology beliefs and practices. [Unpublished doctoral thesis]. University of South Florida, U.S.A.

Quesenberry, A. C., Mustian, A. L., & Clark-Bischke, C. (2016). Tuning in: Strategies for incorporating technology into social skills instruction in preschool and kindergarten. *Young Children*, *71*(1), 74-80. https://www.jstor.org/stable/ycyoungchildren.71.1.74

Saidin, N. F., Halim, N. D. A., & Yahaya, N. (2015). A review of research on augmented reality in education: Advantages and applications. *International education studies*, *8*(13), 1-8. https://doi.org/ 10.5539/ies.v8n13p1

Şahin, D. (2017). *Effect of science teaching with the augmented reality technology on secondary school students' achievement and their attitude towards the course* [Unpublished master's thesis]. Atatürk University, Erzurum.

Somyürek, S. (2014). Gaining the attention of generation z in learning process: augmented reality. *Educational Technology Teory and Practice*, *4*(1), 63-80. https://doi.org/10.17943/etku.88319

Spektor-Levy, O., Baruch, Y. K., & Mevarech, Z. (2013). Science and Scientific Curiosity in Pre-school—The teacher's point of view. *International Journal of Science Education*, *35*(13), 2226-2253. https://doi.org/10.1080/09500693.2011.631608

Streubert, H. J. & Carpenter, D. R. (2011). *Qualitative research in nursing: advancing the humanistic imperative* (5th ed.). Wolters Kluwer Health.

Ucar, S. (2014). The effect of simulation-based and model-based education on the transfer of teaching with reagard to moon phases. *Journal of Baltic Science Education*, *13*(3), 327–338. https://doi.org/10.33225/jbse/14.13.327

West, D. M. (2012). *Digital schools: How technology can transform education*. Washington: Brookings Institution Press.

Wu, H.K., Lee, S.W.Y., Chang, H.Y, & Liang, J.C. (2013). Current Status, Opportunities and Challenges of Augmented Reality in Education. Computers & Education 62: 41-49. https://doi.org/ 10.1016/j.compedu.2012.10.024

Yıldırım, A., & Şimşek, H. (2008). *Qualitative research methods in social sciences* (6th Edition). Seçkin Publishing.

Yıldız, C. (2021). Usability of open source planetarium softwares in preschool science education. *Istanbul Sabahattin Zaim University Journal of the Institute of Science and Technology*, *3*(1), 38-41. https://doi.org/10.47769/izufbed.862541

Yılmaz, Z. A., & Gözüm, A. İ. C. (2023). Augmented reality app in pre-school education: Children's knowledge about animals. *Southeast Asia Early Childhood Journal*, *12*(2), 130-151. https://doi.org/10.37134/saecj.vol12.2.8.2023

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

The Use of Vlogs and Collaborative Reflection in Teacher Education

Zeynep Yaprak[1]

To cite this article:
Yaprak, Z. (2024). The use of vlogs and collaborative reflection in teacher education. *e-Kafkas Journal of Educational Research, 11,* 227-242. doi: 10.30900/kafkasegt.1318084

Research article **Received:21.06.2023** **Accepted:19.04.2023**

Abstract

The primary purpose of this paper is to explore the nature of student teachers' reflections initiated and supported by certain reflection prompts such as SAT (Self-Assessment Tool) and vlogs shared on a Google classroom. Within the context of practicum, ten teacher candidates were randomly recruited for the study. Quantitative data were analyzed through SPSS with the purpose of generating a summary of descriptive statistics. Qualitative data were employed in depth-analysis for the interpretation of emerged patterns and themes. In order to understand how collaborative reflections emerged and developed between the student teachers, discussion transcripts were analyzed and coded with discourse analysis. The results indicated that regular and collaborative reflections had important contributions to the participants' teaching practice. Through finding the opportunities of having real classroom teaching experiences, sharing these practices, and getting new perspectives, student teachers have become more cognizant of their beliefs, teaching behaviors, and their teaching settings. On the way of being strong decision-makers of their future teaching, it can be highlighted that through the reflective practices enhanced with peer collaboration, teacher candidates have become more willing in reflecting and sharing their experiences and professional knowledge and more determined in practicing theory to deal with the problems in their classrooms.

Keywords: Collaborative reflection, teacher education, vlog, practicum, second language education

[1] Corresponding Author, yaprakze@gmail.com, Dicle University

Introduction

The importance of reflection in teacher education has been generally accepted and confirmed in research (Arslan, 2019; Beauchamp, 2015; Farrell, 2019; Hatton and Smith, 1995; Klein, 2008; Loughran, 2002; Richter et al., 2022; Shoffner, 2008). According to Sternberg and Horvath (1995:13), reflection in teacher education refers to "continuous learning through experience". For Newell (1996), it also entails the "interaction" of these experiences in relation to teachers' beliefs lying in them. It is a thinking process and self-examination based on "classroom events, experiences or critical incidents" (Cirocki & Widodo, 2019). Engaging in this process of introspection not only helps teachers to develop conscious state related to own thoughts and feelings but also with its "transformative potential" it allows teachers to modify these thoughts and emotions (Gorski & Dalton, 2020, p. 357). The aim of providing teacher candidates with the opportunities of constructing their understanding of being a reflective teacher and learning from their experiences has emphasized the importance of reflective practices in teacher training programs (Anselmann, 2023; Farrell, 2007;Farrell, 2018; Widodo &Ferdiansyah, 2018). According to Falter and Barnes (2020) and Sturkie (2017), in this reflection process how these students feel should not be masked as reflective teaching has positive contribution to teacher intellect and emotion. Within this respect, in these teacher education programs, curriculum decisions need to take into consideration the educational strategies that promote teacher candidates' "emotional sharing and regulation" (Näykki et al., 2022). However, despite its reported value and being integral part of many teacher training programs, still there exists confusion regarding the definition of reflection, its scope, and application in the preparation of teacher candidates. In theoretical and practical terms, reflection and reflective teaching need to be rethought and refocused. Whether it is a purely cognitive process and only goes on inside people's mind or it has any driving force on shaping the outside world as well is the main point for understanding its value in training prospective teachers. According Klein (2008), even though reflection encompasses a number of critical thinking abilities like "analytical, linear, logical, rational thinking, deductive reasoning, and meta-cognition about teaching", reflection that does not promote contemplative or imaginative thinking is not enough to let teachers judge well and see the details embedded in teaching. For this reason, it is essential for teacher candidates to think about teaching through either reflecting on real experiences or imaginative situations.

In the literature of teacher education, reflection and reflective teaching are highly emphasized two notions (Jarvis et al. 2014; Clarà et al., 2019). According to Dewey (1933:432), reflection can be defined as "a deliberate, purposeful act" that motivates students to employ "their artful skills" in their learning process. On the way of being an effective teacher in response to the educational challenges, through this "active and deliberate reflection and analysis", teacher candidates learn to develop professional strategies (Shandomo, 2010; Reagan et al., 2000). This deliberate reflection is a product of a multidimensional process which requires the facilitation of "internal dialogue" with thinking, writing, and interaction with other people (Falter & Barnes, 2020; Killeavy & Moloney, 2010: 1071; Williams & Svensson, 2020). As indicated by McKnight (2002:1), developing understanding of classroom can be achievable through full awareness and understanding of what happens in the classroom, which inevitably entails "the consistent practice of reflective thinking". Being productive in reflection process depends on a number of conditions like showing willingness and engagement and being educated about how to reflect (LaBoskey, 1993). Rogers provides details related to the important four criteria for reflection (2002:845). The first criterion depicts reflection as a "meaning-making process" in which individuals learn to develop understanding about their experiences and based on this insight and awareness, they can make meaningful connections between different experiences that eventually will promote their learning. Systematic questioning way of thinking is the second principle for the reflection indicated by Rogers (2002:845). As a third criterion, being in interaction with other people is a social dimension of reflection and also important for feeding the thought process. The last standard is related to dispositions essential for reflection. According to Rogers (2002: 845), having and maintaining a positive attitude is required for the development of self through reflection.

Through reflection teachers get the chance of checking own conceptualization of teaching, evaluating their teaching behaviors, and therefore, they could be more professional while making decisions with ambiguous situations (Iqbal, 2017). Reflection-in-action and reflection-on-action are two types that are

often emphasized in literature. According to Schön (1983), reflection-in-action is done by teachers during the problem while teaching. Reflection-on-action, on the other hand, is carried out after the incident (Schön, 1983). Reframing and new action are two important components of reflection-in-action: reframing is "seeing a situation in a new way" and a new action refers to "a new approach to practice" shaped by reframing (Russel, 1988). For both of types of reflection, there is a "puzzling or troubling or interesting phenomenon" that teachers try to figure out. While dealing with the problem, teachers are expected to focus on their underlying beliefs and construct their own understandings (Schön, 1983:50). Reflection-in-action necessitates the individual to decide during the event and act immediately. Reflection-on-action is retrospective thinking of the experience. Individuals can make use of time and think about the alternative reactions and actions might be given or taken if the same problem occurred again. For the reflection-on-action, people could depend on others' collaboration and opinions in order to execute more effective actions next time.

For Boud et al. (1985:18), reflection is a learner's reaction and "response" to experience. However, the notion of reflection should go beyond being a "promise", and it needs to be considered as a "reality" of teacher education (Clarà et al., 2019). While learning from experiences through reflection, learners also need to be supported to engage in collaboration. Collaborative environments recognize, support, value teachers, and encourage them to try new trends in their fields (Hargreaves & Fink, 2006). The use of different platforms especially the integration of digital technologies into reflection has potential impact on enhancing the teacher candidates' critical thinking in connecting theory and practice (Botturi, 2019; Rodrigues, 2020; Widodo & Ferdiansyah, 2018). Many scholars (Clarà et al., 2019; Harford & MacRuaric, 2008; Mitchell & Sackney, 2009) have claimed that collaborative reflection could provide assistance to the teacher candidates in order to learn to reflect. As indicated by Newell (1996), collaboration encourages interaction and helps learners share their views with their peers. Working collaboratively facilitates elaboration, expanding of ideas, and provides opportunities to support their point of views (Newell, 1996). Recognizing and nurturing teachers' inner life play a central role in teachers' professional development. Therefore, evolving teachers into "integrated teachers" could be achieved by supporting their inner life through facilitating reflective thinking in teacher education (Klein, 2008). However, asking teachers to reflect and talk about their experiences is not enough to create the expected impact (Menekse et al., 2020). For higher levels of reflection, socialization and collaborative argumentation need to be promoted through peer collaboration. Collaborative reflection help teacher candidates critically rethink and elaborate on the experience at greater depth and encourage them to take more active role in knowledge generation and construction (Attard, 2012).

With this respect, in this study, collaborative reflection was integrated with the technique of vlogging and it was studied in the mode of reflection-on-action and reflection as off-line or imagined practices. In the first type, student teachers were expected to reconsider their experiences and reflect on the previous events and emotional states that they went through during these teaching experiences. For this retrospective thinking, they exploited the technique of vlogging in which they were supposed to record a short video for their self-reflection. Teacher candidates were encouraged to follow these three stages of reflection-on-action: live-reconsider-articulate. The function of a video blog or a vlog in reflective practice can be defined as "a recorded video" in which student teachers reflect on their practice, understandings, and sometimes misunderstandings of, and in, their actions in the field" (Parkers & Kajder, 2010: 219). According to Brott (2020), through vlogging, learners deliberately and critically take part in self-reflection. In this study, it was utilized both for a medium of reflection and a tool for convenience data collection. In other words, video blogs for the reflection-on-action were encouraged to eliminate demotivation caused by writing and not to overwhelm the student teachers with the mechanics of writing. In the second mode of reflection, participants reflected on an imagined situation or problem and commented on their peers' vlogs. Vlogs were viewed as a way of promoting constructivist environment in which teachers could share their thoughts, recognize and appreciate different perspectives. Moreover, exploiting the students' vlogs also helped the researcher to gain higher level of insights in teacher candidates' learning and professional development (Fidan& Debbag, 2018; Ong et al., 2020) . Within these aspects, this study proposes these research questions:

1. Is there any difference between the pre and post SAT reflections of the teacher candidates of English based on their teaching practicum enhanced with reflective teaching?

2. What kind of teaching experiences and peer reflections did the student teachers share during their vlogs and collaborative reflection sessions done through the use of digital platform of Google Classroom?

Method

Research Design

Quantitative and qualitative research procedures were used in data collection and analysis. The study adopts exploratory approach for gathering and analyzing the data as it primarily explores the research points and tries to uncover the effects of practicum on teacher candidates' based on their self-declaration and reflection. Data related to the research phenomenon was verified with a number of data collection tools and in a multilevel triangulation model, the interpretation and credibility of data were enhanced through quantitative and qualitative methods (Creswell et al., 2003; Tashakkori and Teddlie, 1998).

Participants

Ten teacher candidates (3 male and 7 female) of English language teaching were determined as study sample. Before their teaching experiences in a real school environment, each teacher candidate has already taken a number of courses in which they have been exposed to theoretical and practical knowledge in language and teacher education. Random sampling was used as a sampling technique. The students who took the teaching practice course were systematically divided into groups of 4 and 5 people. While determining the groups, students' identity numbers were taken as a basis. In order to manage confidentiality and anonymity, the identity of each student was protected with codes like "ST1, ST2, ST3…". Each student group was assigned to a public school and included in a 12-week practicum. Within the scope of practicum, teacher candidates are expected to be at the practice school for 6 hours, 2 hours of which is teaching, and to attend theory classes for 2 hours.

Data Collection and Analysis

Data were collected over 12-week practicum period with regular face-to-face and online meetings. For quantitative data collection, Self-Assessment Tool (SAT) developed by Borg and Edmett (2018) was used. The tool has nine sub-factors as Planning lessons and courses, Managing the lesson, Understanding learners, Knowing the subject, Managing resources, Assessing learning, Integrating information and communications technology (ICT), Using inclusive practices , and Promoting 21st-century skills. SAT was based on the responses of 1,716 teachers around the world and made available to English language teachers. Originally the tool was designed around 48 items, however, as 43 items were applicable for the research context, tool was reduced to 43 items. A Likert scale which was based on a continuum from strongly disagree to strongly agree, was applied to collect the teacher candidates' responses related to their views about their teaching practices. Cronbach's alpha scale's dependability is rated excellent as coefficient values of 0.96 which is greater than 0.90. The collected data was analyzed on a five-point rating while strongly disagree was rated with 1 and strongly agree was scored with 5 point. In order to have the participants' consents and inform them with the research, they were recruited through informed consents. For the purpose of gaining the research an ethical and legal basis,ethics approval was obtained from ethics committee. Additionally, qualitative data were gathered with the use of shared vlogs and comments given by the other teacher candidates. This learning environment was supported with online platform, Google Classroom, on which the teacher candidates shared their video recordings and reflections without being constrained with time and space (Cho et al., 2016).

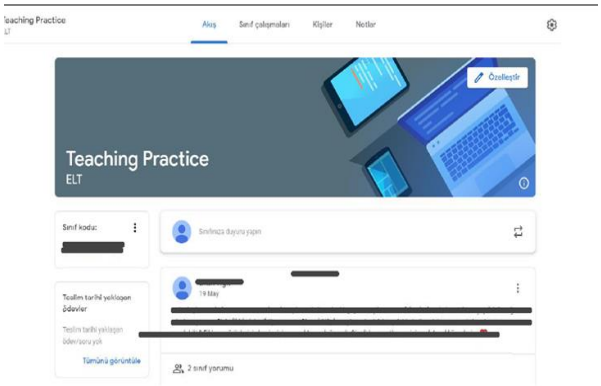


Figure 1. Screenshot of google classroom

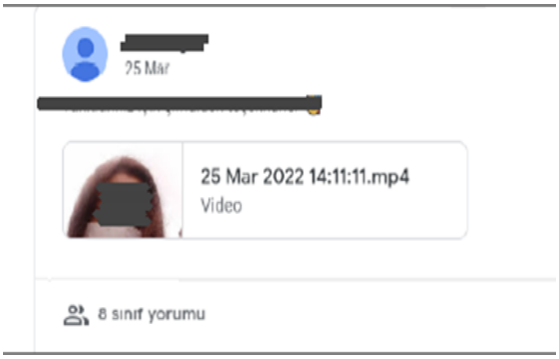


Figure 2. Screenshot of sample vlog

Quantitative data were analyzed through SPSS with the purpose of generating a summary of descriptive statistics. Due to the small sample size, in order to indicate possible significant differences between the participants' pre and post treatments, the Wilcoxon signed rank test was applied. Qualitative data were employed in depth-analysis for the interpretation of emerged patterns and themes. In order to understand how collaborative reflections emerged and developed between the student teachers, discussion transcripts were analyzed and coded with a discourse analysis. As a result of this analysis and qualitative data-reduction process, reflection data enhanced with collaboration were coded around five main codes as below:

Table 1.
Discourse Codes Emerged from Vlog-based Collaborative Reflection

Code of Discourse	**Description**
DE:	Detailing/Describing an experience
SOA:	Seeking opinion/assistance
MS:	Making a suggestion (for the solution of a classroom problem)
EoS:	Elaborating on a given suggestion
AGS:	Agreeing with a given suggestion

Based on the discourse analysis results on Table 1, it was noted that there were two conversation patterns that triggered collaborative reflection among the teacher candidates in vlog-prompted reflection sections. In their vlogs, student teachers either preferred to share details related to their teaching experience and what they thought and felt about that experience or they preferred to share a classroom problem emerged during the practicum and sought their peers' opinions and alternative solutions. In response to teacher candidates' initiation with vlogs, their peers displayed three behaviors like making a suggestion, giving details about suggestion, or agreeing with others' suggestions.

Teaching Practicum

Teaching practicum which was designed to allow the teacher candidates to put the theory of Second Language Education into practice was framed around 12-week training. The first 2-week of the practicum was spared for school choice, student placement, and the introduction of the practicum. Throughout the practicum, except for the last week which was considered for general evaluation of the teaching practice, teacher candidates were asked to design a 80-minute long lesson plan for their teachings based on each week's teaching point indicated in the syllabus. Additionally, every two weeks, student teachers were assigned with different tasks. For the first task, teacher candidates were asked to analyze the term plan designed by the Ministry of Education which acted as a guide for the language teachers to base their teachings on. For the second task, teacher candidates were asked to write a report about the classroom atmosphere, educational materials, and other resources. For the next task, pre-service teachers were informed about the course book evaluation both externally and internally and asked to conduct that evaluation with the course book that their mentor teachers were using in their teachings. In the fourth task, students were guided to design language activities that promoted pair and group works. For the fifth one given on the 8th week of the practicum, teacher candidates were held responsible for designing an exam, its evaluation and grading process. In the last task, students were asked to evaluate their teaching experiences as a prospective teacher.

Findings

Teacher Candidates' Pre and Post SAT Findings

In this study, ten teacher candidates were asked to reflect on their experiences related to 12-week practicum. The first part of the findings' section provides statistical and qualitative results obtained through SAT (Self-Assessment Tool). In the second part, participants' collaborative reflection results which were gathered through Google classroom were presented.

Table 2.
Wilcoxon Signed Ranks Test Analysis of the Pre and Post Ratings Based on Self-Assessment Tool

	N	Mean	Std.Deviation		
Pre-Test	10	2.758	0.649		
Post-Test	10	4.246	0.301		
Pre-Test& Post-Test	**N**	**Mean Rank**	**Sum of Ranks**	**z**	**p**
Negative Ranks	10[a]	5.50	55.00		
Positive Ranks	0[b]	.00	.00	-2.805[b]	.005
Ties	0[c]				

Based on the Wilcoxon Signed Ranks Test Analysis, there is a significant difference between the teacher candidates pre and post ratings related to SAT. While the mean for the post-test is noted as M= 4.2, for the pre-test it is recorded as M=2.7. Therefore, the median post-test ranks were statistically significantly higher than the median pre-test ranks with $z=-2.805$; $p<.05$.

Table 3.
Item Pre and Post Analysis of SAT (Highly rated items by the student teachers)

Item No	Self-assessment Scale Item	Mean (Pre – test)	Item No	Self-assessment Scale Item	Mean (Post –test)
#1	I treat all my learners equally and with respect	3.9	#36	I can use digital tools effectively to help my students learn English.	4.9
#2	I develop positive attitudes towards diversity in my classroom	3.6	#38	I can evaluate the quality of digital content.	4.8
#24	I promote collaboration and communication	3.5	#1	I treat all my learners equally and with respect.	4.7
#7	I can select activities which help meet the aims of the lesson.	3.3	#4	I can create a positive learning environment.	4.7
#33	I can work with colleagues to design materials collaboratively	3.2	#28	I can use technology confidently for the purposes of teaching English	4.7
#4	I can create a positive learning environment.	3.1	#42	I can use technology to design and create teaching and learning materials.	4.7

As indicated in Table 3 which is based on the student teachers' pre and post ratings of self-assessment tool, while treating the learners equally and with respect and developing positive attitudes towards diversity in their classrooms are highly rated in their pre-evaluation, building a positive learning environment which fosters respect and positive relationships with the students and value their learning are recorded as the most rated items in the participants' post-evaluations.

Table 4.
Item Analysis of SAT (The points in which student teachers developed most)

Item No	Self-assessment Scale Item	Mean Difference
#38	I can evaluate the quality of digital content.	1.9
#8	I can give instructions effectively	1.8
#10	I can select materials and resources based on learner needs.	1.8
#23	I can use a range of engaging techniques to teach my learners to speak English.	1.8
#34	I can describe how learner understanding will be assessed	1.8
#36	I can use digital tools effectively to help my students learn English.	1.8
#42	I can use technology to design and create teaching and learning materials.	1.8

Based on the mean differences obtained through the pre and post applications of SAT on Table 4, teacher candidates indicated that regarding English language education, as a teacher they showed development in a number of areas. They have become more effective in giving instructions with the techniques that boost students' engagement. Additionally, designing and evaluating technology-assisted learning materials are the other SAT statements and aspects that depict the student teachers' pedagogical development throughout the practicum.

Findings Related to Teacher Candidates' Reflections Gathered via Vlogs and Google Classroom

Table 5.
Pedagogical Points Teacher Candidates Stated that They Needed to Improve More

The Pedagogical Points	Frequency of Utterances
Classroom management	4
Teaching skills	3
Giving clear instructions	3
Developing and using materials	3

Even though the pre-service teachers stated that they made progress in some areas during the practicum, they admitted that they still needed to improve themselves at some points, such as managing a large class size, using voice effectively, teaching and creating learning opportunities to improve language skills, giving clear instructions, and using instructional materials to support learning.

Table 6.
Topics Emerged During the Collaborative Reflection Sections and Vlogs

Use of library and designing appropriate activities for the effective use of materials and sources
Controlled exercises and selecting different students to answer questions
Group works and managing noise
Use of demonstration and materials to enhance vocabulary teaching process
Activities to increase attention span
Nominating students for the activities
Designing clear and effective assessment tools
Deductive& Inductive grammar teaching
Building rapport with the students
Classrooms specially designed for language education
Classroom management –dealing with discipline problems

The topics presented on the Table 6 were the main themes emerged and highlighted through student teachers' vlogs. Teacher candidates either chose to talk about their teaching experiences or directly asked their friends' opinions related to controversial pedagogical issues. In these collaborative reflections, student teachers discussed about significant incidents and decision making processes

related to these experiences. They shared their opinions and teaching experiences and with their peers they collaboratively constructed new knowledge and teaching act for future teaching experiences.

Table 7.
Discourse Analysis Results of Vlogs

	Examples	**Frequency**	**Percentage**
DE: Detailing/Describing an experience	"I applied pair/group work and a short exam during my internship today. I can say that it was very productive and fun for students. I observed that the students who chose the name of their group were more active and effective in building sentences in English……"	18	%11
SOA: Seeking opinion/assistance	"When I have an activity on the smart board, in terms of giving the students the right to speak to what should I pay attention? I tried to get the answer individually but still they gave the answer in unison and this caused too much noise. What would you recommend on this?"	8	%5
MS: Making a suggestion	"You can use a plastic ball and sticks which have the students' names in order nominate the student to give the answer."	50	%30
EoS: Elaborating on a given suggestion	"…..as the students wouldn't be able to know the one who is going to answer, they are all going to be prepared for the question...they would enjoy this technique as it would be seen as a game."	44	%27
AGS: Agreeing with a given suggestion	"I'm really glad that the students are having fun and being motivated. I also think that making noise in group or pair activities will not be a problem."	44	%27

Online collaborative reflections were mostly initiated by teacher candidates' desire to share a teaching experience which they thought worth to share, which was recorded as 18 times. Stating a problem and trying to gain different perspectives through asking their advices or opinions was the second type of initiation for online discussion. None of these initiation attempts were overlooked. They were all responded by fellow teacher candidates with a suggestion. In most of the discussions, which was 44 times out of 50 incidences, student teachers preferred to make a suggestion and then present details in order to ensure that their peers fully understand the given suggestion. In the collaborative nature of discussion, teacher candidates were also open and willing to show their support to their peers when they agreed with the given suggestion.

Sample Vlogs Shared on Google Classroom

In this Vlog I *#Vocabulary Teaching*, student teacher shared her experiences related to vocabulary teaching with and without the use of technology. For the first hour of her weekly teaching, she reported that as their mentor teacher asked them to do so, with her partner they only used the board to introduce new vocabulary to the class. With their Turkish equivalences, they wrote the words on the board and students took notes. Then, for the second hour, they played a digital vocabulary game with the students. In relation to differences between two hours, she stated in terms of recalling new vocabulary and interaction between teacher and students, the second hour was more effective and fun (DE/SOA).

> "For me, asking students to memorize the words with Turkish equivalences is time and effort consuming. Instead, integrating the words into contexts like video or games is more enjoyable and long-lasting learning."(ST3-MS/EoS)

> "I also do not agree with the idea of teaching vocabulary with their native language equivalences. The use of visuals, drawings, real objects, PPT slides and body language is more effective to catch students' attention and stimulate their senses." (ST4- MS/EoS)

> "In vocabulary teaching, teacher's performance is also as important as the quality of the platform and the material that we use to teach."(ST9-MS)
>
> "When we ask the students to take notes of the new vocabulary, they are perceived by the students as a pile of letters nothing more. In order to elicit the vocabulary and make the students learn new words, activities need to be interesting and we need to relate them to real life."(ST10-MS/EoS)

In this Vlog II *#Testing in Foreign Language Education*, student teacher reflected on the importance of giving clear and specific instructions in order to achieve the goals of the assessment in language education. Based on her observation, student teacher stated that due to testing anxiety, even though you provided students with clear instructions, students still might experience difficulty in understanding the directions in the test tools. She said that during one of the exams in practicum school, students couldn't start exams because of poor instructions. Although they rephrased the instructions a number of times, students did not satisfy and concentrate for the exam. From this experience, she added that teachers might violate or disqualify their exams because of unclear instructions (DE).

> "Not only instructions but also the quality of the copy papers is also important. Blurred text or images also cause tension during the exam." (ST3-MS)
>
> "I also experienced the same thing. As the students didn't understand the instructions, they were distracted and felt stressed. Maybe giving sample answer would be helpful for the students. By this way, they won't waste time while trying to figure out the exam."(ST4-DE/MS/EoS)
>
> "We can also apply process assessment. Instead of using only one time testing and a single paper, designing sections and dividing the testing process into the parts would be more effective."(ST9-MS/EoS)

In Vlog III *#Use of Group Works in Language Teaching,* the teacher candidate reflected on his teaching experience related to the implementation of group work. He said that allowing the students to choose their group names and rewarding the winner group made the students feel more included in language learning. As students worked in groups and shared ideas, there was a potential for an increased noise. He said that he did not try to quiet down the class as he believed that noise was an indication of their involvement and he asked his friends' opinions related to group works (DE).

> "It is really motivating to witness the students' engagement with the activity. However, we need to ensure the noise is related to their involvement or it is only chatting."(ST3-AGS/MS)
>
> "Group works are effective in promoting classroom dynamics and supporting different mindsets. I also agree that noise is natural part of language learning. (ST10-AGS)

In one of the other reflections-on-action, ST3 talked about her disturbing experience related to not having language based classroom. Regarding this teaching practice, she said that she had to leave the activity incomplete due to the inadequacy of the classroom. Based on this experience, other teacher candidates (ST1, ST4, ST5, and ST9) also confirmed the idea that we needed classrooms which are specially designed for each subject. "I believed that language based classrooms positively affect students' motivation and success in language learning" (ST1-AGS). "By this way, classroom interaction could be increased" (ST4-AGS). "I totally agree with my friends; you don't have to spend too much on new technology to transform the classrooms. In our material design course, we have already experienced that we can design materials with the available resources" (ST5-AGS/DE). "…..activities also can be varied as stirring and settling activities. Thus, all students would be more active" (ST9-MS/EoS)).

In the next vlog, teacher candidate (ST4) shared her teaching practice about grammar teaching. She expressed her concern and effort of using only target language. She said that even though she tried hard not to use native language while teaching grammar and giving instructions, she realized that students and their mentor teacher who was persistently using grammar translation method did not

support her effort and they still did not leave their habit of translating every word they used or heard (DE/SOA). In their comments about the vlog, student teachers stated that effective grammar instruction should be in context. “For this age group, I think that grammar teaching should be inductive. I mean, first we should use a context to give the rules and we need to apply a number of activities to reinforce learning…In this way, our classroom would turn into student-centered learning environment. In this kind of classroom, you do not need to concern with classroom management” (ST10-MS/EoS). “I have also never thought that I would have lived any problem with classroom management. I don’t want to quiet down them as we as a teacher we try to make them speak. I use two techniques to catch their attention. First one is clapping hands and the second one is tapping on the table with the pen. You can also try” (ST3-DE/MS).

In another reflection-on-action vlog, ST10 gave details about her observation. During the teaching practice, she realized that teacher all the time the same students were nominated, which caused other students to speak less and she asked her friends what she could do not to be in the same position (DE/SOA). As a response to this vlog, one of the student teacher suggested one application to facilitate this nomination process. “I came across a tool in which you can record your students’ names and that app chooses students for you. Then, it deletes the nominated student from the list. Therefore, there is no way left for the same students to be chosen again” (ST3-MS/EoS). Through this application, we can also control ourselves and can give all students a chance to respond without favoring any” (ST8-AGS).

In the rest of reflections, student teachers reflected on the design and application of syllabuses, integration of skills, and assessment procedures applied by the mentor teachers. Regarding the design of term plans, they almost expressed the same opinions. Schools use fixed syllabuses and in terms of integration of skills and encouraging communicativeness, teacher candidates thought that the suggested term plans were effective. “Integration and balance of skills is good; there are all skills in each unit and they are given in an integrated way” (ST1 & ST5-AGS), “The themes and activities in the plan have been prepared in a way that will enable students to use the target language actively and effectively” (ST3-AGS), “There is enough information about skills and learning outcomes as well as suggested contexts, tasks, and assignments….themes are determined on the basis of cognitive, social, and affective development of the students” (ST4-AGS), “Language skills such as listening, speaking, reading, and writing take place in each week’s schedule and keeping students' skills alive is aimed” (ST6-AGS), “The term plan includes many kinds of activities and opportunities in order to promote communicative competence” (ST8-AGS), “The main goal of the plan is to engage learners of English in stimulating, motivating, and enjoyable learning environments so that they can become effective, accurate, and fluent communicators in English” (ST10-AGS).

Discussion and Conclusion

This study presented the findings related to the student teachers’ reflections on their teaching practices. In teacher education, teachers’ reflections cannot be separated from their professional development of teachers (DeLuca,2022; Körkkö, 2021; Orakcı, 2021; Schön, 1983, Slade et al., 2019; Farahian & Rajabi, 2022; Van Beveren et al., 2018). According to Tripp and Rich (2012:678), in reflection teachers put themselves into “investigative process” in which they evaluate the consequences of their teaching with the purpose of developing their teaching. In order to increase the productivity of teacher candidates’ reflection, collaborative reflection gives importance to the interaction between the peers, which is the primary mode of reflection suggested in the present study. For this purpose, participants were encouraged to reflect on their practicum practices within the context of joint reflection with other teacher candidates. The findings from gathered through different modes of reflection prompts indicated that teaching practicum had significant impact on student teachers’ self-evaluation and reflection. Within social constructivism approach, reflection constructed and supported with peer interaction facilitates the process of finding solution to the prroblems (Backman et al., 2023; Dutta et al., 2023; Falter & Barnes, 2020). As an important outcome of teaching practice, teacher candidates claimed that they became more conscious of their teaching and were more able to deduce the changes. This finding was congruent with Trevethan and Sandretto (2017) who argue that reflection has important functions in changing teachers’ teaching behaviors and thinking. For Darling-Hammond and Bransford (2005), learning and theories of learning need to be at the center of teacher education as the

phenomenon of learning should be the primary purpose of any educational process. In line with this aim, the findings from this study also revealed that teaching practicum supported with collaborative reflection yielded positive effects on building positive learning environment and relationships with the students (Gröschner et al., 2018; Yüksel & Başaran, 2020). According to Gröschner et al. (2018), the use of technology in teacher training during reflection part promotes the process of analysing and discussing the points related to teaching experience. Another highly stated self-evaluation (SAT) criteria by the teacher candidates regarding their pedagogical development was creating and applying technologically supported learning materials. This finding is in line with the other studies (Fulton et al., 2003; Kay, 2006) that appreciate teacher education programs as the contexts in which teacher candidates could be encouraged to integrate technology into their teaching (Widodo & Ferdiansyah, 2018). On the other hand, Gulbahar (2008) in her study which provides findings related to pre-service teachers and their appropriate use of instruction materials, reports that teacher education programs are not successful in training future teachers for the effective of technology. Based on other statistical findings, in addition to the material selection and design, teacher candidates claimed that teacher instructions is also one of the aspects that practicum had important contributions. According to Entwistle and Walker (2000:343), teaching has three important parts like knowing "subject matter", building "relationships with the learner", and constructing learning, in which teacher instructions have important functions. Concerning the analysis of participants' reflections gathered through vlogs, it would be concluded that most of the teacher candidates were familiar with modern language teaching methods and ready to apply this knowledge into their teaching. In one of the reflection-on-action and related collaborative feedback from the peers, teacher candidates highlighted the importance of using contexts and digital resources for meaningful vocabulary learning instead of forcing students to do rote-memorization. In another sample of reflection-on-action, student teachers were discussing the role of giving clear instructions during the test. Based on their experiences, student teachers indicated that instructions not well thought could cause confusion in test administration and increase students' test anxiety. Promoting active learning environments with learner-centered teaching methods was the main focus of the rest of reflections. In these reflections, participants stated that not ensuring equal opportunity to all students in order to make them talk might negatively affect their language learning motivation and achievement.

In conclusion, there is a mutual dependence between reflective practice and teaching practice. As indicated by Williams and Grudnoff (2011) reflection cannot be seen as spontaneous and unlearned behavior without conscious reasoning. Rather, it needs to be systematically taught and practiced with the teacher candidates and teachers (Cirocki & Widodo,2019; Farrell, 2015; Körkkö, 2021). Through reflective approach, student teachers can develop consciousness in their personal experiences during the teaching practices. On the other side, practicum provides teacher candidates with teaching and learning opportunities through which they can apply theoretical knowledge and techniques, and a result, they can reflect and see which ones work best for them. As limitations of this study, further and longitudinal studies are needed to give detailed findings related to collaborative reflection. In this study, in order to keep the participants motivated to reflect at regular intervals teacher praises and prompts were used. Thus, in order to effectively integrate the power of reflection into teacher education programs, teacher candidates need to be informed and trained to improve their thinking skills and to be more reflective. In this sense, self and peer reflections need to be a common practice in students' initial teacher education. Some systematic frameworks could be designed to effectively guide the future teachers to be more reflective in their peer supported reflections.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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.

Funding: This research received no funding.

Institutional Review Board Statement: Permissions were from Dicle University Social and Human Sciences Research Ethics Committee's meeting dated 17/05/2022, and the decision number 286720.

Data Availability Statement: Data generated or analyzed during this study is available from the author on request.

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

References

Anselmann, V. (2023). How to Promote Preservice Teachers' Reflections through Critical Incident Training. In Frontiers in Education, 8:1212158. doi: 10.3389/feduc.2023.1212158

Arslan, F. Y. (2019). Reflection in pre-service teacher education: Exploring the nature of four EFL pre-service teachers' reflections. *Reflective Practice,* 20(1), 111–124.

Attard, K. (2012). Public reflection within learning communities: an incessant type of professional development. *European Journal of Teacher Education*, 35:2, 199-211.

Beauchamp, C. (2015) Reflection in teacher education: issues emerging from a review of current literature, *Reflective Practice*, 16:1, 123-141, DOI:10.1080/14623943.2014.982525

Borg, S., & Edmett, A. (2018). Developing a self-assessment tool for English language teachers. *Language Teaching Research*, 2019, 1-25.

Botturi, L. (2019). Digital and media literacy in pre-service teacher education. *Nordic Journal of Digital Literacy*, 14(03-04), 147-163.

Boud, D., Keogh, R., &Walker, D. (1985). Promoting reflection in learning: A model. In D. Boud, R.Keogh,&D.Walker, *Reflection: Turning experience into learning* (pp. 18–40). London: Kogan Page.

Brott P. E. (2020). Vlogging and reflexive applications. Open Learning: *The Journal of Open, Distance and E-Learning*, 1–13. https://doi.org/10.1080/02680513.2020.1869536

Cirocki, A., & Widodo, H.P. (2019). Reflective practice in English language teaching in Indonesia: Shared Practices from Two Teacher Educators. *Iranian Journal of Language Teaching Research* 7(3), 15-35

Clarà, M., Mauri,T., Colomina, R., Onrubia,J. (2019). Supporting collaborative reflection in teacher education: a case study, *European Journal of Teacher Education*, 42:2, 175-191, DOI: 10.1080/02619768.2019.1576626

Cho, J. Y., M. H. Cho and Kozinets, N. (2016). "Does the Medium Matter in Collaboration? Using Visually Supported Collaboration Technology in an Interior Design Studio." *International Journal of Technology and Design Education* 26 (4): 567–586. doi:https://doi.org/10.1007/s10798-015-9322-3.

Creswell, J. W., Plano Clark, V. L., Gutmann, M. L., & Hanson, W. E. (2003). Advanced Mixed Methods Research Designs. In A. Tashakkori, & C. Teddlie (Eds.), *Handbook of Mixed Methods in Social and Behavioral Research* (pp. 209-240). Thousand Oaks, CA: Sage.

Darling-Hammond, L. & Bransford, J. (Eds) (2005). *Preparing Teachers for a Changing World: what teachers should learn and be able to do* (San Francisco, Jossey-Bass).

DeLuca, C., Willis, J., Dorji, K., & Sherman, A. (2022). Cultivating reflective teachers: Challenging power and promoting pedagogy of self-assessment in Autralian, Bhutanese, and Canadian teacher education programs. *Power and Education*, 1-8

Dewey, J. (1933). *How we think*. New York: Heath & Co.

Dutta, S., He, M., Tsang, D. (2023). Reflection and peer assessment to promote self-directed learning in higher education. *Journal of Educational Research and Reviews,* 11(3):35:46.

Entwistle, N., & Walker, P. (2000). Strategic alertness and expanded awareness within sophisticated conceptions-of-teaching. *Instructional Science,* 28(5), 335-361.

Backman, E., Quennerstedt, M., Björn Tolgfors, B. & Nyberg, G. (2023): Peer assessment in physical education teacher education – a complex process making social and physical capital visible, Curriculum Studies in Health and Physical Education, doi:https://doi.org 10.1080/25742981.2023.2256327

Falter, M.M. and Barnes, M.E. (2020) The Importance of the "Comfort Zone" in Preservice Teachers' Evaluation of Video Analysis Sessions as a Tool for Enhanced Reflection, *Teacher Education Quarterly.47*(2), 64-85

Farahian, M., Rajabi, Y. (2022).An Investigation into the Level of Reflection and Barriers to EFL Teachers' Reflective Practice. *International journal of Research in English Education*, 7 (2)

Farrell, T. S. C. (2007). *Reflective language teaching: Practical applications for TESOL teachers*. London: Bloomsbury Academic.

Farrell, S.C. (2013). Reflecting on ESL teacher expertise: A case study. *System* 41(2013)1070-1082

Farrell, T. S. C. (2015). *Promoting teacher reflection in second language education. A framework for TESOL professionals.* London and New York: Routledge.

Farrell, T. S. C. (2018). *Research on reflective practice in TESOL.* New York, NY: Routledge.
Farrell, T. S. C. (2019). *Reflective practice in ELT.* London: Equinox.
Fidan, M., & Debbag, M. (2018). The usage of video blog (vlog) in the "school experience" course: The opinions of the pre-service teachers. *Journal of Education and Future,* 13, 161–177. https://dergipark.org.tr/tr/download/article-file/420174
Fulton, K., Glenn, A., & Valdez, G. (2003). *Three preservice programs preparing tomorrow's teachers to use technology: A study in partnerships.* Retrieved June 29, 2004 from http://www.ncrel.org/tech/preservice/.
Gorski, P. C., & Dalton, K. (2020). Striving for critical reflection in multicultural and social justice teacher education: Introducing a typology of reflection approaches. *Journal of Teacher Education*, 71(3), 357–368. doi: 10.1177/0022487119883545.
Gröschner, A., Schindler, A-K., Hozberger, D., Alles, M. & Seidel, T. (2018). How systematic video reflection in teacher professional development regarding classroom discourse contributes to teacher and student self-efficacy. *International Journal of Educational Research*, 90, 223-233. doi:10.1016/j.ijer.2018.02.003.
Gulbahar, Y. (2008). ICT usage in higher education: A case study on preservice teachers and instructors. *The Turkish Online Journal of Educational Technology*, 7(1), 32-37.
Harford, J., and MacRuairc.,G. (2008). "Engaging Student Teachers in Meaningful Reflective Practice."*Teaching and Teacher Education* 24: 1884–1892. doi:10.1016/j.tate.2008.02.010.
Hargreaves, A., & Fink, D. (2006). *Sustainable leadership.* San Francisco: John Wiley and Sons.
Hatton, N. & Smith, D. (1995). Reflection in teacher education: Towards a definition and implementation. *Teaching & Teacher Education,* 11, 33-49. doi:10.1016/0742-051X(94)00012-U
Iqbal, M. Z. (2017). Reflection-in-action: A stimulus reflective practice for professional development of student teachers. *Bulletin of Education and Research,* 39(2), 65-82.
Jarvis, J., C. Dickerson, K. Thomas, and S. Graham. (2014). "The Action-Reflection-Modeling (ARM) Pedagogical Approach for Teacher Education: A Malaysia-UK Project." *Australian Journal of Teacher Education* 39 (3): 89–118. doi:10.14221/Ajte.2014v39n3.2.
Kay, R. H. (2006). Evaluating strategies used to incorporate technology into pre-service education: a review of the literature. *Journal of Research on Computing in Education,* 38(4), 383–408.
Killeavy, M., & Moloney, A. (2010). Reflection in a social space: Can blogging support reflective practice for beginning teachers? *Teaching and Teacher Education*, 26, 1070–1076. doi:10.1016/j. tate.2009.11.002
Klein, S. R. (2008). Holistic reflection in teacher education: issues and strategies, *Reflective Practice,* 9:2, 111-121, DOI: 10.1080/14623940802005384
Körkkö, M. (2021). Towards Meaningful Reflection and a Holistic Approach: Creating a Reflection Framework in Teacher Education. *Scandinavian Journal of Educational Research,* 65(2), 258-275. doi:10.1080/00313831.2019.1676306.
LaBoskey, V.K. (2004). The methodology of self-study and its theoretical underpinnings. In J.J. Loughran, M.L. Hamilton, V.K. LaBoskey, & T. Russell (Eds.), *International handbook of self-study of teaching and teacher education practices* (pp. 817–870). Dordrecht, The Netherlands: Kluwer.
Loughran, J. (2002). Effective reflective practice: In search of meaning in learning about teaching. *Journal of Teacher Education,* 53, 33–43.
McKnight, D. (2002). *Field experience handbook: A guide for the teacher intern and mentor teacher.* College Park: University of Maryland.
Menekse, M., Anwar, S. and Akdemir, Z.(2020). "How Do Different Reflection Prompts Affect Engineering Students' Academic Performance and Engagement?" *The Journal of Experimental Education.* doi:https://doi.org/10.1080/00220973.2020.1786346.
Mitchell, C., & Sackney, L. (2009). *Sustainable improvement: Building learning communities that endure.* Rotterdam: Sense.
Näykki, P., Laitinen-Väänänen, S., & Burns, E. (2022). Student Teachers' Video-Assisted Collaborative Reflections of Socio-Emotional Experiences During Teaching Practicum. *Frontiers in Education,* 7, Article 846567. https://doi.org/10.3389/feduc.2022.846567

Newell, S. T. (1996). Practical inquiry: Collaboration and reflection in teacher education reform. *Teaching and Teacher Education*, 12(6).

Ong, W. A., Swanto, S., & Alsaqqaf, A. (2020). Engaging in reflective practice via vlogs: Experience of Malaysian ESL pre-service teachers. *Indonesian Journal of Applied Linguistics*, 9, 716-724. doi: 10.17509/ijal.v9i3.23222

Orakci, S. (2021). Teachers' reflection and level of reflective thinking on the different dimensions of their teaching practice. *International Journal of Modern Education Studies*, 5(1), 118-149. https://doi.org/10.51383/ijonmes.2021.88

Parkes, K.A., & Kajder, S. (2010). Eliciting and assessing reflective practice: A case study in web 2.0 technologies. *International Journal of Teaching and Learning in Higher Education*, 22(2), 218-228.

Richter, E., Hußner, I., Huang, Y., Richter, D., & Lazarides, R. (2022). Video-based reflection in teacher education: comparing virtual reality and real classroom videos. *Computers & Education*, 190, 104601.

Reagan, T. G., Case, C. W., & Brubacher, J. W. (2000). *Becoming a reflective educator: How to build a culture of inquiry in the schools* (2nd ed.). Thousand Oaks, CA: Corwin.

Rodrigues, A. L. (2020). Digital technologies integration in teacher education: the active teacher training model. *Journal of E-Learning and Knowledge Society,* 16(3), 24-33. https://doi.org/10.20368/1971-8829/1135273

Rogers, C. (2002). Defining reflection: Another look at John Dewey and reflective thinking. *Teachers College Record*, 104(4), 842–866.

Russell, T. (1988). From pre-service teacher education to first year of teaching: A study of theory and practice. In J. Calderhead (editor), *Teachers 'professional learning* (pp 13-34). London: Falmer Press.

Schon, D.A., (1983). *The reflective practitioner: How professionals think in action.* Basic Books Inc., New York.

Shandomo, H. M. (2010). The role of critical reflection in teacher education. *School-University Partnerships*, 4(1), 101-113 (EJ915885). ERIC

Shoffner, M. (2008). Informal reflection in pre-service teacher education, *Reflective Practice*, 9(2), 123–134.

Slade, M. L., Burnham, T. J., Catalana, S. M., & Waters, T. (2019). The impact of reflective practice on teacher candidates' learning, *International Journal for the Scholarship of Teaching and Learning*, 13(2), 15.

Sternberg, R.J., Horvath, J.A., (1995). A prototype view of expert teaching. Educ. Res. 24 (6), 9e17.

Sturkie, L. M. (2017). *The impact of a reflective practice series on the awareness level of six teacher candidates at a public university in the Southeast.* Doctoral dissertation, Francis Marion University.

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches.* Thousand Oaks, CA: Sage Publications.

Trevethan, H., and S. Sandretto. (2017). "Repositioning Mentoring as Educative: Examining Missed Opportunities for Professional Learning". *Teaching and Teacher Education* 68: 127–133. doi:10. 1016/j.tate.2017.08.012.

Tripp, T., & Rich, P. (2012). Using video to analyze one's own teaching. *British Journal of Educational Technology*, 43(4), 678–704. https://doi.org/10.1111/j.1467-8535.2011.01234.x

Van Beveren, L., Roets, G., Buysse, A., and Rutten, K. (2018). We all reflect, but why? A systematic review of the purposes of reflection in higher education in social and behavioral sciences. *Educ. Res. Rev*. 24, 1–9. doi: 10.1016/j.edurev.2018.01.002

Widodo, H. P., & Ferdiansyah, S. (2018). Engaging student teachers in video-mediated self-reflection in teaching practica. In K. J. Kennedy & J. C-K. Lee (Eds), *The Routledge Handbook of Schools and Schooling in Asia* (pp. 922–934). London: Routledge.

Williams, R., & Grudnoff, L. (2011). Making sense of reflection: A comparison of beginning and experienced teachers' perceptions of reflection for practice. *Reflective Practice: International and Multidisciplinary Perspectives*, 12, 281–291.

Williams, A. T., and Svensson, M. (2020). Student Teachers' Collaborative Learning of Science in Small-Group Discussions. *Scandinavian J. Educ. Res.* 65, 914–927. doi: 10.1080/00313831.2020.1788141

Yüksel, İ., & Başaran, B. (2020). Reflective peer feedback in the practicum: Qualitative and quantitative practices. *Turkish Online Journal of Qualitative Inquiry*, 11(1), 85-109. https://doi.org/10.17569/tojqi.627310

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

Listening Comprehension Skills in Children with Attention Deficit and Hyperactivity Disorder: A Review Study[1]

Nardane Ece Bülbül[2] **Selmin Çuhadar**[3]

To cite this article:
Ece Bülbül, N. & Çuhadar, S. (2024). Listening comprehension skills in children with attention deficit and hyperactivity disorder: A review study. *e-Kafkas Journal of Educational Research*, *11*, 243-263. doi: 10.30900/kafkasegt. 1434673

Review article **Received:24.04.2024** **Accepted:10.05.2024**

Abstract

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by symptoms of inattention, hyperactivity and impulsivity that may begin in early childhood and continue into adolescence and adulthood and are incompatible with the developmental level of the individual. Most children with ADHD are at risk of facing significant academic problems throughout their educational life. In recent studies aiming to reveal the causes of academic problems experienced by children with ADHD, academic problems have been associated with the difficulties in reading and listening comprehension skills of children with ADHD. The relatively common prevalence of ADHD, the extent of academic problems experienced by children with ADHD, and the lack of clarity about reading difficulties require further examination of the relationship between ADHD and reading and listening comprehension skills, which are often based on the same language and cognitive skills. Listening comprehension, which is defined as the ability to understand, interpret, organize, and evaluate the ideas and thoughts in a speech heard or a text read aloud, is one of the most important early literacy skills necessary for the ultimate goal of reading, which is reading comprehension. In this review study, listening comprehension skills of children with ADHD were discussed together with the literature.

Keywords: Attention deficit and hyperactivity disorder, early literacy, listening comprehension

[1] This study is based on the first author's Ph.D. dissertation entitled "The Effectiveness of the Dialogic Reading Method on the Listening Comprehension Skills of Children Attending Kindergarten with Attention Deficit and Hyperactivity Disorder", completed in 2023 under the supervision of the second author.

[2] Corresponding author, nardaneece06@gmail.com, Ministry of Education

[3] Author, selmincuhadar@trakya.edu.tr, Trakya University

INTRODUCTION

Attention deficit and hyperactivity disorder, which can begin in early childhood and continue in adolescence and adulthood, and is incompatible with the person's level of development, is a neurodevelopmental disorder characterized by symptoms of inattention, hyperactivity, and impulsivity. Individuals diagnosed with ADHD may experience problems in areas such as cognitive processes, emotional and behavioral regulation, and interpersonal relationships, and these problems negatively affect areas of functionality such as family and peer relationships and academic success (APA, 2013). Although ADHD was identified by researchers many years ago, its prevalence has recently been attempted to be revealed through studies conducted in different countries. Although the research results in the literature on the prevalence of ADHD vary, it is estimated that the worldwide prevalence rate of ADHD is between 3 and 10 percent in school-age children and 4 and 5 percent in adults (Bitsko et al., 2022; Buttross, 2009; Jacobs and Miles, 2011; Wender, 2001). Similar to many disorders that affect the development of the central nervous system, the prevalence and nature of ADHD differ between boys and girls.Particularly by school age, boys are three to four times more likely to be diagnosed with ADHD than girls (Bitsko et al., 2022; Jacobs and Miles, 2011; O'Brien, et al., 2010; Wender, 2001).

In addition to the physiological, psychological, and social effects of ADHD, which is characterized by inattention, hyperactivity and deficits in impulse control, another important effect on children is in the academic field. Most children with ADHD are at risk of facing significant academic problems throughout their education. Academic difficulties that children with ADHD may face are mostly about the presence of disruptive behavior during learning activities in the classroom (difficulties in completing tasks within the specified time, the need to move around, etc.) and patterns of behavior that predict the risk of exclusion from school (difficulties in relationships with adults and peers). In addition, a significant portion of children with ADHD have deficiencies in reading, spelling, mathematics, writing, and language (Barkley, 2015; Cain and Bignell, 2014; Frazier et al., 2007; Miller et al., 2013; Sims and Lonigan, 2013). Children with ADHD, especially due to attention deficit, experience learning difficulties, and perform worse than their peers on standard tests, and for these reasons, many of them repeat grades and face the risk of dropping out of school or being suspended (Frazier et al., 2007, Hayden et al., 2018; Niu et al., 2021).

It does not seem difficult to prove that children with ADHD show poor academic performance in school. However, it is not so easy to explain why these children perform so poorly at school (Lorch, O'Neil, Berthiaume et al., 2004). In the literature, there are many studies that aim to reveal the reasons for academic problems experienced by children with ADHD. (Adams and Snowling, 2001; Bauermeister et al., 2005; Cain and Bignell, 2014; Carroll et al., 2005; Denton et al., 2020; Hayden, 2018; Lamminmäki et al., 1995; Lorch et al., 2004; McGee et al., 2002; Sims and Lonigan, 2013; Willcutt, Pennington and DeFries, 2000; Willcutt and Pennington, 2000). Most of these studies focused primarily on children's learning difficulties caused by attention deficit and understanding the relationship between ADHD and reading ability (reading difficulty).

However, these studies investigating the relationship between ADHD and reading skills focused on clinically diagnosed, school-age and adolescent children. Few studies have addressed the early developmental link between inattentive and hyperactive/impulsive behavior and academic problems in the preschool years. For these reasons, in contrast to the evidence regarding the link between behavior and academic skills in older children, little is known about this link in the preschool period. The reason for this lack of interest may be the view of some researchers that there may be no relationship between ADHD and early literacy skills in preschool children because attention and restraint are not required to participate in learning activities in which preschool children acquire early literacy skills. However, this does not appear to be the case. Children in preschool programs are expected to acquire basic skills that closely reflect the behaviors needed to succeed and benefit in formal education settings. Children who cannot acquire these skills may not be ready to learn in structured learning activities (Sims and Lonigan, 2013).

Recent studies aiming to reveal the reasons for the academic problems experienced by children with ADHD (Aram, Bazelet, and Goldman, 2010; Hayden, 2018; Miller et al., 2013; Sims and Lonigan, 2013; Velting and Whitehurst 1997) are seen to focus on early literacy skills that emerge during the pre-school

period, which predict the ability of children to acquire the skills of reading and writing, their reading competency and their future academic success at school. Research conducted in this context (Aram et al., 2010; Lonigan et al., 1999; Velting and Whitehurst, 1997) provides evidence that there are strong connections between ADHD, which includes inattentive and hyperactive/impulsive behaviors, and early literacy skills. In these studies, the difficulties experienced by preschool children with ADHD in reading and listening comprehension skills were associated with their academic problems (Cain and Bignell, 2014; Flake et al., 2007; Flory et al., 2006; Lorch et al., 2004; McInnes et al., 2003; Miller et al., 2013; Renz et al., 2003; Schmiedeler and Schneider, 2014; Zentall, 1988). Furthermore, there are research results in the literature which exert that children with ADHD also experience difficulties in other early literacy skills such as vocabulary, letter/alphabet knowledge and phonological awareness, in addition to reading and listening comprehension skills.

The relative prevalence of ADHD, the extent of academic problems experienced by children with ADHD, and the lack of clarity regarding reading difficulties require further examination of the relationship between ADHD and reading and listening comprehension skills, which often rely on the same language and cognitive skills. At this point, listening comprehension skill, which is one of the early literacy skills that is very important for the academic success of children with ADHD, stands out.

Early Literacy

The literacy process from birth to the period when the child transitions to formal reading and writing is called "emergent literacy" or "early literacy" (Cabell et al., 2015; Hume et al., 2016; Makin and Whitehead, 2004; Nutbrown, 1997; Teale and Sulzby, 1992; Whitehurst and Lonigan, 1998). Early literacy; is expressed as all the prerequisite knowledge, skills, and attitudes regarding reading and writing that children are expected to acquire in the preschool period before starting formal reading and writing education (Sulzby and Teale, 1991; Teale, 1987; Whitehurst and Lonigan, 1998). Many researchers view these prerequisite skills as the beginning of a developmental process that begins early in life and continues as children enter the school environment (Whitehurst and Lonigan, 1998).

Research conducted in the field of early childhood education is of great importance in the development of the early literacy approach. Research has made significant contributions to understanding how literacy is learned and how it can be better taught. Fundamental research on early literacy development has taught us much about the stages in which children progress from early exploration to later skills on the path to becoming literate. However, it can be said that research on early literacy development has progressed irregularly. While the focus of early research was on the importance of using books in the development of children's early literacy skills, the focus of subsequent research was on the development of writing. Later studies focused on children's perceptions and abilities in learning to recognize and read some environmental texts. Oral language has also been a constant focus of attention, although at different times the emphasis has been on different aspects (such as conversation, storytelling, or phonological awareness) (Nutbrown, 1997).

Although there has been a large consensus in the early literacy literature in recent years about what the skills that will form the basis of children's successful literacy should include, there are different approaches to the classification of these skills (Cabell et al., 2015; Majorona et al., 2021; Neuman, 2014; Roskos et al., 2012; Whitehurst and Lonigan, 1998). Five prerequisite skills, which are widely accepted in the literature as early predictors of a successful literacy process, can be listed as follows. Th*is is Vocabulary*, which refers to vocabulary skills an individual can use speaking and writing in the expressive language and understanding what he listens to and reads in the receptive language (Read and Ghoting, 2015; Roskos et al., 2012), *Print Awareness*, which includes learning concepts such as awareness of the function of writing, learning the units that make up writing and the direction of writing (Whitehurst and Lonigan, 1998), and *Letter/Alphabet Knowledge*, which includes children's ability to quickly and accurately understand the shapes, names, and sounds of letters in the alphabet (Cabell et al., 2015; van Tilborg, 2018; Roskos et al., 2012; Whitehurst and Lonigan, 2001), *Phonological Awareness*, which is defined as the ability to separate words into syllables and syllables into sounds, and forming words by combining sounds by being aware of the phonemes of the spoken language regardless of meaning (Anthony and Francis, 2005; Whitehurst and Lonigan, 1998), and *Listening Comprehension*

skills (Hogan et al., 2014), which are expressed as the ability to understand, interpret, organize and evaluate the ideas and thoughts in a heard speech or a text read aloud.

Listening Comprehension Skills

Listening comprehension has an important place among early literacy skills before formal reading activity, especially since it is one of the prerequisite skills for reading comprehension, which will form the basis of future academic success (Asadi et al., 2022; Kargın, et al., 2015; Oakhill and Cain, 2007; Tompkins et al., 2013). An important part of the oral language skills that children have is listening comprehension. Listening comprehension, which includes both the understanding of individual words, phrases, and sentences, as well as broader elements of discourse (Jackson et al ., 2022), is also considered a higher level of oral language skill that enhances early literacy (DeVore, 2020). The listening comprehension skill, which begins at birth (perhaps in the womb) and develops long before formal reading instruction begins (Hogan et al., 2014), is an independent skill necessary for daily functioning at home and in the classroom, for example, to understand orally presented stories and complex instructions. In addition to contributing to academic success in the long term, considering its effects on reading comprehension (Alanzo et al., 2016), it is also critical for positive life experiences such as employability, income, and participation in society (DeVore, 2020; Hagen et al., 2022).

Listening comprehension involves the ability to analyze, integrate, and understand verbal input. Good listeners go beyond understanding a single word and sentence to build a mental model that integrates the multiple premises of a story and prior knowledge into a coherent whole. Listening comprehension utilizes the same linguistic processes used to understand language through text, but without the cognitive demands of having to decode text (figure out the meaning of words) (Hogan et al., 2014). In this sense, listening comprehension is more broadly seen as a necessary skill not only in the service of reading comprehension but also for other purposes in many different settings (e.g., understanding a story told at the dinner table or building a mental model while watching a cartoon on television), can be conceptualized (Kendou, et al., 2005). According to such an approach, listening comprehension is a complex process that results in a coherent mental representation of the meaning of a text. This meaning-making process requires the listener to apply linguistic and world knowledge to understand both the information explicitly presented in the text and the implicit knowledge that can be extracted from the text. Effective and good listeners can understand “what is said” and “what is meant” by using literal and inferential comprehension skills in this way (Florit et al., 2011).

Students who understand spoken language well in the first years of school life, where learning and teaching activities are mostly carried out through verbal communication, are likely to develop strong reading comprehension skills in later grades (Hwang and Cabell, 2021; Kim, 2016; Storch and Whitehurst, 2002). The assumption that listening comprehension is the essence of reading comprehension and that it contributes to children's later reading comprehension skills has been proven by many longitudinal research results.

In the literature, the results of many studies (Florit et al., 2014; Hjetland et al., 2017; Hogan et al., 2014; Kargın et al., 2017; Kim, 2016; Kendeou et al., 2005; Kendeou et al., 2008; Kendeou et al., 2018; Storch and Whitehurst, 2002) have revealed that there is a strong relationship between the listening comprehension skills that children acquire in the early period and their reading comprehension performance in primary and secondary school. Therefore, when designing approaches for early reading teaching, foundational language skills should be considered together. These results also support the assumptions of the Simple view of the reading approach put forward by Gough and Tunmer (1986; cited by Hogan et al., 2014). According to the simple reading view approach, reading comprehension is the product of listening comprehension and decoding. While decoding means encoding written material and being able to read written material fluently, listening comprehension means deciphering the meaning behind written or spoken language. Decoding and comprehension are interconnected because without decoding it is not possible to understand written text, and without comprehension, decoding is more or less useless. However, these two processes have different developmental paths and predictors (Ebert, 2020). According to this approach, although it is accepted that there are some differences, especially in the coding of visual and auditory stimuli, reading comprehension and listening comprehension are based

on the same comprehension processes. According to this view, once a child masters decoding skills, he or she will show similar success in understanding reading and listening texts (Florit et al., 2011; Kim, 2016). Contrary to this traditional view, which bases the success of listening comprehension skills development on foundational language skills, recent evidence has revealed that listening comprehension is not a simple skill, but benefits from multiple language and cognitive skills in addition to foundational language skills (Florit et al., 2011, Florit et al., 2014; Kendeou et al., 2008; Kim, 2015; Kim and Phillips, 2014; Tompkins et al., 2013).

Considering the importance of early listening comprehension skills in children's literacy journey, it is important to consider in detail the linguistic and cognitive skills related to the development of listening comprehension skills.

Components of Listening Comprehension

Despite their importance in a successful literacy process, comprehensive research on the component skills of listening comprehension has not received much attention until recently (Hagen et al., 2022; Hwang and Cabell, 2021). In the first studies on listening comprehension, it was assumed that the components examined in the context of reading comprehension also played a role in listening comprehension. These studies have focused on a few language and cognitive skills that provide limited evidence. However, recently, there have been studies in the literature aimed at understanding the multicomponent structure of listening comprehension skills in early childhood (Alanzo et al., 2016; Ebert, 2020; Florit et al., 2009, 2011, 2014; Fong and Ho, 2017; Kim, 2015, Kim, 2016; Strasser and del Rio, 2014; Tompkins et al., 2013). The results obtained in these studies have revealed that listening comprehension should be considered a complex and difficult process that requires more than vocabulary and understanding various word combinations and involves several cognitive and linguistic skills. According to such an approach, although basic linguistic skills (e.g. vocabulary) are necessary for listening comprehension, they are not sufficient for successful listening comprehension. Successful listening comprehension requires going beyond the meaning of individual words and sentences and creating a coherent mental representation of the meaning of the text. This is a complex multi-component process that requires both general cognitive and more specific language skills. This process is expressed in various stages and includes multiple components and resources, each of which has the potential to lead to individual differences in listening comprehension skills (Alanzo et al., 2016; Kim and Phillips, 2014; Oakhill and Cain, 2007).

Based on the research results, to demonstrate successful performance in listening comprehension skills, which are closely related to verbal language comprehension skills, children must have skills collected in three interrelated stages namely *foundational cognitive skills, foundational language skills, and higher-order cognitive skills*.

Foundational Cognitive Skills

Within the scope of foundational cognitive skills, children; attention, working memory and inhibitory control (Daneman and Merikle, 1996; Florit et al., 2009; Florit et al., 2014; Kim, 2016; Oakhill and Cain, 2007). These skills are also considered among the executive function skills of the cognitive system. Executive function skills emerge from the first year of life and develop gradually over a long period. They show significant development in childhood, especially in the preschool years, but do not reach full maturity until early adulthood (Gandolfi and Viterbori, 2020). For this reason, early childhood education has a critical effect on triggering high-level cognitive skills, especially working memory and attention. The observable difference in children's cognitive, social and emotional, motor development and academic skills in later years is related to the support of working memory and attention in early childhood. Attention, working memory and inhibitory control are related to each other, and the discussions on how they affect each other are discussed in the theoretical dimension and examined in the light of relevant research (Gözüm, 2020).

Working Memory

Working memory; it can be defined as the ability to store and process information in memory for a sufficient period to complete a task. Working memory is a mental workspace where incoming information is stored and manipulated simultaneously. Working memory is, in a sense, the key to how

efficient the listener is at retaining and processing information (Florit et al., 2014; Fong and Ho, 2017; Kim, 2016). Working memory, which involves the simultaneous storage and active manipulation of information, is considered a foundational cognitive skill that supports foundational language skills as well as higher-order cognitive skills such as monitoring comprehension and making inferences (Kim, 2015). Children are unlikely to perform well on any linguistic tasks or higher-order cognitive tasks if they do not have sufficient memory capacity to retain words and sentences as well as process their meaning (Florit et al., 2009). Working memory is crucial for text-based representation, which allows linguistic input to be held temporarily while processing and integrating new linguistic information, especially to form basic propositions and some initial inferences. In other words, while listeners access previously processed linguistic and semantic information, they must also be able to process incoming semantic input to establish connections between meanings, integrate them, and make inferences (Kim, 2016).

Working memory is a potential predictor of listening comprehension due to such demands placed on memory resources during listening comprehension tasks (Alanzo et al., 2016; Florit et al., 2009; Kim, 2015, 2016). Research findings also support the view that working memory is a critical component for listening comprehension and contributes to listening comprehension directly and indirectly through foundational language skills and higher-order cognitive skills (Florit et al., 2009, 2014; Kim, 2015, 2016; Jiang and Farquharson, 2018). For example, in the study conducted by Kim (2016), it was found that working memory and attention were moderately related to vocabulary and grammatical knowledge. It has also been shown that working memory, although weak, is directly related to higher-order cognitive skills, comprehension monitoring, inference, theory of mind, and listening comprehension. In another study conducted by Kim (2015), it was determined that the role of working memory in listening comprehension was partially mediated by higher-order cognitive skills such as theory of mind and comprehension monitoring.

Attention

Attention is another basic cognitive skill that is considered important for listening comprehension. Because listening comprehension requires focused attention to process significant grammatical information (Kim and Phillips, 2014). Defined as "the focusing of sensory, motor and/or mental resources on information-requiring aspects of the environment" (Sheridan, 2007; cited in Beattie et al., 2018), attention begins to develop in infancy and becomes more complex throughout childhood. While even very young babies can be selective in their attention, other aspects develop later in childhood, including the ability to shift attention to other directions. Attentional control refers to a person's ability to focus attention on relevant stimuli to solve a task, including the ability to shift attention from one stimulus to another when necessary (Blair and Diamond, 2008). Although there are very few studies in the literature that aim to reveal the relationship between attention and listening comprehension skills, some studies have revealed the relationship between attention and listening comprehension skills (Kim, 2016; Jiang and Farquharson, 2018; Strasser and del Rio, 2014). For example, in the study conducted by Strasser and del Rio (2014), the relationship between attention and story comprehension was examined for 6-year-old children. As a result of the research, it was determined that attention has a direct relationship with understanding the story. As a result of the research conducted by Kim (2016), it appears that the effect of attention on six-year-old children's listening comprehension, although the smallest among all language and cognitive skills included, may be indirect through foundational language skills and working memory. The study conducted by Jiang and Farquharson (2018) revealed that cognitive resources, including working memory and attention, are effective in predicting both reading and listening comprehension in the early grades (from kindergarten to third grade of primary school), and that their effect on listening comprehension is greater than on reading comprehension.

Inhibitory Control

Inhibitory control is a cognitive process that is included in many definitions of executive function and develops early in life. Inhibitory control is defined as the ability to prevent a dominant action that occurs outside the purpose or to suppress a sudden (automatic) behavior to show the appropriate behavior necessary to achieve a goal (Bettie et al., 2018). Similarly, inhibitory control was defined by Scrimin et al. (2017) as the ability to inhibit a dominant response and initiate a sub-dominant response, and

Diamond and Lee (2011) defined it as a person's ability to inhibit a dominant response in favor of a more appropriate response. Inhibitory control, one of several processes involved in the executive functioning of the cognitive system, plays an important role in determining how various mental processes work together in the successful execution of a task. Data on the role of this competence in children's listening comprehension in the preschool period are still quite limited but very promising (Wolf et al., 2019). Only a few studies (Kim and Phillips; 2014; Strasser and del Rio, 2014) have examined the effects of inhibitory control on listening comprehension. For example, Kim and Phillips (2014) found in their research that inhibitory control was a direct predictor of listening comprehension in children attending kindergarten and first grade students from impoverished schools.

Foundational language skills

The second stage skills that contribute to listening comprehension *are foundational language skills.* Within the scope of foundational language skills, children; they are expected to reach a certain level of competence in vocabulary knowledge, syntactic knowledge and skills and morphological awareness skills (Florit et al., 2009; Florit et al., 2014; Hogan et al., 2014; Kendeou et al., 2005; Nadig, 2013). Most of these skills are foundational language skills that develop relatively easily and quickly in early childhood and form the foundational for higher-order language skills (Alanzo et al., 2016; Florit et al., 2014; Kendeou et al., 2005; Kim, 2015, 2016).

Vocabulary knowledge

Foundational listening comprehension begins with the development of vocabulary. Regarding listening comprehension, it is known that it is one of the most important predictors of vocabulary knowledge (Cain and Oakhill, 2014; Florit et al., 2011; Wolf et al., 2019). The more children know the meaning of the words they hear, the more accurately they can make inferences from verbal messages, resulting in better listening comprehension (DeVore, 2020; Hogan et al., 2014; Hwang and Cabell, 2021). Vocabulary knowledge/repertoire can be examined in two ways: "...vocabulary breadth (how many words are known) and vocabulary depth (how well the words are known)". Vocabulary breadth is more closely related to encoding-related skills, decoding, and phonemic awareness. However, vocabulary depth is predictive of future reading comprehension and is therefore related to meaning-related skills (DeVore, 2020). Therefore, a basic language measure such as basic vocabulary knowledge can be considered one of the best predictors of listening comprehension (Alanzo et al., 2016). Considering the important role that vocabulary plays in the development of listening comprehension, it can be said that there is a need for more comprehensive evaluations of the development of vocabulary in early childhood classes and its impact on listening comprehension (Hwang and Cabell, 2021).

Syntactic Knowledge and Skills

In addition to vocabulary knowledge, another determinant in listening comprehension is syntactic knowledge and skills. Syntactic knowledge and skills refer to the ability to understand the internal grammatical structure within a sentence, which includes understanding grammatical rules and how sentences are constructed (Tong and McBride, 2017). Syntactic knowledge and skills, which can also be expressed as implicit knowledge of the rules that determine the structural relationships in sentences, directly affect children's success in listening comprehension. Because meaning can be deciphered by arranging words and phrases. Syntactic knowledge and skills support the development of children's ability to use sentence context and word definition skills by helping them decipher the meanings of words. Syntactic skills also make it easier for children to understand and recognize difficult words they have not learned. Deficiencies in syntactic knowledge will impair the development of word definition skills by limiting their ability to use sentence context (Kim, 2015; Tong and McBride, 2017; Tunmer, 2008). Syntactic knowledge and skills also clearly form the basis for higher levels of understanding. In addition, syntactic knowledge and skills make it easier to monitor comprehension by helping children detect and correct word recognition errors and deduce the meanings of unknown words (Hjetland et al., 2017; Kim, 2015).

Morphological Awareness

Morphological knowledge and morphological awareness are concepts used to characterize knowledge and awareness about the morphological structure of words. Morphological awareness means children's

conscious awareness of the structure of morphemes, the smallest meaning-based elements of words, and their ability to think about and manipulate this structure. Morphemes are the basic building blocks of words in both spoken and written language. Words containing more than one morpheme can be broken down into smaller units, providing clues for meaning, spelling, and pronunciation (Carlisle, 1995; Lyster et al., 2016). Being able to easily manipulate morphological structures can help new readers both break down large and confusing words for better understanding and create new words by adding other morphemes (e.g., suffixes) to a root word (Fracasso et al ., 2016). Children who develop morphological awareness realize that language contains simple and complex words, that these words are composed of subunits, and how these lexical units combine to form new words with meaning. These new uses of morphemes indicate their independent representation in the mental lexicon, which, with experience, is gradually expanded by their use in speech and reading. This morpheme manipulation occurs naturally, without any conscious effort, and develops with exposure to spoken and written language (Vaknin-Nusbaum et al., 2016).

Result of many studies in the literature reveal that (Florit et al., 2009; Florit et al., 2011, Florit 2014; Fong and Ho, 2017; Lepola et al., 2012; Tompkins et al., 2013), foundational language skills such as vocabulary knowledge, morphological awareness and syntactic knowledge are directly related to listening comprehension, furthermore these skills contribute to listening comprehension by supporting higher-order cognitive skills. According to the research results; receptive and expressive vocabulary knowledge consistently predicts individual differences in listening comprehension (Florit et al ., 2009; 2014; Kim, 2015; Lepola et al ., 2012). For example, Florit et al. (2009), in their study, tried to verify the hypothesis that memory makes a special contribution to listening comprehension in preschool children, after controlling the foundational language skills of 44 children aged 4-5. The results concluded that there was a strong relationship between verbal abilities and listening comprehension in 4- and 5-year-old children. In a follow-up study, Florit et al. (2014) found that pre-kindergarten vocabulary and higher-order language measures explained approximately 50% of the variance in listening comprehension later in kindergarten.

Despite these results revealing the relationship between language skills and listening comprehension, some research results in the literature have revealed that the role of foundational language skills, including vocabulary, syntactic knowledge, and skills, in listening comprehension, is unclear and that these skills may be more effective on listening comprehension when evaluated together with basic and high-level skills (Alanzo et al., 2016). For example, in his studies with preschool children, Kim (2015, 2016) found that vocabulary knowledge indirectly predicts listening comprehension through higher-order skills such as comprehension monitoring and theory of mind. Despite the different findings, it makes sense to consider foundational language skills in discussing possible predictors of listening comprehension (Alanzo et al., 2016). However, to support early literacy skills, focusing only on developing foundational language skills in the preschool period is likely to be insufficient to develop early literacy skills. Although listening comprehension begins with building a vocabulary, "good comprehends must go beyond understanding a single word and sentence to build a mental model that integrates multiple propositions of a story (e.g., story elements) and prior knowledge into a coherent whole" (DeVore, 2020; Hogan et al., 2014).

Higher-order Cognitive Skills

The third and final stage skills that contribute to listening comprehension are defined as *higher-order cognitive skills*. Higher-order cognitive skills are skills that integrate words, phrases, and sentences to create a mental model of a text and its meaning, including making inferences, monitoring comprehension, and identifying text structures. These higher-order cognitive skills contribute to the capture of processes "beyond the literal meaning of phrases and sentences" and build on previously possessed basic language and cognitive skills to create mental models of the meaning of a text (Alanzo et al., 2016; Kim, 2015). Within the scope of high-level cognitive skills, children are expected to reach competence in skills such as comprehension monitoring, inference-making, theory of mind, and background knowledge (Fong and Ho, 2017; Hogan et al., 2014; Kim, 2016; Strasser and del Rio, 2014).

Comprehension monitoring

Comprehension monitoring can be expressed as the ability to reflect and evaluate a person's ability to understand the narrated or written text (Kim and Phillips, 2014; Kim, 2015; Oakhill et al., 2005). Comprehension monitoring, which involves deliberately reflecting on one's understanding; is considered a metacognitive skill consisting of individual, strategy, and task variables. Comprehension monitoring, is viewed as a two-component process called evaluation and regulation (Baker, 1985; cited in Kinnunen et al., 1998), which is controlled using various standards or criteria and may not develop at the same pace. Evaluation involves assessing a reader/listener's current state of comprehension. Editing, on the other hand, occurs when the reader/listener evaluates comprehension and finds it inadequate, chooses and implements a strategy such as re-reading the text or making inferences to correct the failure to understand (Yeomans-Maldonado, 2017). Individuals who monitor their comprehension will detect when they do not know the meaning of a keyword, when information in the text does not match their background knowledge, and when two pieces of information are difficult to integrate (Oakhill et al., 2005).

Comprehension monitoring, as the process by which an individual evaluates his or her understanding of information, is primarily seen as a fundamental skill for proficient reading (Wagoner, 1983; cited by Yeomans-Maldonado, 2017). For this reason, the first studies on comprehension monitoring (Baker, 1984; Cain et al., 2001; Cain et al., 2004; Kinnunen et al., 1998; Ruffman, 1996, 1999; Oakhill et al., 2005) examined written texts (comprehension monitoring in reading) and its relationship with reading comprehension. However, recently, there has been an increase in research aiming to reveal how monitoring comprehension in a verbal context is related to listening comprehension. Since in comprehension monitoring tasks the child is asked to identify any inconsistencies or contradictions in the text, this is likely to contribute to listening comprehension. Because children will only notice and identify problems if they evaluate and monitor their understanding (Kim, 2015; Strasser and del Rio, 2014). In the literature, there are research results that show that monitoring comprehension, measured by the ability to identify any inconsistency or contradiction in the spoken text, is directly and indirectly associated with listening comprehension (Kim, 2015, 2016; Kim and Phillips, 2014) and story comprehension (Strasser and del Rio, 2014) skills in preschool children. Research results show that they are related. For example, the study conducted by Strasser and del Rio, (2014) with preschool children revealed that comprehension monitoring partially mediated the relationship between working memory and storybook comprehension. Similarly, Kim (2016) obtained evidence that there is an indirect relationship between comprehension monitoring and listening for six-year-old children. However, in another study conducted by Kim (2015) with preschool students, it was determined that monitoring comprehension directly predicted listening comprehension.

Inference-making

Another higher cognitive skill related to listening comprehension skill is inference-making (Florit et al., 2011; Kendeou et al., 2008; Kim, 2016; Lepola et al., 2012; Strasser and del Rio, 2014; Tompkins et al., 2013). It is expressed in similar forms such as the process of filling in the gaps left open in a story (Hogan et al., 2014), the ability to derive a meaning that is not explicitly stated in the text (Lepola et al., 2012), or the ability of one to fill in the gaps in the text and extract meaning (conclusions) to create a comprehensive mental model of a text and the ability to transcend the literal meaning of words to create a comprehensive mental model (Cain and Oakhill, 2014; Alanzo et al., 2016).

Inference-making is an important component of listening comprehension. Inferences allow the listener to understand information that may not have been directly expressed by using background knowledge and contextual clues to make inferences from the information provided (Hogan et al., 2014). Inferences also include the listener filling in information that is not directly presented in the story, making connections between events in the story, and interpreting events in the story according to one's knowledge of the world (Kendeou et al., 2008; Tompkins et al., 2013). Inferring from tacit knowledge is essential to creating a coherent representation of a story. For example, consider the sentences " Pedro forgot his umbrella" and " Pedro was wet." To connect the two sentences, it is necessary to conclude that it is raining. This inference connects both sentences and gives meaning to the text, making it a coherent whole. Without such inferences, stories become a list of unrelated events (Strasser and del Rio, 2014). In another example, it might be expressed as follows: For example, a child may hear his teacher tell another teacher that there is a banana peel on the floor of his classroom, that one of his students

broke his glass, and that his foot is covered in blood. Although it is not stated explicitly, the young listener can understand that his classmate slipped on a slippery banana peel, broke a glass as he fell, and cut his foot on the broken glass. The child built this mental model by filling in the gaps in the story parts (Hogan et al ., 2014).

Most of the research that aims to reveal the relationship between listening comprehension and inference-making has been conducted with school-age children and adults (Lynch et al., 2008). There is little research examining the inferences that preschoolers make when exposed to a story. Little research has been conducted, probably due to the difficulty of examining inference-making ability in young children who have not yet learned to read and write (DeVore, 2020). However, the number of recent studies aiming to reveal the relationship between preschool children's inference skills and listening comprehension skills (Kendeou et al., 2008; Kim, 2015, 2016; Lepola et al., 2012; Strasser and del Rio, 2014; Tompkins et al., 2013) is seen to be increasing. Research results have revealed that inference-making skills contribute significantly to listening comprehension both directly (Kim, 2016; Kendeou et al ., 2008; Lepola et al., 2012) and indirectly (Florit et al., 2014). For example, Kendeou et al. (2008), in a two-year longitudinal study, aimed to reveal that 4- and 6-year-old children drew inferences from the narratives they remembered about the stories they both listened to verbally and watched on television, including goals, actions, and causal premises, causal consequences, character states and character emotions. aims to reveal. In the study, children's understanding of the story was evaluated by evaluating the combination of three skills. These; are the number of events children remembered from the story, sensitivity to the causal structure of the story, and responses to comprehension questions about the story. As a result of the research, it was concluded that the stories listened to verbally and watched on television and children's inference formation (i.e., the combination of the three skills) were significantly related to their understanding of the narrative at both time points for both 4 and 6 year-old children. In another study using a similar method, Lynch et al. (2008) aimed to examine the relationship between listening comprehension skills and inference-making of 4 and 6 year-old children. Children's recall of verbal and televised stories was assessed by responses to comprehension questions. Research results revealed that children's sensitivity to the causal structure of narratives was significantly related to their overall story recall and the comprehension questions asked following their recall.

Theory of Mind

Theory of mind is another metacognitive skill that is related to listening comprehension. This metacognitive skill involves understanding one's own and others' cognitive states, especially their beliefs and desires (Kim, 2015, 2016; Strasser and del Rio, 2014). Theory of mind allows one to predict and explain the behavior of others based on an understanding of their mental states (Jackson et al., 2022). In this sense, theory of mind refers to the knowledge and understanding of cognitive states and processes and, more broadly, includes social understanding in general (Ebert, 2020). Theory of mind helps listeners understand speakers' intentions, desires, and perspectives, as well as create a mental representation of what the text is about by providing better awareness of social details in the text being listened to. This mental representation may include information about characters, intentionality (or goals), and causality, and thus the theory of mind is an important source of information (Jackson et al., 2022).

One of the main steps in children's theory of mind development is their understanding of false beliefs between the ages of 3 and 5. When children develop the understanding that beliefs can be false (i.e., they can change and differ from reality), they are assumed to have developed a meta-representational understanding of the mind. This understanding can support them to understand multiple perspectives and psychological causality earlier, faster, and more flexibly. As a result, developing a meta-representational understanding of theory of mind can support children's understanding of text through their ability to infer an author's intentions and characters' thoughts and feelings (Kim, 2017). Most research on the theory of mind has been conducted with children ages 3 to 6, looking at the age at which they understand what other people think and want, and whether they understand how those thoughts and desires might be right or wrong. This kind of understanding is important for understanding stories. In the narrative genre, most relationships of coherence are based on the mental states of the characters (Lynch and van den Broek, 2007). Since a critical aspect of understanding narrative texts is not just understanding a series of events but also understanding how the story unfolds as a function of the

characters' goals, beliefs, and emotional responses to the events, thinking about the mental state or thoughts of others, which is a metacognitive ability, is particularly important for listening comprehension in narrative texts (Kim, 2016).

Although the developmental trajectory of the relationship between theory of mind and listening comprehension skills has not yet been determined, there are several studies in the literature showing that theory of mind is an important predictor of listening comprehension skills for children of various ages (Jackson et al., 2022). Especially recent studies (Kim, 2015, 2016, 2017; Kim and Phillips, 2014; Jackson et al., 2022; Strasser and Rio, 2014) provide evidence that theory of mind can be considered a skill related to listening comprehension for children in kindergarten and first grade. For example, in the longitudinal study conducted by Jackson et al. (2022) with 147 children between the ages of 4 and 5, it was aimed to reveal whether theory of mind ability in the preschool period has an effect on later listening skills. In the study, theory of mind, working memory, vocabulary, and grammatical knowledge were tested with both concurrent and longitudinal data. As a result of the research, concurrent findings showed that the theory of mind has a direct effect on listening comprehension. However, longitudinal findings showed that theory of mind in preschool had no direct effect on listening comprehension 22 months later.

Background Information

Another important, but less studied, component of listening comprehension is background knowledge. Creating a rich mental model while listening or reading a text requires integrating new information with our previous knowledge. This adaptation process is defined as a process between a text and our personal and world knowledge, and other texts we hear or read (Hogan et al., 2014; Hwang and Cabell, 2021). It makes sense that to understand a story or text, readers need a threshold of knowledge about the subject. Without such information, it becomes difficult to form a meaningful mental model of what the text is about (Neuman et al., 2014). Without having basic knowledge and context for a particular situation or text, it is difficult to create a mental map to fill in the gaps through inference. Additionally, children demonstrate poor comprehension when they lack background knowledge, even if they know all the words in the text. Children, especially those from disadvantaged backgrounds, lack the basic background knowledge needed to understand academic texts, even if they "know" all the words in academic texts Hogan et al., 2014). Background knowledge associated with the text by the reader or listener interacts with text information to facilitate and enhance comprehension. Input from the text is interpreted in the context of the reader's knowledge, which places constraints on the reader's developing mental representation of the text. In this way, relevant background information facilitates processing of the text and aids subsequent recall. Strong background knowledge can make it easier to make inferences about missing information in a text, a crucial comprehension process (Hogan et al., 2014; Hwang and Cabell, 2021).

Listening Comprehension Skills in Children with Attention Deficit and Hyperactivity Disorder

Although early literacy skills are critical for children's reading and other academic performances, there is limited information regarding the early literacy skills of children with ADHD the literature. The preschool years are a critical time for children with ADHD to develop the language skills and reading interests they need to be successful in school. Identifying the reasons for the problems that children with ADHD experience in early literacy skills during this period can help provide effective support to help children with ADHD achieve age-appropriate success.

Attention deficit hyperactivity disorder is often accompanied by oral language problems, complicating any relationship between attention, hyperactivity, and reading/listening comprehension (Cain and Bignell, 2014). Listening comprehension deficiencies related to both basic and higher-order language skills, especially those that occur with ADHD, prevent children from being successful in academic activities (McInnes et al., 2003). Many studies in the literature have revealed evidence regarding the problems experienced by children with ADHD regarding listening comprehension. In this context, recent studies aimed to examine the high-level linguistic skills of children with ADHD regarding listening comprehension, such as making inferences, integration, and determining cause-effect relationships (Cain and Bignell, 2014; Denton et al., 2020; Flory et al., 2006). Research results show that children with ADHD have difficulty remembering ideas that are central to the meaning of a text

(Miller et al., 2013) and show less sensitivity to cause-effect relationships compared to typically developing children (Lorch, Diener, Sanchez, et al., 1999; Lorch, et al., 2004) revealed that they have difficulties in making inferences and monitoring comprehension from verbally presented narratives and that they also have problems producing verbal retellings by organizing narratives read to them or illustrated in wordless picture books (Denton et al., 2020; Flory et al., 2006; Hayden, 2018; Tannock et al.,1993). However, research results show that in children with ADHD; It has been revealed that they also experience problems with other cognitive skills related to listening comprehension, such as problem-solving, information acquisition, and strategy use, and that the problems continue and even increase over time.

Children with ADHD have difficulty remembering what they listen to; In the first studies examining the listening comprehension skills of children with ADHD (O'Neill and Douglas, 1991; Zentall, 1988), the listening comprehension skills of children were compared with typically developing children. In these studies, the listening comprehension skills of children with ADHD were generally evaluated in terms of understanding and remembering explicit story information. As a result of the research, no significant difference was found between the listening comprehension skills of children with ADHD and typically developing children, but it was determined that children with ADHD remembered fewer details from the stories they listened to. For example, in the first study conducted on this subject by O'Neill and Douglas (1991), researchers used a memory task that involved retelling stories by children. The primary focus of the research concerns the study strategies of children with ADHD. Research results revealed that the number of main ideas produced by children with ADHD was not different from that of typically developing children in the control group, but that typically developing children in the control group used more effective study strategies to help them remember. In the study conducted by Zentall (1988), again using a story-telling task, it was found that children with ADHD produced relevant main ideas and event explanations as much as normally developing children in the control group. However, children with ADHD remembered less story content and produced shorter protocols when asked to create their own stories.

Since these first two studies used standard measurements to evaluate the listening comprehension skills of children with ADHD and typically developing children, they could not reveal other recall dimensions that could be more indicative of listening comprehension skills. Another dimension that could not be evaluated in these studies was the effect of differences in importance between story events on recall. Thus, although these early studies show that children with ADHD can recall the same number of story events as typically developing children in the control group, they do not provide information about whether children differ from control children in how they are influenced by factors such as the types and importance of story events they remember (Flake et al., 2007; Lorch et al., 1999; Lorch et al., 2004). However, in later studies, to evaluate the listening comprehension skills of children with ADHD and typically developing children, they moved away from standard measurements and evaluated in the context of "the thematic importance of story events". Studies conducted in this context (Purvis and Tannock, 1997; Tannock, Purvis, and Schachar, 1993) revealed that, as expected, listening comprehension skills in children with ADHD are weaker than their typically developing peers.

For example, the study conducted by Tannock, Purvis, and Schachar (1993) was one of the first studies to use multiple assessments. In the study, boys with ADHD (30 children) and non-ADHD (30 children) aged between 7 and 11 listened to two-voice folk tales and then retold the stories in their own words. Each story was divided into individual events, and the thematic significance of each event was determined by adult raters. The main measure of understanding was the proportion of events remembered at each of the four levels of thematic importance. The study revealed that although children with ADHD had difficulty verbally retelling a complex story, they understood the main ideas and facts in the story as well as the children in the control group. However, as a result of the research, it was found that boys with ADHD remembered significantly fewer events in the story than boys in the control group, but the level of thematic importance had a similar positive effect on recall for both groups. In a similar study, Purvis and Tannock (1997) found that only boys in the control group tended to remember more than boys with ADHD, and once again, the group did not interact with importance. The results of these studies show that children with ADHD are as sensitive to the thematic importance of story information as typically developing children in the control group, but are slightly less able to recall stories.

Children with ADHD experience decentralization; There are several possible reasons why children with ADHD have poorer listening comprehension skills than typically developing children. The first is that children with ADHD show a lack of centrality when listening due to the fleeting nature of their auditory information. A child who has difficulty sustaining attention may show certain problems in the auditory area. Considering how ADHD can impact comprehension processes, it can similarly strain the pool of cognitive resources available to make connections between text ideas. Even when not accompanied by word decoding problems in children with ADHD, reduced attentional resources may impair making text connections, so that text representations may not reveal as much central information as in children without ADHD. This leads to a centrality deficit (Miller et al., 2013). In other words, children with ADHD have difficulty distinguishing between unimportant events and events that are important for the overall meaning of the story. When trying to understand and remember a story, it is helpful to focus one's attention on encoding the more important story events, because not everything can be remembered and these events form the main points or gist of the story. Additionally, these events may be easier and less time-consuming to code than unimportant events because they have a greater number of connections or ties to other important story events. Thus, the connections between these events that enable the creation of a coherent story representation in memory are already provided by the story, and therefore no additional cognitive resources need to be allocated to this task. Therefore, children with ADHD have difficulty identifying important story events and are less able to direct their attention to encoding and then retrieving this information (Flake et al., 2007).

Children with ADHD have problems with working memory; a second reason for the problems experienced by children with ADHD regarding listening comprehension skills is that they have difficulty decoding information in stories due to their limited working memory capacity (Flake et al., 2007 McInnes et al., 2003; Shaw, 2011). Working memory is an aspect of executive function and is also central to current theories about language comprehension and discourse processing. Working memory, often described as the "mental workspace," refers to the ability to actively retain task-relevant information during information processing or problem-solving and is an important cognitive resource associated with individual differences in comprehension (McInnes et al., 2003). When processing and comprehending information, working memory allows the thinker to simultaneously remove irrelevant information, modify relevant information, and create connections and inferences based on stored information. Since this situation is impaired in children with ADHD, it has been observed that understanding explanatory information creates problems that may affect academic success (Shaw, 2011). It is known that children with ADHD experience deficits in many components of working memory. These deficits are linked to difficulties encoding information from stories because they limit the amount of available cognitive resources that can be allocated to this task. Additionally, deficits in working memory limit the ability to encode a coherent story representation in memory, making it less able to sustain the activation of primes when processing new information. Thus, difficulties may arise because children with ADHD have fewer cognitive resources to devote to encoding information and relating this information to previously encoded information (Flake et al., 2007).

The literature shows that children with ADHD face difficulties distinguishing unimportant events from important events (Miller et al., 2013; Lorch et al., 2006), using story structure or clues to get the necessary information (Flory et al., 2006), understanding and recalling causal relationships between events in the story (Flake et al., 2007; Lorch et al., 1999; Lorch et al., 2004; McInnes et al., 2003), making logical inferences based on stories and that they face more difficulty compared to typically developing children in these subjects (Dong, 2022; Lorch et al., 2006; Niu et al., 2021). All of these areas of difficulty experienced by children with ADHD are interrelated and require higher-order cognitive processing to achieve and maintain a coherent understanding of a story they are listening to (Hayden, 2018).

One of the main problems experienced by children with ADHD due to poor working memory is the difficulties they experience in listening comprehension skills, which require them to make inferences and establish causal connections. Because declarative information relies heavily on working memory and is less predictable, therefore, the child may use limited prior knowledge to aid comprehension (Cain and Bignell, 2014; Shaw, 2011). Explanatory listening comprehension consists of academic tasks that children must complete, such as listening to a lecture in class or learning from a textbook. These tasks

require the ability to grasp facts, make inferences, and determine what information is important and irrelevant. Making inferences and making causal connections is vital to understanding the information presented in the classroom. These skills are frequently impaired in children with ADHD and are related to working memory. For children with ADHD, events in a story that are highly causally linked to other events become a causal chain that directs events from the beginning to the end of the story. Events in this causal chain are often evaluated by adults as very important and are therefore often the most important events in the narrative, and those events with multiple causal connections (i.e., important and often goal-related events) are remembered more than other events in a narrative. However, children with ADHD have more trouble distinguishing unimportant events in the story from important events and identifying and remembering events in the causal chain than typically developing children (Hayden, 2018).

These opinions are supported by research results in the literature (Lorch et al ., 1998; Lorch, Diener, Sanchez, et al., 1999; Lorch, Sanchez, et al., 1999; Lorch et al., 2000; Lorch et al., 2004; McInnes et al., 2003; McInnes et al., 2007). For example, Lorch et al. (1998), based on an examination of normal children's understanding of story information in their study, found that children with ADHD may be poorer than normal children in understanding complex causal relationships in stories.

Lorch, Diener, Sanchez, et al. (1999) compared the listening comprehension skills of children with ADHD and typically developing children in their study. The study examined recall as a function of two-story structure variables (the number of causal connections a story event has with other events and whether an event is included in the causal chain connecting events from the beginning to the end of the story) in the context of audio folk tales (fairy tales). 74 children with ADHD and 62 control group children, aged between 7 and 11, participated in the study. Research results showed that the number of causal connections predicted recall in both children with ADHD and children in the control group. However, as the number of causal connections to a story event increased, the increase in recall was greater in control children than in children with ADHD.

In another study conducted by Lorch, Sanchez et al. (1999), four to six-year-old children with and without ADHD watched a television program (Sesame Street). Half of the children were shown toys during the program, and the other half were not shown toys. Within the scope of the research, it was examined whether children's recall of story events was related to various story structure features (number of causal connections, whether an event is in the causal chain of the story, story-grammar category, and hierarchical structure of the story). Both groups of children participated significantly less in the program when toys were present than when toys were not present, but this effect was larger for children with ADHD. Furthermore, both groups of children showed sensitivity to the causal structure of stories, but when attention was reduced by the presence of distracting stimuli, children with ADHD showed less sensitivity to the causal structure of stories.

In their study, McInnes et al. (2003) examined listening comprehension skills in the context of explanatory information in four groups of children with ADHD, ADHD together with language impairment, only language impairment, and no learning, language, or attention impairment, and compared them in the domains of verbal memory span, verbal working memory, spatial span and spatial working memory. Results showed that children with ADHD understood explanatory information less than children in the comparison group. Although children with ADHD performed the same as the comparison group when asked about factual information, they had difficulty making inferences and self-monitoring to understand instructions. Children with ADHD also performed less well than children in the comparison group on verbal working memory, spatial span, and spatial working memory, and had difficulty finding errors in sequential instructions. These results indicate that even if children with ADHD have sufficiently developed foundational language skills, they have problems with listening comprehension tasks that require higher levels of working memory, comprehension monitoring, and controlled processing.

In another study conducted by McInnes et al. (2007), they investigated the effects of working memory, vocabulary, and grammar on story comprehension in children with ADHD. Research results have shown that children with ADHD remember less information from stories than typically developing children and are less sensitive to the importance of the information they remember. Additionally, children with

ADHD have been found to have problems answering factual questions. Further analysis revealed that deficits in story comprehension could be explained by problems in working memory.

As can be seen from the above research results, it is quite clear that children with ADHD exhibit listening comprehension difficulties compared to their typically developing peers. Many studies show that children with ADHD have difficulty producing explanatory inferences and predictions due to their inability to distinguish between explicit and implicit causal connections (Hayden, 2018).

Conclusion

Effective listening comprehension is an important component of school performance, especially in the early years of school, and requires a range of cognitive skills. First of all, listening comprehension is a strong indicator of cognitive processing and cognitive development. Therefore, by investigating listening comprehension, one can gain insight into aspects of children's cognitive functioning. These include strategic allocation of attention, selecting, coding, and interpreting important information, use of story structure, retrieving relevant historical information, generating inferences that enable interpretation of the information presented, monitoring comprehension, and using retrieval skills. Thus, listening comprehension provides a sort of microcosm for investigating almost all aspects of comprehension in general. Such information is particularly important in better understanding the academic difficulties experienced by children with ADHD (Lorch et al., 2004).

The listening comprehension skills of children with ADHD show great differences compared to typically developing children. For children with ADHD, some listening situations overload their processing abilities, leading to problems such as inattention or on-task behavior. Such potential difficulties with sub-dimensions of listening behavior can prevent accurate understanding and recall of information in many cases; for example, knowing the amount of processing effort required to understand information, knowing what is salient, and making sense of what is said. Additionally, incomplete understanding of verbal information may affect children's ability to respond appropriately to the communication of others and may be an important factor underlying some of the behavioral symptoms of ADHD that are most detrimental to social development and learning (McInnes et al., 2001).

For these reasons, considering the developmental characteristics of children with ADHD, supporting early literacy skills in the preschool period is very important for the development of children's skills in the fields of language and social development. Improving the listening comprehension skills of preschool children with ADHD may help prevent both academic failures and social adaptation behaviors that these children may experience in the future. In addition, accurately assessing the listening comprehension skills of preschool children with ADHD and the relationship between these skills and their inattentive and hyperactive/impulsive behaviors will facilitate the identification of children at risk of future reading difficulties.

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

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, Ece Bülbül, N. and Çuhadar, S.; methodology, Ece Bülbül, N. and Çuhadar, S.; validation, Ece Bülbül, N. and Çuhadar, S..; writing, review and editing, Ece Bülbül, N. and Çuhadar, S.; supervision, Ece Bülbül, N. and Çuhadar, S.

Funding: This research received no funding.

Institutional Review Board Statement: Ethics committee name: Trakya University Ethics Committee. Ethics committee decision date: 23.03.2022, Ethics committee document number: 2022.03.05

Data Availability Statement: Data generated or analyzed during this study should be available from the authors on request.

Conflict of Interest: We declare that there is no conflict of interest between the authors.

References

Adams, J. W. & Snowling, M. J. (2001). Executive function and reading impairments in children reported by their teachers as 'hyperactive'. *British Journal of Developmental Psychology, 19,* 293–306. https://doi.org/10.1348/026151001166083

Alonzo, C. N., Yeomans-Maldonado, G., Murphy, K. A., & Bevens, B. (2016). Predicting second grade listening comprehension using prekindergarten measures. *Topics in Language Disorders, 36*(4), 312-333.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (DSM-5). Washington, DC: American psychiatric association.

Anthony, J. L., & Francis, D. J. (2005). Development of phonological awareness. *Current Directions in Psychological Science, 14(*5), 255 – 259.

Aram, D., Bazelet, I., & Goldman, H. (2010). Early literacy and parental writing mediation in young children with and without ADHD. *European Journal of Special Needs Education, 25*(4), 397-412.

Asadi, I. A., Khateb, A., Mansour-Adwan, J., & Khoury-Metanis, A. (2022). When developmental language disorder meets diglossia: A cross-sectional investigation of listening comprehension among native Arabic-speaking preschoolers. *Journal of Psycholinguistic Research, 51*(5), 1083-1099.

Barkley, R. A. (2015). *Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment* (4th ed.). Guilford

Bauermeister, J. J., Matos, M., Reina, G., Salas, C. C., Martinez, J. V., Cumba, E., & Barkley, R. A. (2005). Comparison of the DSM-IV combined and inattentive types of ADHD in a school-based sample of Latino/Hispanic children. *Journal of Child Psychology and Psychiatry, 46*, 166–179.

Beattie, H. L., Schutte, A. R., & Cortesa, C. S. (2018). The relationship between spatial working memory precision and attention and inhibitory control in young children. *Cognitive Development, 47*, 32-45.

Blair, C., & Diamond, A. (2008). Biological processes in prevention and intervention: The promotion of self- regulation as a means of preventing school failure. *Development and Psychopathology, 20*(3), 899 – 911.

Bitsko, R. H., Claussen, A. H., Lichstein, J., Black, L. I., Jones, S. E., Danielson, M. L., ... & Meyer, L. N. (2022). Mental health surveillance among children—United States, 2013–2019. *MMWR supplements, 71*(2), 1.

Buttross, L. S. (2009). *Understanding attention deficit hyperactivity disorder*. Univ. Press of Mississippi.

Cabell, S. Q., Breit-Smith, A., Fazal, Z., Turnbull, K. P., Justice, L. M., & Kaderavek, J. N. (2015). *Emergent literacy : Lessons for success*. Plural Publishing, Inc.

Cain, K., Oakhill, J. V., Barnes, M. A., & Bryant, P. E. (2001). Comprehension skill, inference-making ability, and their relation to knowledge. *Memory & Cognition, 29*(6), 850–859.

Cain, K., Oakhill, J. V., & Lemmon, K. (2004). Individual differences in the inference of Word meanings from context: The influence of reading comprehension, vocabulary knowledge, and memory capacity. *Journal of Educational Psychology, 96*, 671–681.

Cain, K., & Bignell, S. (2014). Reading and listening comprehension and their relation to inattention and hyperactivity. *British journal of educational psychology, 84*(1), 108-124.

Carlisle, J. F. (1995). *Morphological awareness and early reading achievement*. In L. Feldman (Ed.), Morphological aspects of language processing (pp. 189-209). Hillsdale, NJ: Erlbaum.

Carroll, J. M., Maughan, B., Goodman, R., & Meltzer, H. (2005). Literacy difficulties and psychiatric disorders: Evidence for comorbidity. *Journal of Child Psychology and Psychiatry, 46*, 524–532.

Daneman, M., & Merikle, P. M. (1996). Working memory and language comprehension: A meta-analysis. *Psychonomic Bulletin & Review, 3*, 422–433.

Denton, C. A., Tamm, L., Schatschneider, C., ve Epstein, J. N. (2020). The effects of ADHD treatment and reading intervention on the fluency and comprehension of children with ADHD and word reading difficulties: A randomized clinical trial. *Scientific Studies of Reading, 24*(1), 72-89.

DeVore, T. M. (2020). Effect of single vs. immediate repeated read-aloud on preschoolers? Listening comprehension. [Unpublished doctoral dissertation]. The Ohio State University.

Diamond, A. ve Lee, K. (2011). Interventions shown to aid executive function development in children 4 to 12 years old. *Science, 333*(6045), 959–964. doi: 10.1126/science.1204529

Dong, Y., Chow, B. W. Y., Mo, J., & Zheng, H. Y. (2022). Dialogic reading with attention-deficit-hyperactivity disorder (ADHD) kindergarteners: Does reading with parents or siblings enhance their language development?. *Developmental Psychology, 59*(5), 862.

Ebert, S. (2020). Early language competencies and advanced measures of mental state understanding are differently related to listening and reading comprehension in early adolescence. *Frontiers in Psychology, 11*, 952.

Flake, R. A., Lorch, E. P., & Milich, R. (2007). The effects of thematic importance on story recall among children with attention deficit hyperactivity disorder and comparison children. *Journal of Abnormal Child Psychology, 35*, 43-53.

Florit, E., Roch, M., Altoè, G., & Levorato, M. C. (2009). Listening comprehension in preschoolers: The role of memory. *British Journal of Developmental Psychology, 27*, 935–951.

Florit, E., Roch, M., & Levorato, M. C. (2011). Listening text comprehension of explicit and implicit information in preschoolers: The role of verbal and inferential skills. *Discourse Processes, 48*, 119–138.

Florit, E., Roch, M., & Levorato, M. C. (2014). Listening text comprehension in preschoolers: A longitudinal study on the role of semantic components. *Reading and Writing, 27*, 793-817.

Flory, K., Milich, R., Lorch, E. P., Hayden, A. N., Strange, C., & Welsh, R. (2006). Online story comprehension among children with ADHD: Which core deficits are involved? *Journal of Abnormal Child Psychology, 34*(6), 853–865.

Fong, C. Y. C., & Ho, C. S. H. (2017). What are the contributing cognitive-linguistic skills for early Chinese listening comprehension?. *Learning and Individual Differences, 59*, 78-85.

Fracasso, L. E., Bangs, K., & Binder, K. S. (2016). The contributions of phonological and morphological awareness to literacy skills in the adult basic education population. *Journal of Learning Disabilities, 49*(2), 140–151.

Frazier, T. W., Youngstrom, E. A., Glutting, J. J., & Watkins, M. W. (2007). ADHD and achievement: Meta-analysis of the child, adolescent, and adult literatures and a concomitant study with college students. *Journal of Learning Disabilities, 40*, 49–65. doi:10.1177/00222194070400010401.

Gandolfi, E., & Viterbori, P. (2020). Inhibitory control skills and language acquisition in toddlers and preschool children. *Language Learning, 70*(3), 604-642.

Gözüm, A. İ. C. (2020). Okul öncesi dönem çocuklarında çalışma belleği ve engelleyici kontrol: Dikkatin aracı rolü. Erken Çocukluk Çalışmaları Dergisi, 4(3), 609-638.

Hagen, Å. M., Knoph, R., Hjetland, H. N., Rogde, K., Lawrence, J. F., Lervåg, A., & Melby-Lervåg, M. (2022). Measuring listening comprehension and predicting language development in at-risk preschoolers. *Scandinavian Journal of Educational Research, 66*(5), 778-792.

Hayden, A., Lorch, E. P., Milich, R., Cosoreanu, C., & Van Neste, J. (2018). Predictive inference generation and story comprehension among children with ADHD: Is making predictions helpful?. *Contemporary Educational Psychology, 53*, 123-134.

Hjetland, H. N., Brinchmann, E. I., Scherer, R., & Melby-Lervåg, M. (2017). Preschool predictors of later reading comprehension ability: A systematic review. *Campbell Systematic Reviews, 13*(1), 1-155.

Hogan, P. T., Adlof, M. S. ve Alonzo, N. C. (2014) On the importance of listening comprehension. *International Journal of Speech-Language Pathology, 16*(3), 199-207.

Hume, L. E., Allan, D. M., & Lonigan, C. J. (2016). Links between preschoolers' literacy interest, inattention, and emergent literacy skills. *Learning and Individual Differences, 47*, 88-95.

Hwang, H., & Cabell, S. Q. (2021). Latent profiles of vocabulary and domain knowledge and their relation to listening comprehension in kindergarten. *Journal of Research in Reading, 44*(3), 636-653.

Jackson, S., Slade, L., Levy, J. P., & McCormick, S. F. (2022). A longitudinal study of theory of mind and listening comprehension: Is preschool theory of mind important?. *Journal of Experimental Child Psychology, 219,* 105388.

Jacobs, B., & Miles, L. (2011). *Parenting a Child with Attention Deficit Hyperactivity Disorder* (Parenting Matters). CoramBAAF. ProQuest Ebook Central, http://ebookcentral.proquest.com/lib/trakya/detail.action?docID=3002790.

Jiang, H., & Farquharson, K. (2018). Are working memory and behavioral attention equally important for both reading and listening comprehension? A developmental comparison. *Reading and writing, 31,* 1449-1477.

Kargın, T., Ergül, C., Büyüköztürk, Ş., ve Güldenoğlu, B. (2015). 60-72 aylık çocuklara yönelik Erken Okuryazarlık Testi (EROT) geliştirme çalışması. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Özel Eğitim Dergisi, 16*(3), 237-270.

Kargın, T., Güldenoğlu, B., & Ergül, C. (2017). Dinlediğini anlama becerisinin okuduğunu anlama üzerindeki yordayıcılığının incelenmesi. *Kastamonu Eğitim Dergisi, 25*(6), 2369-2384.

Kendeou, P., Lynch, J. S., van den Broek, P., Espin, C. A., White, M. J., & Kremer, K. E. (2005). Developing successful readers: Building early comprehension skills through television viewing and listening. *Early Childhood Education Journal, 33,* 91–98.

Kendeou, P., Bohn-Gettler, C. M., White, M. J., & van den Broek, P. (2008). Children's inference generation across different media. *Journal of Research in Reading, 31,* 259–272.

Kendeou, P., van den Broek, P., Helder, A., & Karlsson, J. (2014). A cognitive view of reading comprehension: Implications for reading difficulties. *Learning Disabilities Research and Practice, 29,* 10–16.

Kim, Y. S. (2011). Considering linguistic and orthographic features in early literacy acquisition: Evidence from Korean. *Contemporary Educational Psychology, 36*(3), 177-189.

Kim, Y. S., & Phillips, B. (2014). Cognitive correlates of listening comprehension. *Reading Research Quarterly, 49*(3), 269-281.

Kim, Y. S. (2015). Language and cognitive predictors of text comprehension: Evidence from multivariate analysis. *Child development, 86*(1), 128-144.

Kim, Y. S. G. (2016). Direct and mediated effects of language and cognitive skills on comprehension of oral narrative texts (listening comprehension) for children. *Journal of experimental child psychology, 141,* 101-120.

Kim, Y. S. G. (2017). Why the simple view of reading is not simplistic: Unpacking component skills of reading using a direct and indirect effect model of reading (DIER). *Scientific Studies of Reading, 21*(4), 310-333.

Kinnunen, R., Vauras, M., & Niemi, P. (1998). Comprehension monitoring in beginning readers. *Scientific studies of Reading, 2*(4), 353-375.

Lamminmäki, T., Ahonen, T., Närhi, V., Lyytinen, H., & de Barra, H. T. (1995). Attention deficit hyperactivity disorder subtypes: Are there differences in academic problems?. Developmental *Neuropsychology, 11*(3), 297-310.

Lepola, J., Lynch, J., Laakkonen, E., Silvén, M., & Niemi, P. (2012). The role of inference making and other language skills in the development of narrative listening comprehension in 4–6-year-old children. *Reading Research Quarterly, 47*(3), 259-282.

Lonigan, C. J., Bloomfield, B. G., Anthony, J. L., Bacon, K. D., Phillips, B. M., & Samwel, C. S. (1999). Relations among emergent literacy skills, behavior problems, and social competence in preschool children from low-and middle-income backgrounds. *Topics in Early Childhood Special Education, 19*(1), 40-53.

Lorch, E. P., Diener, M. B., Sanchez, R. P., Milich, R., & Welsh, R. (1999). The Effects of Story Structure on the Recall of Stories in Children With Attention Deficit Hyperactivity Disorder. *Journal of Educational Psychology, 91*(2), 273-283.

Lorch, E. P., Milich, R., Sanchez, R. P., van den Brock, P., Baer, S., Hooks, K., et al. (2000). Comprehension of televised stories in boys with attention deficit hyperactivity disorder. *Journal of Abnormal Psychology, 109,* 321–330

Lorch, E. P., Eastham, D., Milich, R., Lemberger, C. C., Sanchez, R. P., Welsh, R., & van den Broek, P. (2004). Difficulties in comprehending causal relations among children with ADHD: The role of cognitive engagement. *Journal of Abnormal Psychology, 113*(1), 56-63.

Lorch, E. P., O'Neil, K., Berthiaume, K. S., Milich, R., Eastham, D., & Brooks, T. (2004). Story comprehension and the impact of studying on recall in children with Attention Deficit Hyperactivity Disorder. *Journal of Clinical Child and Adolescent Psychology, 33*(3), 506-515.

Lynch, J. S., & van den Broek, P. (2007). Understanding the glue of narrative structure: Children's on- and off-line inferences about characters' goals. *Cognitive Development, 22*(3), 323-340.

Lynch, J. S., Van Den Broek, P., Kremer, K. E., Kendeou, P., White, M. J., & Lorch, E. P. (2008). The development of narrative comprehension and its relation to other early reading skills. *Reading Psychology, 29*(4), 327-365.

Lyster, S. A. H., Lervåg, A. O., & Hulme, C. (2016). Preschool morphological training produces long-term improvements in reading comprehension. *Reading and Writing, 29*, 1269-1288.

Majorano, M., Bastianello, T., Bodea-Hategan, C., Fantuzzi, P., Fontana, G., Hoste, E., ... & Persici, V. (2021). Early literacy skills and later reading and writing performance across countries: The effects of orthographic consistency and preschool curriculum. *In Child & Youth Care Forum, 50*, 1063-1085.

Makin, L. & Whitehead. R. M. (2004). *How to develop children's early literacy : A Guide for professional carers and educators*. SAGE Publications Ltd.

McGee, R., Prior, M., Williams, S., Smart, D., & Sanson, A. (2002). The long-term significance of teacher-rated hyperactivity and reading ability in childhood: Findings from two longitudinal studies. *Journal of Child Psychology and Psychiatry, 43*, 1004–1016. doi:10.1111/1469-7610. 00228

McInnes, A. J. (2001). Listening comprehension abilities in children with attention deficit hyperactivity disorder and language impairment [Doctoral dissertation, University of Toronto].

McInnes, A., Humphries, T., Hogg-Johnson, S., & Tannock, R. (2003). Listening Comprehension and Working Memory Are Impaired in Attention-Deficit Hyperactivity Disorder Irrespective of Language Impairment. *Journal of Abnormal Child Psychology, 31*(4), 427-443.

McInnes A, Bedard AC, Hogg-Johnson S, Tannock R. (2007). Preliminary evidence of beneficial effects of methylphenidate on listening comprehension in children with attention-deficit/hyperactivity disorder. *Journal of Abnormal Child Psychology, 17*(1):35-49. doi: 10.1089/cap.2006.0051. PMID: 17343552.

Miller, A. C., Keenan, J. M., Betjemann, R. S., Willcutt, E. G., Pennington, B. F., & Olson, R. K. (2013). Reading comprehension in children with ADHD: Cognitive underpinnings of the centrality deficit. *Journal of abnormal child psychology, 41*, 473-483.

Nadig, A. (2013). Listening comprehension. Encyclopedia of autism spectrum disorders, 1743.

Neuman, S. B. (2014). Explaining and understanding early literacy. *Investigaciones Sobre Lectura, 2*, 7-14.

Niu, W., Cheng, L., Xu, W., Zhang, Q., & Zhang, X. (2021). Improving resilience of a child with ADHD: A context specific intervention program through dialogic and guided reading. International *Journal of Disability Development and Education, 68*(6), 1–18. https://doi.org/10.1080/1034912X.2021.1929085

Nutbrown, C. (1997). *Recognising early literacy development : Assessing children's achievements*. SAGE Publications Ltd.

Oakhill, J., Hartt, J., & Samols, D. (2005). Levels of comprehension monitoring and working memory in good and poor comprehenders. *Reading and Writing: An Interdisciplinary Journal, 18*, 657–686. doi:10.1007/s11145- 005-3355-z

Oakhill, J. V., & Cain, K., (2007). *Introduction to comprehension development*. In K. Cain, & J. V Oakhill (Eds.), Children's comprehension problems in oral and written language: A cognitive perspective (pp. 41–73). New York: Guilford Press.

O'Brien, J. W., Dowell, L. R., Mostofsky, S. H., Denckla, M. B., & Mahone, E. M. (2010). Neuropsychological profile of executive function in girls with attention-deficit/hyperactivity disorder. *Archives of Clinical Neuropsychology, 25*(7), 656-670.

O'Neill, M. E., & Douglas, V. I. (1991). Study strategies and story recall in attention deficit hyperactivity disorder and reading disability. *Journal of Abnormal Child Psychology, 19*, 671-692.

Purvis, K. L., & Tannock, R. (1997). Language abilities in children with attention deficit hyperactivity disorder, reading disabilities, and normal controls. *Journal of Abnormal Child Psychology, 25*(2), 133-145.

Read, A. B., & Ghoting, S. N. (2015). *Time for a story: Sharing books with infants and toddlers*. Published by Gryphon House.

Renz, K., Lorch, E. P., Milich, R., Lemberger, C., Bodner, A., & Welsh, R. (2003). On-line story representation in boys with attention deficit hyperactivity disorder. *Journal of Abnormal c-Child Psychology, 31*, 93-104.

Roskos, K., Lenhart, L. & Noll, B. (2012). *Early Literacy Materials Selector (ELMS) : A Tool for Review of Early Literacy Program Materials*. Corwin.

Schmiedeler, S., & Schneider, W. (2014). Attention-deficit hyperactivity disorder (ADHD) in the early years: Diagnostic issues and educational relevance. *Clinical Child Psychology and Psychiatry, 19(*3), 460-475.

Scrimin, S., Patron, E., Florit, E., Palomba, D., & Mason, L. (2017). The role of cardiac vagal tone and inhibitory control in pre-schoolers' listening comprehension. *Developmental psychobiology, 59*(8), 970-975.

Shaw, W. N. (2011). Listening comprehension difficulties in children with co-occurring language impairment and ADHD. [Doctoral dissertation, The University of Texas at Austin].

Sims, D. M., & Lonigan, C. J. (2013). Inattention, hyperactivity, and emergent literacy: Different facets of inattention relate uniquely to preschoolers' reading-related skills. *Journal of Clinical Child & Adolescent Psychology, 42*(2), 208-219.

Strasser, K., & del Rio, F. (2014). The role of comprehension monitoring, theory of mind, and vocabulary depth in predicting story comprehension and recall of kindergarten children. Reading Research Quarterly, 49, 169–187.

Storch, S. A., & Whitehurst, G. J. (2002). Oral language and code-related precursors to reading: Evidence from a longitudinal structural model. *Developmental Psychology*, 38, 934–947. https://doi.org/10.1037/0012- 1649.38.6.934

Sulzby, E., & Teale, W. (1991). *Emergent literacy*. In R. Barr, M. L. Kamil, P. B. Mosenthal & P. D. Pearson (Eds.), Handbook of reading research (pp. 727-757). Longman.

Tannock, R., Purvis, K. L., & Schachar, R. J. (1993). Narrative abilities in children with attention deficit hyperactivity disorder and normal peers. *Journal of Abnormal Child Psychology, 21*(1), 103-118.

Teale, W. H. (1987). Emergent literacy: Reading and writing development in early childhood. In National Reading Conference Yearbook. National Reading Conference.

Teale, W. H. ve Sulzby, E. (1992). *Emergent literacy writing and reading* (5th.print). Norwood. Ablex Publishing Corporation.

Tompkins, V., Guo, Y., & Justice, L. M. (2013). Inference generation, story comprehension, and language skills in the preschool years. Reading and Writing, 26, 403-429.

Tong, X., & McBride, C. (2017). A reciprocal relationship between syntactic awareness and reading comprehension. *Learning and Individual Differences, 57*, 33-44.

Tunmer, W. E. (2008). Recent developments in reading intervention research: Introduction to the special issue. Reading and Writing, 21(4), 299-316.

Vaknin-Nusbaum, V., Sarid, M., Raveh, M., & Nevo, E. (2016). The contribution of morphological awareness to reading comprehension in early stages of reading. *Reading and Writing, 29*, 1915-1934.

van Tilborg, A. J. (2018). Early literacy development in children with intellectual disabilities (Doctoral dissertation, [Sl]:[Sn]). Behavioural Science Institute, Radboud University, The Netherlands.

Velting, O.N., & G.J. Whitehurst. (1997). Inattention-hyperactivity and reading achievement in children from low-income families: A longitudinal model. *Journal of Abnormal Child Psychology 25*, 321–31.

Wender, P. H. (2001). ADHD: *Attention-deficit hyperactivity disorder in children, adolescents, and adults*. Oxford University Press, Incorporated.

Wolf, M. C., Muijselaar, M. M., Boonstra, A. M., & de Bree, E. H. (2019). The relationship between reading and listening comprehension: shared and modality-specific components. *Reading and Writing, 32*, 1747-1767.

Whitehurst, G. J. and Lonigan, C. J. (1998). Child development and emergent literacy. Child Development, 69 (3), 848-872

Whitehurst, G. J., & Lonigan, C. (2001). *Emergent literacy: Development from prereaders to readers.* In S. Neuman & D. Dickinson (Eds.), Handbook of early literacy research (pp. 11–30). New York: Guilford.

Willcutt E. G. ve Pennington B. F. (2000). Comorbidity of reading disability and attention-deficit/hyperactivity disorder: Differences by gender and subtype. *Journal of Learning Disabilities*, *33*, 179–191.

Willcutt E.G, Pennington BF & DeFries JC. (2000). Twin study of the etiology of comorbidity between reading disability and attention-deficit/hyperactivity disorder. *American Journal of Medical Genetics*, *96*, 293–301

Yeomans-Maldonado, G. (2017). Development of comprehension monitoring in beginner readers. *Reading and Writing*, *30*, 2039-2067

Zentall, S. S. (1988). Production deficiencies in elicited languages but not in the spontaneous verbalizations of hyperactive children. *Journal of Abnormal Child Psychology*, *16*, 657- 673.