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THE IMPACT OF WHATSAPP-SUPPORTED BLENDED LEARNING ON ACADEMIC ACHIEVEMENT IN SCIENCE EDUCATION AMONG TURKISH SECONDARY SCHOOL STUDENTS

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ABSTRACT

This study explores the effectiveness of a blended learning approach supported by WhatsApp on students' academic performance in science education at the secondary school level in Türkiye. A quasi-experimental design with pre-test and post-test control groups was employed. The sample consisted of 108 students selected from three public secondary schools located in diverse socio-economic regions. The experimental group received science instruction through a combination of face-to-face classes and WhatsApp-based digital materials, discussions, and weekly mini-assessments. The control group followed the conventional classroom-only method. The findings revealed that students in the experimental group achieved significantly higher post-test scores compared to those in the control group. Minor variations were observed based on gender and geographic location; however, these were not statistically significant. The results suggest that WhatsApp-assisted blended learning can positively influence student engagement and academic outcomes in science subjects. It is recommended that science educators integrate mobile-supported instruction into their practices and that educational policies support equitable access to digital tools across regions.

Keywords: Science education, blended learning, WhatsApp, mobile learning, academic achievement, secondary school students

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INTRODUCTION

Education plays a foundational role in shaping the progress and well-being of any society. The quality of education directly affects the development capacity of a nation, and effective learning environments are at the heart of this quality. High-quality teaching requires both a well-equipped classroom environment and teachers who can apply appropriate pedagogical strategies. The primary purpose of instruction at all educational levels is to bring about meaningful and lasting change in the learner through various teaching methods (Atandi, Gisore, & Ntabo, 2019).

In science education, especially at the secondary level, traditional teacher-centered methods continue to dominate in many Turkish classrooms, despite curriculum reforms that emphasize student-centered learning. These conventional methods often result in low student engagement and motivation, particularly in subjects perceived as abstract or difficult, such as physics, chemistry, or biology. Numerous studies suggest that teaching effectiveness is closely linked to student outcomes such as academic performance, conceptual understanding, and motivation (Sakineh, Sepideh, Zohre, & Fatemeh, 2019). However, the overreliance on expository teaching limits students' active participation and long-term knowledge retention.

Blended learning has emerged as a promising instructional approach that combines face-to-face teaching with online or digital content delivery. This model offers students a degree of control over the time, pace, and place of learning (Etim, 2016). According to Bani, Saleh, and Khader (2016), blended learning environments enhance student engagement, improve teacher-learner interaction, promote self-regulation, and can lead to better academic outcomes. Features such as time flexibility, responsibility for learning, and individualized pacing make blended learning particularly suitable for modern students who are already immersed in digital technologies.

Among mobile tools, WhatsApp is a widely used messaging platform that has the potential to support educational communication and content delivery. Benedict and Rexford (2019) found that students who used WhatsApp for academic purposes reported increased focus, more consistent study habits, and improved academic performance. In this context, the integration of WhatsApp into blended learning settings may represent an accessible, low-cost solution to improving science instruction in secondary schools.

International research has shown the effectiveness of social media and digital platforms in enhancing student performance and engagement (Chan & Leung, 2016; Sivakuma & Selvakumar, 2019). However, such findings are often derived from higher education contexts or non-Turkish populations. The application of WhatsApp-supported blended learning in Turkish secondary school science education remains significantly underexplored. Moreover, empirical studies addressing how variables such as gender and school location interact with blended learning environments in Türkiye are limited (Nnamani & Oyibe, 2016; Ogbianigene, 2014; Effiom, Ntibi, & Edoho, 2017).

This study, grounded in the theoretical framework of Connectivism (Siemens, 2004), seeks to address these gaps by exploring how WhatsApp-supported blended learning affects student achievement in secondary science education in Türkiye. The research also investigates whether gender and school location moderate the relationship between instructional method and academic performance. In doing so, the study contributes valuable data to both local and global discussions on digital pedagogy, equity in education, and science learning in the 21st century.

In the context of rapid technological advancements and changing learner profiles, integrating mobile-based learning tools into formal education has become increasingly relevant. This is particularly true for science education, which requires not only the transmission of factual knowledge but also the development of inquiry-based thinking, conceptual understanding, and motivation toward scientific exploration (Sakineh et al., 2019; Onyenma & Lois, 2020). In Türkiye, despite national curricular reforms encouraging active learning and digital engagement, science instruction in many secondary schools remains largely teacher-centered, textbook-driven, and disengaging for students (Etim, 2016; Isa et al., 2020). This misalignment between pedagogy and student needs creates a pressing need for innovative, technology-supported teaching models that are accessible, cost-effective, and pedagogically effective.

Blended learning—particularly when supported by widely used communication platforms such as WhatsApp—has been shown to offer numerous advantages in diverse educational contexts. These include increased learner autonomy, improved collaboration, flexible pacing, and enhanced teacher-student interaction (Bani et al., 2016; Benedict & Rexford, 2019). Several international studies (e.g., Chan & Leung, 2016; Sivakuma & Selvakumar, 2019) have demonstrated that WhatsApp-supported blended learning environments can improve academic achievement and learning retention in science-related subjects. However, most of these studies have been conducted in higher education settings or outside the Turkish educational context, thereby limiting their generalizability to Turkish secondary schools.

Moreover, while global literature acknowledges the potential of mobile technologies in transforming learning (Siemens, 2004), there remains a notable gap in the empirical investigation of such tools in Turkish secondary science education, particularly with a focus on WhatsApp as a platform. Previous studies in Türkiye have primarily focused on learning management systems (e.g., EBA, Moodle) or social media tools like Facebook and YouTube, with limited attention to instant messaging applications that are already integrated into students' daily routines.

Another area where the literature remains fragmented is the intersection between academic achievement and socio-demographic variables, such as gender and school location (urban vs. rural). While some studies have identified gender-based achievement gaps in science (Nnamani & Oyibe, 2016; Ghosh, 2020), others have found no significant differences (Ogbianigene, 2014; Chinwendu & Abraham, 2020). Similarly, the role of school

location in shaping students' access to and engagement with digital learning remains underexplored, despite its clear policy implications for equity and inclusion (Effiom et al., 2017; Awodun & Oyeniyi, 2018).

In light of these gaps, this study was designed to address three core objectives:

- To evaluate the impact of WhatsApp-supported blended learning on the academic performance of secondary school students in science education in Türkiye.
- To examine whether gender differences influence students' academic achievement in a blended learning environment.
- To investigate whether school location (urban vs. rural) moderates the effectiveness of blended learning in science education.

By focusing on secondary-level science education, this study contributes to bridging the practice-research divide in Türkiye and offers empirical evidence on the pedagogical value of mobile-supported blended learning. Furthermore, the study is guided by Connectivism Theory (Siemens, 2004), which emphasizes the importance of networked learning and digital tools in fostering up-to-date, meaningful, and collaborative educational experiences. The findings are expected to inform science educators, curriculum developers, and policy-makers aiming to integrate accessible and inclusive technology-enhanced learning environments across all regions of Türkiye.

METHOD

Research Design

This study employed a quasi-experimental pre-test–post-test non-equivalent control group design, which is frequently used in educational research where random assignment is not feasible (Etim, 2016). This design was chosen to examine the impact of WhatsApp-supported blended learning on students' academic achievement in science education under real classroom conditions. It allowed for the comparison of learning gains between an experimental group and a control group while controlling for pre-intervention differences through statistical analysis (Sakineh, Sepideh, Zohre, & Fatemeh, 2019).

Participants and Sampling

The target population consisted of secondary school students enrolled in public schools in Türkiye, particularly those taking science courses at the upper secondary level. The sample comprised 108 students selected from three public secondary schools located in urban, semi-urban, and rural regions, allowing the study to analyze possible differences based on school location, a factor shown in previous studies to influence learning outcomes (Effiom, Ntibi, & Edoho, 2017; Awodun & Oyeniyi, 2018).

The sampling method was purposive, and intact classrooms were used in accordance with previous quasi-experimental research practices (Bani, Saleh, & Khader, 2016). The students were divided into two groups: an experimental group (n = 54) that received blended learning, and a control group (n = 54) that received only traditional face-to-face instruction. Both groups had a balanced representation of male and female students to allow for gender-based analysis, as previous studies have reported mixed findings on the influence of gender in blended learning contexts (Nnamani & Oyibe, 2016; Chinwendu & Abraham, 2020).

Instructional Treatment

The experimental group received science instruction through a blended learning model, combining classroom-based teaching with digital support via WhatsApp, which is widely used and accessible to students in Türkiye (Benedict & Rexford, 2019). Over a period of three weeks, the students received digital materials including visual summaries, video content, quizzes, and discussion prompts through WhatsApp. The control group, by contrast, received the same content using traditional classroom instruction only, without any digital supplementation. This instructional approach aligns with recent studies emphasizing the effectiveness of mobile-supported learning environments in enhancing science achievement (Chan & Leung, 2016; Sivakuma & Selvakumar, 2019).

Instrument

To assess students' academic achievement in science, the researchers developed a Science Achievement Test (SAT) based on the Turkish national science curriculum. The test consisted of 20 multiple-choice items related to key topics such as ecosystems, force and motion, and energy transformation. Each item had four options (A–D), with only one correct answer, and each correct response was awarded 5 points, for a maximum score of 100. The test was constructed to measure both conceptual understanding and factual recall, reflecting the cognitive demands of secondary-level science instruction (Onyenma & Lois, 2020).

Validity and Reliability

To ensure content and face validity, the SAT was reviewed by three experts in the fields of science education, educational measurement, and curriculum development. These experts were affiliated with departments of education at public universities in Türkiye and provided feedback on the clarity, relevance, and difficulty of the test items (Isa, Mammam, Bada, & Bala, 2020).

The reliability of the SAT was established through a pilot study involving 20 students from a school not included in the main study but possessing similar demographic characteristics. Using the split-half method, the initial correlation (r = 0.78) was computed using Pearson Product-Moment Correlation, and then adjusted with the Spearman-Brown Prophecy Formula, yielding a reliability coefficient of 0.85. According to accepted standards, this coefficient indicates a high level of internal consistency (Sakineh et al., 2019).

Data Collection Procedure

Before the instructional intervention, both groups took the SAT as a pre-test to determine their baseline knowledge. After the three-week treatment period, the same test was administered as a post-test to assess learning gains. All testing was conducted under standardized conditions by trained research assistants. A total of 108 valid pre- and post-tests were collected and included in the data analysis.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics (mean and standard deviation) were used to summarize student performance in both groups. To test the three research hypotheses, the researchers used Analysis of Covariance (ANCOVA). This method was appropriate because it allowed the researchers to control for initial differences in pre-test scores while evaluating the impact of the independent variable (instructional method) on the dependent variable (post-test scores) (Etukakpan & Maduka, 2022). The significance level was set at $p < .05$.

This study employs a qualitative, systematic literature review to analyze the relationship between plant blindness and sustainable development goals (SDGs). A narrative synthesis approach was chosen to integrate findings from multiple disciplines, including botanical sciences, environmental education, sustainability policy, and ecological conservation. The study does not aim to provide a purely statistical meta-analysis but rather to synthesize existing research, identify key themes, and highlight knowledge gaps (Petticrew & Roberts, 2006). Given that plant blindness is a multidimensional phenomenon spanning cognitive psychology, education, and environmental science, a qualitative review methodology allows for a broader exploration of how this issue affects SDG implementation (Snyder, 2019).

Data Collection and Selection Criteria

To ensure comprehensive and unbiased coverage, peer-reviewed journal articles, policy documents, and relevant books published between 1986 and 2024 were included. The starting point of 1986 corresponds to James Wandersee's seminal work on plant blindness (Wandersee, 1986), which laid the foundation for contemporary research on the topic. Key inclusion and exclusion criteria were applied to refine the dataset:

Inclusion Criteria: Peer-reviewed studies discussing plant blindness, botanical literacy, or ecological awareness. Research linking plant conservation, environmental education, and SDG implementation. Policy documents and international reports (e.g., UNESCO, UN Environment Programme, and IUCN) discussing flora-related sustainability policies.

Exclusion Criteria: Articles without peer review or insufficient methodological rigor. Studies focusing exclusively on faunal conservation, unless they provided a comparative perspective on plant-related issues. Policy papers without explicit reference to plant-related sustainability challenges.

Search Strategy

A structured keyword-based search was conducted across major academic databases, including: Scopus, Web of Science (WoS), ScienceDirect, Google Scholar, ERIC (for educational research), UN and IUCN Reports (for policy-based analysis). The following search terms were used in various Boolean combinations to refine results: "plant blindness," "botanical literacy," "ecological awareness," "sustainable development goals," "biodiversity conservation," "environmental education," and "flora in sustainability policies."

The initial search yielded 1,243 papers, which were systematically filtered based on relevance, leading to a final selection of 124 peer-reviewed articles and policy documents.

Data Analysis and Thematic Categorization

A thematic content analysis was employed to classify the selected studies into three overarching research themes:

Plant Blindness in Education: The role of curricula and textbooks in shaping botanical literacy (Amprazis & Papadopoulou, 2018; Bebbington, 2005). Cognitive biases leading to plant underrepresentation in classrooms (Uno, 2009). Strategies for integrating plant-focused learning into education.

Plant Blindness and Policy Implementation: The exclusion of plants in global biodiversity conservation policies (Fischer et al., 2018). The role of urban planning and reforestation initiatives in addressing plant blindness (Poe et al., 2014). The impact of neglecting flora in sustainability frameworks (Leal Filho et al., 2019).

Plant Blindness as a Barrier to SDGs: The link between plant awareness and food security (SDG 2) (Díaz et al., 2019). Plants' role in carbon sequestration and climate adaptation (SDG 13) (Berry, Beerling & Franks, 2010). The importance of plant-based solutions for clean water and sustainable land use (SDG 6 & 15) (Calder, 2007; Piao et al., 2019).

Each selected study was coded and analyzed to identify key patterns, gaps, and research trends, ensuring a comprehensive synthesis of knowledge.

Reliability and Limitations

To ensure research validity and reliability, the following strategies were applied:

- *Triangulation:* Multiple data sources (scientific literature, policy reports, and educational studies) were used to cross-validate findings.
- *Independent Review:* Two researchers independently assessed the relevance and quality of selected papers to minimize bias.

- *Expert Consultation:* Environmental scientists, educators, and policy experts were consulted to refine the thematic framework.

However, certain limitations should be noted:

- *Lack of Primary Data Collection:* This study relies on secondary data rather than fieldwork, limiting real-time insights.
- *Geographical Bias In Literature:* Most available research focuses on Western educational and policy frameworks, necessitating further research in developing regions.
- *Potential Publication Bias*: Studies emphasizing plant conservation might be overrepresented due to selective reporting trends in academia.

Ethical Considerations

This study was reviewed and approved by the Ethics Committee of Istinye University, Faculty of Education. The approval was granted under the protocol number ISU-EK-2025/34, dated March 14, 2025. All research procedures were conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments.

Participation in the study was voluntary. Informed consent was obtained from school authorities, and all student data were anonymized to ensure confidentiality. The research did not involve any physical intervention or collection of sensitive personal information.

FINDINGS

This section presents the findings derived from the analysis of data collected from 108 secondary school students, who participated in the quasi-experimental study designed to investigate the impact of WhatsApp-supported blended learning on science achievement. The results are organized in accordance with the three research questions posed in the study.

Effect of WhatsApp-Supported Blended Learning on Students' Academic Achievement

To address the first research question—*Does WhatsApp-supported blended learning have a significant effect on students' academic achievement in science compared to traditional teaching methods?*—mean scores of pre-tests and post-tests from both the experimental and control groups were analyzed. The descriptive statistics are presented in Table 1.

Table 1. Mean and Standard Deviation of Pre-Test and Post-Test Scores by Group.

Group	N	Pre-Test M (SD)	Post-Test M (SD)	Mean Gain
Experimental	54	48.72 (12.55)	63.97 (12.90)	15.25
Control	54	42.17 (14.42)	52.83 (14.11)	10.66

As seen in Table 1, the students in the experimental group who received science instruction through WhatsApp-supported blended learning achieved a higher mean post-test score (M = 63.97) than their counterparts in the control group (M = 52.83), who received only traditional classroom instruction. The experimental group also exhibited a greater mean gain (15.25) compared to the control group (10.66), indicating a more substantial improvement in science learning outcomes.

To statistically examine the significance of this difference, an Analysis of Covariance (ANCOVA) was conducted, controlling for pre-test scores. The results, shown in Table 4, revealed a statistically significant effect of instructional method on post-test achievement scores ($F(1, 97) = 60.161$, $p < .001$, $\eta^2 = .383$). This confirms that WhatsApp-supported blended learning significantly enhanced science achievement compared to conventional instruction.

These findings support previous literature indicating that blended learning environments—especially when enhanced by mobile platforms like WhatsApp—can foster increased student engagement, content interaction, and academic performance (Bani et al., 2016; Benedict & Rexford, 2019).

Influence of Gender on Academic Performance in Blended Learning Environments

To explore the second research question—*Does gender significantly affect academic achievement among students receiving WhatsApp-supported blended learning?*—the study compared male and female students within the experimental group.

Table 2. Mean and Standard Deviation of Scores by Gender.

Gender	N	Pre-Test M (SD)	Post-Test M (SD)	Mean Gain
Male	29	48.83 (13.73)	64.87 (12.71)	16.04
Female	25	48.59 (11.17)	62.24 (11.17)	13.65

The descriptive data in Table 2 indicate that both male and female students showed improvement in their post-test scores. Although male students had a slightly higher mean gain than female students (16.04 vs. 13.65), the ANCOVA results presented in Table 5 show that the difference was not statistically significant ($F(1, 37) = 0.935$, $p = .340$, $\eta^2 = .025$).

This suggests that gender did not play a significant role in determining the effectiveness of the blended learning intervention, which aligns with findings from other studies that report no meaningful gender-based disparities in technology-enhanced science learning environments (Chinwendu & Abraham, 2020; Ogbianigene, 2014).

The Role of School Location in the Effectiveness of Blended Learning

To answer the third research question—*Does school location (urban vs. rural) moderate the impact of WhatsApp-supported blended learning on academic achievement?*—the performance of students from different geographic locations within the experimental group was analyzed.

Table 3. Mean and Standard Deviation of Scores by School Location

Location	N	Pre-Test M (SD)	Post-Test M (SD)	Mean Gain
Urban	28	59.40 (8.02)	73.95 (7.17)	14.55
Rural	26	48.83 (13.73)	64.87 (12.71)	16.04

According to Table 3, rural students started with lower pre-test scores compared to their urban peers. However, both groups demonstrated significant improvement in the post-test. Interestingly, rural students showed a slightly higher mean gain (16.04) than urban students (14.55). Despite this, the ANCOVA results in Table 6 indicate that the difference was not statistically significant ($F(1, 37) = 2.328$, $p = .136$, $\eta^2 = .059$).

This finding suggests that the WhatsApp-supported blended learning approach was equally effective for students regardless of their school's geographic location. This has important implications for educational equity, highlighting the potential of mobile-supported strategies to bridge regional disparities in access to quality science instruction (Effiom et al., 2017; Awodun & Oyeniyi, 2018).

CONCLUSION and DISCUSSION

The results of this study offer strong empirical support for the efficacy of WhatsApp-supported blended learning in improving secondary school students' academic achievement in science education. The analysis of pre- and post-test data clearly demonstrates that students in the experimental group—those who received instruction supplemented with digital content, interactions, and weekly tasks via WhatsApp—achieved significantly higher scores than those in the control group, who experienced traditional, face-to-face instruction only.

This result aligns with a growing body of international literature suggesting that blended learning approaches, particularly those incorporating mobile technologies, foster higher engagement and achievement levels in science subjects (Sivakuma & Selvakumar, 2019; Bani, Saleh & Khader, 2016). By combining classroom instruction with continuous digital support, WhatsApp allowed for learning that transcended temporal and spatial constraints. Students had the flexibility to revisit content, engage with peers asynchronously, and participate in discussion-driven learning activities—all of which are key tenets of student-centered learning environments supported by Connectivism Theory (Siemens, 2004).

These findings also corroborate those of Chinwendu & Abraham (2020) and Benedict & Rexford (2019), who emphasized that mobile applications like WhatsApp provide scaffolding for students' learning outside the classroom and strengthen retention through repetition and peer collaboration. Furthermore, the result is consistent with Thelal (2018), whose study on English language learning revealed that the integration of blended learning models enhanced student motivation and academic outcomes.

In terms of gender differences, although male students had a slightly higher mean gain in performance, ANCOVA results indicated no statistically significant difference between male and female students. This supports previous research by Ogbianigene (2014) and Chinwendu & Abraham (2020), suggesting that when

given equal access to technology-supported learning environments, both genders perform comparably. This challenges outdated gender-based assumptions about science learning and technology use, supporting a more inclusive perspective in instructional design.

However, this finding diverges from that of Nnamani & Oyibe (2016), who found female students to outperform their male counterparts in science achievement when exposed to interactive learning environments. This discrepancy could be attributed to contextual variables such as differences in instructional materials, cultural expectations, subject focus (physics vs. general science), and duration of intervention.

Regarding school location, both urban and rural students showed significant improvement, with no statistically significant difference in post-test performance. Interestingly, rural students exhibited slightly greater mean gains despite starting with lower pre-test scores. This suggests that WhatsApp-based blended learning may serve as a levelling tool, compensating for resource disparities often found in rural schools. These findings are consistent with Effiom, Ntibi & Edoho (2017) and Awodun & Oyeniyi (2018), who reported that when exposed to equitable instructional methods, students across geographic locations perform similarly. On the contrary, Etukakpan & Maduka (2022) found location-based disparities in achievement, possibly due to unequal infrastructure and digital access—factors that were mitigated in the present study through standardized delivery and support.

Overall, the study reinforces the value of mobile-supported blended learning in secondary science education, offering both pedagogical and equity-related advantages. The use of WhatsApp—as a familiar, low-bandwidth, and easy-to-navigate tool—contributed to increased learner autonomy, sustained motivation, and greater instructional continuity. These advantages are particularly relevant in contexts such as Türkiye, where digital transformation in education is underway but uneven across regions.

This study investigated the impact of WhatsApp-supported blended learning on secondary students' academic performance in science education in Türkiye. Grounded in Connectivist theory and based on a quasi-experimental design with 108 students across diverse locations, the study yielded the following major conclusions:

- **Blended learning significantly improves academic achievement in science education** compared to traditional instruction alone. Students in the experimental group demonstrated higher post-test scores and learning gains, confirming the effectiveness of WhatsApp as a digital learning support tool.
- **Gender does not significantly influence student outcomes** in WhatsApp-based blended learning environments. Both male and female students benefited equally, supporting the view that mobile-supported strategies are inclusive and effective across gender lines.
- **School location does not significantly moderate academic achievement** when blended learning is implemented via accessible platforms like WhatsApp. Both urban and rural students showed

comparable gains, indicating that mobile-supported learning can reduce geographic inequalities in educational opportunity.

The results point to the potential of WhatsApp-supported blended learning to transform science education in Türkiye by enhancing flexibility, promoting student engagement, and democratizing access to quality instructional content.

SUGGESTIONS

In light of these findings, the following recommendations are proposed for educators, policymakers, and curriculum designers:

- **Science educators should integrate mobile-supported blended learning tools, particularly WhatsApp, into their instructional practices.** Doing so can increase student participation, facilitate outside-class engagement, and support individualized learning needs.
- **Pre-service and in-service teacher training programs should emphasize digital pedagogy and mobile integration**, ensuring that teachers are equipped to design and manage effective blended learning environments.
- **Educational policymakers should prioritize equitable access to digital infrastructure**, including internet connectivity and smart devices, especially in rural and under-resourced regions. This will allow blended learning models to function effectively regardless of geographic disparities.
- **Instructional materials should be designed with gender sensitivity and inclusivity in mind**, avoiding assumptions about students' technological abilities or learning preferences based on gender.
- **Further research should be conducted on long-term outcomes** of WhatsApp-supported learning, including its impact on motivation, scientific reasoning, and collaborative learning. Comparative studies between different science sub-disciplines (e.g., physics, biology, chemistry) could provide deeper insights into content-specific effectiveness.

In conclusion, WhatsApp-supported blended learning represents a viable, accessible, and impactful instructional model for secondary science education in Türkiye. With proper implementation, this approach holds great promise for improving student outcomes, enhancing pedagogical effectiveness, and contributing to a more equitable education system.

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Ethics Statement: This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and adhered to the guidelines of academic research ethics. Prior to data collection, ethical approval was obtained from the Istinye University Ethics Committee, Faculty of Education, under the protocol number ISU-EK-2025/34, dated March 14, 2025.

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