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The Positive Effect of Technology-Integrated Teaching on Students' Grammar Learning

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Abstract
The primary aim of this study is to examine and assess the impact of technology-integrated education on students' acquisition of grammatical skills. In this context, thirty students participated in this study; the stratified sampling method allocated 15 intermediate-level students to the control group, while another 15 students were assigned to the experimental groups. To assess the grammar proficiency of both groups at the start of the study, a pre-test was administered. The control group received traditional grammatical education centered around books, while the experimental group received grammar education utilizing mobile phones, smart boards, and technological applications. Although the pre-test analyses conducted at the start of the study did not reveal any notable distinction between the two groups, the post-test analyses using SPSS-7 and t-statistics calculations indicated a significant difference of .001 between the two groups. The control group experienced a 12.17% gain in grammatical level, while the experimental group showed a higher increase of 27.25%. Upon concluding the study, during the interview analysis conducted with the students, they expressed that technology-integrated grammar education is beneficial due to its flexibility, immediate feedback, and inclusion of video clips, quizzes, and sample essays pertaining to grammar.

Keywords: positive effect of technology, education, grammar, technology integrated teaching

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Introduction

Technology has become a revolutionary force in the quickly changing educational scene, altering conventional teaching methods and improving the learning process. Technology proves to be quite effective in the domain of grammar training (Kucuk, 2023). Several scholarly studies have extensively examined the impact of technology-integrated education on students' acquisition of grammatical skills (Janssen et al., 2021; Haggag, 2019; Kara, 2023). The incorporation of technology in education has granted students independence, dynamic engagement in classes, and fresh viewpoints (Chiu, 2021). Given the interactive, versatile, and adjustable nature of technology applications, along with the prompt response that students receive, their significance in education is highly crucial (Kara & Kucuk, 2023). The adaptability of technology is quite advantageous for educators in instructing grammar and assisting students (Saglam & Sert, 2012). Integrating technology into grammar training offers a significant advantage by providing students with personalized learning experiences that are specifically designed to meet their individual requirements and learning preferences.

Teaching English as a foreign language presents significant difficulties, particularly in properly communicating grammatical ideas (Daskan, 2023). The main factors contributing to this issue are the students' pessimistic attitudes, the complex nature of grammar concepts, and the disparities in grammatical structure between the target language and their mother tongue (Lee et al., 2022). Nevertheless, students typically view grammar teaching as monotonous. A major contributing factor to this problem is the absence of educational enhancements in the course syllabus, along with the exclusive dependence on a solitary textbook as the lone reservoir of information. Undoubtedly, it is crucial to recognize that the teaching of grammar has a significant impact on the development of language proficiency (Ahmad, 2020).

Integrating technology into grammar training offers a significant advantage by providing students with personalized learning experiences specifically designed to meet their individual requirements and learning preferences (Celik et al., 2022). Traditional one-size-fits-all approaches frequently fail to accommodate the various levels of language proficiency and individual preferences in a classroom. Technology enables educators to design adaptive curricula that adapt to each student's progress and requirements (Kucuk, 2023). Interactive platforms and applications can assess a student's current knowledge of grammar, identify areas of weakness, and design individualized courses that build on existing skills while addressing specific challenges. This individualized strategy not only improves student engagement but also facilitates more efficient and effective grammar acquisition (Tuan & Doan, 2010).

Active engagement is another crucial aspect of effective grammar instruction, and technology offers novel methods to encourage it. Through the use of interactive applications, gamified platforms, and multimedia resources, inert learning is transformed into active participation. As illustrated by the research of Prensky (2003) on digital game-based learning, platforms that simulate real-world communication scenarios require students to use correct grammar in context-rich situations. This approach enables students to observe the practical applications of grammar in their daily lives, bridging the divide between theoretical knowledge and real-world communication. As students actively navigate grammar challenges and implement concepts in interactive environments, they gain a deeper understanding of linguistic nuances, resulting in enhanced language skills.

The significance of technology in grammar instruction extends beyond immediate educational advantages; it equips students with the necessary digital literacy skills for the

contemporary world. Effective communication in the digital age depends heavily on written and digital media, making grammar and online communication skills essential. Integrating technology into grammar instruction prepares students for the workplace communication requirements of the twenty-first century. Students who are familiar with word-processing tools, online collaboration platforms, and grammar-checking software can not only communicate plainly and effectively but also confidently navigate the complexities of digital communication (Kucuk, 2023).
This study aimed to address the following questions:

1. Does the integration of technology in education positively impact the teaching of grammar to students?
2. Are there significant differences between technology-integrated grammar instruction and teacher-centered grammar education?

Literature Review

The use of technology in language education has created new opportunities for engaging and productive learning. Grammar principles can be presented and practiced using various digital methods, including interactive apps, online platforms, and multimedia presentations. Warschauer (2006) claims that technology can improve language learning by facilitating realistic conversation, individualized education, and real-world language use.

Multiple studies have emphasized the advantages of incorporating technology into grammar instruction. According to a study by Stockwell (2007), mobile-assisted language learning enhanced learners' comprehension and retention of grammar. Technology enables dynamic and interactive exercises with immediate feedback and adaptive content delivery, thus catering to various learning styles (Borg & Burns, 2008).

In addition, integration technology into grammar instruction offers the invaluable benefit of providing students with immediate and constructive feedback (Kucuk, 2024). Real-time feedback is essential to effective learning because it enables students to identify and correct their errors in real-time. Due to time constraints, traditional classroom environments limit the teacher's ability to provide immediate feedback to each student. However, technology-driven grammar tools, as demonstrated by Kulik and Kulik's (1991) research on the efficacy of educational technology, allow students to receive immediate feedback on their grammar exercises and assignments. This immediate corrective feedback not only reinforces correct grammar usage but also assists students in internalizing grammatical rules and concepts, resulting in a deeper understanding and enhanced writing and speaking abilities (Çelik, 2022).

In a study conducted in Japan by Underwood (2017), the impact of communicative courses on pupils' grammatical development was examined. Four public and private school teachers participated in this 16-month study. This study has revealed significant changes in the way that students who acquire grammar through communicative approaches do so. Grammar is a part of everyday life, has been the focus of numerous academic research in the past and present, and continues to be significant today. The four fundamental linguistic skills of writing, speaking, listening, and reading are all impacted by technology. Technology integration in these crucial sectors provides benefits and drawbacks. For successful communication, Dontcheva-Navratilova (2012) emphasized the need to understand and correctly use grammatical norms. She then proceeded. Correct grammar usage facilitates proper communication by enabling us to

comprehend what the other person is trying to say.

Grammar instruction that integrates technology frequently involves interactive learning environments in which students actively engage with digital content. Students can investigate grammar rules and concepts at their own pace in these environments, which promotes self-directed learning. Not only do gamification elements such as quizzes, puzzles, and simulations make learning enjoyable, but they also promote a deeper level of comprehension (Reinders & Wattana, 2014).

In a study they conducted, Saeedi and Biri (2016) revealed that students gain grammar knowledge through videos they watch using technological devices, especially sitcoms. In these studies, there were 34 participants, 17 as the control group and the other 17 as the experimental group. While the control group was taught grammar topics with various methods, the experimental group was tried to be taught conditional sentences with sitcom videos. As a result of the study, it was shown that the students who tried to learn grammar topics with videos showed a visible difference and learned better than the control group. In a separate study, the significance of technological instruments in foreign language instruction, particularly grammar instruction, was highlighted. In addition to the significance of technological instruments, it is suggested that educators be receptive to such innovations and incorporate them into the curriculum. Thus, it has been determined that the student's learning methods will be enriched, and education will become more enjoyable (Armstrong & Yetter-Vassot, 1994).

While technology offers promising opportunities for grammar instruction, obstacles remain (Celik, 2023). Levy and Stockwell (2013) suggest that an excessive reliance on technology may hinder the development of face-to-face communication skills. Additionally, unequal access to technology may aggravate educational disparities. Educators must, therefore, select and design technology-integrated activities with care to ensure inclusivity and rich learning experiences.

Methodology

Participants

Students at the Language Preparatory School of Tishk University in Iraq participated in this study. A total of 30 pupils participated in the research. According to the Oxford Common Standards, all students were at an intermediate level; 15 were assigned to the control group and 15 to the experimental group by using the Stratified random sampling method. All of the students are Kurdish, and they are capable of expressing themselves fluently in English.

Research Instruments

The study employed a mixed-method design. Prior to launching the research process, the participants were provided with an explanation regarding the objectives of the study. Subsequently, they were assigned to either the control or experimental groups based on the stratified random sampling technique. The students in the control group engaged in teacher-centered classes that employed conventional instructional approaches, following the prescribed curriculum outlined in the grammar book. The experimental group was provided with technology-based instruction utilizing smart boards and mobile phones. A pre-test was administered to gauge the initial proficiency levels of the students prior to the start of the research. Subsequently, a post-test was employed at the conclusion of the study to acquire quantitative data, which was then utilized to investigate the alterations in their grammatical proficiency. Upon the conclusion of the study, a semi-structured interview was administered through the utilization of Google Forms in

order to elicit perspectives and qualitative information from the students. The responses provided by the students were carefully documented.

Findings

The results obtained in this section are collected under two main headings. First, pre-test and post-test results were analyzed using SPSS 7 t-statistics. Secondly, semi-structured student interviews were analyzed. The results obtained are as follows.

Table 1. *Pre-test and post-test analyses of students.*

Variables	**Measurement**	***N***	***M***	***SD***	***t***	***df***	***p***
Pre-test	Control	15	58.58	12.369			
Pre-test	Experimental	15	60.83	13.176	-327	22	.670
Post-test	Control	15	70.75	5.396			
Post-test	Experimental	15	88.08	6.501	-6.384	22	.001

Table one presents the outcomes derived from the pre-test and post-tests administered to the students in both the control and experimental groups. Based on the computed t-statistic values, the outcomes of the pre-test administered to the students before the beginning of the study, with the aim of assessing their grammatical proficiency, indicated that the levels of the control and experimental groups were very similar. Based on the statistical analyses conducted using SPSS-7, the mean score for the control group was found to be 58.58, while the experimental group exhibited an average score of 60.83. The findings indicate that the students were appropriately allocated into groups.

Upon the conclusion of the five-week study, a post-test, which was developed by Oxford University Press and evaluated by proficient educators, was administered to determine if any disparities existed between the control group and the experimental group. Based on the T-statistics calculations, it can be shown that the control group's level exhibited a rise from 58.58 to 70.75, indicating a percentage increase of 12.17%. The experimental group showed a notable improvement in their grammatical proficiency. Based on the findings from the post-test assessment, it was observed that the experimental group exhibited a noteworthy improvement in their level, as indicated by an increase from 60.83 to 88.08. This change signifies a statistically significant growth of 27.25%. Based on the t-statistics calculations conducted using SPSS, a statistically significant difference of .001 was observed between the two groups. Based on the findings presented it can be concluded that the incorporation of technology in grammar teaching yields a significant improvement in students' grammar proficiency.

Interview Analysis

In this section of the study, students were questioned about their opinions on technology-integrated grammar instruction. The students responded to the questions using Google Forms, and their responses were recorded. The results obtained according to the answers given by the students

to the interview questions can be examined in two paragraphs as the advantages and disadvantages of the technology.

Most students reported that technology-integrated grammar learning was interesting and interactive for them. Participants reported that using online applications in grammar lessons enabled more dynamic and personalized learning environments. According to the answers obtained from the students, they reported that technological tools and applications were very useful as they instantly answered students' questions and provided constructive feedback for the mistakes they made. In addition, they reported that online applications offer rich resources in terms of content, such as videos, quizzes, example sentences, and sample essays. Finally, they stated that the flexibility of online grammar platforms to be accessible anytime and anywhere is the most significant advantage for students.

In addition to the mentioned benefits, it is apparent from the responses provided by the students that some worries are present among the student population. One of the primary worries expressed is the potential for increased reliance on technology among pupils, leading to a significant decrease in face-to-face interactions with both teachers and peers. It is noteworthy that certain pupils have claimed that there is a negative effect on their handwriting abilities due to their addiction to technology. While our study group did not encounter this issue, certain students expressed concerns about the ability of financially disadvantaged students to keep up with technological advancements, perhaps leading to educational disparities and falling behind their peers.

Discussion

According to the results obtained from the pre-test, post-test and student interviews applied in the study, technology-integrated grammar teaching has a positive effect on students' grammar acquisition.

Based on the analysis of pre-test and post-test findings using SPSS-7, it can be concluded that technology-integrated grammar learning offers greater benefits compared to traditional instructional approaches. The findings of this study align with the findings of Ilmi et al. (2023), Bahari and Gholami (2022), and Khodabandeh and Tharirian (2020) since they all reported comparable results in their respective investigations. One notable observation is that students increasingly embrace the use of technology in education, and it has been found to enhance their academic progress. Based on the T-statistics calculations, it was observed that the control group exhibited a 27.25% rise in grammar level. Additionally, a marginal difference of .001 was noted between the control group and the experimental group. According to Hashim et al. (2019), there is evidence to suggest that incorporating games and technological applications into grammar instruction yields several advantages for students. These benefits include enhanced student motivation and a more enjoyable learning experience. In addition, in the study, since the students' mobile phones were positively integrated into the lesson, they were prevented from dealing with unnecessary information and using technology with useless materials.

The second part of the study used semi-structured interviews to get students' thoughts about technology-integrated grammar learning. Similar to the Shatri (2020) study, students discussed the benefits and drawbacks of technology. According to studies by Al Rawashdeh et al. (2021), there are more benefits than drawbacks to technology-integrated education.

During the interview, the students expressed that classes that incorporated technology enhanced their level of engagement and made the lessons more enjoyable. The feedback received

from students yielded comparable findings to the research done by Tuma (2021). Both studies concluded that incorporating technology into education had positive effects on both students and teachers. Additional data has surfaced indicating that the technological tools utilized by students were beneficial due to their ability to provide pupils with prompt feedback and promptly rectify grammatical problems. According to Wood and Shirazi (2020), in our current technology era, students have a preference for expediency and tend to avoid activities that involve waiting or using time. One of the most advantageous features of technology-integrated grammar education is its flexibility (Veletsianos & Houlden, 2019). According to the interview findings, students have the freedom to obtain grammar-related answers to their inquiries at their convenience, without any limitations. Integrating technology into education can be both time-consuming and challenging (Müller & Mildenberger, 2021). Although considerable time and effort are invested, students affirm that technology-integrated grammar teaching is beneficial due to its facilitation of easy access to films, clips, previously written samples, and automated grammatical correction apps.

Although technology-integrated grammar education has its advantages, there are issues raised by pupils based on the collected data. The study we conducted shares common characteristics with several studies conducted on this subject (Al Rawashdeh et al., 2021; Tang & Foley, 2022; Somjai & Soontornwipast, 2020). According to students, the use of technology in grammar study resulted in a reliance on technological devices and a decrease in self-assurance. Another issue arising from the acquired data is that technology diminishes the children's engagement with both their teachers and classmates. In their study, Chubb et al. (2020) highlighted the role of technology in enhancing interpersonal interaction. However, our investigation yielded contrasting findings. Further examination of interviews has also uncovered an additional finding: pupils lacking enough financial resources will be unable to reap the advantages of technology-integrated education compared to their peers. In their study, Ferri et al. (2020) found that students from disadvantaged economic backgrounds experienced a significant educational setback, particularly during the COVID-19 pandemic. This was mostly due to their lack of access to technology gadgets and reliable internet connection at home, which hindered their ability to benefit from online education fully. The responses provided by students during the interview and the findings reported by Ferri et al. (2020) were consistent. Both findings indicate that in order for students to attain an equitable education, they must have equivalent economic circumstances. What sets this study apart from others is that certain students expressed that incorporating technology into education hindered their ability to develop and enhance their handwriting skills.

Conclusion

The detailed literature study, pre-test and post-test findings, and semi-structured interview analysis conducted on the students demonstrated that technology-integrated grammar education has a good impact on improving the students' grammar proficiency. Upon individual examination of the studies, it was found that the pre-test results administered at the start of the study indicated that the students' levels were statistically equivalent based on t-statistics calculations. Following the five-week study, the students were provided with a post-test that was developed by Oxford University Press and reviewed by an expert. The pre-test and post-test data were analyzed using the Spss-7 analytic software. Based on the acquired data, the control group had a slight increase, whereas the experimental group demonstrated a significant 27.25% increase. Based on the T-statistics calculations, there was a statistically significant difference of .001 seen between the

control group and the experimental group. Based on the collected data, it was shown that incorporating technology into grammar teaching had a beneficial impact on the students' grammar proficiency.

In the second phase of the study, semi-structured interviews conducted with the students likewise yielded remarkable findings. Contemporary students affirm that incorporating technology into language study is interactive and entertaining due to their aversion to monotony. The salient data reveals that pupils adeptly resolve any grammatical issues quickly by utilizing the programs at their disposal. They asserted that they could readily repair their grammatical problems and that they could get this information anytime and anywhere owing to the internet. Technology-integrated education offers the advantage of being adaptable and providing a wealth of information. Within this framework, students expressed their ability to retrieve videos, clips, essays, and other relevant papers relating to various grammatical topics. Furthermore, they highlighted their capacity to compare these resources with alternative possibilities.

Furthermore, with the benefits provided by technology, certain issues have been recognized. The interview results revealed that those students developed a dependency on technology and experienced a decline in their self-assurance. Another issue of concern is that technology diminishes students' engagement with peers and instructors. The source of students' uneasiness stems from their overreliance on technology devices. It is an undeniable reality that pupils do not all possess identical economic circumstances. The interview analysis revealed that pupils with low income are unable to reap the benefits of technology fully. It is now recognized that kids who are too reliant on technology tend to lose their physical dexterity and struggle to enhance their handwriting abilities.

Upon thorough examination of SPSS data and interview analyses, it becomes evident that technology provides students with a plethora of benefits while also raising a few worries. However, the advantages of technology exceed the downsides.

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I declare that there is no conflict of interest.

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