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The Effect of Technology-Supported Language Learning on Communication Competencies

Teknoloji Destekli Dil Öğreniminin İletişim Yeterlilikleri Üzerindeki Etkisi

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Abstract: This study aimed to explore how technology-supported language learning affected the communication competencies of tertiary-level students. 48 prep-class students at the ELT department at a state university in Turkiye participated in the study. A mixed-method sequential explanatory design was employed to collect data that lasted 12 weeks. The quantitative data were obtained through a pre-questionnaire, a pretest and a posttest, and semi-structured interviews were used to collect qualitative data. The quantitative analysis showed that despite the improvement in the students' performance, a statistically significant difference was not found between the scores of the experimental and control groups concerning their communication proficiency levels. However, the conventional content analysis indicated that technology-supported language learning provided the participants with a rich content, enhanced interaction, collaboration, individualization, an enjoyable learning setting, an opportunity to see progress and flexibility in terms of time and space. Based on the findings of this study, it is recommended to integrate technology into the language learning process for the improvement of communication skills.

Keywords: Technology-supported language learning (TSLL), communication skills, listening skill, speaking skill

Öz: Bu çalışmanın amacı, teknoloji destekli dil öğreniminin yükseköğretim öğrencilerinin iletişim yeterliliklerini nasıl etkilediğini araştırmaktır. Çalışmaya Türkiye'deki bir devlet üniversitesinin İngilizce öğretmenliği bölümündeki 48 hazırlık sınıfı öğrencisi katılmıştır. Veri toplamak için 12 hafta süren karma yöntemli sıralı açıklayıcı bir araştırma deseni kullanılmıştır. Nicel veriler ön anket, ön test ve son test aracılığıyla elde edilirken, nitel verileri toplamak için yarı yapılandırılmış görüşmeler kullanılmıştır. Nicel analiz, öğrencilerin performanslarındaki iyileşmeye rağmen deney ve kontrol gruplarının iletişim yeterlilik düzeylerine ilişkin puanları arasında istatistiksel olarak anlamlı bir fark bulunmadığını göstermiştir. Bununla birlikte, geleneksel içerik analizi, teknoloji destekli dil öğreniminin katılımcılara zengin bir içerik, gelişmiş etkileşim, iş birliği, bireyselleştirme, eğlenceli bir öğrenme ortamı, ilerlemeyi görme fırsatı ve zaman ve mekân açısından esneklik sağladığını göstermiştir. Bu çalışmanın bulgularına dayanarak, iletişim becerilerinin geliştirilmesi için teknolojinin dil öğrenme sürecine entegre edilmesi önerilmektedir.

Anahtar Kelimeler: Teknoloji destekli dil öğrenimi, iletişim becerileri, dinleme becerisi, konuşma becerisi

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Introduction

Technology plays an indispensable role in various aspects of individuals' lives, driven by the advancements and demands of the 21st century. Its pervasive presence cannot be overlooked. The ever-growing array of technological tools has revolutionized the way individuals live, work, access information, communicate, and interact. Consequently, people are increasingly inclined toward technology, and they progressively acquire or develop their digital literacy (Iivari et al., 2020). The integration of digital tools into education has also been a result of advancements in technology (Bernacki et al., 2020; Haleem et al., 2022). The prevalence of mobile technologies and wireless communication has irreversibly transformed the way educators teach. In other words, the educational process, institutions' structures and functions, learning environments, sources and materials, as well as the roles of teachers and students, have undergone significant alterations to meet the needs and expectations of people who have become more familiar with using technology (Smith et al., 2020; Srebnaja, 2020; Yang, 2018). This change arises not only from the characteristics of digital learners but also from the advantages offered by technology such as providing rich context, fostering student participation and interaction (Schreiber & Jansz, 2020; Zhang & Zhou, 2022).

The field of language education has greatly benefited from the integration of technology, which is widely acknowledged as one of the most influential factors in this domain (Shadiev & Yang, 2020). The integration of technology into language education is no longer a mere trend but a necessity due to its potential to enhance learners' language proficiency. Considering the demands of the globalizing world, effective communication skills have become increasingly crucial. Mere knowledge of language rules is not sufficient; individuals need to actively use the language, which primarily involves the development of communication competence. Unfortunately, in traditional learning environments, there is a limit to access to sources and exposure to the target language. However, digital tools have the potential to minimize the factors that prevent individuals from interacting effectively. These tools can enhance learners' understanding of common words (Sari & Aminatun, 2021), improve their pronunciation (Alemi & Khatoony, 2020; Rahmania & Mandasari, 2021; Wongsuriya, 2020), and facilitate the development of fluency and accuracy in their speech (Cadena Aguilar et al., 2019). Technological tools offer abundant multimodal resources, allowing for extensive practice within the limited course time (Marek & Wu, 2019). They also play a prominent role in providing opportunities for authentic target language practice and facilitating interaction with native speakers or other EFL learners (Lin et al., 2022; Yeh & Lai, 2019).

Building on the broader understanding of technology's impact on language education, specific studies have delved into various aspects of technology-supported language learning,

shedding light on its effectiveness and benefits for learners' language proficiency. For example, Xu et al. (2017) examined Chinese learners' perceptions of mobile-assisted feedback on speaking skills. The findings revealed that learners gained confidence in speaking when receiving feedback through mobile devices. In their meta-analysis, Mahdi and Khateeb (2019) assessed the overall effectiveness of computer-based instruction in pronunciation learning and training by comparing computer-based and traditional teaching methods through 20 studies, including a total of 1014 participants. The results indicated that despite the positive effect of computer-assisted instruction on pronunciation, it was more beneficial for beginner and intermediate level learners. Yeh and Lai (2019) studied the effects of online tutoring on the development of speaking skills and comprehension. It was concluded that negotiation facilitated practice in a more fluent and accurate way. Pratama et al. (2020) examined the role of YouTube as an effective tool in the educational process, specifically for enhancing college students' listening skills. The results highlighted the benefits of incorporating YouTube into classrooms such as capturing students' attention, promoting creativity, and covering educational materials comprehensively. In their study, Van et al. (2021) investigated the effectiveness of using technology in integrated language learning, and the findings showed that despite an overall increase in the students' performance, listening skills were the ones that improved most. Agustin and Ayu (2021) used Instagram as a ubiquitous tool to improve vocabulary and listening skills and concluded that a range of materials enabled students to access authentic materials and engage through captions and videos. Similarly, Sosas (2021) utilized technology in teaching speaking skills and studied its impact on the speaking development of English language learners with different proficiency levels. It was concluded that the use of technology in teaching speaking aligned with a communicative approach, facilitating students' effective and competent communication skills.

In relation to communication competence in the national context, Incecay and Kocoglu (2017) examined whether different types of input delivery, audio only, audio with video, audio with video also including subtitles and audio with a PowerPoint presentation, affected the students' listening comprehension. The results indicated that students who had subtitles in the videos performed worse compared to those exposed to other delivery types. The highest scores were observed among students who received audio with a PowerPoint presentation. In their study focusing on the impact of authentic materials on listening comprehension, Gunduz et al. (2017) concluded that the authentic content was motivating for the learners as they encountered real life situations. Gonulal (2020) explored the impact of podcasts and vodcasts on the listening skills and extensive listening of 49 EFL students in a year-long study. The results showed that although podcasts were widely preferred compared to vodcasts, both had a positive effect on the students' performance in different skills including pronunciation and word knowledge. Demir and Tavil (2021) similarly focused on the listening skills of EFL students in a comparative study in which technology-based sources enabled students to have slightly higher scores. Gezer and Anilan (2021) used digital materials to improve young learners' listening comprehension and the findings revealed that the use of digital materials had a positive influence on students' listening comprehension, attention and motivation levels.

In summary, these studies demonstrate the multifaceted benefits of technology in language education, ranging from improved speaking confidence through mobile feedback to the effectiveness of computer-based instruction for pronunciation. They also emphasize the role of multimedia resources and social media platforms in enhancing various language skills, including listening, vocabulary, and speaking. They highlight the significance of considering the delivery format, incorporating authentic materials, and utilizing audiovisual resources to motivate learners and improve their listening proficiency in diverse educational contexts.

Based on the studies in the relevant literature, it can be said that there is considerable amount of research focusing on the effectiveness of technology in language learning. However, a closer examination reveals that these studies predominantly focus on aspects such as perceptions and attitudes towards digital tools, motivation, autonomy, and overall achievement levels (Lamb & Arisandy, 2020; Stockwell & Reinders, 2019; Sun & Gao, 2020; Wang et al., 2021). Literature on technology integration also presents studies in relation to different language skills: reading comprehension (Bozorova & Salixova, 2019; Gutiérrez-Colón et al., 2023; Klimova & Zamborova, 2020; Li, 2022; Pardede, 2019; Taylor, 2021), vocabulary knowledge (Alam & Mizan, 2019; Cakmak et al., 2021; Hao et al., 2021; Iravi & Malmir, 2023; Merzifonluoglu & Takkac Tulgar; 2022) and writing skills (Elkot & Ali, 2020; Kessler, 2020; Shin et al., 2021; Strobl et al., 2019).

When it comes to examining the influence of educational technologies on targeted skills, listening and speaking, there are relatively fewer studies in which the impact of technology is dominantly explored through either numeric data or learners' opinions. In addition, there is scarcity of mixed-method studies in the existing literature, which has a great potential to explain the relationship between technology use and language improvement statistically and support that relationship with learners' insights. This gap highlights the need for comprehensive investigations that utilize both quantitative and qualitative approaches. Setting out from the conclusions in relation to the existing research, the current study aims to examine the effect of technology-supported language learning on the improvement of listening and speaking skills and provide valuable insights for researchers in the field.

With the existing research gap in mind, the primary goal in this study is to explore the influence of technology on ELT students' communication competence. By raising awareness of educational technologies and their contributions, the study aims to explore whether a more comprehensive and authentic language learning environment can be created with the support of technology. It is hypothesized that incorporating technology will enhance the communication competence of ELT students, leveraging the potential of versatile technological devices that offer numerous functions in the language learning process. In line with this aim, the study addresses the following questions to align with the aforementioned objectives:

1. Is there a significant difference between the experimental and control groups in terms of their success in communicative competence?
2. What are the students' perceptions of the integration of technology in developing communication skills?

Method

Research Design

The research was conducted with a sequential explanatory design. Therefore, quantitative data were complemented for a comprehensive explanation through the addition of qualitative data (Ozmen & Karamustafaoglu, 2019; Tashakkori & Teddlie, 2003). Consistent with this objective, the present study followed a sequential process of collecting and analyzing the data. The first phase involved the assessment of the students' achievements following the implementation while the second phase focused on their perspectives and opinions regarding technology-supported language learning.

Participants and Setting

The study group consisted of 48 prep class students (15 male and 33 female) attending listening and speaking courses at tertiary level. The study group was selected through purposive and convenient sampling methods. Employing these sampling methods, the study group was chosen with consideration for the constraints posed by limited time, resources, and available workforce, as acknowledged by Etikan et al. (2016). This deliberate approach allowed for the inclusion of participants from varied backgrounds, including gender, age, educational history, major, preferred mobile device usage, and motivations for engaging with technology. The participants' age distribution spanned from 17 to 25 years, offering a comprehensive representation of the age spectrum within the student population. By taking these multifaceted characteristics into account during the study's design, the research aimed to enhance the transparency and comprehensiveness of its methodology, thus contributing to the overall rigor of the investigation.

The prep class program was used as the research content. It consisted of 20 hours of instruction per week, covering grammar, listening, speaking, reading, and writing. The study focused specifically on the listening and speaking courses that were held for four hours each week. The classroom was equipped with an interactive board and Internet access, allowing students to utilize technology through their personal devices. The researcher took part as the course instructor and observer during the implementation. Technology was integrated into every phase of the course inside and outside the classroom while other instructors refrained from using technological tools to avoid interfering with the study's outcomes.

Data Collection Tools

As this study followed a mixed-methods research design, various data collection tools were utilized. The tools for data collection employed in the study are explained below.

Quantitative Data Collection Tools

Pretest

A pretest was administered to assess the students' proficiency levels in listening and speaking skills. The listening section, adapted from the TOEFL IBT and carefully reviewed by four experts in the field of language education, is comprised of three parts with a total of 20 questions. In the light of the experts' feedback, the questions were designed to assess the students' listening comprehension skills, with fill-in-the-blank activities. The second session of the pretest focused on speaking skills. That section was aligned with the objectives and content of the prep class program. The topics for the speaking questions were selected based on the specific language skills and themes covered in the course. By using a bowl containing randomly selected questions, the administration of the speaking section aimed to introduce an element of randomness and minimize potential bias or influence in the question selection process.

Pre-questionnaire

A pre-questionnaire was administered to gather demographic information about the students including gender, age, the schools they graduated, their major, the technological devices they had and their common purposes for using technology. After the administration of the pre-questionnaire and pretest, the experimental and control groups having similar language proficiency levels were created. 24 students were included in each group.

Posttest

At the end of the semester, a posttest with two sections was conducted to evaluate the students' progress. The same listening questions included in the pretest were used to assess the students' performance. Two raters attended the oral exam. Students were instructed to select two topics and speak about them.

Qualitative Data Collection Tool

Semi-structured Interview

Semi-structured interviews were conducted to gain a more comprehensive understanding of the experimental group students' overall perceptions of technology-supported language learning. A total of 14 interview questions covering such issues as the students' perceptions of the course design, the impact of activities on their progress, deficiencies in terms of content and activities, suggestions for alternative applications, and changes in their attitudes towards using technology for educational purposes were carefully developed by the researcher. The interview questions were revised by the supervisor and another field expert to increase content validity, and the final version of the interview questions was obtained.

Data Collection Procedure

This study was carried out with the decision of Ethics Committee and approval of Erzincan Binali Yildirim University Rectorate Department of Student Affairs numbered 93368059-302.08.01-E.32875 and dated 12.07.2019.

The students first completed the pretest on the targeted skills, listening and speaking. The listening section was conducted in the morning for 40 minutes. After a break, the speaking section was completed. Each student was supposed to talk about the topics they chose for approximately six minutes. The whole process was audio recorded. A pre-questionnaire was administered in the second phase of the research.

The implementation, lasting a total of 12 weeks, began after forming the control and experimental groups. Four hours of face-to-face sessions were conducted per week. In terms of instructional approach, online resources were dominantly used by experimental group students in the classroom while more traditional instruction with minimal use of technology, primarily relying on paper-based materials, was preferred in the control group. Out-of-class activities, including audio files on the course content, speaking, and listening logs were also accomplished through technology in the experimental group. Students were required to answer some questions to confirm

their engagement with the listening materials. For speaking practice, two topic options were given to the students, and they were requested to record a minimum two-minute speech and submit it to the instructor on a weekly basis. For out-of-class activities in the control group, conversation tasks, based on the same topics covered in the experimental group, were given to enable the students to listen to each other and have speaking practice. This allowed the students to engage in discussions, listen to each other's perspectives, and actively participate in oral communication activities. In the final week of the semester, a posttest was administered. The first part focused on listening skills and was identical to the listening section of the pretest, aiming to assess students' proficiency levels in listening. Then, students attended an oral exam which included similar questions posed in the pretest speaking section.

In order to gather qualitative data at the end of the implementation, nine students having different achievement levels were chosen for the interview. The selection process took into account the students' willingness to participate as well as their levels of success. L1 was preferred for the semi-structured interviews to ensure students felt comfortable and could provide more detailed insights. Each interview was held in an office and lasted an average of six minutes. After completing the interviews, the researcher transcribed and translated the records, and member-check was followed to obtain the students' approval, which was to increase the trustworthiness of the data collection process.

Data Analysis

The quantitative data obtained from the pretest and the pre-questionnaire were subjected to statistical analysis and homogeneity tests. These analyses were performed separately for each aspect of the test and the questionnaire. The Shapiro-Wilk tests were conducted to assess whether the scores had a normal distribution as the sample size was lower than 50 (Buyukozturk, 2011). The results revealed that except for the data related to pretest speaking scores of the experimental group ($p = .003$, $p < .05$) and the pretest speaking scores of the control group ($p = .002$, $p < .05$), the data related to the pretest and posttest listening, and pretest speaking scores of the experimental group ($p = .230$, $p = .104$, $p = .727$, $p > .05$) and the pretest and posttest listening scores, as well as the posttest speaking scores of the control group ($p = .108$, $p = .126$, $p = .463$, $p > .05$) exhibited normal distribution. Based on the normality test results, parametric and non-parametric tests were employed.

Conventional content analysis, which involves systematically examining texts and other sources to uncover their explicit and implicit meanings (Simsek & Yildirim, 2011), was used for the analysis of the qualitative data. Initially, preliminary codes were generated. These codes were then combined into meaningful categories and broader themes by the researcher and the supervisor as the second coder to ensure the reliability and validity of the analysis.

Validity and Reliability

Multiple measures were implemented to increase the validity and reliability of the research:

- To ensure internal validity, both groups were carefully created by taking the students' characteristics into consideration. By equating the groups, a similar learning environment in which the same syllabus was also followed was established.
- To ensure external validity, the research model, data collection tools, data analysis and implementation process were explained in detail. In the qualitative data, non-random sampling was used to select interviewees who represented diverse perspectives and were representative of their respective groups.
- To ensure internal reliability, a rubric was utilized by two different raters, which provided detailed criteria for assessing important aspects such as pronunciation, fluency, and accuracy. The interview questions were modeled after structured or semi-structured questions used in previous studies, and they were further structured with input from external evaluators who were experts in the field. Furthermore, an inter-coding process was employed to enhance the reliability of qualitative data. Two raters independently coded the transcripts and then compared and discussed their codes, categories, and themes.
- To ensure external reliability, the findings were discussed appropriately in terms of their similarities and differences with other studies in the literature.

Findings

The findings of the study are presented in this section. The analysis of the data is organized according to the research questions. The findings showed that the experimental and control groups were similar in terms of language proficiency except for pretest speaking scores. The statistical relationships are shown in the tables and the evaluations are presented under the tables.

RQ1

RQ1 aimed to explore whether the scores of the students differed significantly after attending a technology-supported language learning process. A pretest and a posttest on listening and speaking skills were applied. In order to determine whether there is a statistically significant difference between academic achievement in the listening and speaking scores of the experimental and control groups, Dependent Sample T-test and Independent Sample T-test were conducted.

Table 1 findings demonstrated a significant improvement in the listening comprehension of the experimental group students, with their posttest scores differing significantly from their pretest scores ($t = -2.967$, $p = .007$, $d = .50$). Similarly, Dependent Sample T-test was conducted to compare the differences in pretest and posttest listening scores of the control group.

As indicated in Table 2, a statistically significant difference was observed between the pretest and posttest listening scores of the control group ($t = -2.806$; $p = 0.10$, $d = 0.62$). This suggests that the students exhibited increased proficiency despite being exposed to a conventional learning environment.

Table 1. Dependent Sample T-test Results for Pretest and Posttest Listening of Experimental Group

				95 % Confidence Interval of the Difference				
		M	SD	Lower	Upper	t	df	*p*
Experimental Group	Pretest listening-Posttest listening	-2.04167	3.37161	-3.46537	-.61796	-2.967	23	.007

Table 2. Dependent Sample T-test Results for Pretest and Posttest Listening of Control Group

				95 % Confidence Interval of the Difference				
Control Group		M	SD	Lower	Upper	t	df	*p*
	Pretest listening-Posttest listening	-1.62500	2.83706	-2.82299	-.42701	-2.806	23	.010

Table 3. Independent Sample T-test for Pretest Listening Scores

		Levene's Test for Equality of Variances				
		F	Sig.	t	df	*p*
Pretest listening	Equal variances assumed	11.005	.002	1.306	46	.198
	Equal variances not assumed			1.306	34.21	.200

Table 4. Independent Sample T-test for Posttest Listening Scores

		Levene's Test for Equality of Variances				
		F	Sig.	t	df	*p*
Posttest listening	Equal variances assumed	5.071	.029	1.622	46	.112
	Equal variances not assumed			1.622	43.07	.112

To determine the differences between the pretest listening scores of the two groups, an Independent Sample T-test was applied, and the findings are displayed in Table 3.

Based on the results, it was observed that there was no statistically significant difference in the pretest listening scores between the experimental and control groups (t (34.21) = 1.306, p = 0.198, d = .38). This analysis aimed to assess whether the groups had similar pretest listening scores, and the results supported the notion that the students in both the experimental and control groups exhibited similar pre-test listening achievements.

To examine the statistical significance of the difference in posttest mean scores of listening between the groups, an Independent Sample t-test was performed. The decision to use this test was based on the normal distribution assumption, which was confirmed as the p-values were greater than .05 for both the experimental group (p = 0.104) and the control group (p = 0.126).

As observed in Table 4, the p-value for the distribution variance was found to be 0.029 ($p < 0.05$), indicating that the assumption of homogeneous distribution variance for the posttest listening scores was violated. Therefore, the analysis considered the assumption of unequal variances. Despite a difference in the mean scores, there was no significant distinction between the students in both groups regarding their posttest listening scores ($t_{(43.069)} = 1.622$, $p = 0.112$, $d = 0.47$). This suggests that the experimental group students performed similarly to the control group students in the posttest listening task. In other words, technology-supported language learning did not yield a statistically significant difference in the students' listening comprehension.

For the analysis of the speaking scores that did not have a normal distribution, the Wilcoxon Signed-Rank Test was employed to compare the pretest and posttest speaking scores of the experimental and control groups, aiming to determine if there was any improvement within the group. Table 5 presents the findings belonging to the experimental group pretest and posttest speaking scores while Table 6 presents the findings of the control group pretest and posttest speaking scores.

As shown in Table 5, the significance value was found to be .000 ($p < .05$), indicating a statistically significant difference between the pretest and posttest speaking scores of the students in the experimental group.

Table 5. Wilcoxon Signed-Rank Test Results for Pretest and Posttest Speaking Scores of the Experimental Group

Z	-4.294[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

Table 6. Wilcoxon Signed-Rank Test Results for Pretest and Posttest Speaking Scores of the Control Group

Z	-4.289[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

Based on the data presented in Table 6, the significance value was found to be .000 ($p < .05$). The results indicated that there was a significant improvement in the speaking scores of the control group students between the pretest and posttests (p = .000, $p < .05$). Thus, it can be concluded that the students in the control group enhanced their speaking skills even without any specific intervention.

To assess the comparability of the groups before the intervention, the non-parametric Mann-Whitney U Test was conducted. The findings of this analysis are presented in Table 7.

Table 7. Mann-Whitney U Test Results for Pretest Speaking

Mann-Whitney U	279.500
Wilcoxon W	579.500
Z	-.188
Asymp. Sig. (2-tailed)	.851

As indicated in Table 7, no statistically significant difference in the pretest speaking scores between the experimental and control groups was found (U = 279.5, p = .851).

As the assumptions of ANCOVA were not violated for posttest speaking scores based on the results of multiple analyses, ANCOVA was used to statistically demonstrate the distinction between the two groups and to analyze the posttest speaking scores while controlling for the influence of the pretest speaking scores.

Table 8. ANCOVA Results for Posttest Speaking Scores

Predictor	Sum of Squares	df	Mean Square	F	P	Ƞ2
Corrected Model	17.992	2	8.755	1.634	.207	.068
Intercept	4272.995	1	4272.995	797.342	.000	.947
Pre-test speaking	10.759	1	10.759	2.008	.163	.043
Group	5.655	1	5.655	1.055	.310	.023
Error	241.157	45	5.359			

a. R Squared =.068 (Adjusted R Squared = .026)

As presented in Table 8, there was no significant difference in the students' posttest speaking scores ($F_{(1)} = 1.055$, $p > .05$). The effect size measure for this difference was found to be (Ƞ2) 0.023. Analyzing the effect size, it can be inferred that the independent variable had a small impact on the dependent variable. In simpler terms, the use of technology in developing speaking skills had a minimal influence on the students' academic achievement.

RQ2

RQ2 aimed to investigate the students' perceptions of the integration of technology in developing communication skills both inside and outside the classroom. Qualitative data, obtained through semi-structured interviews allowed for adaptable questioning to gather further insights based on the students' responses and engage in detailed discussions beyond a predetermined script. Based on the examination, four main themes were identified.

Theme 1: The attitudes towards TSLL

The first theme of the study focused on what the concerns, feelings and perceptions of the interviewees were and whether these aspects changed after the implementation. In this theme, the interviewees' statements are categorized into two main groups: "before the course" and "after the course." The related codes and categories are shown in Figure 1.

The data revealed that the interviewees had different perceptions of participating in a technology-supported course. In relation to the first code, anxiety, it was observed that many interviewees felt anxious at first because they were accustomed to using technology for various purposes, but not specifically for education. One interviewee (I3) shared her apprehension expressing fear of making mistakes due to her limited experience in technology-supported language learning. The second code, uncertainty, stemmed from the unawareness of the students of educational tools. It became apparent from the comments that the varying attitudes of the interviewees, particularly those unsure of their role, were primarily due to their limited understanding of and experience with educational technologies. Regarding the third and fourth codes in the "before the course" category, some interviewees expressed curiosity and excitement about participating in a technology-supported course while others had reservations about its implementation. One of the interviewees (I8) expressed her feelings as follows: *"Being immersed in a technology-rich environment attracted my attention and led to my excitement about attending the course. The prospect of exploring and engaging with technology further evoked my enthusiasm for this course."*

In the second category of this theme, the first code, satisfaction, indicated that the majority of interviewees shared a sense of gratification after experiencing the technology-supported learning environment. The interviewees expressed positive views on the effect of technology use, highlighting the advantages it offered. Some interviewees mentioned the benefits of recording and listening to their own speech, while others emphasized the interactive and engaging nature of the course. One interviewee (I6) commented on the entertaining learning process: *"I enjoyed incorporating technology into the learning and teaching process. I found it to be a delightful and entertaining experience. The lessons offered a sense of enjoyment and amusement."* By sharing a similar perspective, another interviewee (I2) commented on this code by indicating:

> *"The course exceeded my expectations and proved to be highly beneficial due to its abundant range of activities. One notable example was the opportunity to record and share my speech, which was a new experience for me. Through this course, I came to appreciate the value of monitoring my progress and found it to be an advantageous and rewarding aspect. This realization has led me to believe that the course was effective due to the practical experiences."*

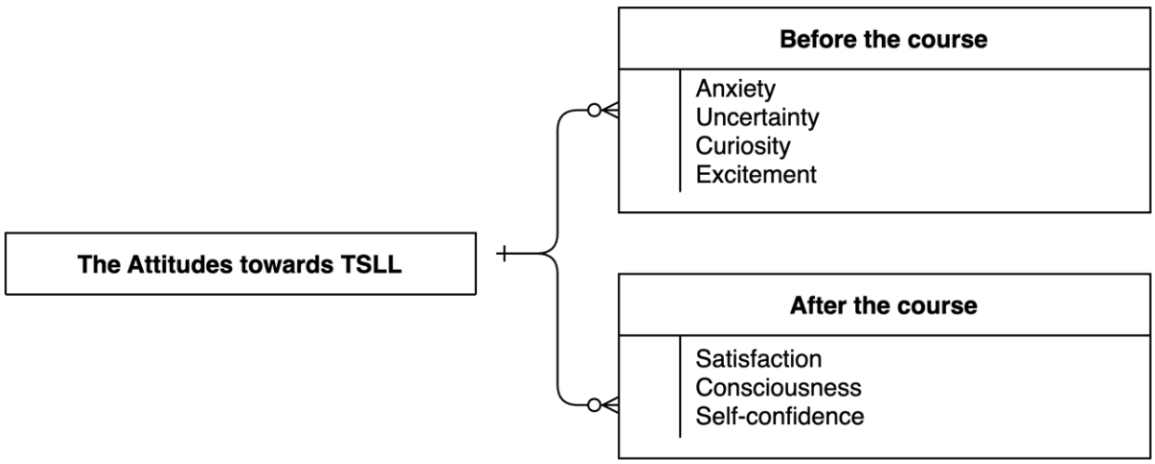

Figure 1. The attitudes towards TSLL

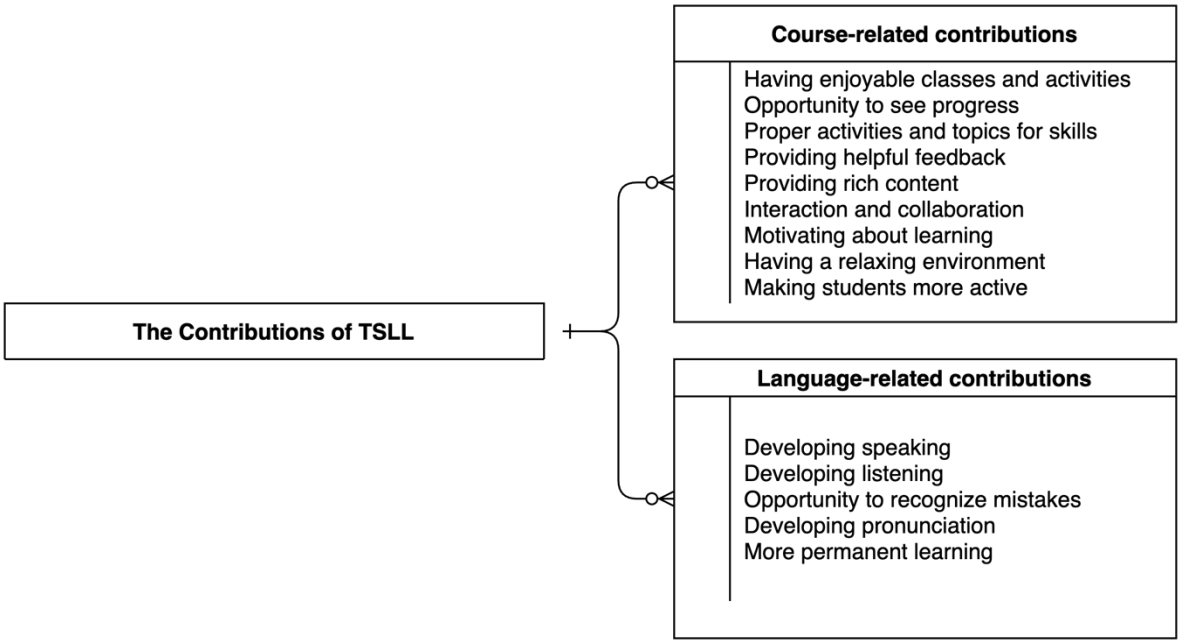

Figure 2. The contributions of TSLL

The second code, consciousness, reflected the interviewees' increased awareness of utilizing digital tools for educational aims. Through the integration of technology into the course, they became more conscious of its educational potential. One of the interviewees (I3) underlined his awareness by stating:

> *"I strongly oppose the technology-supported language learning as I believe it lacks practicality and usefulness. However, my perspective changed when I experienced technology being used in a classroom setting for learning purposes. Taking this course, I came to realize that technology can be effectively utilized both inside and outside the classroom, making the learning experience much more meaningful and practical. Overall, it was a highly rewarding experience for me."*

Self-confidence, the third code, highlighted the interviewees' increased confidence in using technology. Most students indicated that the experience of learning with technology and the positive outcomes they achieved boosted their confidence levels. One interviewee (I1) reflected his thoughts in the following way: *"Through the various activities and assignments in this course, my anxiety diminished, and my concerns about attending the course faded away. As a result, I have gained more confidence in my abilities."*

Overall, the analysis of the interviewees' perceptions before and after the course revealed a shift towards more positive attitudes and opinions. The interviewees experienced awareness, pleasure, and confidence as they gained knowledge and practical experience with educational technologies. Their initial hesitations were replaced by a greater appreciation of technology integration and its impact on their learning journey.

Theme 2: The contributions of TSLL

The second theme was related to the benefits of technology use in the language learning process. The data revealed two primary categories: "course-related contributions" and "language-related contributions". The related codes in each category are presented in Figure 2.

In terms of the first code in the first category, the interviewees expressed positive opinions about the course being fun and entertaining. One interviewee (I7) underlined the contribution of the course referring to the first code: *"The utilization of applications and websites on smart boards, along with the chosen activities, significantly enhanced the course's appeal, making it a highly enjoyable experience for me. I greatly appreciated the engaging nature of the lessons."* The second significant contribution, as indicated by the data, was the opportunity to see progress. The students acknowledged the usefulness of these tools in evaluating their progress and becoming more aware of what they had learned. One interviewee (I1) stated as follows: *"In certain circumstances, it is easy to overlook what we have learned and what we have not. However, thanks to the use of recordings and games, I gained insights into my progress. These tools proved highly beneficial."* Regarding the appropriateness of activities, the majority of interviewees agreed that the selected online activities, conducted through smartphones or smart boards, aligned well with the course content and targeted skills. Immediate feedback was another important aspect of the course. The interviewees noted that technology enabled them to receive immediate feedback and make improvements accordingly. One of the interviewees (I7) highlighted the role of feedback as the following:

> *"I submitted my assignments punctually and received feedback on all of them. I carefully reviewed the feedback, which also highlighted my errors. Thanks to the constructive feedback provided, I was able to avoid making similar mistakes in the future. The valuable feedback I received brought me satisfaction."*

The provision of extensive sources inside and outside the classroom was emphasized by the interviewees. They highlighted the use of smart boards, which allowed access to abundant visual materials and enhanced the learning experience. By pointing at the rich content, one of the interviewees (I9) stated its role with these sentences: *"I am naturally inclined towards technology, and in previous courses, we have been exposed to visual educational materials. Therefore, I find it much more appealing and beneficial to follow content from the smart board."* The students also mentioned the relaxing learning environment and enjoyable

activities as contributing factors to their satisfaction. Referring to the last code, one interviewee (I3) reported:

"Initially, I had concerns about actively participating in the activities. However, my perspective changed positively after attending the course. The integration of smart boards and interactive activities using our smartphones allowed us to take on more active roles during the course."

In the second category, the students highlighted the practicality and overall impact of technology-supported language learning on their performance. Related to speaking, they expressed increased confidence after engaging in various speaking activities, both in the classroom and through speaking logs. They recorded their own speech and listened to it, which was helpful in identifying and improving their speaking skills. The chance for repetition and excessive practice provided by technology was recognized as a key factor in their progress. Two interviewees highlighted the positive impact of this process on speaking skills with the following statements:

"I initially felt uncomfortable speaking in the classroom, but this course boosted my confidence through various in-class and out-of-class activities, including speaking logs. As a result, I became more at ease expressing myself in the learning environment and found it more productive" (I2)

"Voice recording positively contributed to my personal development. It played a significant role in boosting my self-confidence, especially since I had never spoken English before joining the prep class and had never heard my own voice in English. Initially, it felt somewhat uncomfortable, but with time, I became more comfortable. This course significantly improved my speaking fluency." (I9)

For the listening comprehension, the students highlighted the benefit of having access to a variety of audio files through technology. They mentioned that practices, listening logs and exercises, helped them improve their listening skills. One interviewee (I2) stated her experience with the following:

"At the beginning of this course, my listening skills were not particularly strong. However, I believe that the technology-integrated activities implemented in the course, along with the repetitive exercises, greatly contributed to the development of my listening skills."

Referring to another code in the second category, by repeatedly listening to audio files and taking notes, the students had opportunities to notice their mistakes. One of the interviewees (I5) stated: *"After repeatedly listening to my recorded speech, I became aware of my mistakes, which proved to be quite beneficial. This practice significantly contributed to the development of my speaking skill."* Referring to pronunciation skill, one interviewee (I2) emphasized its impact as follows:

"During the preparation of my speaking log assignments, I was not sure about the pronunciation of certain words. To address this, I repeatedly listened to my recordings and searched for the correct pronunciation. This process allowed me to recognize my mistakes, and I found that reviewing my own recordings acted as a form of reinforcement."

Some interviewees (I1, I2, I3) also indicated the beneficial influence leading to permanent learning especially with the help of the games.

Overall, the integration of technological tools in the learning process facilitated the students' progress not only in the target skills but also in other skills and sub-skills besides offering benefits such as exposure to rich context, visual aids, interactive experiences, collaboration opportunities, increased motivation, constructive feedback, and the ability to record and review their own speech. The students expressed satisfaction with the practical and enjoyable nature of the activities and the positive impact on their language development in different learning environments.

Theme 3: The drawbacks of TSLL

In the third theme, the disadvantages of integrating technology into the language learning process were examined. The data revealed two primary categories: content-related drawbacks and course-related drawbacks. The related codes are indicated in Figure 3.

The analysis showed that most students had concerns about the heavy workload of assignments. The students mentioned difficulties in completing the assignments on a weekly basis, often due to technological issues such as Internet access or other technical problems. A quote from one of the interviewees (I5) confirmed the burden of assignments: *"The homework load should be decreased despite their positive impact on the performance."*

Referring to the second code, some interviewees mentioned issues such as Internet connection problems and application-related errors, which posed limitations. One interviewee (I7) pointed at this problem as follows: *"I consider the Internet connection as a limitation. Our class was situated far from the central building, making it somewhat challenging to establish a stable connection. Therefore, I would pinpoint the Internet as the sole issue."* Some students also acknowledged the potential for technology to be distracting in certain situations, which emerged as the code "distraction". One interviewee (I6) commented on this code with the following statements: *"The course was enjoyable and engaging. However, I found myself getting distracted by notifications, calls, and messages, especially during listening logs and recordings."*

Overall, the weekly assignments the students had to complete was stated as the main drawback in the course-related category in technology-supported language learning. Moreover, technological problems such as limited Internet connection or the use of various devices had a negative impact on the effective completion of some activities. The students also reported that using digital tools for particularly listening logs and recordings led to distractions with notifications, calls, and messages.

Theme 4: Suggestions for effective technology integration

The last theme is related to the students' suggestions for more effective technology integration. Two main categories were identified in this theme: content-related suggestions and course-related suggestions. Figure 4 presents the related codes in each category.

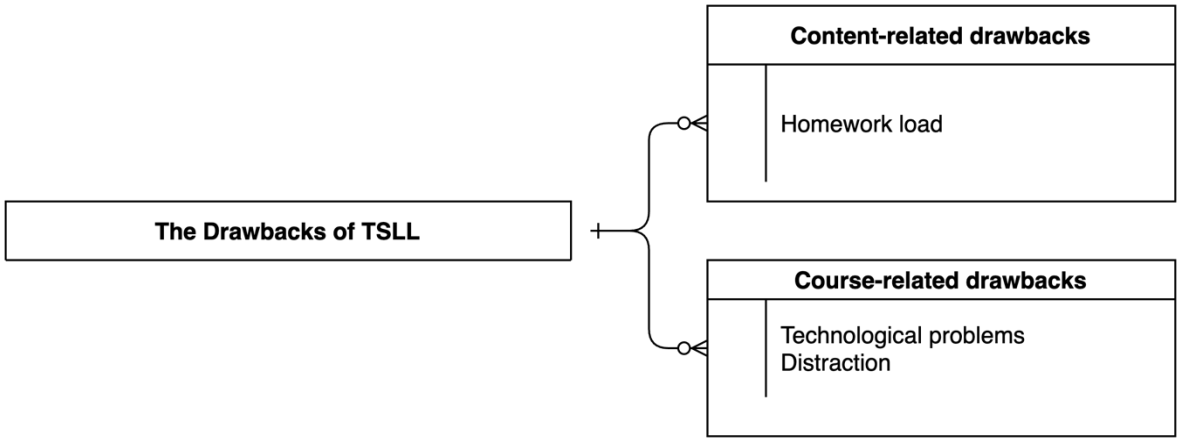

Figure 3. The drawbacks of TSLL

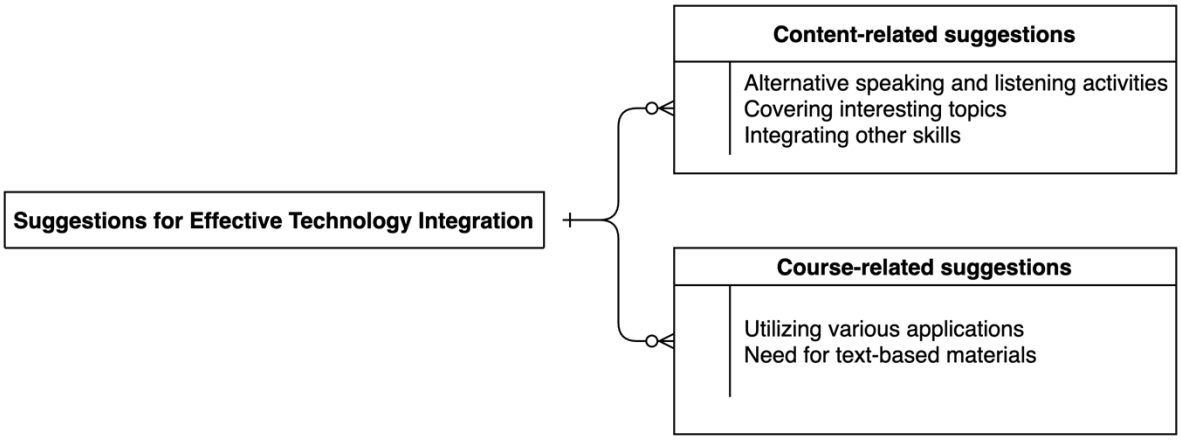

Figure 4. Suggestions for effective technology integration

As revealed in the first and second codes within the content-related category, the data indicated a desire for supplementary activities to enhance the targeted skills while the third code pointed at the inclusion of interesting topics. While most interviewees found the topics suitable and engaging, two students suggested incorporating more captivating topics into the course. They felt that the chosen topics could sometimes be restrictive. Additionally, some students emphasized the importance of comprehensive content in an integrated way. One interviewee (I1) expressed her thoughts in this way: *"From my perspective, grammar courses are commonly difficult to focus and study because most instruction is conducted through paper-based materials. However, if technology is integrated into the process, teachers can create funnier and more memorable learning environments."*

In the second category, the data highlighted the students' desire to utilize various applications and the need for paper-based materials, which were the two codes of this category. One interviewee (I6) recommended the use of different applications for a more effective learning process. Some interviewees expressed their need for printed documents due to Internet connection issues or for note-taking purposes. One of them (I1) expressed similar thoughts with these sentences: *"Considering the Internet connection issues, having a course material in a printed format would have been more beneficial for me. This way, I could easily refer to printed documents when needed."*

In summary, the students mostly exhibited positive attitudes towards the integration of technology in the language learning process, acknowledging its potential benefits for language proficiency improvement such as reaching various sources, improving the targeted skills, learning in an entertaining way and having a more engaging and flexible learning experience. However, some challenges related to technology use, such as distractions and technology-based problems, were also noted. Students provided valuable feedback and recommendations to optimize technology-supported language learning, emphasizing the importance of attractive content, diversity of the programs and applications utilized, and more integrated language instruction. Overall, the study underscores the significant role of technology in language education while emphasizing the need for careful planning and continuous improvement based on student needs and preferences.

Discussion and Conclusion

This study sought to investigate how technology instruction affected the development of students' communication competence. Furthermore, it was aimed to gain deeper insights on the implementation within and outside the classroom at the tertiary level. The subsequent section discusses the findings obtained from the students' opinions in relation to each research question.

RQ1

RQ1 aimed to investigate whether there were differences in the scores of the groups and a statistically significant difference was not found between the pretest and posttest scores belonging to the groups. The insignificant findings can be accounted for by Chamot's (2005) claim that enhancing communication competence is comparatively more challenging for students'

language proficiency. In this study, several factors may have impeded obtaining significant results such as students' inadequate knowledge, distractions, and limited integration of technology into the curriculum.

Considering the non-significant findings in the listening skill, one possible barrier can be the learners' inadequate knowledge of how to effectively use technology for enhancing their listening skills. Similarly, in terms of speaking skills, students primarily used their electronic devices to communicate in their native language rather than listening to their own speech, identifying grammar or pronunciation mistakes, and focusing on fluency, accuracy, and the accent. Students' unfamiliarity with the process and inadequate knowledge may have resulted in non-significant results in the posttest scores. This notion is reinforced by Shadiev and Yang's (2020) analysis, which emphasized the limited understanding among learners regarding the effective utilization of technological devices in language learning. Similarly, in Ahmed and Roche's (2021) study and Arono et al.'s (2022) study, digital literacy skills were presented as the most effective factor in the students' performance, success, and retention in higher education environments.

Another potential obstacle that may have impacted the results between two groups is the distraction experienced by learners while using technological devices. In the classroom setting and outside the classroom, the students in the experimental group may have been diverted by notifications, text messages, and phone calls during activities. Therefore, it can be deduced that distracting elements coming along with digital tools might have hindered their level of achievement. The findings of Murray et al.'s (2020) research indicated that distractions could potentially be the most influential factor in students' concentration and academic achievement. Hung and Nguyen's (2022) study supported this notion by stating that distracting elements should be taken into consideration to minimize the insignificant results. Similarly, in their study on the use of WhatsApp to increase achievement levels, Alamer et al. (2023) highlighted the potential of distracting factors in technology-mediated language learning.

The researcher may have encountered unsatisfactory results due to the limited integration of technology into course syllabuses and curriculum. In the context of the current study, participants were obliged to complete assignments to enhance their targeted skills within the course content. Aligning the content fully with the curriculum might have impacted the findings. This perspective is supported by Yang (2013), who contended that partial integration of digital tools in the learning process may yield insignificant results. Sharing a similar perspective, González-Lloret (2020) pointed at the effective impact of the full integration of technology into the learning process to promote learners' proficiency levels. Thus, integrating technological tools into the course syllabus emerges as an essential requirement to accurately evaluate the effectiveness of technology integration in language education.

In summary, it can be concluded that technology offers various advantages in the development of communication competence when learners are aware of the potential of digital tools as effective supporters in language learning process. However, it should be noted that the mere use of technological devices does not guarantee effective teaching due to various internal (e.g., motivation, beliefs, attitudes) and external factors (e.g., learning settings and teaching methods).

RQ2

RQ2 focused on the students' perceptions of technology integration in developing communication skills inside and outside the classroom. Based on the qualitative findings, four themes with different categories were formed: the attitudes towards TSLL, the contributions of TSLL, the drawbacks of TSLL and suggestions for effective technology integration.

Wang's (2017) investigation on the influence of mobile learning on learners' achievement and satisfaction levels corresponds with the results of the present study highlighting the relationship between the performance and the satisfaction level of the students. This may be attributed to the provision of learner-centered instruction and active engagement in the learning process, which likely contributed to student satisfaction. Similar findings regarding the correlation between technology utilization, academic success, and satisfaction were also observed in some other studies (Qi, 2020; Raygan & Moradkhani, 2022; Taghizadeh & Hasani Yourdshahi, 2020; Zhonggen et al., 2019)

The second consideration is about the contributions and many studies (Aydin, 2018; Dehganzadeh et al., 2021; Maican & Cocoradă, 2021) had similar results pointing at the entertaining role of technology in the learning process. Setiawan and Wiedarti (2020) yielded comparable conclusions in their research, demonstrating increased motivation and an engaging learning environment. Likewise, the utilization of technological devices with Internet access provided the students with abundant resources, immediate feedback and various activities tailored to their individual learning styles and pace. The benefits of technological devices also encompassed opportunities for interaction and collaboration, as highlighted by Sumardi and Muamaroh (2020), who emphasized the role of technology in facilitating interaction with native speakers or other speakers of English, fostering active learning. Additionally, through such interaction, students were able to enhance their pronunciation and gain insights into everyday use of the target language, which was affirmed by the findings of Bedenlier et al.'s (2020), Fansury et al.'s (2020) Zahra et al.'s (2020) studies.

The third consideration is related to the drawbacks faced during the implementation. Technological problems and distraction were indicated as the main barriers. The results of the current study align with those of Alfallaj and Alfallaj's (2020), Mendoze et al.'s (2018), Metruk's (2020) and Murray et al.'s (2020) in which excessive online engagement and distracting factors potentially affected the students' focus and overall achievement. Therefore, it can be inferred that while technological tools have proven to be effective in the learning process, they also have the potential to divert learners' attention and yield insignificant outcomes.

The final aspect discussed in relation to RQ2 pertains to the students' suggestions. The students expressed that incorporating alternative activities for the targeted skills would enable them to improve their competence. This highlights the potential of technology to provide learners with increased practice opportunities within limited duration (Akkara et al., 2020; Kessler, 2018; Nazari & Xodabanda, 2022). Different from a common belief in the facilitating role of technology, some students stated their need for paper-based materials. Considering the technological drawbacks and access issues that may be faced in the process, the students' request for text-based materials is understandable and aligns with their needs in overcoming such limitations.

In summary, the introduction of various technological devices has significantly transformed the process of language learning (Hwang et al., 2008). Consequently, technology-supported language learning is considered an effective approach that provides numerous benefits for teachers, instructors, and learners alike. It is crucial for educators to harness the advantages by involving technologies in their classrooms, and further extensive research should be conducted to enhance the development of language skills.

Implications and Further Research

Some practical implications are offered in this section. Teachers and instructors should specifically prefer technology-enhanced tools and applications offering audio and video content, interactive activities and speaking practice to improve listening and speaking skills. Teachers should encourage students to actively participate in technology-supported speaking activities such as voice recordings, video conferencing, and online discussions to enable them to gain confidence in expressing themselves in the target language and develop their communicative skills. The study provides pedagogical implications for the effective integration of technological tools. Teachers are advised to select interesting topics and activities to promote active listening and encourage students to engage in attentive listening. Through asynchronous speaking practice, speaking logs, teachers should support students to practice at their own pace and promote their fluency and accuracy by providing constructive feedback on their recordings. Teachers should create authentic speaking opportunities by using video conferencing tools to connect native speakers or other EFL learners and to have collaborative learning experiences beyond the classroom. These pedagogical implications enrich learners' language learning experiences and prepare them for effective communication in real-life situations.

In line with all the findings and students' perceptions and experiences, the following suggestions can be presented to expand the scope of future research:

- Longitudinal research should be conducted to see long-term effects of the implementation in tertiary level language education across different contexts.
- Research at different educational levels should be conducted to see differences based on educational levels.
- The effects of technology integration should be examined in an integrated language skill instruction.
- The influence of intrinsic and extrinsic variables that may be effective factors on the efficiency of the technology-supported learning should be investigated.

Author Contributions

The current study was a part of the first author's doctoral study, which was conducted under the guidance of the second author. Both authors had read and approved the final version.

Ethical Declaration

This study was carried out with the decision of Ethics Committee and approval of Erzincan Binali Yildirim University Rectorate Department of Student Affairs numbered 93368059-302.08.01-E.32875 and dated 12.07.2019.

Conflict of Interest

Both authors declare that there is no conflict of interest with any institution or person within the scope of the study.

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