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DEPARTMENT OF FOREIGN LANGUAGES
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MASTER'S THESIS

THE CONTRIBUTION OF AI VOICE-BASED CHATBOTS TO LISTENING COMPREHENSION SKILLS AND INTERACTIVE LISTENING STRATEGIES OF HIGH SCHOOL EFL LEARNERS

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ASST. PROF. GÜLÜMSER EFEOĞLU

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Beyzanur ASLAN tarafından hazırlanan “Ses Tabanlı Yapay Zekâ Sohbet Robotlarının Lise Düzeyindeki Yabacı Dil Olarak İngilizce Öğrenenlerin Dinlediğini Anlama Becerileri ve Etkileşimli Dinleme Stratejilerine Katkısı” başlıklı çalışma, **18/06/2025** tarihinde yapılan savunma sınavı sonucunda oybirliği ile başarılı bulunmuş ve jürimiz tarafından Yabancı Diller Eğitimi Ana Bilim Dalı İngiliz Dili Eğitimi Programında **YÜKSEK LİSANS** tezi olarak kabul edilmiştir.

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ABSTRACT

THE CONTRIBUTION OF AI VOICE-BASED CHATBOTS TO LISTENING COMPREHENSION SKILLS AND INTERACTIVE LISTENING STRATEGIES OF HIGH SCHOOL EFL LEARNERS

As artificial intelligence (AI) tools are integrated into English language instruction, enhancing listening comprehension and the use of interactive listening strategies in EFL settings becomes increasingly important. Although many studies on AI-assisted language acquisition have been conducted, few have explored how voice-based AI chatbots support the listening development of high school students (Yang et al., 2024; Tai & Chen, 2024). An embedded mixed-methods design was implemented to investigate the impact of AI voice-based chatbots on 10th-grade EFL students' listening comprehension skills and their use of interactive listening strategies. The study involved 129 A2-level EFL students from a public high school in Türkiye, selected through convenience sampling. Four intact classes were assigned to an experimental group (n=66) that participated in a ten-week listening intervention with the chatbot, while a control group (n=63) continued regular listening activities in class. Data collection tools included the Cambridge A2 Key English Tests, used as both the pre- and post-test for listening assessment to gather quantitative data. Additionally, a focus group interview was conducted for the qualitative strand. The SPSS software was used for qualitative data analysis, whereas thematic analysis was employed for qualitative data.

Quantitative results revealed that students in the experimental group showed a significant improvement in listening comprehension. Additionally, the experimental group outperformed the control group by achieving higher scores in the post-test for listening. Qualitative results uncovered predominantly favorable student perceptions regarding the authenticity of the chatbot, its interactivity, and support for listening improvement. Additionally, students actively employed various interactive listening strategies, including negotiation for meaning, top-down, bottom-up, fluency-maintaining, changing the topic, and self-repair. The study highlights that, in the EFL context, AI voice-based chatbots can serve as valuable tools for improving listening comprehension skills and fostering interactive listening strategies.

Keywords: English language teaching, listening comprehension, listening skills, artificial intelligence, voice-based chatbots, interactive listening strategies, English as a foreign language

ÖZET

SES TABANLI YAPAY ZEKÂ SOHBET ROBOTLARININ LİSE DÜZEYİNDEKİ YABACI DİL OLARAK İNGİLİZCE ÖĞRENENLERİN DİNLEDİĞİNİ ANLAMA BECERİLERİ VE ETKİLEŞİMLİ DİNLEME STRATEJİLERİNE KATKISI

Yapay zekâ (YZ) araçlarının İngilizce dil öğretimine entegre edilmesiyle birlikte, dinlediğini anlama becerilerinin geliştirilmesi ve etkileşimli dinleme stratejilerinin kullanımı, yabancı dil olarak İngilizce öğrenme bağlamlarında giderek daha önemli hale gelmektedir. Yapay zekâ destekli dil edinimine ilişkin çok sayıda çalışma yapılmış olsa da, ses tabanlı YZ sohbet botlarının lise öğrencilerinin dinleme becerilerinin gelişimini nasıl desteklediğini inceleyen araştırmalar oldukça sınırlıdır (Yang ve diğ., 2024; Tai & Chen, 2024). Bu çalışmada, ses tabanlı YZ sohbet botlarının 10. sınıf yabancı dil olarak İngilizce öğrenen öğrencilerinin dinlediğini anlama becerileri ve etkileşimli dinleme stratejilerini kullanımları üzerindeki etkisini incelemek amacıyla gömülü karma yöntem desenine başvurulmuştur. Araştırma, Türkiye'deki bir devlet lisesinde öğrenim gören ve uygun örnekleme yoluyla seçilen A2 düzeyinde 129 yabancı dil olarak ingilizce öğrenen öğrenciler ile yürütülmüştür. Dört mevcut sınıf, deney grubu (s=66) ve kontrol grubu (s=63) olarak atanmıştır. Deney grubu on haftalık sohbet robotu destekli dinleme uygulamasına katılırken, kontrol grubu dinleme etkinliklerine sınıf ortamında geleneksel yöntemle devam etmiştir. Nicel veriler, ön test ve son test olarak uygulanan Cambridge A2 Key English Test aracılığıyla toplanmıştır. Nitel veri toplama aracı olarak ise odak grup görüşmesi gerçekleştirilmiştir. Nicel veriler SPSS yazılımı ile analiz edilmiş, nitel veriler ise tematik analiz yöntemiyle incelenmiştir.

Nicel bulgular, deney grubundaki öğrencilerin dinlediğini anlama becerilerinde anlamlı bir gelişme gösterdiğini ortaya koymuştur. Ayrıca, deney grubu, dinleme son testinden elde ettikleri daha yüksek puanlarla kontrol grubunun üzerinde performans sergilemiştir. Nitel bulgular ise öğrencilerin sohbet robotunun özgünlüğü, etkileşimli yapısı ve dinleme becerilerini geliştirmeye yönelik desteği hakkında büyük ölçüde olumlu algılara sahip olduklarını ortaya koymuştur. Bunun yanında, öğrenciler anlam müzakeresi, bağlama dayalı ve dilsel çözümleme temelli, akıcılığı sürdürme, konuyu değiştirme ve öz-düzeltme gibi çeşitli etkileşimli dinleme stratejilerini aktif olarak kullanmışlardır. Çalışma, yabancı dil olarak İngilizce bağlamında ses tabanlı yapay zekâ sohbet robotlarının dinlediğini anlama becerilerini geliştirmede ve etkileşimli dinleme stratejilerini teşvik etmede değerli araçlar olabileceğini vurgulamaktadır.

Anahtar kelimeler: İngilizce öğretimi, dinlediğini anlama, dinleme becerileri, yapay zekâ, ses tabanlı sohbet robotları, etkileşimli dinleme stratejileri, yabancı dil olarak İngilizce

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LIST OF ABBREVIATIONS

AI	: Artificial Intelligence
CEFR	: Common European Framework of Reference for Languages
EFL	: English as a Foreign Language
ELT	: English Language Teaching
GAI	: Generative Artificial Intelligence
IPA	: Intelligent Personal Assistant
L2	: Second Language
MALL	: Mobile-Assisted Language Learning
MONE	: Ministry of National Education
NLP	: Natural Language Processing
SLA	: Second Language Acquisition
YTU	: Yildiz Technical University
ZPD	: Zone of Proximal Development

1. INTRODUCTION

This chapter defines the scope of the present study regarding its background, purpose, and significance. First, the subject matter is reviewed, and the problem statement is analyzed. Then, the purpose of the study and the research questions to be addressed are identified. Finally, the chapter concludes with a list of key term definitions.

1.1. Background of the Study

Listening comprises a fundamental language skill that significantly aids learners in enhancing their capacity to engage in conversational exchanges during the language learning process (Rost, 2024). It is a critical component of successful interaction within the realm of English Language Teaching (ELT). Listening serves both as a receptacle for messages across diverse contexts and as a mechanism facilitating interactions among individuals. This skill not only promotes effective communication but also fosters an in-depth understanding of various fields.

Improving listening skills is crucial for achieving proficiency in a language, as it enables learners to communicate effectively and comprehend the speaker's intent. Despite its importance, many EFL learners experience anxiety during listening tasks due to the lack of exposure to authentic input and limited opportunities for meaningful interaction in classroom settings. In order to overcome such challenges, language learners adopt a variety of strategies to enhance their comprehension and engagement during listening activities (Deregözü, 2021).

In recent years, technological advancements, especially in artificial intelligence, have provided innovative ways to address listening difficulties in EFL contexts. Among these, AI-based tools such as chatbots have gained prominence for their capacity to simulate real-life communication environments by providing multimodal input and interaction (Tai & Chen, 2024). These digital tools not only create authentic language exposure but also promote the development of specific listening subskills, such as identifying main ideas, recognizing specific details, and making inferences.

To better understand how interaction facilitates listening comprehension, it is essential to consider the relevant theoretical foundations. Long's (1996) interaction hypothesis posits that negotiation of meaning plays a central role in language acquisition. This negotiation enhances the learner's capability to simultaneously process and evaluate auditory information (Aryadoust et al., 2021). Listening is an active ability that requires interactive engagement, strategic processing, clarification, and turn-taking (Huang, 2020). In support of this perspective, Huang (2020) asserts that interactive listening requires learners to assume dual roles as both listeners and co-constructors of meaning, actively engaging in the monitoring, predicting, and negotiating of meaning through the utilization of both verbal and nonverbal reception strategies. The interaction process, as proposed by Long (1996), corresponds with dialogical and sociocultural views of listening, wherein comprehension arises from collaboratively developed discourse rather than from isolated decoding (Huang, 2020; Aryadoust et al., 2021). Within this framework, the use of AI chatbots can serve as an additional tool that follows interactionist principles, engaging learners in negotiation processes and providing scaffolded support for developing listening subskills.

In parallel, constructivist learning theory also offers a valuable lens for understanding how listening skills can be developed. Constructivism regards learning as an active, socially mediated process in which knowledge is constructed through interaction with tools and others (Vygotsky, 1978; Suhendi, 2018). Within the constructivist framework, artificial intelligence, particularly AI chatbots, can support the development of listening comprehension skills and interactive listening strategies by offering dynamic and engaging learning experiences (Jackson, 2024). These tools personalize instruction and promote active participation, aligning with the principles of student-centered learning. Furthermore, AI chatbots can serve as scaffolding agents by adapting their input to learners' needs, prompting clarification, and encouraging self-repair, thus helping students to operate within their Zone of Proximal Development (ZPD) and gradually internalize more advanced listening processes (Vygotsky, 1978).

Today, artificial intelligence (AI) is producing remarkable and substantial advancements in many aspects of society, including education, business, healthcare, and transportation. At the 1956 Dartmouth Conference, John McCarthy presented AI as a novel notion in computer science focused on imitating human-like behavior in

machines (Dehghani & Mashhadi, 2024). AlAfnan et al. (2023) define AI as intelligent technologies and software that can think, process, acquire knowledge, engage, monitor, and differentiate among objects. The notion of artificial intelligence has yielded numerous advantages, and it has improved our lives from the past to the present (Coşkun & Gülleroğlu, 2021; Sucu, 2019).

Due to the advancements in artificial intelligence, the areas and roles that require human involvement have evolved. As a result, the impact of artificial intelligence (AI) technology has fundamentally altered traditional methods of education, leading to the emergence of entirely novel perspectives and scopes. In this regard, AI technologies provide outstanding potential for individualized instruction, time-efficient applications, automation of administrative tasks, instant feedback, autonomy, self-regulated learning, and valuable information regarding student participation and achievement attributes (Duran, 2024). He further noted that AI in education is not intended to replace humans but to complement educators. Since digital and technological competence is essential for both students and educators, it is imperative that professional development services are offered to equip educators with the necessary training in AI for effective implementation (Ayanwale & Sanusi, 2023; Kaya, 2024). Accordingly, several studies and the education departments of nations examine approaches to including AI in the curriculum to prepare both students and educators for its applications (Salhab, 2024; U.S. Department of Education, Office of Educational Technology, 2024; Türkiye Ministry of National Education, 2024; UK Department of Education, 2024).

The improvement of AI in education is becoming increasingly important, especially in English Language Teaching (ELT) (Sharadgah & Sa'di, 2022). AI provides numerous opportunities for learning English language skills, as indicated by many studies (Tai & Chen, 2024; Hsu et al., 2023; Lin & Chang, 2020). Many different applications of artificial intelligence have been used in L2 learning, such as intelligent tutoring systems (Ni & Cheung, 2023), chatbots, intelligent personal assistants or conversational agents (Yang et al., 2022), automated speech recognition (Bachiri, 2024), adaptive learning (Feng, 2025), AI writing assistants (Tseng & Lin, 2024), virtual reality (Sun Joo & Lee Jin, 2024), and augmented reality (Chen et al., 2022).

Chatbots are among the most favored applications of these AI Technologies (Sahito et al., 2025). Notably, they have drawn considerable attention because they facilitate extensive conversational opportunities and practice (Jeon, 2024). In addition, different linguistic skills and subskills can be enhanced through the use of chatbots (Huang et al., 2024). For instance, chatbots can promote extensive reading, enhance reading skills, and increase learners' interest and motivation through mentoring and companionship (Liu et al., 2024). Due to EFL learners' restricted exposure to authentic language usage, they offer an unprecedented opportunity to practice English similarly to real-life interactions (Yang et al., 2024). This increased exposure contributes to greater engagement among learners, and the speaking performance of learners rises, while speaking anxiety decreases during interactions with chatbots (Çakmak, 2022; Hsu et al., 2023). Furthermore, chatbots can assist learners in attaining success by providing scaffolding and feedback (Lin & Chang, 2020). Their contribution extends to listening skills as well, offering an interactive environment where learners participate actively rather than remaining passive listeners (Tai & Chen, 2024). As a result of these pedagogical affordances, learners frequently express positive perceptions about their experiences with chatbots while learning English (Huang et al., 2024; Kim & Su, 2024; Tai & Chen, 2024).

As AI becomes incorporated into our lives, its impact on English language proficiency is considered to be crucial (Yang et al., 2024). Examining the integration of chatbots in enhancing EFL learners' listening comprehension skills and interactive listening strategies provides insight into the pedagogical potential of chatbots in the classroom.

1.2. Statement of the Problem

One of the most important aspects of communication is listening comprehension, which is a multifaceted skill and learners are unlikely to be able to learn how to communicate successfully if they do not have excellent listening skills (Nunan, 1998). Developing listening skills is not merely a passive activity; rather, it necessitates negotiation of meaning, giving feedback, and the interaction of both parties (Field, 2008; Rost, 2013). However, EFL learners may experience feelings of worry and stress as a result of the obstacles they encounter when listening, such as accent, speech rate, lack of feedback, limited opportunities for practice, fear of making mistakes, and context (Hasan, 2000). AI chatbots have the potential to be utilized for

the purpose of overcoming these problems, enhancing listening skills, and implementing interactive listening strategies. Chatbots tailor their pace and accent according to individual preferences and needs (Jeon, 2024). They offer immediate feedback and responses, making listening dynamic. Moreover, they provide an interactive context relating to the learners' interests.

Although it is asserted that the integration of artificial intelligence technologies into education has significantly altered language learning paradigms (Liang et al., 2023), existing research lacks sufficient examination of the effects of voice-based chatbots on EFL learners' listening comprehension and use of interactive strategies. There is also a lack of studies exploring learners' perceptions of chatbots in relation to listening comprehension skills and the interactive listening strategies they employ during listening practices. This gap is particularly significant given that listening, as a receptive skill, plays a crucial role in developing communicative competence and that effective strategy use is essential for processing spoken input (Vandergrift & Goh, 2012).

The listening skills practices now in use provide insufficient assistance in overcoming the challenges that learners experience with listening comprehension. Despite the recognized importance of interactive and strategy-based instruction, in the English instruction currently provided, learners do not have the opportunity to engage in interactive practice of their listening skills and strategies. As a result, they often monitor listening tasks passively, with limited support or opportunities to negotiate meaning. This challenge obstructs the advancement of both comprehension and confidence. Therefore, examining the role of AI chatbots in addressing these pedagogical shortcomings is timely and necessary.

The influence of AI chatbots on the listening comprehension skills and interactive listening strategies of high school EFL learners has not been as extensively investigated. Therefore, a study is needed to offer educators practical recommendations for enhancing the listening skills of their high school learners of EFL. Practitioners and policymakers could more effectively develop approaches to integrate AI into ELT by gaining an improved understanding of the impact of AI chatbots on listening comprehension.

1.3. Purpose of the Study

As AI technology advances, chatbots have become more significant in learning languages (Jeon, 2024). While the integration of AI technologies into language education has been widely examined, research specifically addressing their contribution to the development of listening comprehension and the use of interactive strategies among EFL students remains scarce (Huang, 2020). Since listening is one of the most challenging skills for EFL learners, particularly in environments with limited authentic input and interaction, it is crucial to explore how AI chatbots can function as interactive tools to enhance listening development (Kim, 2018; Nushi & Orouji, 2020; Bozorgian et al., 2024). Therefore, the purpose of this mixed-method study is to examine the relationship between AI chatbots and listening skills in EFL. This study aims to investigate how high school EFL learners perceive the integration of AI-based conversational agents in fostering listening development and the application of interactive listening strategies. The study explores how interacting with AI voice-based chat robots contributes to the advancement of learners' listening comprehension, grounded in constructivist and interactionist perspectives on language learning.

There have been several studies that have investigated the impact that AI chatbots have on language learning. Fryer et al. (2019) scrutinized university students' interest in chatbots and found that students viewed chatbots as valuable tools for language learning, especially for practicing pronunciation and grammar. They also reported that interactions with chatbots enhanced their engagement and interest in English learning activities. Later, Han et al. (2023) examined how native and non-native English speakers interacted with a chatbot in online courses and found that non-native users made extra efforts to communicate clearly by rephrasing their questions and showing interest in how the chatbot works. Most recently, Jeon (2024) investigated how chatbots promote young learners' motivation and found that students enjoyed using chatbots to practice English, felt more confident speaking without fear of making mistakes, and appreciated having more chances to speak and get feedback. The relationship between chatbots and the listening comprehension skills and interactive listening strategies of EFL learners, however, has not been thoroughly investigated. The aim of this study is to shed light on the impact that chatbots have on listening

skills in EFL contexts by employing both quantitative and qualitative research methods.

Through the provision of valuable insights, educators, practitioners, and policymakers will be provided with information regarding the potential uses of chatbots in English language learning. The study intends to provide educational implications for practitioners, educators, and policymakers regarding the effective application of chatbots in English language instruction. By examining the possible advantages that chatbots may offer in terms of increasing listening skills and implementing interactive listening strategies, the research endeavors to make remarkable contributions to the curriculum and educational policies.

1.4. Research Questions

The present study poses the following research questions:

1. Are there any improvements in 10th-grade EFL learners' listening comprehension scores, particularly in identifying main ideas and specific details, after engaging with an AI voice-based chatbot?

2. Do students engaged in AI voice-based chatbot activities differ from those who participate in regular listening activities in enhancing listening comprehension skills, particularly in identifying main ideas and specific details among 10th-grade EFL learners?

3. What are 10th-grade EFL learners' perceptions about the AI voice-based chatbot in enhancing their listening comprehension skills, particularly in identifying main ideas and specific details?

4. What interactive listening strategies are employed by 10th-grade EFL learners while engaging with the AI voice-based chatbot listening activities?

1.5. Significance of the Study

Current developments in teaching methods and curriculum design have emphasized the significance and efficiency of personalized education that can be customized to the needs of each learner (Çakmak, 2022). In the realm of English language teaching, AI chatbots demonstrate the ability to promote active learning, provide personalized

educational settings, deliver extensive linguistic input, offer prompt feedback, and facilitate practice opportunities (Yang et al., 2024, Huang et al., 2024; Tai & Chen, 2024). The emergence of artificial intelligence-driven chatbots has led to the evolution of conversational agents capable of engaging with individuals in the online environment, regardless of time and location.

A study of the integration of AI voice-based chat robots in ELT is necessary due to the development of these technologies. This study will provide new insights into the limited literature on the subject. The findings of the empirical data have the potential to illuminate the interactive aspect of employing chatbots to improve listening comprehension skills. This study, which includes students' experiences, is anticipated to encourage their autonomy while enhancing language skills and effectively utilizing interactive listening strategies. Therefore, it is expected that this study's results offer educators practical guidance and suggestions for integrating chatbots into the classroom.

Prior studies examining the influence of chatbots on language learning indicated that they had a positive effect as well as considerations (Mohamed, 2024; Chiu et al., 2024; Kohnke, 2023). While much of the existing literature has focused on higher education (Kim, 2018; Dizon, 2020), there remains a scarcity of empirical research examining the use of chatbots in secondary education, particularly within the Turkish context. This aspect is particularly significant, considering that tenth-grade students in high schools across Türkiye frequently operate at the A2 proficiency level (MoNE, 2018; Çelik, 2021). This level is generally acknowledged as a threshold stage at which learners start to progress from basic language skills toward more independent usage of the language (Council of Europe, 2001). At the A2 proficiency level, learners generally have basic lexical and grammatical competence; however, they continue to encounter difficulties in decoding spoken input fluently and managing real-time interactions (Council of Europe, 2001; Vandergrift & Goh, 2012). Given the limited opportunities for real-life language interaction in Turkish state schools, investigating the pedagogical implications of chatbots in this setting becomes essential.

Chatbots that have been designed particularly for the purpose of learning a foreign language are extremely scarce (Lee & Maeng, 2023). Thus, exploring the capabilities of chatbots in language learning may yield innovative insights into educational technologies. Educational technology has merged innovative teaching methods with

new technologies to improve students' learning experiences (Hsu et al., 2023). Chatbot technology facilitates and improves the learning process for students by combining educational approaches with novel technologies.

Considering the characteristics of the current study, it can be asserted that it will substantially improve our knowledge of utilizing chatbots in listening comprehension skills and interactive listening strategies.

1.6. Definitions

Artificial Intelligence: Artificial intelligence is characterized as a machine exhibiting human-like behaviors, including thinking, problem-solving, inferring meaning, and generalizing, hence using advanced cognitive skills (Fetzer, 1990; Arslan, 2020; Ertel, 2024). Among its various subfields, Generative AI, a novel approach enabling machines to learn from existing data and adjust to new conditions, is particularly relevant to language learning applications (Haase & Hanel, 2023). GAI is capable of producing original content such as text, audio, or images and generating ideas. Many widespread technologies, such as Siri and Amazon Alexa personal assistants, self-driving automobiles, instant language translation, intelligent educational management systems, virtual classrooms, as well as automation and robotics, are now facilitated by artificial intelligence (Arslan, 2020; Yang et al., 2024).

Chatbots: One example of generative artificial intelligence is chatbots that have been trained on large language models (McGrath et al., 2024). Chatbots, sometimes referred to as chatterbots or chatter robots, are software agents that replicate human characteristics. “A chatbot can deliver a vast amount of generated output (Haase & Hanel, 2023, p.2)”. They enable users to communicate with them via written, verbal, or hybrid interactions (Hatwar et al., 2016; Clarizia et al., 2018). Innovations in artificial intelligence have resulted in the implementation of more powerful and effective AI technology into everyday life, making our lives easier (Chaves & Gerosa, 2019).

2. LITERATURE REVIEW

This chapter examines relevant literature to offer a thorough background for the current study, which investigates how voice-based AI chatbots contribute to EFL learners' development of listening comprehension and engagement in interactive listening strategies. The chapter begins with an overview of listening comprehension within the context of English language learning, followed by a discussion on the concept of active listening and the common challenges learners face in developing their listening skills. Then, it delves into interactive listening strategies and methods for improving listening comprehension. Finally, the chapter examines the role of AI chatbots in enhancing listening skills, drawing on recent research to contextualize the study within the EFL settings.

2.1. Listening Comprehension Skills in English Language Learning

The learning of the English language has gained significant momentum in recent years, particularly due to its role as the lingua franca in globalization (Crystal, 2003; Pennycook, 2009; Adawiyah & Gumartifa, 2022). The worldwide interest in English is closely tied to globalization (Lysandrou & Lysandrou, 2003), and the developments it brings have heightened the need for English learning (Pennycook, 2009). Proficiency in English is now essential for communication, education, business, and technology, leading both public and private institutions to promote its learning. Individuals are motivated by socioeconomic status, career prospects, academic goals, and cultural awareness, as English enhances both personal and professional life. It opens up employment opportunities, boosts competitiveness, and strengthens interpersonal relationships. Moreover, proficiency in English grants access to academic resources, supports global scholarly interaction, and is crucial for engaging with the vast body of English-language publications. Therefore, it is indispensable across today's interconnected domains.

To attain English proficiency, learners are expected to develop four essential language skills: reading, writing, listening, and speaking (Ali, 2022). While these skills are often

taught individually, they are inherently interrelated and function most effectively when integrated in real-life communication (Harmer, 2007; Qamili, 2023). In today's globalized and communicative world, language learners rarely rely on a single skill in isolation; instead, they draw on multiple skills simultaneously to construct and convey meaning (Pardede, 2019). Therefore, current English language instruction increasingly emphasizes integrative skill development, reflecting authentic language use across academic, professional, and social contexts. In this regard, the present study focuses specifically on listening, as a key component of integrated language competence.

Listening constitutes more than a passive activity; rather, it requires active engagement through the processes of decoding, interpreting, and responding to auditory input (Lynch & Mendelsohn, 2013). It is crucial to understand the essential qualities of listening, including its subskills and strategies, that support learners in enhancing their listening skills. However, despite its importance, listening skills instruction is often overlooked and rarely discussed, as it is primarily viewed as a means of introducing new linguistic items (Field, 2008; Yıldırım & Yıldırım, 2016). Since many people regard listening skills as passive and their outcomes are not as apparent as those of other skills, it has been depreciated (Field, 2008). Moreover, there was a misconception that L2 listening can be developed solely through exposure, similar to L1 listening, without extensive teacher instruction. These fallacies persisted until the advent of communicative approaches in the 1970s.

Notwithstanding its recognized importance in language acquisition, the implementation of listening within instruction has substantially evolved over time (Loewen, 2020). Initially regarded as a passive skill, listening was overlooked in early methods such as the Grammar-Translation Method, which prioritized written texts and provided little opportunity for auditory exposure (Richards & Rodgers, 2014; Vireak & Bunrosy, 2024). The Direct Method later emphasized oral communication through target-language immersion, while the Audiolingual Method, shaped by behaviorist theories, promoted repetitive listening drills for habit formation. From the late 1960s onward, listening gained more instructional attention, yet structured early lesson formats into pre-, during-, and post-listening stages were criticized for their rigidity and excessive focus on vocabulary and grammar (Field, 2008). The rise of communicative and cognitive approaches, alongside Krashen's (1982) theory of comprehensible input, redefined listening as an active, meaning-making process

(Patrick, 2019). In response, revised listening lesson formats were developed, emphasizing contextual support, guided attention, and learner inference (Field, 2008). The current model encourages prediction, repeated exposure, and analysis of functional language, reflecting a shift from product-oriented to process-oriented pedagogy. These developments collectively underscore the progression toward more authentic, purposeful, and student-centered listening instruction.

As Rost (2013) illustrates, the field of listening is interconnected with diverse disciplines, including the humanities, social sciences, natural sciences, and computer science. He explains that definitions of listening have evolved in response to shifting theoretical and technological trends, from auditory encoding in the early 1900s to digital network engagement in the 2000s, highlighting how listening reflects changing expectations about human cognition and interaction. This historical perspective reveals that listening is not merely passive but a complex mental activity shaped by context and purpose. Similarly, various scholars have described listening as an interactive, strategic process that involves both cognitive and emotional mechanisms (Brown, 2007; Richard, 2008; Worthington et al., 2024). Richard (2008) distinguishes between listening as comprehension, focused on understanding spoken input, and listening as acquisition, where learners actively reconstruct input to expand their language repertoire. Rost (2013) categorizes listening into receptive, constructive, collaborative, and transformative orientations, all emphasizing that effective listening entails active mental participation, selective attention, and empathetic engagement. Together, these perspectives demonstrate that listening is a dynamic and strategic skill essential to language learning.

In light of these evolving perspectives on listening, it becomes essential to examine the theoretical underpinnings that inform such views. Specifically, interactivist and constructivist frameworks offer valuable insights into how learners engage with listening input in dynamic, socially mediated environments. The following section outlines these theories and their relevance to the development of listening comprehension in English language learning.

2.2. Theoretical Background: Interactionism and Constructivism

Interactionism offers a dynamic framework for understanding how learners process and respond to language input in real-time (Reinhardt, 2012). According to

interactionist theories of Second Language Acquisition (SLA), real-time communication plays a central role in developing learners' interlanguage through mechanisms such as negotiation of meaning, comprehensible input, and pushed output (Varonis and Gass, 1985; Long, 1996; Tudini, 2018). Building on this foundation, the interactionist paradigm underscores that interaction fosters language acquisition by providing opportunities for the negotiation of meaning (Reinhardt, 2012). Key components of this process include comprehensible input, corrective feedback, learner noticing of linguistic forms, and modified output. The interactionist approach is foundational in SLA, positing that active engagement and meaning-focused interaction are crucial for second language development (Ziegler et al., 2022). Within this framework, learners are regarded as actively constructing their interlanguage through these interactive processes (Reinhardt, 2012; Ziegler et al., 2022).

Interactionist theory emphasizes that negotiating meaning, where learners and interlocutors address communication challenges, is crucial for language development (Tudini, 2018). This highlights the importance of real-time communication, which facilitates immediate resolution of problems and scaffolding. Consequently, this suggests that chatbots designed for listening practice could improve by including features that enable users to request clarification, repetition, or rephrasing of audio input, simulating natural negotiations of meaning.

Reinhardt (2012) highlights that interactionist principles must be adjusted to fit the realities of digitally mediated learning, where communication standards differ greatly from those in traditional face-to-face settings. Extending this argument to the use of chatbots, for English listening practice with, this view proposes that an interactionist approach might include the chatbot providing varied input, prompting for clarification (triggering negotiation of meaning), offering feedback on comprehension, and encouraging the learner to produce output based on what they've heard.

Overall, the interactionist perspective emphasizes the active relationship between the learner and their linguistic environment. Although typically studied in the context of human-to-human interactions, the principles of input, interaction, and output are highly applicable to designing and analyzing English listening activities mediated by chatbots, where the chatbot serves as an interactive partner that supports language learning.

Constructivism further supports this view by asserting that learners are not passive recipients of information but active constructors of their own knowledge and understanding (Can, 2009). While knowledge is built individually, constructivism, particularly social constructivism, highlights the important role of social interaction and collaboration (Palincsar, 2012). In line with this, listening skills are often enhanced through dialogue, negotiation, and shared activities with others (Tran et al., 2024). Therefore, the chatbot can simulate conversational scenarios, provide prompts for discussion, or even facilitate collaborative tasks that require learners to engage with the "other" (the chatbot) to achieve communicative goals, thereby building listening skills through simulated social interaction.

According to the constructivist view, listeners are not merely passive recipients; instead, they actively build their understanding of messages influenced by their previous knowledge, experiences, expectations, and the interaction context (Burleson, 2011). This means that listeners actively engage in the process of creating meaning from what they hear.

Interactivism and constructivism together offer a strong theoretical basis for this study. Both perspectives underscore the importance of learner agency, strategic processing, and meaningful interaction in EFL, particularly in listening. Given that this study explores the use of voice-based AI chatbots to improve students' listening comprehension and interactive listening strategies, these theories highlight how digital, interactive platforms can promote deeper cognitive engagement and co-constructed meaning in the listening process.

2.3. Active Listening

Listening is a multifaceted skill that serves various purposes and cognitive operations (Worthington et al., 2024). Richards (1983), Field (2008), and Vasanthan & Nandhini (2022) state that listening comprehension is not just a single skill; it comprises several interconnected micro-skills that work together to improve overall understanding. These include bottom-up and top-down processing, which involve decoding linguistic elements and utilizing prior knowledge, respectively (Richards, 2008; Furuya, 2021). In addition to these processes, having a clear objective for listening affects how listeners interact with and understand auditory information. As Brown (2006) and Goh (2012) state, we always have a purpose for listening, and our listening techniques vary

according to this purpose. For instance, we may listen to a podcast for its main idea or to an announcement at an airport to recognize specific details. These two sub-skills, identifying main ideas and recognizing specific details, play a crucial role in listening, as they enable learners to construct both a global understanding and a detailed interpretation of spoken texts (Palmer, 2014). Identifying main ideas helps students grasp the overall meaning of spoken language and understand the purpose behind the audio, while recognizing specific details enables them to extract key information from auditory materials. As Goh and Aryadoust (2015) argue, these sub-skills work in coordination rather than isolation. In this light, this study focuses on active listening, which integrates these micro-skills within interactive and communicative contexts to foster deeper comprehension and engagement.

The objectives of listening in traditional educational settings appear straightforward: listen to instructions, acquire information, achieve comprehension, study, or fill in the blanks with the missing information, for instance (Edwards-Groves & Davidson, 2020). Such practices perceive the listeners as passive recipients of the auditory input. However, this conventional view has been challenged by current listening theories, which emphasize the active participation of the listener in constructing meaning. Instead of merely absorbing the information, the active listener employs strategies to foster, regulate, and assess their listening (Richards, 2008; Nazarieh et al., 2022).

In this context, active listening emerges as a dynamic process that encourages the listener to engage in cognitive activities such as predicting, clarifying, and constructing meaning (Rost, 2013; Fleta, 2014). These procedures demand cognitive processing and are closely linked to learners' communicative competence, particularly their ability to interpret meaning and effectively participate in spoken interaction (Brown, 2007).

From this viewpoint, the practical implications for active listening in the EFL contexts gain significant importance. Field (2008) asserts that teachers should align the type of listening required with the needs of the listener and the expectations found in real-life listening contexts. In everyday interactions, for example, people do not encounter a flight announcement that asks them to fill in a blank with a word, number, date, or any specific details. Therefore, classroom listening activities should reflect authentic tasks that require the listener's active engagement. By integrating tasks that simulate real-life communication, educators can enhance learners' ability to navigate spoken

discourse more effectively, enabling them to process and respond to authentic spoken interactions in a more purposeful and autonomous way.

In contrast to passive listening models, active listening emphasizes the role of the listener in fostering meaningful engagement and goes beyond mere comprehension (Dimoski et al., 2016). Active listening involves producing a sensible, coherent, and appropriate response (Edwards-Groves & Davidson, 2020). Responding appropriately requires generating a logical, cohesive, and contextually relevant reply, which fundamentally exemplifies active listening.

Due to its emphasis on interaction, strategy use, and learner engagement, active listening has drawn considerable attention in recent empirical research in EFL (Newton & Nation, 2020). A number of studies have examined the impact of active listening on teaching EFL listening. The research conducted by Ambubuyog et al. (2023) revealed that active listening significantly impacts various language aspects, particularly phonology, morphology, and pragmatics. Participants reported that active listening enhanced their language awareness and increased their self-awareness as more effective language learners.

Similarly, Sekitani (2022) conducted an experiment on the impact of active listening on the speaking performance of EFL learners. The findings indicated that active listening skills enhanced the learners' fluency and accuracy in speaking.

On the other hand, Jordán et al. (2022) investigated teachers' perceptions regarding the application of active listening in EFL teaching. They introduced a training program that changed teachers' perspectives on active listening thereafter. After the training, teachers gained knowledge about the significance of incorporating active listening into EFL teaching and the strategies for applying it in their lessons.

In conclusion, educators can enhance students' listening skills by encouraging them to concentrate on the purpose of their listening (Brown, 2006). Active listening constitutes an essential competency that facilitates the successful exchange of information and ideas between individuals.

To develop active listening skills, EFL instruction must establish a suitable environment in which learners can implement effective listening strategies (Dimoski, 2016). In this context, AI voice-based chatbots offer significant opportunities, as they reflect real-life communication through interactive and flexible listening experiences

(Jeon, 2024). Thanks to their interactive nature, chatbot listening tasks encourage students to actively participate in interpreting meaning, negotiating, and constructing meaning, which are essential components of active listening (Zheldibayeva, 2025). Integrating chatbot-supported listening activities into EFL teaching provides students with interactive, technology-driven listening experiences while encouraging the use of strategic and interactive listening techniques, ultimately enhancing their overall listening comprehension in real-world, autonomous learning settings.

2.4. Challenges in Listening Skills

Listening skills can be challenging for EFL learners because of their complex nature (Yılmaz & Yavuz, 2015; Wah, 2019). Factors such as learners' self-efficacy, motivation, anxiety, background knowledge, concentration levels, cognitive and metacognitive awareness, and limited vocabulary can influence listening comprehension (Goh, 1999; Yildiz & Albay, 2015; Wang & Treffers-Daller, 2017; Syahreza et al., 2019). Other factors can be related to the listening material itself, including unnatural texts, the rate of speech, background noise, and various accents. These factors manifest as challenges during the listening process.

Goh (2000) explores listening problems from a cognitive perspective and classifies them into three stages: perception, parsing, and utilization. Problems in the parsing stage primarily arise from difficulties in bottom-up processing of sound recognition, an overemphasis on meaning that causes the following parts to be missed, and issues with attention. Parsing stage problems involve difficulty in creating a mental image of spoken information and forgetting things quickly. In the utilization stage, confusion about key ideas and understanding the meaning of words, rather than the intended message, are reported problems. She proposes several solutions to address the listening challenges. First, teachers must identify their students' listening difficulties to use their teaching time effectively and focus exclusively on the areas that need attention. Second, teachers should integrate strategy training into their teaching to help students use strategies for overcoming listening comprehension difficulties. Teachers should instruct students on how to develop metacognitive awareness, which can help them tackle cognitive problems. Lastly, listening teaching activities should combine both bottom-up and top-down processes, emphasizing the significance of pre-listening activities (Goh & Hu, 2014; Wang, 2016).

Similarly, Hasan (2000) investigates the listening comprehension difficulties experienced by EFL students and highlights several difficulties along with their educational implications to assist them. Natural speech, varied accents, lack of contextual clues, unfamiliar vocabulary, and an overemphasis on grammatical structures that cause learners to miss the overall idea or key details are identified as some of the problems faced by EFL learners. External factors such as poor classroom conditions, inadequate audio quality, unclear pronunciation, and lengthy texts represent additional issues reported by learners as adversely impacting their listening comprehension. Some students struggle to discuss the spoken text; therefore, he suggests combining listening and speaking skills to enhance listening comprehension. He further highlights that interactive listening activities, where learners alternate between roles as listeners and speakers in peer or group work, necessitate negotiating meaning and facilitating comprehension. He recommends that teachers guide students to grasp the overall meaning of spoken texts instead of fixating on each word. Finally, he recommends that teachers instruct students in strategies like predicting unfamiliar words before listening to activate their schemata and posing comprehension questions afterward to facilitate interpretations (Namaziandost et al., 2019).

Shu-Yan and Cha (2019) investigate how foreign language listening anxiety affects the listening performance of EFL learners. They state that especially learners with lower proficiency experience more listening anxiety, which manifests as stress, intimidation, and nervousness. Learners' self-perceptions of their listening skills indicate listening anxiety, as low self-confidence in listening contributes to this anxiety. To alleviate listening anxiety, they recommend that teachers offer more listening activities so students can become accustomed to it. Furthermore, students should develop metacognitive strategies to manage their learning effectively, which can help reduce anxiety and enhance listening comprehension.

Another relevant study, Sari and Fithriyana (2019), identified the common listening challenges faced by EFL students. They discovered that the students have low confidence regarding their perceived level of listening comprehension, thereby impeding their ability to achieve effective listening skills. Additionally, students often experience listening fatigue and feel distracted due to the lengthy spoken texts.

Fathi et al. (2020) investigate the effects of strategy training in EFL listening on learners' listening anxiety and self-efficacy. They implemented a strategy training

treatment and found that the experimental group, which received the intervention, achieved better listening performance and experienced reduced listening anxiety compared to the control group. However, they did not find a significant difference in self-efficacy beliefs between the two groups. Their findings showed that incorporating strategy instruction in teaching enhances listening performance, lowers anxiety, and boosts motivation.

Recent research by Abdullah Alharbi and Mohammed Hassan Al-Ahdal (2024) discuss listening barriers that impact effective communication and proposes remedies for them. In their study, the majority of EFL learners reported discomfort in the classroom, excessive information during listening, allocating limited time for listening, and a lack of interactive activities as barriers to hinder effective listening. They suggest interactive, task-oriented listening activities to promote engagement and improve listening comprehension. Teachers should identify their learners' listening difficulties and implement solutions to address them.

Canaran et al. (2024) investigate the relationship among Turkish EFL university students' anxiety, self-efficacy, and proficiency. They categorized problems into individual factors, such as insufficient background knowledge or fear of failure, and external factors, related to the content being listened to, like the speech rate. The findings indicated a positive correlation between listening self-efficacy and proficiency, while revealing a negative correlation with anxiety. One implication for teachers is to incorporate metacognitive strategies into their instruction, enabling students to develop listening awareness and manage their own learning. Strategy training can effectively reduce listening anxiety while enhancing self-efficacy and improving performance in listening tasks.

The studies examined above highlight several difficulties that EFL learners face in listening comprehension. These include both internal factors, such as anxiety, low self-efficacy, limited vocabulary, and cognitive processing difficulties, as well as external concerns about the input and classroom environment (Nushi & Orouji, 2020). These findings are relevant to the current study, emphasizing the need for educational treatments that incorporate interactive participation, strategic approaches, and authentic input. Current research addresses these listening challenges by exploring how AI voice-based chatbots affect listening comprehension and the use of interactive listening strategies. Engaging in listening activities with the chatbot can reduce

anxiety, enhance motivation, support different listening sub-skills, and encourage self-regulated learning by providing students with real-time, realistic, and interactive listening experiences (Koç, 2024). Furthermore, the engaging nature of chatbot interaction promotes active participation and strategy use, as recommended in the reviewed literature. Therefore, this study contributes to the field by addressing the identified challenges, such as learner-related factors like low self-efficacy, anxiety, limited vocabulary, insufficient background knowledge, and reduced concentration (Goh, 2000; Wang & Treffers-Daller, 2017), as well as material-related issues including fast speech rate, background noise, and unfamiliar accents (Field, 2008; Renandya & Farrell, 2011). These difficulties are further compounded by limited strategic listening awareness (Graham et al., 2011; Namaziandost et al., 2019) and the scarcity of authentic, interactive input in traditional classroom environments (Kim, 2018). By adopting a technology-enhanced, learner-centered approach, this study aims to address these challenges that align with pedagogical recommendations.

2.5. Interactive Listening Strategies

Considering the various challenges to effective listening comprehension, researchers emphasize the importance of employing instructional strategies that engage students actively in the listening process interpretations (Nix, 2016; Namaziandost et al., 2019). One such approach is interactive listening, which demands active participation from the listener, such as asking for clarification or offering feedback, to enable effective communication (Vandergrift, 1997; Chou, 2023). First, defining interactive listening and understanding its pedagogical significance in EFL contexts is essential before delving into the specific strategies that facilitate it.

Interactive listening is vital in daily conversations and have a significant impact in EFL teaching (Chou, 2023). In line with this, Celce-Murcia (2001) states that all forms of listening are inherently interactive to some extent because of the processing mechanisms involved. Interactive listening, defined as a collaborative conversation wherein learners interact with one another or with native speakers, is widely acknowledged as an essential approach to language learning and a touchstone of listening performance (Rost, 2013; 2024). Through such interaction, students acquire new language structures by formulating them through the communicative environments provided by interactive listening.

However, despite its benefits, Field (2008) states that interactive listening poses challenges for learners as the two-way exchange can induce anxiety, but it remains essential for mastering a second language. Since interactive listening demands that learners utilize repair strategies, demonstrate understanding signals, engage in turn-taking, and manage time constraints, he suggests a different approach to incorporate interactive listening into language lessons. He suggests that the teacher plays a recording and prompts students to discuss elements such as turn-taking, back-channeling, topic changes, and pauses to enhance their awareness of the interactive components of listening.

Expanding upon this instructional perspective, interactive listening activities include communicative tasks that involve two-way collaborative exchanges (Rost, 2013). These activities emphasize both comprehensible input and pushed output; furthermore, conversation partners frequently collaborate to shape the course of the discourse to accomplish a shared task (Rost, 2013; Gu & Hu, 2018). Within this perspective, listeners are viewed not merely as passive recipients of auditory input who interpret spoken meaning; instead, they are regarded as active learners in interaction (Huang, 2020; Ryan, 2022).

In line with this view, when listeners participate actively in the listening process, they engage not just in traditional listening but also help to co-create meaning within the context (Huang, 2020). The interactive listening process is a continuous collaborative effort where listeners evaluate and adjust one another's contributions. Huang (2020) grounds his research in the dialogical perspective (Linell, 1998; Rommetveit, 2003, as cited in Huang, 2020), which posits that learners alternate roles during interactions. This study revealed two key findings regarding interactive listening: firstly, students collaborated to create meaning while interacting; secondly, they utilized strategies to comprehend and convey the message aligned with cognitive and metacognitive theories (Huang, 2020).

Building on this dialogic view of listening**,** reciprocal interactive listening involves participants switching roles between speaker and listener, assessing and negotiating meaning, starting or responding to dialogue, and fostering interpersonal relationships (Chou, 2023). Listeners take on the roles of both speaker and listener, interpreting meaning, looking for clues to understand, and providing feedback when necessary. They employ strategies such as scanning and word-oriented for successful interactive

listening. Exploring the specific strategies that enable students to manage, maintain, and benefit from these dialogic interactions can maximize the educational advantages of interactive listening.

Interactive listening requires the listener to take on reciprocal roles, employing various strategies for effective communication (Gu & Hu, 2018). Therefore, the cognitive demands of interactive listening, including turn-taking, inferring meaning, and collaboratively building discourse, highlight the importance of strategies for students' success (Huang, 2020; Chou, 2023). Research on listening comprehension has consistently emphasized the importance of cognitive, metacognitive, and social-affective strategies in developing effective listening skills (Sato, 2022). These strategies support learners in managing, evaluating, and regulating their listening processes, particularly in the face of real-time processing demands, varied input types, and individual affective factors (O'Malley et al., 1985; Goh, 1998, 2002, 2008; Ngo, 2015; Vandergrift, 1996; Chamot & O'Malley, 1987; Bozorgian, 2014; Maftoon & Alamdari, 2020; Chon & Shin, 2019; Öztürk, 2021; Namaziandost et al., 2019; Colognesi, 2023; Robillos & Bustos, 2022; Kök, 2023; Zhang & Xu, 2025). Findings from these studies suggest that explicit instruction in listening strategies not only enhances comprehension but also fosters self-regulation, motivation, and learner autonomy. Building on this foundation, this section explores interactive listening strategies, a dynamic set of approaches that emphasize negotiation of meaning and learner participation in authentic communicative contexts.

Listening strategies were defined in three widely acknowledged categories within ELT: cognitive, metacognitive, and social-affective (Goh, 2016; Goh & Vandergrift, 2021). However, this classification often overlooks the interactive aspect of listening, which involves comprehension, response, and meaning co-construction (Sato, 2022). In the real world, listening extends beyond just one-way communication, such as responding to exam questions; it also encompasses conversational purposes, where listeners engage in two-way interactive listening (Chou, 2023). For effective comprehension in such two-way listening, learners employ interactive listening strategies to interpret meaning and maintain conversations (Nakatani, 2006; Oxford, 2016).

According to Vandergrift (1997; 2011), interactive listening is a dynamic process that involves reception strategies, including verbal and nonverbal signals used by listeners

to demonstrate understanding, seek clarification, or obtain extra information during interactions. These strategies necessitate listeners' active participation to understand the information provided.

However, Vandergrift (1997; Goh & Vandergrift, 2021) notes that the interactional contexts in which listeners employ various strategies to clarify meaning and continue the interaction are often neglected in research. In response to this gap, he investigates the reception strategies employed in interactive listening. Although Vandergrift's (1997) study concentrated on English-speaking learners of French, the findings on reception strategy use and its connection to listening comprehension also provide valuable insights for EFL teaching. Drawing on the framework of Rost and Ross (1991, as cited in Vandergrift, 1997), the study categorizes several reception strategies. These include listeners requesting repetition of the utterance, whether general or specific; asking specific questions to confirm their understanding; using verbal or nonverbal cues to indicate a need for clarification; demonstrating comprehension through verbal or nonverbal signs, such as backchanneling; and sometimes providing ambiguous answers to avoid further clarification. The strategy usage varied by learners' proficiency levels: novice learners utilized simpler strategies, whereas proficient learners adopted more advanced strategies such as forward inferencing. These findings offer several implications for teaching listening skills. Explicit training in reception strategies utilized in interactive listening should be incorporated into second language education to assist students in improving their comprehension. Classroom activities should reflect real-life situations where students actively engage in negotiating meaning. Cultivating strategic listening skills significantly enhances comprehension and interaction, thereby fostering greater language proficiency (Goh & Vandergrift, 2021).

Building on this viewpoint, other researchers have also explored how students manage listening interactions, not only through reception techniques but also by engaging in broader communication activities that aid effective understanding. Focusing on both speaking and listening skills, Nakatani's (2006) study provides an extensive analysis of communication strategies within the context of EFL. Nakatani’s findings underscore the significance of interactive strategies in enhancing listening skills. This research provides a comprehensive review of EFL learners' management of listening difficulties. The findings indicate that higher proficiency learners employed positive,

interactive listening strategies such as comprehension checking and meaning negotiation to maintain successful communication in challenging situations. In contrast, lower-proficient learners tended to avoid engagement or listen passively, including abandoning messages, which decreased their involvement in conversations.

As part of the study, Nakatani (2006) developed the Oral Communication Strategy Inventory (OCSI), which included strategies for listening, and he confirmed its reliability. He identified seven factors related to listening strategies: negotiating meaning, maintaining fluency, scanning, getting the gist, using nonverbal cues, being a less active listener, and word-oriented (Nakatani, 2006, pp. 166-168). These strategies provided a foundation for examining the interactive listening strategies employed by EFL learners in the current study.

Furthermore, Nakatani's (2006) study highlights that active listening, which requires involvement and taking a dual role in conversation, is essential for enhancing listening skills and overall language proficiency. This aligns with the interactionist theories, which emphasize that negotiating meaning and comprehensible input are crucial for language acquisition (Long, 1996; 2017).

Given these insights, focusing on interactive listening strategies has several implications. Teachers should include explicit listening strategy training in EFL courses, thereby raising awareness of strategies that support interaction and comprehension (Fathi et al., 2020; Taye et al., 2022). EFL curricula should include activities that foster interactive listening, such as role-plays, debates, and real-life listening tasks.

In conjunction with Nakatani's strategy-based classification, Huang's study (2020) offers valuable insights into the interactive listening strategies of L2 learners. His findings emphasized that L2 students participate actively in the co-construction of meaning within the conversation while simultaneously receiving and interpreting spoken language in "reciprocal active listenership" (Huang, 2020, p. 31).

This perspective suggests that L2 listeners often take on active roles, which contrasts with the traditional view of listeners as simply passive recipients (Huang, 2020). Participants employed a diverse array of discursive strategies, including uptakes, confirmation for understanding, and requests for repetition, as well as questioning, overlaps, and collaborative completions, illustrating the flexible nature of interactive

listening. The implications of these findings include that teachers should create tasks requiring real-world problem-solving, which demands that learners negotiate meaning and collaborate in meaning construction. Teachers can enhance metacognitive awareness and intercultural communication skills by encouraging students to reflect on their use of strategies.

Continuing in this vein of investigation, Chou (2023) delineates interactive listening strategies as techniques that assist learners in comprehending meaning, responding suitably, and sustaining a seamless two-way dialogue. These strategies include planning, controlling, making inferences, summarizing, requesting explanations, seeking clarification and repetition, cooperating, and managing emotions. The findings revealed a clear distinction between learners of different confidence levels. Students with low confidence relied more on passive listening strategies such as translation or decoding word-by-word, while high-confidence learners appreciated inference-making, phonological awareness, and nonverbal strategies. Participants also reported challenges with listening due to speech rate, understanding connected words, and variations in morphology and syntax. Based on these findings, the study suggests that incorporating both strategy use and affective factors such as confidence into listening instruction. Educators should enhance awareness of EFL learners' interactive listening strategies and customize their instruction to align with learners' backgrounds and specific needs.

Among the several approaches, interactive listening strategies stand out as essential tools for managing the dynamic nature of two-way communication in EFL environments (Goh & Vandergrift, 2021). By fostering active engagement, providing clarification, and facilitating the co-construction of meaning, these strategies help learners in addressing listening challenges such as rapid speech, unfamiliar words, and grammatical complexity. In this context, the current study contributes to the field by examining how AI voice-based chatbots facilitate students' active engagement in listening and foster the development of interactive listening strategies. The implementation of chatbots and interactive listening strategies can enhance students' ability to manage real-world listening situations by integrating these methodologies into EFL listening instruction (Alrajhi, 2024).

2.6. Improving Listening Comprehension Skills

Improving listening skills is crucial to the overall success or failure of the EFL learner and is a fundamental component of the language learning process (Rost, 2013; Mado et al., 2025). Instructional methods to improve listening skills have evolved over the years, transitioning from conventional, teacher-centered approaches to more learner-centered and technology-driven methodologies (Nazarieh et al., 2022). This section offers an overview of pedagogical approaches that enhance listening comprehension.

Osada (2004) provides a comprehensive historical analysis of the evolution of listening comprehension in language acquisition, transforming from a passive and overlooked skill into an active and essential aspect of communication. The study emphasizes how traditional methodologies, such as the audiolingual approach, have overlooked the cognitive dimension of listening by restricting learners to repetitive and mechanical listening exercises. Research suggests that to improve listening comprehension, activities must involve regular exposure, utilization of authentic materials, and strategy training, rather than merely providing simple exposure.

Gilakjani and Ahmadi (2011) highlight the interaction between bottom-up (linguistic decoding) and top-down (activation of schemata) processes in enhancing listening skills. They point out that listening comprehension is a multifaceted skill that encompasses numerous cognitive processes. Their findings indicate that learners enhance their listening comprehension most effectively through integrated teaching that combines metacognitive awareness, real-world input, and strategy instruction. They argue that comprehension is enhanced when learners are equipped with listening strategies. The pedagogical implications of the study include that teachers in EFL settings should use communicative activities, reinforced by explicit training in listening skills and constant, meaningful listening practice using authentic materials.

Sarıçoban and Karakurt (2016) illustrate how task-based learning (TBL) enhances the oral communication skills of EFL students, focusing on listening and speaking. According to their study involving B1 and B1+ university students in Turkey, tasks utilizing authentic audio materials and note-taking activities significantly enhance students' listening comprehension skills. The results indicated that students at the B1+ level showed significant improvement in post-listening assessments after engaging in task-based exercises. In EFL contexts, integrating meaningful, real-world activities in

listening instruction enhances performance while boosting student confidence and motivation.

Employing sociocultural theory as a framework, Safa and Rozati (2017) examined the role of scaffolding techniques in the development of listening skills. Their experimental research found that students receiving scaffolding, particularly from experienced peers, performed better in listening comprehension compared to those relying solely on cognitive techniques like note-taking. The study emphasizes the importance of interactive, socially mediated learning to enhance listening skills.

According to Elmetaher (2021), listening skills can be improved by focusing not only on intensive and extensive activities but also on active participation and meaningful interaction among students. This study suggests that instead of solely focusing on listening to an audiotape and responding to questions passively, teachers should emphasize group discussions that foster student interaction and active participation. This approach is consistent with active listening principles, emphasizing collaboration, engagement, interaction, and authentic tasks as essential for improving listening skills.

Overall, the reviewed research emphasizes the importance of communicative, task-based, and strategy-oriented methods to improve the listening comprehension skills of EFL learners (Komol & Suwanphathama, 2020; Goh & Vandergrift, 2021). Educational methods emphasizing active student engagement, interaction, and strategy instruction yield positive outcomes in listening skills. While these strategies have been effective in traditional classroom settings, today's rapidly changing educational environment requires the integration of digital resources to further enhance listening instruction (Hubbard, 2017; Li, 2023). Recent research has increasingly focused on using digital technologies, such as mobile apps, podcasts, video-based tools, virtual reality, and AI-powered tools, to enhance and personalize EFL listening instruction (Tai & Chen, 2021; Chen et al., 2022). Studies on the use of podcasts, vodcasts, TED Talks, and YouTube videos have highlighted their potential to deliver authentic language input and increase learner motivation (Al Qasim & Al Fadda, 2013; Gönülal, 2020; Al-Jarf, 2021; Chien et al., 2020). Mobile-Assisted Language Learning (MALL) and virtual reality applications have also demonstrated positive effects on listening comprehension through personalization and immersive environments (Li, 2023; Ye & Kaplan-Rakowski, 2024). Although these technologies offer valuable input and engagement, they often lack opportunities for active negotiation of meaning and real-

time interaction that occurs in two-way listening (Lynch & Mendelsohn, 2013). Through spontaneous, reciprocal interaction supported by immediate feedback and appropriate responses, AI voice-based chatbots create an interactive environment where students can practice listening (Xiao, 2025). Therefore, the next section reviews current research on the role of chatbots in EFL listening instruction and explores their pedagogical implications.

2.7. The Role of AI-Powered Chatbot Use in Enhancing EFL Learners' Listening Proficiency

The incorporation of AI technologies into English language education has facilitated the emergence of personalized, autonomous, and interactive instructional settings (Wu & Wang, 2021; Abdellatif et al., 2024). Among these novelties, AI chatbots driven by Natural Language Processing (NLP) technologies have become quite popular tools for promoting language learning (Mohamed, 2024). NLP enables chatbots to comprehend human input and subsequently produce suitable answers (Kim, 2018; Huang et al., 2024). Although the pedagogical application of AI chatbots in EFL education has gained significant attention in recent years, much of the existing research focuses on productive skills, such as speaking and writing (Yang et al., 2022; Guo et al., 2022; Jinming & Daniel, 2024). Despite being a fundamental component of language proficiency, the impact of chatbots on listening is still under-researched. This section begins by discussing studies on chatbots in general EFL settings, followed by a focus on their particular contributions to supporting listening comprehension and interactive strategy usage.

While the current study primarily focuses on listening comprehension, it is important to note that chatbots have largely been used to support speaking skills in EFL settings (Yang et al., 2022; Hsu et al., 2023). Many studies have investigated the role of chatbots in improving speaking skills in EFL contexts. For instance, Kim et al. (2021) explored the pedagogical potential of chatbots as L2 conversational agents to enhance learners' oral interaction skills in EFL contexts. According to their findings, students believed that engaging with chatbots helped them in practicing spoken English in a less stressful and more independent environment. However, some students noted limitations such as the chatbot's restricted conversational skills and its inability to fully understand student remarks. The study concluded that, with appropriate design,

pedagogical chatbots may offer significant opportunities for spoken engagement and serve as effective complements to classroom learning.

In a later study, Çakmak (2022) explored the effect of an artificial intelligence chat robot on university EFL students' speaking performance and speaking anxiety over a 12-week period. Findings indicated a significant improvement in learners' speaking scores when interacting with the chatbot compared to peer conversations. However, students reported increased speaking anxiety post-intervention and held negative perceptions about chatbot interactions due to robotic responses and communication breakdowns. This emphasizes that although chatbots can enhance speaking skills, emotional factors like anxiety need to be considered for their classroom implications.

Similarly, Hsu, Chen, and Yu (2023) designed a task-oriented AI chatbot system called TPBOT to improve speaking proficiency and reduce anxiety among Taiwanese EFL learners. In a four-month experimental study, university students in the experimental group used TPBOT weekly to complete TOEIC-based speaking tasks, while the control group followed traditional materials. A statistically significant increase was observed in the participants of the experimental group's post-test results regarding spoken language proficiency. Participants reported that TPBOT enhanced their speaking confidence, lowered their anxiety, and provided useful corrective feedback. The system's mobile accessibility and structured tasks also contributed to learner motivation and autonomous practice. The authors concluded that chatbot-supported speaking practice can be an effective tool for improving oral English performance and reducing affective barriers in EFL contexts.

Most recently, Yıldız (2024) examined the impact of ChatGPT on the speaking self-efficacy of Turkish EFL university students. Over a ten-week period, the experimental group engaged in chatbot-mediated speaking activities, while the control group followed traditional instruction. The results showed a significant increase in speaking self-efficacy among the experimental group. Qualitative findings revealed enhanced confidence, enjoyment, and perceived improvement in grammar and fluency.

In addition to speaking, writing is another skill in which chatbots have been integrated into the EFL curriculum (Zhang et al., 2024). Through real-time feedback and guided practice, various studies have explored how interaction with chatbots can facilitate writing development (Duong & Chen, 2025). For instance, Guo et al. (2024)

investigated the interactions of Chinese EFL university students with the chatbot Argumate while they completed argumentative writing tasks. The chatbot offered prompts, counterarguments, and suggestions, which helped students alleviate writing anxiety and boost their confidence. However, limitations were noted in areas such as supportive evidence, where the chatbot was limited in providing examples. Additionally, students frequently utilized extra resources like translation apps and search engines to enhance the chatbot's assistance. The study emphasizes the role of chatbots as collaborative writing partners and highlights the necessity for digital literacy and strategic tool use in AI-assisted writing. Furthermore, a study by Duong and Chen (2025) examined how an AI chatbot supported high school EFL students in improving their writing skills. The findings indicated that both high- and low-proficiency students exhibited improvements in language usage, vocabulary, content, and organization. Higher-level students used the chatbot for grammar and structure, while lower-level students primarily relied on it for developing ideas. Although lower-level students faced some difficulties, most students found the chatbot helpful. The research indicates that chatbots could serve as effective writing aids due to their ability to adjust to students' skill levels and the support provided by instructors

Recent studies have also explored the potential of chatbots to enhance reading comprehension and vocabulary development in EFL contexts (Pan et al., 2024; Zheng, 2024). Zheng (2024) investigated the role of AI-driven conversational agents on foreign language reading anxiety and reading performance among Chinese secondary school EFL students. Using a mixed-methods quasi-experimental design, the study compared an experimental group engaged in chatbot-supported reading activities with a control group receiving traditional reading instruction. The findings showed that the experimental group had a significant decrease in foreign language reading anxiety and attained higher reading comprehension scores compared to the control group. Students reported that the chatbot fostered a more engaging and relaxed reading atmosphere by providing instant feedback and personalized responses. The research indicates that using chatbots for reading skills may effectively reduce emotional barriers and improve reading performance in EFL settings.

Since studies on AI chatbots for EFL have primarily focused on other skills, the aspect of listening and the chatbot has largely been overlooked. Listening, an important yet challenging receptive skill, is suitable for interactive chatbot technology as it requires

real-time processing and active engagement (Koç, 2024; Huang et al., 2024). Although AI voice-based chatbots have great potential to encourage authentic and interactive listening experiences, there is currently a lack of empirical research regarding chatbots and listening comprehension in EFL settings. Several studies have examined Intelligent Personal Assistants (IPAs) such as Alexa and Google Assistant, which facilitate voice-based interaction and provide immediate responses, in an effort to address this gap (Dizon, 2020; Tai & Chen, 2024; Yang et al., 2024). Increased exposure, engagement, and personalization of these technologies have been demonstrated to support students' listening skills, with notable functional parallels to AI chatbots (Dokukina & Gumanova, 2020). Therefore, integrating research on chatbots and IPA technologies helps clarify how AI voice-based systems can support listening comprehension and interactive listening strategies in EFL learning.

Given the limited research on chatbot-supported listening, studies on IPAs provide valuable insights into voice-based interaction in EFL contexts. A study examining the role of IPAs in supporting EFL learners' autonomous development of both listening and spoken language performance reported positive outcomes (Yang et al., 2024). Their findings indicated that ongoing engagement with IPAs resulted in significant enhancements in listening comprehension, as it provided learners with greater exposure to authentic spoken language and allowed for repeated practice. Participants reported an enhanced ability to decode natural speech, increased confidence in understanding oral language, and viewed the technology as a supportive tool for developing independent listening skills.

Similarly, Tai and Chen (2024) examined how teenage EFL students benefited from using Google Assistant to enhance their understanding of auditory input. Their findings indicated that students using the multimodal version of the IPAs (Google Nest Hub) showed statistically significant improvement in listening skills, whereas audio-only and traditional listening groups did not. Learners reported that visual aids reduced anxiety and enhanced comprehension. These findings emphasize the importance of multimodal support and interactive design for enhancing listening skills and learner engagement in EFL contexts.

Although these studies focus on IPAs, research shows that chatbots can enhance interactive listening by providing real-time feedback, simulating real-world conversations, and alleviating learner anxiety in listening situations, even though there

are few studies specifically examining listening through chatbot interactions (Shikun et al., 2024; Dorgham, 2024; Sahito et al, 2025).

To illustrate this instructional technology, Kim (2018) examined the impact of the chatbot Elbot on enhancing the reading and listening skills of Korean EFL university students during a sixteen-week intervention period. The experimental group that participated in listening activities with the chatbot showed significantly better listening development than the participants in the control group who received regular instruction. Furthermore, the listening proficiency of the participants who interacted with the chatbot increased from an intermediate level to an advanced level after their engagement with the chatbot. These findings indicate that AI chat robots, designed to engage in human-like conversation, might function as native English speakers providing real linguistic input, especially when students have limited exposure to authentic English.

Similarly, Huang et al. (2024) conducted a study that sought to enhance EFL learners' aural decoding skills, a crucial aspect of bottom-up listening, through chatbot listening activities. In their study, while both groups participated in the same decoding activities, only the experimental group interacted with a chatbot, whereas the control group utilized a flipped model with teacher support. Results revealed that in decoding tests, the chatbot-supported group and the flipped learning group demonstrated similar outcomes. However, learners engaged with the chatbot demonstrated greater interest and motivation in decoding tasks. This study indicates that chatbots can be utilized in listening lessons to enhance bottom-up skills. They can be incorporated during the pre-, while, and post-listening stages by offering personalized assistance in online classrooms.

In conclusion, the analyzed studies contribute to our understanding of chatbot-supported listening instruction in EFL settings; however, further research is needed to investigate how AI-driven voice-based chatbots impact the listening proficiency and interactive listening strategies of EFL high school learners. Exploring the integration of these chatbots into ELT would yield significant pedagogical implications for enhancing listening skills and maximizing the potential of technology-enhanced learning.

3. METHODOLOGY

This chapter outlines the methodology employed in the current study, which investigates how AI-driven, voice-based chatbots contribute to the development of listening comprehension and interactive strategy use among EFL learners. It begins by presenting the overall research design, followed by detailed information about the setting and participants. The data collection instruments are then introduced, including the demographic questionnaire, the Cambridge A2 Key listening tests, the focus group interview, and the AI voice-based chatbot used during the intervention. Then, it explains the data collection procedure implemented throughout the study. This is followed by a description of the data analysis methods used for both quantitative and qualitative data. Finally, the chapter addresses ethical considerations.

3.1. Research Design

This study utilized AI chatbots to assess their influence on EFL learners' listening comprehension skills and interactive listening strategies. It employed the Cambridge KET Listening Exam for quantitative data to evaluate the effect of the intervention and focus group interviews for qualitative data to gain insights into learners' perspectives on their experiences with AI chatbots. Hence, a mixed-method study strategy was adopted to enhance comprehension of the research questions. The quantitative data derived from KET exam outcomes reveals statistical disparities between and within groups, while the qualitative data shows participants' perceptions of the learning experience.

Plano Clark and Creswell (2015) assert that a mixed-method approach is appropriate for examining different research questions from several perspectives to elucidate the effectiveness of the intervention. By integrating quantitative and qualitative data, the study can provide a more comprehensive understanding of the subject matter, including trends and personal experiences (Plano Clark & Creswell, 2015). In the current study, the effectiveness of the intervention was evaluated, and the experiences of the participants during the intervention were examined.

An embedded mixed-method design was employed sequentially to investigate participants' experiences and address distinct research questions (RQ3 and RQ4) through qualitative data after collecting quantitative data (RQ1 and RQ2) (QUAN, qual). The embedded design allows for the use of qualitative datasets to bolster and enhance the primary research questions that require quantitative outcomes (Plano Clark & Creswell, 2015). While qualitative results are used to better understand the intervention process, quantitative results are given more weight in this study. The reasons for collecting qualitative data after the intervention concluded can be listed as (Creswell & Clark, 2011, p. 192):

- It helps to understand how participants experience the effects of the experiment.
- Participants provide feedback regarding the experiment.
- It explains the quantitative data results.

The quantitative component of this study utilizes a quasi-experimental design, which is particularly suitable when the researcher evaluates the intervention with already existing groups (Plano Clark & Creswell, 2015). A quasi-experimental design was adopted to assess the influence of AI chatbots on intact groups. Four intact groups were divided into experimental and control groups. The Cambridge A2 KEY Listening Exam was used as a pre-test for both groups to assess the participants' listening comprehension.

Qualitative data was collected from the experimental group to gain deeper insight into the participants' experiences with AI chatbots. At the last stage of the procedure, participants in the experimental group were asked to express their learning experiences with the AI chatbot and the interactive listening strategies they employed with AI chatbots through the focus group interview.

3.2. Setting and Participants

The present study was carried out in a public high school located in İstanbul, Türkiye. Students enroll in this high school by passing the High School Entrance Exam, the central examination for secondary education institutions that admit students by exam administered by the Ministry of National Education. The target population of this study consists of 129 10th-grade students who receive four hours of English instruction

weekly. For the intervention, four intact classes were divided into experimental (n = 66) and control (n = 63) groups. Students' names were anonymized using basic identification labels such as S1, S2, S3, and so on, to ensure participant confidentiality.

The present study used convenience sampling, which offers benefits for cost and ease of implementation. Convenience sampling is utilized when researchers have readily available access to participants (Muijs, 2010). This sampling is suitable as the objective of this research is to evaluate the relationships among variables and explore viewpoints (Plano Clark & Creswell, 2015). Despite practical limitations like time and resources, the chosen group yields significant data on the intervention's efficacy within its particular context.

3.3. Data Collection Instruments

The data were collected using the demographic questionnaire, Cambridge A2 KEY listening tests as pre- and post-tests, and focus group interviews. Prior to data collection, ethical permission was obtained from the Ethics Committee of the Social Sciences Institute at Yıldız Technical University. Ethical consent is available with ethics approval report number 20240903275 and a verification code 7396e (Appendix 4). Each participant was requested to provide informed consent and permission before the study started (Appendix 1).

3.3.1. Demographic Questionnaire

A demographic questionnaire was used to gather background information about the participants. The questionnaire aims to collect information about variables that could affect the study's results and allow for inferences about the study's setting.

The questionnaire seeks information from participants about their names, ages, genders, family sizes, the educational backgrounds of their parents, how often they use a foreign language at home, how long they have been learning English, how they think they performed in previous English tests, their experience with AI chatbots, their access to technology, and whether they are involved in additional English education. It also asks about other languages they speak in addition to their native language and English, and their self-assessment of their English skills.

3.3.2. Cambridge A2 Key Listening Tests

In this study, a traditional experimental structure was adopted, commonly referred to as the pre/post-test control group model, where only the intervention group received listening activities through AI chatbot interaction, while the comparison group did not engage in such practices (Muijs, 2010).

Table 1. The Sequence of Traditional Experimental Design

	1. Pre-test	*2. Treatment*	*3. Post-test*
Experimental group	X	X	X
Control group	X		X

Source: Muijs, 2010, p. 18

In order to implement the research design in Table 1, a pre-test was conducted prior to the intervention, and a post-test was administered subsequent to the intervention. The purpose of these tests was to assess the listening skills of both the control and the experimental groups. Participants from both groups were assigned to complete Cambridge A2 KEY listening tests[1] before and after the experiment.

The Cambridge KEY listening tests evaluate English proficiency at the A2 level in line with the CEFR. The Key English Test (KET) is a Cambridge ESOL examination that validates an individual's proficiency in using written and spoken English in everyday contexts at a pre-intermediate level. The study's group of interest, 10th-grade students, often demonstrates language proficiency at this level. The examination ensures validity in the assessment of participants' development by providing a consistent and reliable evaluation of their competencies (Cambridge English, 2024). The Key English Test contains real-life conversations that resemble authentic listening tasks, proving to be an appropriate tool for assessing participants' practical language proficiency. Additionally, it includes questions designed for learners to identify the main idea and recognize key details.

[1] Cambridge Assessment A2 Key preparation sample tests, which are available online at cambridgeenglish.org/exams-and-tests/key/preparation/ © Cambridge University Press & Assessment, 2022.

Each test required approximately 35 minutes. The listening test comprises five parts, with each containing five questions. The listening assessment included questions scored out of four points and was evaluated on a 100-point scale. The pre-test and post-test contain identical item types and amounts, though their content differs. Table 2 illustrates the question types of each part of the Cambridge KET listening test.

Table 2. Cambridge A2 KEY Listening Tests

Sections	Question Types
Part 1	Learners listen to five discrete short dialogues involving two speakers and select the correct answers from three visual options.
Part 2	Learners listen to a teacher talking to their students and filling the gaps with one word, a date, a number, or a time.
Part 3	Learners listen to an informal conversation and choose the most suitable answer from a set of three options.
Part 4	Learners listen to five discrete monologues or dialogues, select the correct answers from a list of three options for each.
Part 5	Learners listen to an informal conversation between two people and match the five items with the eight options

Source: Cambridge University Press & Assessment, 2022

The Listening Section of the Cambridge A2 KEY test was developed to evaluate learners' proficiency in understanding spoken English in daily situations. The test is divided into five parts, each containing a specific type of listening task.

The first part includes five short conversations with three visuals. After listening to each conversation, the participants select the image that most accurately reflects the appropriate response. This part assesses comprehension of basic spoken information, including locations, times, and activities.

The second part requires participants to complete the missing information based on a short monologue. Participants need to listen carefully for specific information, such as dates, numbers, names, and key details. This part evaluates the ability to identify important details from spoken English.

In the third part, participants engage in multiple-choice questions and focus on a longer dialogue between two people. This section underscores the importance of a general understanding of auditory input.

The fourth part comprises five short monologues or dialogues, each accompanied by a multiple-choice question. Participants are required to extract the main idea or a key detail from each recording.

Finally, the fifth section presents an activity in which participants are required to match five individuals with specific items or activities following listening to a conversation. This part assesses listening for details.

3.3.3. The Focus Group Interview

Focus group interviews allow multiple participants to be inquired about the subject simultaneously. They provide researchers with the ability to gain insights from the exchanges among participants, in addition to the interaction between the researcher and the interviewees (Plano Clark & Creswell, 2015).

This study intended to explore EFL high school learners' perceptions of AI chatbots regarding listening comprehension and interactive listening strategies. To gain deeper insights into the students' perceptions of the voice-based chatbot listening activities, a focus group interview was conducted with the eight participants from the experimental group after the intervention. The interview included nine open-ended questions, designed to explore students' experiences, perceptions of listening improvement, and the strategies they used during chatbot interactions. The session was conducted face-to-face in the school setting and lasted 48 minutes. The entire interview was audio-recorded with participants' consent and later transcribed verbatim for thematic analysis.

Focus group interviews are appropriate for the current study's objective, as they offer various viewpoints expressed by participants about the outcome or the impact of an instructional period, such as chatbot-supported listening sessions (Cohen et al., 2007). One of the primary reasons for the preference for focus groups is the dynamic interaction that occurs among participants. As participants hear what others say and think about the issue, they are able to express their own experiences in more detail, which provides an extensive perspective (Clark & Creswell, 2015).

3.3.4. The AI Voice-Based Chatbot

Today, artificial intelligence-based language learning tools are widely used to support the development of listening skills (Huang et al., 2024; Jeon, 2024). The AI chatbot tool utilized in the present study is Call Annie, a publicly accessible, voice-interactive application powered by generative AI and speech recognition. This tool enhances the learning process by enabling spontaneous spoken interaction, employing advanced language processing technologies, and providing an authentic conversational environment for users. Call Annie was selected for this study due to its real-time speech capabilities and natural turn-taking design. In contrast to text-based chatbots, it supports dynamic, voice-based communication, making it suitable for practicing listening in authentic contexts.

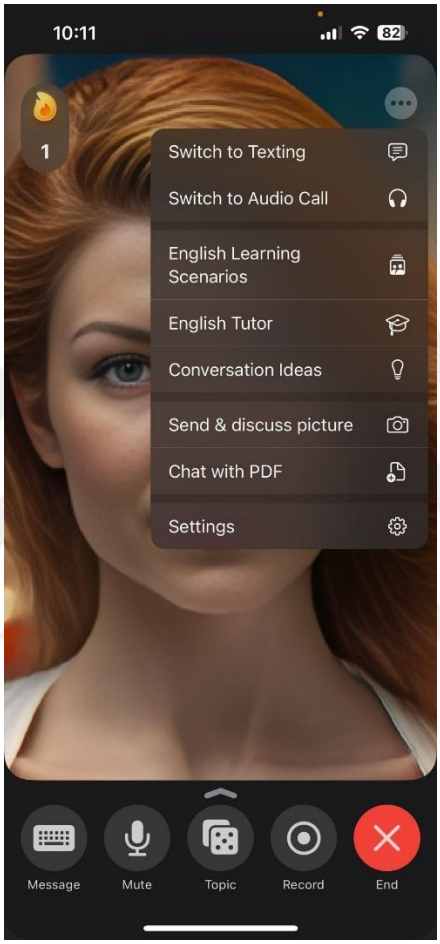
The chatbot is able to understand what is being said and generate appropriate responses. It applies natural language processing (NLP) technology. It offers different scenarios in which users can interact and have daily conversations on specific topics. The application detects the user's speech and adjusts its speech rate. It produces more complex sentences based on the user's language level, provides vocabulary at different levels, and gives immediate feedback. It can provide questions to promote active learning, enabling learners to engage in cognitive processes rather than just passively listening. It is easily accessible, and learners can practice anywhere, at any time, using the chatbot as a mobile app or web tool. The chatbot provides voice communication, and it has visual effects involving the AI character. The characters in the chatbot use mimics, gestures, and eye movements to allow learners to engage in more natural language practice, resembling human-like conversations.

Learners are exposed to English auditory input, and the AI chatbot encourages learners to practice listening skills. Participants actively participate in the listening process with the chatbot rather than only being passive listeners. Participants respond properly to the auditory input they receive by employing interactive listening strategies, such as getting the gist, requesting clarification, and scanning strategies.

The chatbot tailors its input for each participant's language proficiency level by adjusting speech rate, content, and vocabulary to facilitate both individualized and personalized learning experiences.

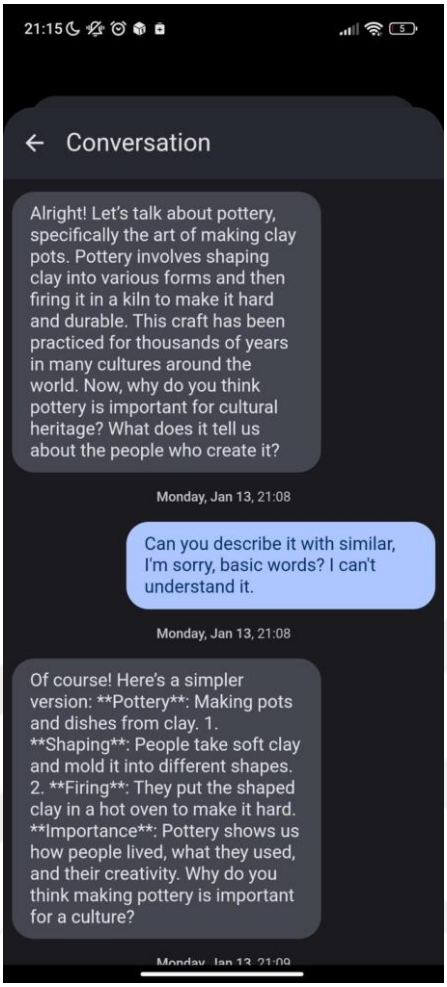
The chatbot is free and accessible through a smartphone or its online website. It serves as a tool that allows users to participate in natural language interactions, responds via speech, and enables real-time conversations. English learners have practice opportunities, and they can develop their listening comprehension skills and interactive listening strategies with the chatbot.

Figure 1. The Interface of the Chatbot



Participants can view recommended conversation prompts and scenario options, enabling them to select from a range of interactive contexts. Moreover, Call Annie has a social dimension that allows users to track their progress and compare achievements with peers who are also completing the same weekly tasks. These features create a gamified, goal-oriented environment that enhances motivation and encourages sustained interaction in English beyond the classroom setting.

Figure 2. Transcription of an Exemplary Interaction

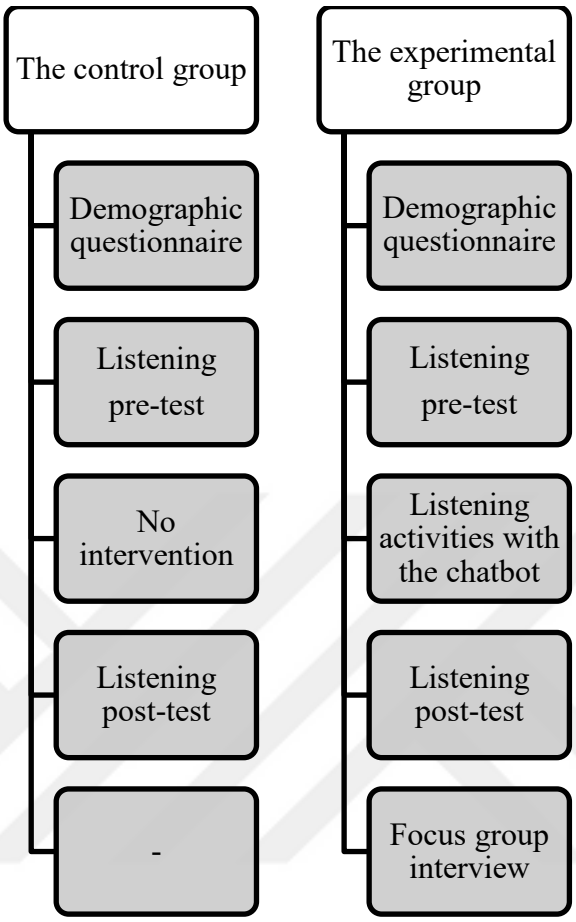


(A record of the interaction between the chatbot and a participant)

3.4. Data Collection Procedure

The study was carried out in the 2024-2025 academic year at a state high school in Türkiye. Prior to the collection of data, the researcher secured authorization from the Ministry of National Education to conduct the research within the educational institution (Appendix 5). Following the MoNE's approval, participants were recruited through informed consent and parent permission forms. To preserve their rights, the study's objective and procedure were clearly explained to them. The four intact classes were randomly separated into experimental and control groups. As illustrated in Figure 3, the participants of both groups completed the demographic questionnaire to gather information about their backgrounds and a pre-test to assess their listening proficiency.

Figure 3. Overall Process of The Study



This study employs an embedded mixed-methods research design, and the data were collected sequentially. The researcher administered the Cambridge A2 Key Listening Test as a pre-test to assess the participants' current listening proficiency in control and experimental groups before the intervention. It was administered on a specified day during class hours. Participants were explained the exam process and instructed on the test format. The researcher ensured that the examination proceeded smoothly, without any disruptions. After the completion of the examination, the participants' answer sheets were collected for evaluation. Responses were scored on a 100-point scale by the researcher and another English language teacher currently pursuing a Master's degree in English Language Teaching (ELT) to ensure the reliability of inter-rater assessments.

After the pre-test, participants in the experimental group started the listening activities with the AI chatbot. The intervention was conducted during regular English class hours

for ten weeks. Alongside the curriculum, 40-minute chatbot sessions were allocated for each week. During these sessions, students engaged in listening tasks aligned with the weekly theme of the curriculum. The activities included role-playing everyday scenarios (such as acting like a new foreign student at the school or embodying a historical figure), answering chatbot-generated questions, and completing listening-based response tasks that required extracting specific details or expressing personal opinions. Students were encouraged to sustain interaction by asking follow-up questions and clarifying misunderstandings, thereby promoting the use of interactive listening strategies.

The experimental group participants were introduced to the chatbot one week before the intervention. The researcher provided details about the application and informed participants on how to use the chatbot correctly. Participants were given prompts to practice listening skills with the chatbot. The prompts were prepared based on the 10th Grade English Language Curriculum (MoNE, 2018). Topics and prompts to engage with the chatbot were given before each week. Table 3 summarizes the chatbot listening activities and the intervention process.

Table 3. Chatbot Activities

Weeks	Topics	Exemplary Prompts
1	Free listening activities	
2	School Life: identifying phrases encountered in school/ everyday life	Please describe an ordinary day in a student's life in another country. Then, ask me three questions about what you said.
3	School Life: receiving expressions related to free time activities	Can you tell me about some popular free time activities for teenagers?
4	Plans: catching the important details of future plans	Talk about a school trip and ask me to list the key points.
5	Plans: recognizing the schedules of future arrangements	Describe a future trip step by step and quiz me about the order of the steps.
6	Legendary Figures: inferring the important events and dates from a legend	Narrate a legend including historical elements from (specific culture or country) and ask me to summarize the events.

7	Legendary Figures: obtaining a historical story describing characters and places	Please tell me about a legendary figure from (specific culture or country) and ask comprehension questions.
8	Traditions: eliciting information about lifestyles and customs of different cultures	Can you describe a traditional festival from (specific culture or country) and ask me to compare it to Türkiye.
9	Traditions: extracting specific information on social, educational, and technological lives of people in the past around the world	Please share examples of how people in a (specific country) used to live and ask me about the different practices of the past and today.
10	Free listening activities	

The first week of the intervention was designated for participants to engage in independent listening activities. They met with the chatbot and exchanged topics based on their interests. In the following weeks, participants were provided a prompt list before each session. The participants arrived in the class after having thoroughly reviewed the given prompts and were prepared to engage with the chatbot. Participants engaged with the chatbot individually in the conference hall, creating a peaceful and focused atmosphere for everyone.

Following the intervention phase, the post-test was administered to the control and experimental groups. The researcher carried out the post-test procedure in the same manner as the pre-test. Consequently, a focus group interview was conducted involving eight participants, who were representatives of the experimental group, based on their engagement with the chatbot to address the third and fourth research questions.

The participants were informed that the interview was recorded. The focus group interview aimed to explore participants' perspectives on improving their listening skills through the chatbot interaction. Participants were requested to discuss the benefits and challenges of integrating the chatbot into English language learning. They evaluated the chatbot's effectiveness in improving listening comprehension skills. They were asked to explain the interactive listening strategies they applied during the

intervention. The researcher collected feedback from participants regarding the differences between chatbot listening sessions and traditional listening activities.

The interviews were conducted in the participants' native language, allowing them to share their experiences and thoughts comfortably. The researcher conducted the interview in a calm and quiet office. The focus group interview was conducted in Turkish, lasting approximately 48 minutes. The verbatim English translation of the transcription yielded a total of 5,250 words, which were subsequently analyzed for qualitative themes. Open-ended questions in Table 4 were posed to encourage participants to share their experiences and thoughts regarding the implementation of the chatbot.

Table 4. Focus Group Interview Questions

1. How has the use of AI chatbots affected your English listening skills?
2. How was your experience practicing listening to English with the AI chatbot?
3. Have you noticed any improvement in your listening comprehension skills with the chatbot? If you believe you have improved your listening skills, how did this improvement take place?
4. What listening strategies do you use when interacting with the chatbot?
5. How did you react when you didn't understand the AI chatbot? What did you do to clarify what you didn't understand? What did you do to get more information or deepen the topic?
6. How did you react when you feel misunderstood during a listening activity with the chatbot?
7. When comparing the listening activities in regular classroom settings with those facilitated by the AI chatbot, which activities did you find to be more beneficial, and why?
8. How has interacting with the AI chatbot impacted your experience of learning English overall? How has this technology supported your language learning journey?
9. What role do you think AI chatbots will play in improving listening skills and interactive listening strategies in the future? Do you have any suggestions for future educational applications of this technology?

The focus group questions were developed in alignment with the study's research questions and were informed by previous studies on AI chatbots in language learning

(Kim, 2018; Huang et al., 2024; Jeon, 2024). Additionally, to support inter-rater reliability, another researcher reviewed the subset of the transcriptions and the emergent codes.

3.5. Data Analysis

The present study employed an embedded mixed-methods design. The quantitative findings were obtained from the Cambridge A2 Key listening assessment results of both groups in the study. Qualitative data were collected by eliciting the participants' perceptions of the intervention in the experimental group.

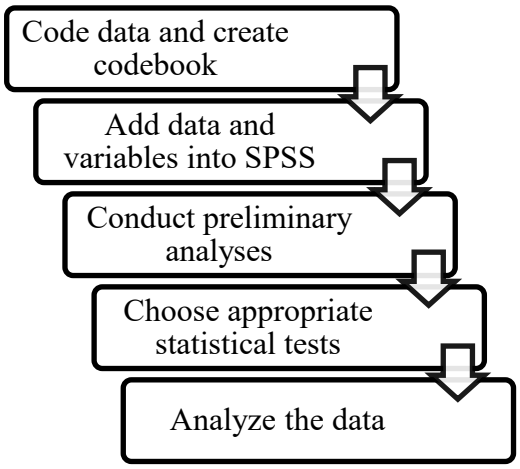
3.5.1. Quantitative Data Analysis

The Statistical Package for Social Sciences (SPSS) version 26.0 was utilized for quantitative data analysis. The quantitative data for this study came from the Cambridge A2 Key English listening test.

Before addressing the research questions, the Kolmogorov-Smirnov and Shapiro-Wilk tests were conducted to assess normal distribution. The results indicated that the data did not follow a normal distribution (p=.008 for the pre-test and p=.000 for the post-test of the experimental group, p=.023 for the post-test of the control group). Therefore, non-parametric statistical tests were run instead of parametric alternatives.

A Wilcoxon Signed Rank Test was employed to evaluate whether exposure to the voice-based chatbot contributed to any measurable change in the listening comprehension of the experimental group. Then, to compare the listening comprehension gains of the experimental group, which engaged with the AI chatbot, and the control group that did not receive such input, a Mann-Whitney U test was conducted. Figure 4 illustrates the procedure of the quantitative data analysis process.

Figure 4. Quantitative Data Analysis Process



3.5.2. Qualitative Data Analysis

This study conducted focus group interviews to determine how and in what ways the qualitative data enhances the quantitative data. Thematic analysis, which facilitates a precise methodology for the development of codes and themes, was employed to examine the qualitative data (Clarke & Braun, 2017). Braun and Clarke (2006) designed an approach that is flexible and applicable to many subjects and frameworks. It is practicable for researchers who have limited or no experience in qualitative research (Braun & Clarke, 2006). It reveals the repeated themes, semantic meanings, or latent aspects that emerge from the data (Braun & Clarke, 2006).

Braun and Clarke (2006) outline a six-step procedure for thematic analysis that was also adapted in the present study. The analysis starts with building familiarity with the data. It requires extensive reading and looking for patterns. When the researcher is familiar with the data, they proceed to the second step, which is developing preliminary codes. In this stage, the researcher starts to identify meaningful and relevant units from the data that are interesting or important. After having a long list of codes, the researcher tries to search for broader themes that connect these codes into main themes or sub-themes for the third stage.

At the fourth stage, the themes are meticulously examined to determine whether they accurately represent the data, are combined coherently, and reflect distinct ideas. At this stage, overlooked codes may occur as coding is an ongoing process. Following the fourth stage, it is essential to clearly characterize and specify the content of each theme.

The researcher assigns names to themes to describe them accurately. The analysis concludes with the presentation of the data report, which includes extracts from the actual data to support the identified themes.

In line with the approach proposed by Braun and Clarke (2006), focus group interviews were initially transcribed from audio recordings into a written text. After the transcription phase, the text was translated from Turkish to English. The researcher read through the data actively and took notes to analyze overarching ideas. After that, the researcher manually identified recurring codes that shape the entire dataset using Microsoft Word. Once the codes were developed, the researcher grouped them into distinct yet coherent themes. The themes were refined, reviewed, and labelled carefully. Finally, the findings were presented in accordance with the research questions, and the results were assessed in relation to the existing body of literature. Table 5 summarizes the qualitative data analysis process.

Table 5. Qualitative Data Analysis Process

The Thematic Data Analysis Process (Braun & Clarke, 2006)
Step 1: Transcribing the data
Step 2: Translating the text
Step 3: Reading thoroughly
Step 4: Identifying the codes
Step 5: Grouping codes into themes
Step 6: Reviewing the themes
Step 7: Defining the themes
Step 8: Presenting findings

Various strategies were employed during the qualitative data analysis to ensure the validity. Initially, two researchers worked together to code the transcripts, discussed their preliminary interpretations, and identified emerging themes, a process known as "peer debriefing," as suggested by Creswell and Miller (2000). Peer debriefing improves the credibility of the thematic analysis by reducing individual bias and ensuring consensus regarding theme generation.

Then, “thick, rich description” was used to describe the setting, participants, and themes in rich detail (Creswell & Miller, 2000). This establishes credibility for readers to make decisions regarding the applicability of the findings.

Additionally, an “audit trail” was maintained throughout the process, in accordance with Creswell and Miller’s (2000) criteria for establishing trustworthiness. The researcher recorded the inquiry process by journaling and memoing, keeping a research log, creating a data gathering timeline, and explicitly describing data analysis processes.

3.6. Ethical Considerations

Ethical approval for the study was obtained from Yıldız Technical University's Academic Ethics Committee prior to data collection. Informed consent forms were distributed and signed by all student participants and their parents or legal guardians, in compliance with ethical research guidelines (Appendix 2). Participants were informed about the study's purpose, scope, and voluntary nature (Appendix 3). Their anonymity and privacy were guaranteed throughout the process. Participants were assigned codes in qualitative data reports to protect participants’ identities. Furthermore, the researcher supervised and monitored the use of the AI chatbot to avoid any kind of participant discomfort.

4. RESULTS

This chapter includes a quantitative analysis of the Cambridge A2 Key listening test scores and the themes that emerged from the focus group interview regarding the experimental group's perceptions of the listening activities with the chatbot and the interactive listening strategies they have employed. An overview of the statistical tests was provided, along with the identification of themes based on participants' reflections on their feelings during the intervention, their observations in listening comprehension skills, and the strategies they employed to address breakdowns in comprehension.

The current research examines how the AI voice-based chatbot influences the listening comprehension skills and interactive listening strategies of high school EFL learners. The study utilized an embedded mixed-methods design, incorporating both quantitative and qualitative approaches to obtain an extensive understanding of the research questions. The study's quantitative strand was based on results obtained from the Cambridge A2 Key listening test conducted before and after the intervention. Additionally, the qualitative strand drew upon data gathered from a focus group interview. The data were analyzed using descriptive statistics and non-parametric statistical procedures. The Wilcoxon Signed Rank Test was conducted to examine the within-group improvement of the experimental group. Then, a Mann-Whitney U Test was employed to assess whether the two groups —those who received the voice-based chatbot intervention and those who did not —demonstrated measurable differences in their post-test results. Next, thematic analysis was employed to gain more profound insights into the participants' responses from the focus group interview. The findings of the study are anticipated to contribute to EFL instruction by presenting novel perspectives and offering innovative methodologies for language learning.

4.1. Quantitative Results

The research employed an embedded mixed-methods research design. The quantitative data were obtained from the Cambridge A2 Key listening test to investigate how the AI chatbot influences 10th-grade EFL learners' listening skills in

terms of identifying main ideas and specific details from audio materials. The listening test was administered as a pre- and post-test to observe the effect of the intervention. Both the control and experimental groups were assessed to compare their listening comprehension skills.

4.1.1. The Impact of the AI Voice-Based Chatbot on Experimental Group's Listening Comprehension Skills

To address the first research question, which seeks to determine whether the AI chatbot affects the listening comprehension skills of 10th-grade EFL learners in identifying main ideas and specific details in auditory input, the quantitative data scores were calculated using SPSS 26.0. The experimental group was tested before and after the intervention to evaluate the changes in their listening test scores. Prior to the actual analyses, normality tests were conducted to decide whether to use parametric or non-parametric statistics. Parametric statistics assume that the group's participant distribution is normal, whereas non-parametric statistics do not make such an assumption (Pallant, 2016). Therefore, the Kolmogorov-Smirnov and Shapiro-Wilk tests were run to assess the normality of the distribution.

Table 6 presents the Kolmogorov-Smirnov and Shapiro-Wilk results for the experimental group's pre- and post-test scores. The Kolmogorov-Smirnov test indicates that the pre-test and the post-test scores of the experimental group do not follow a normal distribution, $D(66) = .129$, $p = .008$ for the pre-test and $D(66) = .156$, $p = .000$ for the post-test. The results of the Shapiro-Wilk test also indicated the violation of the assumption of normality, $D(66) = .957$, $p = .024$ for the pre-test and $D(66) = .909$, $p = .000$ for the post-test .

Table 6. The Test of Normality for the Pre-test and Post-test of the Experimental Group

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	group	Statistic	df	Sig.	Statistic	df	Sig.
pretest	Experimental	.129	66	.008	.957	66	.024
posttest	Experimental	.156	66	.000	.909	66	.000

a. Lilliefors Significance Correction

The analysis of normality concerning both the pre-test and post-test results suggests that using a non-parametric technique is appropriate for comparing the scores (Pallant, 2016). Since the data did not meet parametric assumptions in this study, the Wilcoxon Signed Rank Test—used as an alternative to the paired-samples t-test—was utilized to evaluate changes in listening performance before and after the intervention.

The descriptive statistics, including the mean and the median of the pre- and post-test results of the experimental group, were calculated to detail the preliminary analyses. Descriptive analyses provided insights into the participants' performance before and after the treatment. Both the pre- and post-test results ranged from 19 to 100 points. According to analyses, the pre-test results had a mean of 63.08, while the median was 66.00. After the intervention with the chatbot, the post-test mean was calculated as 73.36, and the median increased to 81.50. It can be inferred that the mean and median scores of the experimental group increased following the intervention. Since median score of the post-test exceeds the mean score, we can conclude that the scores cluster towards the high end, indicating negative skewness. This indicates that the majority of participants had better results in the listening test following the intervention; however, a small number of them displayed lower performance, which decreased the mean score. Descriptive analyses showing the rise in mean and median scores after the intervention indicated that the chatbot had a positive impact on the listening comprehension of the majority of participants. Nevertheless, it is imperative to conduct non-parametric analyses to ascertain whether the observed change in the post-test results is statistically significant.

Changes in the experimental group's listening comprehension were evaluated using the Wilcoxon Signed Rank Test, comparing performance prior to and following the intervention.

Table 7. Ranks Table of the Experimental Group

		N	Mean Rank	Sum of Ranks
posttest - pretest	Negative Ranks	11[a]	22.36	246.00
	Positive Ranks	52[b]	34.04	1770.00
	Ties	3[c]		
	Total	66		

a. posttest < pretest

b. posttest > pretest

c. posttest = pretest

According to the Table 7, 11 participants achieved lower scores on the post-test than they did on the pre-test. Fifty-two participants demonstrated higher scores on post-tests compared to their pre-test results, while three participants had the same scores on both tests. Given that a greater number of participants achieved higher scores in the post-test compared to the pre-test, it can be concluded that there is an improvement in the participants' listening comprehension skills.

Table 8. Wilcoxon Signed Ranks Test Results of The Experimental Group

Test Statistics[a]	
	posttest - pretest
Z	-5.219[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

A negative Z score indicates that the post-test scores are higher than the pre-test scores, which suggests that the intervention was highly effective. Additionally, the Asymp. Sig. (2-tailed), or *p*-value, was found to be .000, which is less than 0.05, indicating that the difference between the two scores is statistically significant. According to table 8, findings from the Wilcoxon Signed Rank Test indicate a notable improvement in the experimental group's listening comprehension following their participation in voice-based chatbot listening tasks. The Wilcoxon Signed-Rank test yielded $Z = -5.219$, $p < .05$. These results illustrate a significant difference between participants' pre-test and post-test scores.

Additionally, the effect size was calculated to assess how large this difference is. The z value was divided by the square root of N to calculate the effect size, and it was found to be $r \approx 0.64$. According to Cohen (2013), this value corresponds to the large effect. This indicates that the difference not only has significant results but also has effective implications for practice.

A Wilcoxon Signed Rank Test revealed a statistically significant increase in listening skills following the chatbot engagement in the intervention, $z = -5.219$, $p = .000$, with a large effect size ($r = 0.64$). In summary, the median score on the Cambridge A2 Key listening test increased from pre-test (Md = 66) to post-test (Md = 81.50).

4.1.2. Comparison of Control and Experimental Groups on Listening Comprehension Skills

The second research question aims to explore whether the listening comprehension skills of the experimental group, who engaged in chatbot listening activities, differ from those of the control group, who received traditional listening in the class, in terms of identifying main ideas and specific details. Both groups took the Cambridge A2 Key listening test for comparison to see if there was a difference in their listening comprehension results.

The normality of the distribution of the post-test results for the control group and the experimental group was checked to determine whether to use the independent-samples t-test or the Mann-Whitney U test. Kolmogorov-Smirnov and Shapiro-Wilk were applied to identify the normality of the distribution (Table 9).

Table 9. The Tests of Normality for The Control and The Experimental Group's Post-Test Results

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	group	Statistic	df	Sig.	Statistic	df	Sig.
posttest	Control	.075	63	.200*	.956	63	.023
	Experimental	.156	66	.000	.909	66	.000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The post-test results for the control group revealed a Kolmogorov-Smirnov test *p*-value of .200, indicating normal distribution. In contrast, the Shapiro-Wilk test reported a *p*-value of .023, which suggests deviation from normal distribution ($p < .05$). The post-test scores of the control group were considered to show a non-normal distribution in light of these results. For the experimental group's results, both the Kolmogorov-Smirnov (p=.000) and the Shapiro-Wilk (p=.000) tests revealed that the scores are not normally distributed. The post-test results of both groups violated the assumption of normal distribution. Consequently, to investigate the differences

between the groups, a non-parametric test, the Mann-Whitney U, was employed rather than the independent-samples t-test.

The descriptive analyses were conducted to examine the central tendencies and characteristics of the groups. The mean value of the post-test results for the control group was 63.97, whereas the median value was computed to be 63.00. The slight difference between the mean and the median implies that the post-test scores for this group have a relatively symmetric distribution. This indicates that the participants in the control group demonstrated a similar level of listening comprehension on the post-test. In contrast, the experimental group's post-test results showed a mean of 73.36 and a median of 81.50. The noticeable difference between the mean and median suggests an asymmetric distribution of scores. This suggests that the majority of participants in this group performed better in the post-test, even though some may have outlier scores that are either much lower or much higher than the average. The descriptives suggested the potential impact of the chatbot on the listening comprehension skills of the experimental group; however, statistical tests are necessary to clarify these results.

First, the normality of the distribution was assessed to decide whether to use a parametric test or a non-parametric alternative. The Kolmogorov-Smirnov and Shapiro-Wilk tests were performed, yielding results that violated the normality assumptions required for parametric procedures, (control group, p=.023; experimental group, p=.000). Consequently, a non-parametric test, the Mann-Whitney U test, was required to pinpoint whether a significant difference exists between the control and experimental groups regarding their English listening comprehension skills (Table 10).

Table 10. Mann-Whitney U Test Results

Independent-Samples Mann-Whitney U Test Summary	
Total N	129
Mann-Whitney U	2557.000
Wilcoxon W	4768.000
Test Statistic	2557.000
Standard Error	212.170
Standardized Test Statistic	2.253
Asymptotic Sig.(2-sided test)	.024

The Mann-Whitney U test indicated that the two groups differed significantly in terms of their performance on the listening tests since the *p*-value of .024 is less than .05. The median scores suggest that the experimental group (81.50) achieved higher listening comprehension performance compared to the control group (63). The intervention given to the experimental group most likely enhanced their achievement on the listening comprehension test.

Furthermore, the effect size was computed to identify the magnitude of the differences between the control and experimental groups, and r ≈ 0.20 was found. According to Cohen's classification (2013), it can be considered a small to medium effect because it falls between the .1 and .3 thresholds. It was observed that a significant difference exists between the two groups; however, it produces a small effect. It can be asserted that the integration of the AI voice-based chatbot into language learning is effective, but its practical applicability remains limited.

A Mann-Whitney U Test revealed a significant difference in the listening comprehension skills of the control group (Md =63, n =63) and the experimental group (Md = 81.5, n = 66), U = 2557, z = 2.253, *p* = .024, r = 0.20. Analysis of the Mann-Whitney U test indicated that the group engaged in chatbot activities outperformed

those who received no such instruction. This indicates that the AI voice-based chatbot demonstrates greater efficacy than traditional listening activities.

Quantitative results showed that participants in the experimental group demonstrated notable progress in understanding spoken English, as indicated by comparisons between their pre- and post-intervention performances. This suggests that students who interacted with the AI chatbot were able to enhance their ability to understand spoken English. The increase in post-test scores indicates a positive development, possibly due to repeated exposure to spoken input and the interactive nature of chatbot conversations.

In contrast, the control group did not show a comparable level of improvement, which may imply that traditional instruction alone was less effective in fostering listening comprehension. These findings underline the potential influence of interactive, voice-based practice on learners' listening skills.

4.2. Qualitative Results

This study employed an embedded mixed-methods research design that integrates both quantitative and qualitative components. Qualitative data was used to augment the quantitative results. A focus group interview was implemented to present a thorough analysis of the research questions.

The focus group interview was conducted with eight participants from the experimental group. The data obtained from the focus group interview was meticulously analyzed using thematic analysis. The emergent themes from the focus group interview were classified into two groups: listening comprehension skills and interactive listening strategies, in order to provide a comprehensive analysis of the data. These groups were delineated in accordance with the research questions and the theoretical framework of the study. Each group was examined separately to provide an in-depth understanding of the participants' perspectives and experiences regarding the chatbot's role in enhancing their listening skills.

4.2.1. Listening Comprehension

Table 11. Themes for Listening Comprehension Skills

Category	Theme	Frequency	Percentage	Category Frequency
1. Supportive Factors	Listening Comprehension Skills	28	26,42%	81,13%
	Integrative Skills	15	14,15%	
	Overall English Proficiency	13	12,26%	
	Characteristics of the chatbot	20	18,87%	
	Emotional Dynamics	10	9,43%	
2. Challenges	Technological Limitations	10	9,43%	18,87%
	Adverse Emotional Experiences	8	7,55%	
	Absence of Perceived Improvement	2	1,89%	

Listening comprehension skills themes fall into two categories: supportive factors and challenges. Supportive factors encompass the beneficial aspects of the AI chatbot, while challenges refer to its drawbacks and limitations. To address the third research question, 10th-grade EFL learners' perceptions of how the AI chatbot contributed to their listening comprehension, particularly in identifying main ideas and specific details, were explored. Through the analysis of the qualitative data, eight themes were identified.

4.2.1.1. Supportive Factors

4.2.1.1.1. Listening Comprehension Skills

During the focus group interview, participants shared their views on how the chatbot influenced their listening skills from different aspects. Participants stated that exposure to natural language and interactions helps them practice listening skills.

> *We improve our English by practicing listening with this type of artificial intelligence. Before, I had difficulty understanding some words or expressions, but with constant practice, my familiarity with them increased.* (S1)

> *Normally, when I listen to a text in class, I sometimes struggle to keep up with the pace and miss important parts, but here I had to respond while interacting with the AI.* (S2)

> *It made me listen more carefully. I mean, when the chatbot sometimes makes long sentences about a topic, I start to focus on important parts and pay more attention to them to answer appropriately.* (S5)

The participants reported a noticeable improvement in their listening comprehension after engaging with the chatbot, particularly in their ability to focus on the main idea and extract key details. They expressed a preference for the chatbot over conventional classroom listening activities, emphasizing that it was more effective in enhancing their active listening skills. According to their reflections, the chatbot fostered more active engagement during listening tasks, which in turn increased their participation in the listening courses. Furthermore, when comparing their listening abilities before and after the intervention, participants stated that they were able to comprehend information more quickly post-intervention. They attributed this development to the chatbot's capacity to help them concentrate on the overall context of the listening input.

In addition to the general improvement of listening comprehension, conscious and careful listening was frequently mentioned during the focus group interview. Participants stated that while interacting with the chatbot, they paid closer attention to what they heard in order to fully understand the auditory input. This behavior was

often described in contrast to their experiences with traditional classroom listening activities. For instance, S3 stated,

> *In the regular listening activities in class, we used to just listen and choose the correct answer. But we participate more actively when listening to the chatbot, so I was more careful while listening.* (S3)

Expanding on this view, S6 and S8 expressed similar yet more elaborated reflections. The reflections of S6 and S8, which support the earlier view, were interpreted in light of their emphasis on active engagement, cognitive engagement, and strategic listening.

> *Since I have to respond while listening, I try to focus on the context so as not to miss any important details. Listening and responding continuously has made me listen carefully.* (S6)

> *In the listening activities we did in the classroom, we were just listening to an audio recording and answering questions, but here, since we were listening interactively, I had to pay attention in order to continue the activity. I tried to listen more carefully to the important points so as not to miss the important events. When I listened carefully, I was able to understand them.* (S8)

They compared the listening activities with the chatbot to real-life listening experiences. Most of the participants considered listening activities with the chatbot more beneficial because they resemble everyday listening experiences. Unlike traditional classroom tasks, where learners passively listen and answer comprehension questions, chatbot interaction required them to engage in real-time communication.

> *In real life, when we do listening activities, we actively listen and respond. But this is not the case with regular listening activities. Because we only listen and write down what we know, we don't speak, and we listen passively. I think artificial intelligence is more educational in this regard.* (S6)

> *I also think the chatbot is more useful because it offers us an interactive learning option. It is also closer to real life. In real life,*

we hear different accents and conversations. Everyone can speak at different speeds. (S7)

The prevailing beliefs regarding the chatbot focused on its educational dimension, particularly in relation to listening skills. After participating in the chatbot activities, most participants favored the chatbot over traditional listening tasks. Participants emphasized that the chatbot's active listening feature resembles genuine listening, offering interactive options that provide them with opportunities for practice, as it was stated in the interview by S1:

Since it also uses the language in everyday speech, when the chatbot tells us something, we actually hear everyday speech. We are exposed to everyday speech and things we don't listen to in classes. (S1)

It was revealed that participants perceived the AI chatbot as an effective tool for developing their listening comprehension skills. They consistently emphasized its interactive and authentic nature, which helped them listen more attentively. The students' reflections highlighted that compared to traditional classroom listening activities, the chatbot provided a more engaging and realistic experience, encouraging active participation and deeper cognitive involvement.

4.2.1.1.2. Integrative Skills

Building on the previous theme, which highlighted learners' increased attention, focus, and motivation in understanding auditory input, the theme of integrative skills goes further by encompassing learners' capability to respond appropriately and sustain meaningful interaction. Participants shared how useful they found the chatbot for enhancing their oral communicative competence, as it encouraged them to speak.

It made me speak more fluently because the more you hear it, the more it sticks in your head. Its accent is actually passed on to us; that is, the pronunciation of words, and so on, is passed on to me. After using the chatbot, I realized that I started to speak more fluently, that is, noticeably. (S7)

I had a little difficulty speaking English with foreign people because, even though I had the words in my mind, I struggled to

speak. But with the chatbot, I started to speak more comfortably because I didn't have a real person in front of me. If I made a mistake, the chatbot wouldn't do anything with it, and I can say that my speaking has improved a little bit. (S3)

Overall, the responses indicated that the chatbot listening activities also had an impact on their speaking skills. These remarks emphasize the chatbot's effectiveness in enhancing integrative skills.

4.2.1.1.3. Overall English Proficiency

In addition to improvements in specific listening skills, participants expressed that the intervention contributed to their overall English proficiency. While the primary focus of the intervention was on listening, many participants reported that their general comprehension of English improved throughout the process. This enabled participants to construct more accurate sentences and express their ideas more clearly. Notably, beyond understanding spoken input, they also began to pay attention to how language was used, which led to increased language awareness. In particular, several participants reported recognizing and acquiring unfamiliar vocabulary items during their interactions with the chatbot. This suggests that, although the activities focused on listening, the chatbot provides opportunities for language learning. Therefore, the chatbot did not solely support listening comprehension, but also provided a flexible and interactive environment for overall language development.

Also, the chatbot uses different words. It makes us learn different things. When we have a lack of subject matter, he opens a different subject and continues it. And at that point, we learn something we don't know, both in terms of knowledge and vocabulary. This was very useful for me. (S1)

For example, when I wanted to talk about mathematics, the chatbot explained the same thing in English. Since I also know the Turkish version of it, my vocabulary has improved, and I have become able to explain it to another person. (S4)

I think it is useful for grammar. I also learned grammatical structures that I didn't know how to use before by hearing them

from the chatbot. For example, question tags. In our English lesson, we had a pronunciation task in the book that focused on question tags. But it was very mechanical and not very informative. But listening to the chatbot, I realized the grammatical structures and learned them. (S5)

The results indicated that employing the AI chatbot positively affected participants' grammatical competence, leading them to enhance their awareness. By engaging with a wide range of topics and linguistic forms, students gradually internalized grammatical patterns and became more confident in their use of English.

4.2.1.1.4. Characteristics of the Chatbot

Participants held positive attitudes toward the chatbot in the listening comprehension process due to its technical and pedagogical capabilities. Participants identified the chatbot as accessible, applicable, and personalized. One participant highlighted this by stating,

The chatbot can be personalized for everyone. It can be personalized according to my own knowledge, according to my own level of English. It adjusts itself according to my understanding and speech rate. (S5)

This perceived adaptability appeared to increase learners' sense of control and comfort during listening activities. They viewed it more as a game than as an obligatory task. They found the chatbot more engaging and enjoyable than the listening activities in the classroom. It emphasizes the chatbot's role in fostering an entertaining environment for language learning.

4.2.1.1.5. Emotional Dynamics

Another result that arose was the positive feelings that the chatbot evoked. Participants' perspectives revealed that the chatbot's benefits extend beyond its linguistic development; it also provides emotional support. Expressions such as "being stress-free," "improving self-confidence," and "motivating to listen" were frequently mentioned in the interview. Some participants stated that listening activities with the chatbot increased their self-confidence and enthusiasm for listening. This type of

feedback suggests that it positively affects their perspectives on listening to the chatbot.

> *It gave me self-confidence. Before, for example, when I was listening in class, I was afraid that I would not understand the texts because they came to me too fast. However, after engaging in practice with artificial intelligence, I developed greater confidence in my listening skills, as I can ask about the aspects of the topic that I did not understand.* (S2)

This shows that the interaction between the chatbot and the participants created a sincere learning atmosphere. It encouraged participants to engage more in listening activities, evoking positive feelings that enhance listening comprehension skills. Many participants perceived the chatbot as human-like, which alleviated anxiety and made the experience enjoyable and safe.

> *I think, since every person we talk to in the application is created as if they have a certain life, it is very successful to make them feel like a real person at that point.* (S6)

This emotionally supportive environment created an experience that reduced anxiety, increased confidence, and encouraged learning. This led to greater willingness to engage in listening tasks.

4.2.1.2. Challenges to Improvement

Despite the positive opinions about using the chatbot in listening activities, participants experienced some difficulties and limitations during the intervention. The disadvantages that the chatbot has indicate that further improvements are necessary.

4.2.1.2.1. Technological Limitations

Several participants expressed concerns regarding the chatbot's technological shortcomings, including misunderstandings, irrelevant replies, and a lack of responsiveness to participants' output. These inconveniences disrupted the continuity of the listening activity and discouraged participants from participating in the listening process actively.

In particular, participants shared that there were moments when the chatbot strayed off-topic, which made them feel less engaged and interested in listening. Furthermore, a few participants described the chatbot as too robotic, making it feel distant from being natural and authentic.

> *Unlike my friends, I couldn't get out of what I thought was a very artificial intelligence, because even if I gave different prompts, it always went back to the same context. I mean, Annie is always doing yoga and hiking. Since she doesn't have many different activities, it feels very artificial.* (S3)

> *My friends talked about the positive sides. I would also like to talk a little bit about the negative sides to be more objective. When you talk, you sometimes feel very much that the other person is very robotic. When I asked a question, it seemed like the chatbot didn't quite understand what I meant, leading us into a conversation about something completely different.* (S4)

Technical issues also include the chatbot's failure to recognize the user's words or respond quickly. S8 explained that there were moments when the chatbot did not hear or respond, which interrupted the flow of the conversation and hindered listening practice.

> *There were times when the chatbot either didn't hear me or failed to respond, disrupting the interaction's flow.* (S8)

Issues such as robotic or repetitive responses and delayed or unrecognized input adversely affected the overall user experience. These shortcomings disrupted the natural flow of interaction and sometimes reduced learners' motivation to engage actively in listening tasks.

4.2.1.2.2. Adverse Emotional Experiences

An additional concern expressed by the participants regarding the chatbot was their negative emotions experienced during listening practice with it. Some participants felt pressured to actively listen and respond simultaneously. They felt stressed and were reluctant to continue the activity at those times.

Actually, I was better focused on listening in class. There were always questions about it in the book, and everything was clear regarding what to do, how to do it, etc. Since I didn't have to speak, I could adapt more easily. I mean, I didn't feel any stress about what I was going to talk about while doing regular listening activities in the classroom. (S4)

Although the chatbot created a generally supportive environment, some participants experienced negative emotions such as stress and pressure, particularly when they were expected to listen and respond at the same time. In contrast to conventional classroom environments where outcomes were more defined and engagement was mostly passive listening, the interactive nature of chatbots sometimes led to feelings of anxiety.

4.2.1.2.3. Absence of Perceived Improvement

While some participants expressed positive views about their growth in listening comprehension, a few participants mentioned they did not notice any improvement. The participants expressed a preference for the chatbot to some extent; however, they did not believe it had a significant impact on their listening skills. They believed a longer process might impact their listening.

I don't have such an extreme difference in my listening right now. Maybe if this lasts longer, it may be more beneficial. Or, of course, I can't say that it has no effect at all. At least it offers us language practice opportunities. (S3)

Nevertheless, these remarks were quite infrequent compared to the positive feedback received from the participants. These views suggest that while the majority of the participants benefited from the intervention, the duration of exposure may play a critical role in determining its effectiveness for all learners.

The participants' perceptions of listening to the chatbot were mainly positive. Participants appreciated several features of the chatbot that enhanced their listening comprehension skills. They found it advantageous as it provided them with familiarity with the language. Mostly, they preferred the chatbot to traditional listening activities. It was mainly because they said that they could adjust the chatbot's content and speech rate according to their preferences and interests. Moreover, it was mentioned in the

interview that listening to the chatbot led to an increase in their speaking practices. Active listening with the chatbot involves both practicing listening and speaking, encouraging student engagement. However, some participants also reported negative aspects of using the chatbot. Those are about some reliance on technology and how it may negatively affect them. These results suggest that chatbots can enhance listening comprehension skills; yet, their limitations must be addressed and considered for successful integration into ELT.

4.2.2. Interactive Listening Strategies

To address the fourth research question, the interactive listening strategies utilized by participants while engaging with the chatbot were examined. In analyzing the strategy sub-themes, the naming for the classification was adapted from Nakatani's (2006) Oral Communication Strategy Inventory (OCSI). Nakatani (2006) categorized strategies to address challenges that learners face in oral communication. According to the classification in the OCSI, interactive listening strategy sub-themes were created, and adjustments were made to align with the current research's framework.

Participants employed different strategies to overcome the listening difficulties during the listening activities with the chatbot. They implemented strategies to enhance their comprehension of the auditory input. In the focus group interview, participants shared a range of strategies that emerged as sub-themes of the interactive listening strategy theme.

Table 12. Sub-themes for Interactive Listening Strategies

Sub-theme	Frequency	Percentage
Negotiation for Meaning	15	44.12%
Top-down	5	14.71%
Bottom-up	4	11.76%
Fluency-Maintaining	4	11.76%
Changing the topic	3	8.82%
Self-repair	3	8.82%

The results derived from the focus group interviews unveiled several sub-themes regarding interactive listening strategies among participants, which are identified as negotiation for meaning, top-down, bottom-up, fluency-maintaining, changing the topic, and self-repair.

The findings indicate that participants primarily used negotiation for meaning strategies to maintain their interaction with the chatbot. This sub-theme mainly focuses on strategies to make communication smoother, including requesting clarification and repetition, asking the chatbot to use simpler language, prompting it to adopt a slower pace, and suggesting using it in a sentence. The most shared strategies to enhance the interaction in active listening center on addressing misunderstandings.

I ask the chatbot to explain the words and sentences I don't understand in a simpler way, and I express that I don't understand. (S5)

For example, when I didn't understand or when he didn't answer something I wanted, I would ask the chatbot to repeat it or explain it more clearly. Then the chatbot would explain it to me more clearly, using words at level A2 if it were speaking at level B1. (S1)

I understand some of it, but when I struggle with some parts, I mention a specific part and ask for opinions to gauge the chatbot's reactions. This helps me understand better. When I don't understand, I ask, "What do you think about this?" (S6)

For example, the chatbot speaks fluently. When I can't find what to say, or when I'm missing words, it slows down when I ask it to. It adjusts itself according to my speed. (S2)

Top-down strategies, which heavily rely on the context, represent the second largest sub-theme. Participants generally drew inferences from the context, even if they did not fully comprehend some parts of the input. When participants struggled to understand what they heard, they attempted to guess the meaning from the context.

Even if I don't fully understand some words during an activity, I don't care. I can understand from overall listening. (S3)

I let the conversation continue for a few minutes; I sometimes understand from other sentences and from the context. (S4)

Participants' comments highlight the importance of focusing on the main idea when addressing listening difficulties. These remarks suggest that these strategies enhanced their understanding of the listening input.

While top-down strategies were an important resource for listening problems, some participants also employed bottom-up approaches during the listening process. When they encountered unfamiliar words while listening, they directly asked for the meaning of those words.

When we don't understand each other with the chatbot, I understand much more clearly by asking what the word means. (S1)

I focused more on what was emphasized and tried to answer from there, thinking, "This is what it wanted to say here," by focusing on keywords. (S6)

These strategies also involved paying attention to important words in order to comprehend the overarching message during listening activities. This suggests that participants actively combined both top-down and bottom-up processing to negotiate meaning.

Another proposed strategy sub-theme focuses on maintaining fluency. Participants showed their understanding to ensure they do not disrupt the interaction. They mentioned that they used expressions such as "hmm," "yeah," or "I see" to indicate understanding. Occasionally, they requested examples to stay engaged if they encounter a breakdown in listening comprehension.

I wanted the chatbot to say different things on the same subject. Or examples. I let him create more distinct lines. I wanted more examples. (S4)

The feedback provided by the participants indicates the importance of active engagement in the listening process. Such engagement not only helped them maintain the flow of conversation but also supported their comprehension by prompting further input from the chatbot, which they found helpful for clarifying meaning and expanding their understanding.

Changing the topic and implementing self-repair strategies occurred with equivalent frequency to enhance interaction during the listening process. These strategies were applied not just when participants struggled to comprehend the chatbot but also when the chatbot failed to understand them. Participants indicated they felt discouraged when the chatbot could not comprehend them, leading to their avoidance of the topic. Furthermore, they reported self-repair strategies that include the expression of being misunderstood. Participants clearly informed the chatbot of its misunderstanding, stating, "You don't understand."

> *Its sentences can be quite long. Even when the chatbot is explaining things to me, I find it hard to understand, and I can feel that when it's speaking. So, I often say, "Let's move on to another topic," and change the topic.* (S3)

> *I do something similar to my friend's example. I say what I want to say two or three times, and the chatbot still doesn't quite get it. Then I say, "Let's talk about something else," and change the topic.* (S8)

> *I sometimes get angry and repeat a sentence three times. The chatbot says it doesn't understand, so I ask it to change the subject.* (S4)

Overall, these findings indicate that the implementation of interactive strategies during active listening significantly contributes to the facilitation of effective communication. Furthermore, it was revealed that participants do not depend on just one strategy; instead, they rely on a combination of various strategies. The strategies participants use while actively listening to the chatbot help improve their understanding, manage misunderstandings, and listen with focus. In the classroom, it is crucial to teach students listening strategies to enhance their listening comprehension and overall communication.

The results of the focus groups indicate that participants found the AI chatbot to be a helpful tool for enhancing their listening comprehension and overall language proficiency. The identified themes showed that participants consistently highlighted the significance of interaction, autonomy, and contextual understanding provided by the chatbot. The participants expressed a change from a passive listener role to active engagement in their listening process. The strategies employed during chatbot sessions demonstrate participants' progress in managing listening comprehension, addressing communication breakdowns, and sustaining focus on their tasks.

This chapter discussed the findings from the Wilcoxon Signed Rank test and Mann-Whitney U test conducted on the Cambridge KET listening test. Furthermore, the themes from the focus group interview were analyzed to explore the participants' perspectives, emotions, beliefs, and strategies related to the AI voice-based chatbot's impact on English listening skills. The next chapter will discuss these findings in the existing literature.

5. DISCUSSION

This embedded mixed-method research aimed to explore how AI voice-based chatbots affect the listening comprehension skills of 10th-grade EFL students, focusing on whether these chatbots enhance their skills and the interactive listening strategies they employed. To address this, four research questions were formulated:

1. Are there any improvements in 10th-grade EFL learners' listening comprehension scores, particularly in identifying main ideas and specific details, after engaging with an AI voice-based chatbot?

2. Do students engaged in AI voice-based chatbot activities differ from those who participate in regular listening activities in enhancing listening comprehension skills, particularly in identifying main ideas and specific details among 10th-grade EFL learners?

3. What are 10th-grade EFL learners' perceptions about the AI voice-based chatbot in enhancing their listening comprehension skills, particularly in identifying main ideas and specific details?

4. What interactive listening strategies are employed by 10th-grade EFL learners while engaging with the AI voice-based chatbot listening activities?

To answer the first two questions, the Cambridge A2 Key English Listening test was administered to both the experimental group, who participated in listening activities with the chatbot, and the control group, who received regular listening activities in class. Furthermore, to address the final two questions, the experimental group took part in a focus group interview after the intervention. The focus group interview aimed to explore participants' perceptions of their listening experience with the chatbot and to understand the interactive strategies they employed. This section will discuss the study's findings under three main headings for a thorough analysis: (1) the impact of chatbots on listening skills, (2) participants' perceptions of chatbots, and (3) the role of chatbots in interactive listening strategies.

5.1. The Impact of Chatbots on Listening Skills

Regarding the first research question, which sought to examine changes in the experimental group's listening performance following chatbot interaction, findings were obtained from their pre- and post-test results. The Wilcoxon Signed Rank test showed that the experimental group enhanced their listening comprehension skills after they have engaged in listening activities with the chatbot. The test results indicated that the AI-driven chatbot intervention effectively improved EFL learners' listening comprehension skills.

Participants in the experimental group were exposed to more natural and authentic language through their increased interaction with the AI chatbot, which appears to have contributed to a significant improvement in their listening comprehension skills. This result is consistent with Kim's (2018) findings, which emphasize that chatbots' interactive and human-like features can enhance learners' comprehension by simulating real-life communication. Similarly, Alrasheedi (2024) found that chatbot use significantly improved both literal and inferential listening comprehension among university-level EFL learners, suggesting the potential of chatbot-mediated instruction across different proficiency levels.

Additionally, the chatbot used in this study may have served as a scaffold, supporting learners' listening by adapting to their input and prompting clarification when needed, which is a process that reflects a social constructivist approach (Pritchard & Woollard, 2013). In line with social constructivist principles, the chatbot-mediated environment helped students negotiate meaning and provided support for comprehending and responding to spoken input. This underscores how chatbots can serve as a listening scaffold, enabling students to bridge the gap between their current listening ability and desired performance level.

In order to address the second research question, the listening post-test scores of both groups were compared using the Mann-Whitney U test. Further analysis indicated that the learners exposed to the intervention exhibited higher levels of listening proficiency than those not exposed to the treatment. This improvement in the experimental group can be attributed to several factors. One possible explanation for this outcome might be the regular exposure to spoken input enabled by the chatbot tool. This suggests that traditional classroom instruction alone may not be sufficient to improve listening

comprehension to the same extent as chatbot interaction. This finding aligns with Kim's (2018) study, which highlighted the ability of chatbot interactions to deliver repeated, personalized, and authentic auditory input, qualities often missing in traditional classrooms. The difference between groups might arise from the absence of real-time feedback and chances for active listening in the control group, while the chatbot allowed learners to engage actively in the listening comprehension process.

Given that AI chatbots provide customized learning experiences, they possess the capacity to enhance listening comprehension skills. This assumption reinforces the argument made by Huang et al. (2024) that AI chatbots can more effectively enhance listening comprehension skills compared to traditional one-way listening tasks by delivering authentic input, immediate feedback, and opportunities for active listening and interaction.

The findings of the current study, which revealed a signifcant increase in the experimental group's listening comprehension skills following the chatbot listening intervention, are corroborated by the recent research conducted by Sahito et al. (2025). Their results align with the findings of the current study that chatbot voice interaction and personalized feedback play an important role in enhancing listening comprehension. Both studies highlight the learning environments characterized by active engagement, personalized instruction, and the immediate feedback provided by chatbots as significant factors in learners' improvement. Such opportunities for comprehensible input and pushed output align with the principles of interactionist theory (Long, 1996) and are essential for listening development in EFL contexts. Recent studies support this claim by demonstrating that AI chatbots facilitate interaction, encourage meaningful learner output, and offer opportunities for negotiating meaning in ways that resemble real-life conversational practices (Yin & Satar, 2020; Jeon & Lee, 2024; Alrajhi, 2024). These advantages are especially valuable for enhancing listening skills in EFL settings, where opportunities for authentic input and interactive listening are frequently limited.

While direct research on AI chatbots and listening comprehension in EFL settings is limited, the current findings can be discussed alongside previous studies on Intelligent Personal Assistants (IPAs), which possess similar technological and educational characteristics (Dizon, 2020; Tai & Chen, 2023). Notably, several studies focused on IPA (Siri, Amazon Alexa, Google Assistant, etc.) have reported results that support

the current study (Tai & Chen, 2024; Yang et al., 2024). For instance, Tai and Chen (2024) investigated the impact of Google Assistant on the listening comprehension of adolescent EFL learners. They found that, while two experimental groups (one group employed IPA providing multimodal responses, and the other group utilized IPA providing audio-only responses) exhibited some improvement in listening skills, only the group using IPA with multimodal responses demonstrated a statistically significant improvement over time. Similarly, Yang et al. (2024) carried out a six-week autonomous learning study with college EFL learners using Google Assistant outside of class. The findings indicate that the experimental group, which received continuous teacher guidance while using IPA, demonstrated improved listening scores.

Although this study demonstrated that engaging with an AI-driven chatbot resulted in noticeable gains in listening skills among EFL students, various other studies examining IPAs yielded contrasting findings. For example, Dizon (2020) and Hsu et al. (2023) found no statistical differences in listening post-test scores among learners who engaged with Amazon Alexa and those in control groups, despite observing meaningful gains in speaking skills. These inconsistencies might arise from the limited adaptive feedback and speech patterns particular to native speakers found in IPAs, which can hinder input comprehensibility for EFL learners (Dizon, 2020; Hsu et al., 2023). Furthermore, many IPA studies employed short-term interventions, often ranging between 2 to 6 weeks, which may not have allowed enough time for noticeable improvements in listening skills (Wu et al., 2024; Tai & Chen, 2023). In contrast, the present study employed a ten-week AI voice-based chatbot intervention that offered personalized, contextual, and interactive audio input tailored to the learners' proficiency and interests. It focused on subskills such as identifying main ideas and recognizing specific details, as assessed in the Cambridge A2 Key listening test. This difference may have contributed to the significant listening gains observed in the experimental group. Furthermore, the participants, who were 10th graders in high school, experienced regular guided exposure to authentic spoken input, which would have improved their comprehension. This suggests that AI chatbots, especially when adapted to learners' proficiency levels and integrated with curriculum content, have the potential to enhance L2 listening comprehension. Moreover, the effectiveness of chatbots may increase when supported by teacher guidance.

5.2. Participants' Perceptions of Chatbots

To address the third research question, which sought to explore the perspectives of the experimental group regarding their experiences with the chatbot, a focus group interview was analyzed through thematic analysis. Eight themes emerged from the focus group interview: (1) listening comprehension skills, (2) integrative skills, (3) overall English proficiency, (4) characteristics of the chatbot, (5) emotional dynamics, (6) technological limitations, (7) adverse emotional experiences, and (8) absence of perceived improvement.

The qualitative data derived from the focus group interviews complemented the quantitative findings. Participants' remarks indicated that they were not only passively exposed to listening input but were actively engaged in interpreting, responding to, and reflecting on spoken content. This corresponds with key aspects of active listening, including focused attention, clarification, and engaging interaction (Rost & Wilson, 2013).

The results of the focus group interview indicated that participants appreciated the interactive and stress-free environment of the chatbot. This aligns with Jeon (2024), who found that learners highlighted chatbots as providing opportunities for interaction without the fear of peer judgment, thereby reducing anxiety and enhancing confidence and motivation for authentic English use. In the present study, participants reported that the AI chatbot-assisted listening exercises were emotionally supportive and educationally beneficial. Similarly, Huang et al. (2024) highlighted how decoding tasks supported by emotionally engaging and motivational chatbot feedback enhanced learners' willingness to participate, which helped them develop confidence. Particularly, participants observed that their listening skills had improved, highlighting progress in comprehending the overall meaning and recognizing key points. These results are consistent with Kim and Su (2024), who found that EFL students perceived an improvement in their language proficiency while using chatbots. Similarly, Tai and Chen (2024) found that adolescents interacting with Google Assistant perceived that it might enhance their listening comprehension due to the interactive listening opportunities offered by the chatbot.

The recurring codes identified in this study were flexibility and authenticity, with learners highlighting the convenience of using the chatbot anytime and anywhere,

along with its capacity to offer extensive, personalized, and authentic spoken input. These findings are consistent with Yang et al. (2024), who demonstrated that chatbot-based autonomous learning provided increased access to personalized interaction, thereby increasing learner motivation and engagement. Participants in the current research also mentioned that the chatbot's flexible pace of speech and smooth conversation style allowed them to become more familiar with everyday English, aligning with Wu et al. (2024), who emphasized the benefits of naturalistic, spontaneous dialogues with IPAs in second language learning settings.

In terms of interactive and cognitive engagement, participants appreciated the chatbot's ability to foster conscious involvement, attentive listening, and focused attention. Participants in this study reported feeling more engaged and careful during listening activities. For emotional dynamics, many participants reported that the chatbot felt "human-like," leading to reduced anxiety and increased motivation to listen. Similar results can also be found in Hsu et al. (2023), Jeon (2024), and Tai and Chen (2024), who highlight the role of chatbots on emotionally supportive and interactive technologies in enhancing listening comprehension and learner motivation.

The qualitative findings on the integrative skills theme indicate that participants not only engaged in listening but were also encouraged to provide immediate and relevant responses. As one participant noted, responding to the chatbot required cognitive processes and generating responses, increasing their confidence in real-life conversations. This observation aligns with the understanding that listening is not an isolated or passive skill, but rather a foundational component of oral communication, as Nunan (2002) emphasized. In this regard, the chatbot-mediated interactions provided learners with authentic opportunities to apply their listening comprehension skills in real-time communication, thereby facilitating the integrative use of listening and speaking within a meaningful context.

Nonetheless, not all perspectives were positive. A few participants reported that technical constraints, including mechanical responses and internet connectivity problems, interrupted their learning experience. Some participants remarked that the chatbot felt "too robotic" or repetitive sometimes, leading to boredom or frustration. Similar concerns were echoed in Yang et al. (2024), who observed that learners sometimes experienced breakdowns in communication with the chatbot because it was overly sensitive to noise and other technical issues. These challenges align with those

noted by Sahito (2025), who found technical limitations and inaccurate speech recognition resulted in misinterpretations.

Some students expressed in the focus group interviews that they did not perceive any improvement in their listening skills throughout the intervention. This perception can be discussed in relation to Cognitive Load Theory (Sweller, 1994; 2011; 2020), which explains how the human working memory has limited capacity for processing information. According to this theory, when learners are exposed to complex or unfamiliar tasks that demand excessive cognitive resources, their ability to effectively process and internalize new information can be hindered. In the context of this study, the use of AI chatbots for listening activities could have imposed a high cognitive load on some students due to the novelty of the technology, the difficulty of processing spoken input in a foreign language, or the need to interact with the chatbot at the same time. Consequently, these factors might have led to cognitive overload, reducing the effectiveness of the learning experience for some participants and thereby contributing to their perception of little progress in listening improvement.

Overall, the perspectives of the participants in the present study emphasize the various benefits of employing AI voice-based chatbots to enhance listening skills. When thoughtfully integrated into language instruction, these technologies appear to enhance language skills and cognitive engagement while also fostering emotional comfort and promoting learner autonomy. Studies consistently highlight that interactions with AI voice-based chatbots contribute meaningfully to the development of learners' listening skils (increased confidence, exposure to authentic input, active involvement in listening). Regular listening classes are often limited by time, lack of interactivity, and passive listener roles. Since chatbots can offer these missing features, their integration into EFL settings can be beneficial. Promoting active listening and interactive listening strategies is important to practice real-world listening and prepare learners for authentic communicative situations.

5.3. The Role of Chatbots in Interactive Listening Strategies

To answer the fourth research question, the interactive listening strategies employed by the experimental group during the practice of listening skills with the chatbot were explored through the focus group interview. The focus group interview revealed that participants mostly employed (1) negotiation for meaning, (2) top-down, (3) bottom-

up, (4) fluency-maintaining, (5) changing the topic, and (6) self-repair strategies when interacting with the chatbot to address their listening difficulties. These strategies indicate that participants did not merely receive language passively but actively participated in the construction of meaning during interaction. Such behavior resonates with Goh's (2010) view of listening as a dynamic, interactive skill requiring real-time problem-solving and management.

The analysis of participant responses in the present study showed that learners used various interactive listening strategies when interacting with the AI chatbot. Among these, negotiation for meaning stood out as the primary strategy, as participants often requested clarification, repetition, or slower speech when facing listening problems. This finding aligns with Long's (2017) Interaction Hypothesis, suggesting that negotiating during conversational breakdowns is essential for facilitating language comprehension. Likewise, Wu et al. (2024) showed that learners interacting with intelligent personal assistants used negotiation strategies such as rephrasing, pronouncing differently, and explicitly stating misunderstandings more frequently than in peer interactions. The authors noted that these strategies led to deeper engagement and helped sustain meaningful conversation even when breakdowns occurred.

Participants also reported using top-down strategies, such as inferring meaning from context and focusing on the main idea, especially when they encountered unfamiliar vocabulary or had difficulty understanding specific words. This result aligns with the framework proposed by Goh and Vandergrift (2021), highlighting the significance of inferencing and contextual deduction during real-time listening. Additionally, participants expressed a self-monitoring attitude towards comprehension, as reflected in statements such as "I don't mind if I don't understand everything," which exemplifies tolerance of ambiguity as a coping mechanism, an insight also noted in Wu et al. (2024).

In terms of bottom-up strategies, some learners reported paying close attention to keywords, stressed words, or lexical items they didn't understand, behaviors that correspond with traditional decoding skills emphasized in listening instruction (Field, 2008). Moreover, fluency-maintaining strategies, such as showing understanding and prompting the chatbot to provide further examples, allowed learners to sustain interaction without losing confidence. Interestingly, some participants also used self-

regulatory or avoidance strategies, including changing the topic or minimizing breakdowns by expressing misunderstandings or repairing their own output, which is also supported in Wu et al. (2024). These behaviors indicate an increasing metacognitive awareness and demonstrate learners' active role in managing their interactions, aligning with Goh's (2010) principles of metacognitive instruction.

Chatbots are capable of improving top-down listening processes by assisting students in inferring meanings from contextual clues and recognizing key concepts in spoken language, particularly when they are integrated with structured and contextually rich activities. These skills are closely connected to instruction of interactive and metacognitive listening strategies as stated by Nakatani (2006) and Goh & Vandergrift (2021). In this regard, AI chatbots function as more than mere input delivery tools; they also promote the use of listening strategies.

These findings contribute to the expanding literature on interactive listening by illustrating how chatbots encourage the use of interactive listening strategies. Although no prior studies have directly investigated the interactive listening strategies employed by EFL learners using chatbots, these findings provide preliminary evidence that voice-based AI tools can encourage authentic use of such strategies.

In summary, this study provides empirical support for integrating AI chatbots in EFL listening instruction. Not only did the chatbot enhance listening comprehension scores, but it also promoted strategy use, reduced learner anxiety, and supported a more active learning environment. By integrating chatbot listening activities into well-designed instruction, educators can harness the benefits of technology, teaching methods, and the interactive listening opportunity that AI chatbots provide, resulting in a more enriching experience for English language learning.

6. CONCLUSION

The embedded mixed-methods study sought to investigate the effect of AI voice-based chatbot activities on improving listening comprehension skills among Turkish EFL high school students, as well as their use of interactive listening strategies. The study particularly focused on examining whether engagement in listening practice with a chatbot could enhance participants' ability to identify main ideas and recognize specific details in auditory input, while also contributing to developing interactive listening strategies. Furthermore, the study examined participants' perspectives on AI voice-based chatbot listening activities, including their listening development, overall English proficiency, affective factors, and views regarding the learning process. Both quantitative (pre- and post-tests) and qualitative (focus group interviews) data collection tools were employed to gain a comprehensive understanding of the subject. This study underscores the role of AI chatbots in improving listening instruction in EFL settings where exposure to authentic spoken English is often limited.

6.1. Summary of Key Findings

The findings indicated that the listening comprehension skills of the experimental group were significantly enhanced by the integration of an AI voice-based chatbot. The pre- and post-test scores indicated a noticeable improvement in the experimental group's skills to identify main ideas and recognize specific details in spoken language. Moreover, in the post-test, the experimental group outperformed the control group, suggesting that chatbot listening activities were more effective than traditional instruction alone. Students improved their comprehension of spoken English when they listened in dynamic and interactive settings provided by the AI voice-based chatbot.

Besides the quantitative gains, qualitative data gathered through the focus group interview provided deeper insight into the students' experiences with the chatbot. Students frequently described the chatbot as an engaging and motivating listening partner, reflecting positive views on the chatbot-assisted listening experience. They

emphasized the benefits of listening in a low-anxiety environment, where individuals can request repetition or clarification without feeling judged. During the listening activities, several participants expressed that they felt more secure and autonomous because the chatbot allowed them to proceed at their own pace and provided immediate feedback or repetitions upon request.

Furthermore, the analysis of focus group interview data revealed the use of various interactive listening strategies by EFL learners. The negotiation of meaning, along with top-down and bottom-up processing, constituted the most frequently mentioned strategies among students. Students also mentioned activities that maintain fluency and strategies for self-repair, reflecting their growing understanding of how to manage conversational breakdowns during listening. These strategies emphasize the instructional potential of chatbots in fostering such skills and align with the idea of listening as an active, problem-solving activity (Vandergrift, 1997).

Overall, both quantitative and qualitative findings indicate that AI voice-based chatbots can improve the strategic skills and promote active listening, along with enhancing the listening comprehension of EFL learners.

6.2. Pedagogical Implications

The findings of this study have several implications for EFL teaching and broader educational policy and planning. The significant improvement in the listening comprehension skills of the experimental group indicates that instruction supported by AI chatbots could be an additional resource to traditional listening activities. Incorporating voice-based chatbots into EFL courses provides students with ongoing opportunities to engage with comprehensible input, thereby facilitating individualized, contextualized, and interactive listening experiences.

From a constructivist perspective, the chatbot served as a dynamic scaffold within the learners' ZPD (Vygotsky, 1978; Song & Song, 2023), providing instant assistance through repetition, explanation, and simplified input. This kind of support is particularly beneficial in crowded classrooms, where personalized teacher feedback may be limited. Teachers and school managers aiming to address the challenges of large class sizes and limited opportunities for authentic listening practice in public schools should pay close attention to this application.

Qualitative data revealed that students employed various interactive listening strategies, indicating that the chatbot may foster metacognitive engagement. These results suggest that curriculum and material developers in MoNE should integrate strategy-based listening training designed to help students become active and independent listeners. As highlighted by Vandergrift and Goh (2012), explicit listening strategy instruction should be included in curricula, as it can help students understand and manage their listening skills, becoming more autonomous and self-regulated.

The positive emotional environment created by chatbots suggests that these tools can foster psychologically safe settings for learning. Therefore, policymakers and educational institutions should consider the integration of chatbots a pedagogical innovation that supports both emotional and cognitive aspects of learning, rather than just a technological tool.

Additionally, the contribution of AI voice-based chatbots in English language learning represents a significant opportunity for their incorporation into national digital education initiatives. Such tools can offer continuous practice opportunities, reduce teacher workload, and enhance exposure to authentic spoken English. Therefore, policymakers and curriculum designers should consider implementing the chatbot initiatives into the English curriculum while ensuring proper teacher training and ethical standards are applied to enhance instructional benefits.

6.3. Limitations and Recommendations

This study aimed to contribute to the growing yet still limited literature on integrating AI voice-based chatbots into EFL listening instruction by exploring a particular case in the Turkish secondary school context. While the findings of this study offer valuable insights into the pedagogical potential of such technologies in EFL, there are also several limitations that should be acknowledged.

First, the sample consisted of 10^{th} graders from a single public high school in Turkey, which limits the generalizability of the results to broader educational settings. Future research should confirm and expand on the current findings by repeating this study with larger and more diverse participant groups across various regions and educational institutions.

Secondly, the duration of the intervention was relatively short. The short-term implementation does not allow conclusions to be drawn about the long-term retention of listening gains. Therefore, a longitudinal study is necessary to assess the ongoing impact of chatbots on listening comprehension skills.

Thirdly, while the chatbot used in the study provided real-time, voice-based interaction, it was developed for general exchanges rather than for educational contexts or curriculum-focused instruction. Given these constraints, the findings of this study encourage future researchers and educational authorities to investigate the development and implementation of a national-level English language chatbot integrated within digital platforms such as EBA. This tool could align with learners' proficiency levels, curriculum objectives, and communication goals, creating a more contextual and suitable environment for practicing listening and interactive skills both inside and outside the classroom.

Additionally, given that some students reported no perceived improvement in their listening skills, possibly due to the cognitive demands involved in interacting with AI chatbots, it is important for future research to focus on strategies that optimize cognitive load during such technology-mediated listening activities. By managing cognitive load effectively, learning experiences can become more accessible and beneficial for all learners, thereby enhancing the overall effectiveness of chatbot listening practice.

Lastly, this study focused solely on listening skills, although the chatbot may enhance integrative language skills. Future research should explore how chatbot-based training can enhance various integrated language skills.

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APPENDICES

Appendix 1. Participant Information Form

DENEKLERİN GÖNÜLLÜLÜĞÜ
VE
AYDINLATILMIŞ ONAM FORMU

Bu çalışma, Beyzanur Aslan'ın Yapay Zekâ Sohbet Robotlarının Yabancı Dil Olarak İngilizce Öğrenen Öğrencilerin Dinlediğini Anlama Becerilerine ve Etkileşimli Dinleme Stratejilerine Etkisini incelemeyi amaçladığı bir araştırmadır. Araştırma sürecinde katılımcılardan çeşitli testler ve anketler aracılığıyla bilgi toplanacaktır. Katılımcılar, toplamda 1 yıl sürecek araştırma ve 2 aylık veri toplama sürecinde, etkinliklere ve testlere katılacaklardır ve görüşmeler ses kaydı ile kayıt altına alınacaktır.
Araştırma sürecinde, dinleme becerilerini ölçmek amacıyla ön test ve son test uygulanacak, ayrıca etkileşimli dinleme stratejilerini değerlendirmek için odak grup görüşmeleri gerçekleştirilecektir. Katılım tamamen gönüllüdür; katılmayı reddedebilir veya araştırma süresince istediğiniz zaman katılımınızı sonlandırabilirsiniz, bu durum herhangi bir olumsuz sonuç doğurmayacaktır.
Araştırmaya katılanların kişisel bilgileri tamamen gizli tutulacak ve yalnızca araştırma amacıyla kullanılacaktır. Kişisel bilgilerinizin korunması sağlanacak ve veriler anonimleştirilecektir. Katılımcıların kimlik bilgileri, analizlerde veya sonuçların raporlanmasında kullanılmayacaktır. Bu konuda gerekli güvenlik önlemleri alınmıştır. Bu araştırma, 6698 sayılı Kişisel Verilerin Korunması Kanunu (KVKK) ve ilgili mevzuata uygun olarak yürütülmektedir. Katılımcıların kişisel verileri, kanun ve ilgili mevzuat hükümlerine uygun olarak işlenecek, saklanacak ve imha edilecektir. Katılımcıların KVKK kapsamında sahip olduğu haklar (bilgi talep etme, verilerin düzeltilmesini veya silinmesini isteme gibi) saklı tutulmaktadır.

Araştırma sırasında fiziksel veya psikolojik risk bulunmamaktadır. Araştırmanın sonuçları, yapay zekâ sohbet robotlarının eğitimde nasıl kullanılabileceği konusunda önemli veriler sağlayacaktır ve bu da eğitim süreçlerine katkıda bulunabilir.
Araştırma ile ilgili herhangi bir sorunuz olması durumunda Beyzanur Aslan ile
telefon numarasından veya beyzanurelt@gmail.com üzerinden iletişime geçebilirsiniz.

Yukarıda belirtilen bilgileri okudum, anladım ve bu araştırmaya katılmayı gönüllü olarak kabul ediyorum. Katılımımın tamamen gönüllü olduğunu ve istediğim zaman araştırmadan çekilme hakkına sahip olduğumu anlıyorum.

Adı ve Soyadı:

İmzası:

Tarih:

Appendix 2. Parental Consent Form

Sayın Veli/Yetkili,

Çocuğunuzun, yukarıda belirtilen araştırmaya katılması için izninizi rica ediyoruz. Araştırmamız, lise öğrencilerinin yapay zekâ sohbet robotlarıyla etkileşimlerinin dinleme becerileri ve etkileşimli dinleme stratejileri üzerindeki etkisini incelemeyi amaçlamaktadır. Bu form, size araştırmanın amacı, katılım süreci, gizlilik politikası ve çocuğunuzun hakları hakkında bilgi vermektedir.

Araştırma, çocuğunuzun dinleme becerilerini geliştirmeye yönelik çeşitli aktiviteleri içerir. Araştırma sürecinde, öğrencilerden dinleme testleri ve görüşmeler istenecektir. Görüşmeler ses kaydı ile kayıt altına alınacak olup, 6698 sayılı Kişisel Verilerin Korunması Kanunu (KVKK) ve ilgili mevzuat hükümlerine uygun olarak işlenecek ve saklanacaktır.

Araştırma sırasında çocuğunuzdan herhangi bir fiziksel müdahale veya zorlayıcı etkinlik talep edilmeyecektir. Tüm süreç, eğitim-öğretim faaliyetlerine zarar vermeden, uygun zaman dilimlerinde gerçekleştirilecektir.

Çocuğunuzun kişisel bilgileri ve araştırma sürecinde elde edilen tüm veriler gizli tutulacaktır. Veriler, yalnızca araştırma amaçları için kullanılacak ve kimseyle paylaşılmayacaktır. Çocuğunuzun kimlik bilgileri, anonimleştirilmiş verilerle birlikte saklanacak ve yalnızca kod numaraları kullanılarak analiz edilecektir. Araştırma verileri, 6698 sayılı Kişisel Verilerin Korunması Kanunu (KVKK) ve ilgili mevzuat hükümlerine uygun olarak işlenecek ve saklanacaktır.

Çocuğunuzun araştırmaya katılımı tamamen gönüllülük esasına dayanmaktadır ve herhangi bir zaman katılımı sonlandırma hakkına sahiptir. Çocuğunuzun katılımı, derslerinde veya sosyal hayatında herhangi bir olumsuz etkiye yol açmayacaktır. Araştırma sırasında çocuğunuzun mahremiyeti ve kişilik hakları titizlikle korunacaktır. Toplanan veriler, araştırmanın tamamlanmasının ardından güvenli bir şekilde imha edilecektir.

Ekte çocuğunuza(öğrencinize) uygulayacağımız anket/görüşme mevcuttur. Bu bilgiler araştırma amaçlı olup İngilizce eğitimi alanında kullanılacaktır. Bu bilgiler herhangi bir özel bilgi içermemektedir ve etik ilkelere paralel olarak kullanılacaktır.

Not: Ayrıca ilgili çocuk (öğrencilere) bilgilendirme yapılmalıdır.

Ben, …'in velisi olarak, yukarıda belirtilen araştırma hakkında yeterli bilgi almış bulunuyorum ve çocuğumun bu araştırmaya katılmasına gönüllü olarak izin veriyorum. Araştırmada çocuğumun haklarının korunacağını ve kişisel bilgilerinin gizli tutulacağını anladım.

Çocuğun adı, soyadı:

Çocuğun imzası: Tarih:

Velisinin adı, soyadı:

Velisinin imzası: Tarih:

Appendix 3. Informed Consent Form

BİLGİLENDİRİLMİŞ OLUR FORMU

1. Aşağıda imzası olan ben "*Yapay Zekâ Sohbet Robotlarının Yabancı Dil Olarak İngilizce Öğrenen Öğrencilerin Dinlediğini Anlama Becerilerine ve Etkileşimli Dinleme Stratejilerine Etkisi*" başlıklı çalışmaya katılmayı kabul ediyorum.
2. Bu çalışmayı yürüten Beyzanur ASLAN çalışmanın yapısı, amacı ve muhtemel süresi, hakkında ayrıntılı sözlü ve yazılı bilgi verdi.
3. Araştırmacı Beyzanur ASLAN' a çalışmasıyla ilgili her soruyu sorma fırsatını buldum. Cevapları ve bana verilen bilgiyi anladım.
4. Araştırmacı Beyzanur ASLAN' a bilgilerin ayrıntılarını açıklamama ve benimle ilgili sırları koruması şartıyla benimle bu çalışmayı yapmasına izin veriyorum.
5. Çalışma boyunca tüm kurallara uyacağıma, araştırmacı Beyzanur ASLAN ile tam bir uyum içinde çalışacağıma ve konuyla ilgili herhangi bir sorun çıktığında hemen onu arayacağımı kabul ediyorum.
6. Bu çalışma sonuçlarının kullanılmasını kısıtlamayacağımı ve yayın, rapor ve benzeri bilimsel dokümanlarda kullanabileceğini kabul ediyorum.
7. Bu çalışmadan istediğim zaman çıkabileceğimi anladım.

OKUDUM VE ONAYLADIM.

Katılımcının Adı ve Soyadı, Adresi: Tarih, İmza:

Araştırmacının Adı ve Soyadı, Adresi: Tarih, İmza:

Appendix 4. IRB Approval



YILDIZ TEKNİK ÜNİVERSİTESİ
Sosyal ve Beşeri Bilimler Araştırmaları Etik Kurulu

Toplantı Tarihi: 30.09.2024 **Toplantı No: 2024.09**

SOSYAL VE BEŞERİ BİLİMLER ARAŞTIRMALARI ETİK KURULU TOPLANTI KARARI

Yürütücülüğünü Üniversitemiz Sosyal Bilimler Enstitüsü öğretim üyelerinden Dr. Öğr. Üyesi Gülümser Efeoğlu danışmanlığında lisansüstü öğrencisi BEYZANUR ASLAN tarafından yapılacak olan "Yapay Zekâ Sohbet Robotlarının Yabancı Dil Olarak İngilizce Öğrenen Öğrencilerin Dinlediğini Anlama Becerilerine Ve Etkileşimli Dinleme Stratejilerine Etkisi" adlı çalışma ve bu çalışmada kullanılacak veri toplama araçları ve yöntemlerine ilişkin bilgilerde etiğe aykırı herhangi bir bulguya rastlanmamıştır.

Etik Kurul Üyeleri

DocuSigned by:

Prof. Dr. Murat DONDURAN
Başkan

DocuSigned by:

Prof. Dr. Fatih GÜLGEN
Üye

DocuSigned by:

Prof. Dr. Yiğit EVREN
Üye

DocuSigned by:

Doç. Dr. Begüm SATICI
Üye

DocuSigned by:

Doç. Dr. Nur CEMELELİOĞLU
Üye

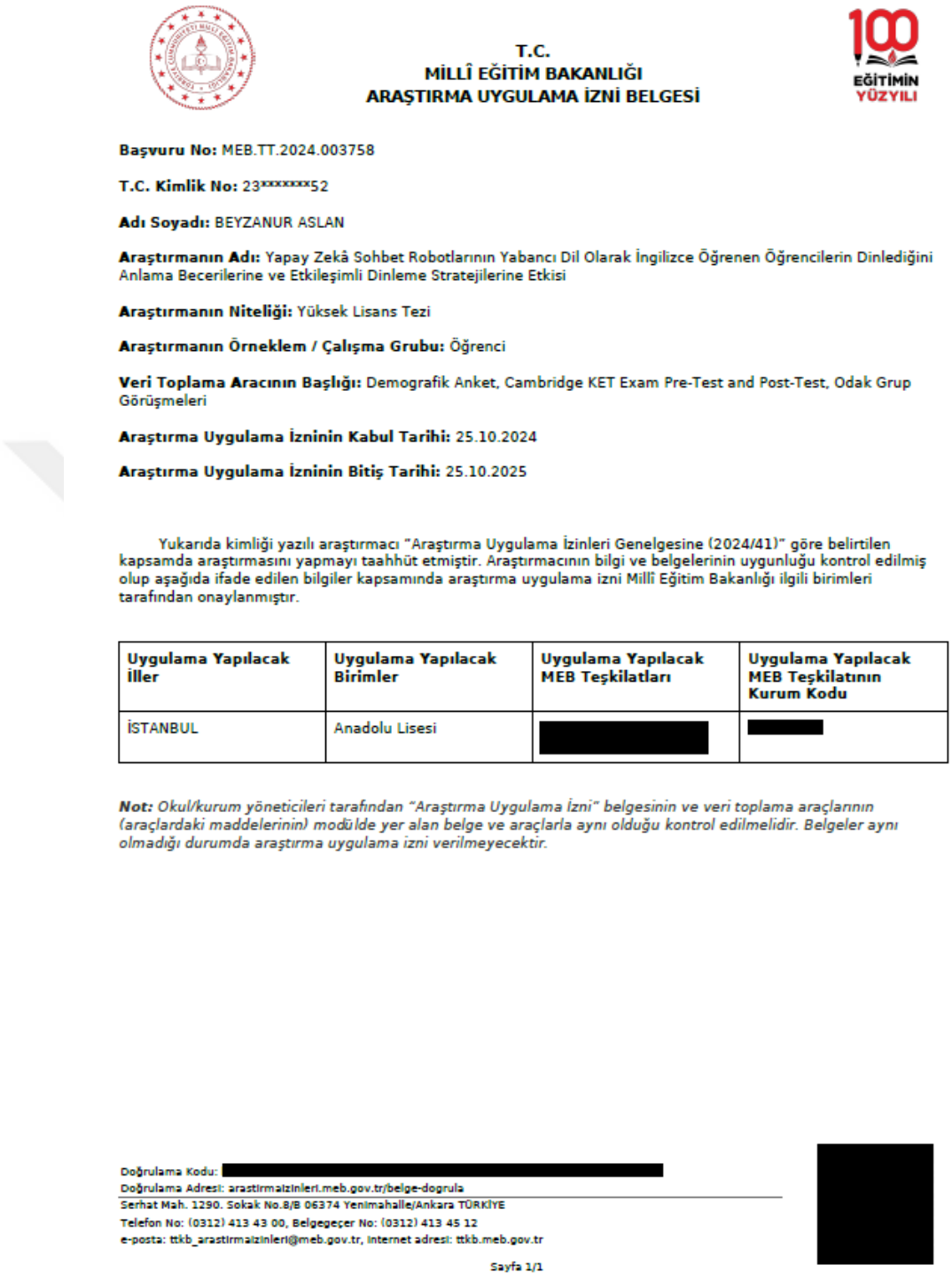
DocuSigned by:

Doç. Dr. Gülbin ÖZKAN
Üye

Dr. Öğr. Üyesi H. Ağan KARADUMAN
Üye

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Rapor Doğrulama Adresi: "etik.yildiz.edu.tr/dogrula" Rapor No: 20240903275 Doğrulama Kodu: 7396e

Appendix 5. MoNE Research Application Permission



T.C.
MİLLÎ EĞİTİM BAKANLIĞI
ARAŞTIRMA UYGULAMA İZNİ BELGESİ

EĞİTİMİN YÜZYILI

Başvuru No: MEB.TT.2024.003758

T.C. Kimlik No: 23[redacted]52

Adı Soyadı: BEYZANUR ASLAN

Araştırmanın Adı: Yapay Zekâ Sohbet Robotlarının Yabancı Dil Olarak İngilizce Öğrenen Öğrencilerin Dinlediğini Anlama Becerilerine ve Etkileşimli Dinleme Stratejilerine Etkisi

Araştırmanın Niteliği: Yüksek Lisans Tezi

Araştırmanın Örneklem / Çalışma Grubu: Öğrenci

Veri Toplama Aracının Başlığı: Demografik Anket, Cambridge KET Exam Pre-Test and Post-Test, Odak Grup Görüşmeleri

Araştırma Uygulama İzninin Kabul Tarihi: 25.10.2024

Araştırma Uygulama İzninin Bitiş Tarihi: 25.10.2025

Yukarıda kimliği yazılı araştırmacı "Araştırma Uygulama İzinleri Genelgesine (2024/41)" göre belirtilen kapsamda araştırmasını yapmayı taahhüt etmiştir. Araştırmacının bilgi ve belgelerinin uygunluğu kontrol edilmiş olup aşağıda ifade edilen bilgiler kapsamında araştırma uygulama izni Millî Eğitim Bakanlığı ilgili birimleri tarafından onaylanmıştır.

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
İSTANBUL	Anadolu Lisesi	[redacted]	[redacted]

Not: *Okul/kurum yöneticileri tarafından "Araştırma Uygulama İzni" belgesinin ve veri toplama araçlarının (araçlardaki maddelerinin) modülde yer alan belge ve araçlarla aynı olduğu kontrol edilmelidir. Belgeler aynı olmadığı durumda araştırma uygulama izni verilmeyecektir.*

Doğrulama Kodu: [redacted]
Doğrulama Adresi: arastirmaizinleri.meb.gov.tr/belge-dogrula
Serhat Mah. 1290. Sokak No.8/B 06374 Yenimahalle/Ankara TÜRKİYE
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Sayfa 1/1

[redacted]

The *Research Application Permission Document* obtained from the Ministry of National Education, as well as the data collection instruments, have been checked by the school administrators. For confidentiality reasons, the school's name, the QR code, and the verification code provided in the original document have been intentionally blurred in this appendix to protect the institution's privacy.