

KARADENİZ TECHNICAL UNIVERSITY * THE INSTITUTE OF SOCIAL SCIENCES

DEPARTMENT OF WESTERN LANGUAGES AND LITERATURE

MASTER’S PROGRAM IN APPLIED LINGUISTICS

**PERCEPTIONS AND THE READINESS LEVEL OF EFL TEACHERS TOWARDS
ARTIFICIAL INTELLIGENCE (AI)**

MASTER’S THESIS

Özlem TAŞKARA

SEPTEMBER - 2025

TRABZON

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Supervisor: Prof. Dr. Mustafa Naci KAYAOĞLU

SEPTEMBER - 2025

TRABZON

APPROVAL

Upon the submission of the dissertation, **Özlem TAŞKARA** has defended the study “**Perceptions and the Readiness Level of EFL Teachers Towards Artificial Intelligence (AI)**” in partial fulfillment of the requirements for the degree of Master of Arts in Applied Linguistics at Karadeniz Technical University, and the study has been found fully adequate in scope and quality as a thesis by **unanimous / majority** on **04/11/2025**.

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Date 04.11.2025

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September, 2025

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ÖZET

Yabancı Dil Olarak İngilizce (EFL) bağlamında da yapay zeka (YZ), geleneksel dil öğretimini yeniden şekillendirmede umut verici bir araç olarak görülmektedir. Bu nedenle bu çalışma, hizmet içi EFL öğretmenlerinin YZ'yi dil öğretimine entegre etme hazırbulunuşluk düzeylerini TPACK modeli, algılarını ise Teknoloji Kabul Modeli (TAM) üzerinden incelemiş ve özellikle eğitim bağlamındaki algılanan fayda ve sınırlılıklara odaklanmıştır. Bununla birlikte öğretmenlerin dijital araçlara aşinalıkları ile TPACK temelli hazırbulunuşlukları arasındaki ilişki, ayrıca hazırbulunuşluk düzeyleri ile YZ'ye ilişkin algıları ve yaş, cinsiyet, eğitim geçmişi, öğretim deneyimi, öğretim kademesi ve istihdam durumu gibi demografik değişkenler arasındaki bağlantılar da araştırılmıştır. Açıklayıcı sıralı karma yöntem deseninin benimsendiği çalışmada, nicel veriler araştırmacı tarafından geliştirilen “*EFL Öğretmenlerinin Yapay Zekâya Yönelik Algıları ve Hazırbulunuşluk Düzeyleri*” adlı beşli Likert ölçeği kullanılarak 90 hizmet içi öğretmenden toplanmıştır. Nitel veriler ise 10 öğretmenle yapılan yarı yapılandırılmış görüşmeler yoluyla elde edilmiştir. Her iki aşamada da uygun örnekleme yöntemi kullanılmıştır. Bulgular şunları ortaya koymuştur: (1) Öğretmenler genel olarak orta-üst düzeyde bir hazırbulunuşluk bildirmiş, TCK boyutu en yüksek ortalama puanı alarak öğretmenlerin teknoloji ve içerik bilgisini öğretim uygulamalarında ilişkilendirme konusunda kendilerini daha yeterli gördüklerini göstermiştir; (2) YZ hazırbulunuşluğu ile dijital araçlara aşinalık arasında pozitif bir ilişki bulunmuş, bu da dijital teknolojilere daha hâkim olan öğretmenlerin YZ entegrasyonuna kendilerini daha hazırlıklı gördüklerini ortaya koymuştur; (3) YZ hazırbulunuşluğu ile algılanan fayda (PU) arasında pozitif, algılanan riskler ile de orta düzeyde pozitif bir ilişki bulunmuş, bu da daha yüksek hazırbulunuşluğun YZ'nin potansiyel zorluklarına yönelik daha fazla farkındalıkla ilişkili olduğunu göstermiştir; (4) Demografik değişkenler açısından anlamlı bir farklılık bulunmamış olsa da betimsel istatistikler, genç, deneyimsiz, kadın, ilkökul düzeyinde özel okulda çalışan öğretmenlerin ve İngiliz Dili ve Edebiyatı mezunlarının kendilerini daha hazır gördüklerini göstermiştir; (5) YZ'yi iş yükünü azaltma, ders planlama, materyal hazırlama, ölçme-değerlendirme ve fikir üretiminde önemli bir araç olarak gördükleri belirlenmiştir. Öğretmenler ayrıca YZ'nin motivasyonu, katılımı, özerkliği ve dil becerilerinin gelişimini artırma ile kişiselleştirilmiş öğretimi destekleme kapasitesine dikkat çekmiştir. Bununla birlikte aşırı bağımlılık, eleştirel düşünme ve yaratıcılığın azalması, akademik dürüstlük ve veri gizliliği gibi etik sorunlar ile altyapısal yetersizlikler entegrasyonun önünde engel olarak görülmüş ve algılanan kullanım kolaylığını (PEOU) olumsuz etkilebileceği belirtmiştir.

Anahtar Kelimeler: Yapay Zekâ, Hizmet İçi Öğretmenler, TPACK, TAM, Hazırbulunuşluk, Algı

ABSTRACT

Within English as a Foreign Language (EFL) contexts, artificial intelligent (AI) has been recognized as a promising tool for reshaping traditional language instruction. Thus, this study aimed to assess in-service EFL teachers' readiness to integrate AI into language teaching within the framework of the TPACK model. In addition, the study examined teachers' perceptions of AI through the Technology Acceptance Model (TAM), focusing on perceived benefits and drawbacks in educational contexts. It also explored the relationship between teachers' digital tool familiarity and their TPACK-based readiness, as well as the connection between readiness levels, perceptions of AI, and demographic factors such as age, gender, educational background, teaching experience, teaching level, and employment status. Adopting a sequential explanatory mixed-methods design, the study collected quantitative data from 90 in-service teachers using a five-point Likert-scale survey developed by the researcher, titled "*Perceptions and Readiness Level of EFL Teachers Towards Artificial Intelligence.*" Qualitative data were obtained from semi-structured interviews with 10 teachers. Convenience sampling was employed for both phases. The findings revealed that: (1) teachers reported moderately high overall readiness, with TCK yielding the highest mean score, suggesting confidence in linking technology with content knowledge in instructional practice; (2) AI readiness positively correlated with digital tool familiarity, indicating that technologically proficient teachers feel more prepared to integrate AI; (3) a positive relationship was found between AI readiness and perceived usefulness (PU), while a moderate positive association also emerged between readiness and perceived risks, suggesting that greater readiness is linked to higher awareness of AI's potential challenges; (4) no statistically significant differences were found across demographic variables, however, descriptive statistics indicated that younger, novice, female, primary-level private school teachers and ELL graduates perceived themselves as more ready; and (5) both quantitative and qualitative results showed that teachers perceive AI as highly useful for reducing workload, enhancing lesson planning, material preparation, grading, and idea generation. Teachers also highlighted AI's potential to increase motivation, engagement, autonomy, and language skill development, as well as its capacity for personalized instruction. However, concerns were raised regarding overreliance, reduced critical thinking and creativity, ethical challenges such as academic integrity and data privacy, and infrastructural shortcomings that hinder integration and reduce perceived ease of use (PEOU).

Keywords: Artificial Intelligence, In-Service Teachers, TPACK, TAM, Readiness, Perceptions

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LIST OF ABBREVIATIONS

AESs	: Automatic Evaluation Systems
AGI	: Artificial General Intelligence
AI	: Artificial Intelligence
AIEd	: Artificial Intelligence in Education
ALS	: Adaptive Learning Systems
ANI	: Artificial Narrow Intelligence
ASI	: Artificial Super Intelligence
BI	: Behavioral Intention to Use
CALL	: Computer-Assisted Language Learning
CK	: Content Knowledge
DL	: Deep Learning
EFL	: English as a Foreign Language
ITSs	: Intelligent Tutoring Systems
LLMs	: Large Language Models
MALL	: Mobile-Assisted Language Learning
ML	: Machine Learning
NLP	: Natural Language Processing
PCK	: Pedagogical Content Knowledge
PEOU	: Perceived Ease of Use
PK	: Pedagogical Knowledge
PU	: Perceived Usefulness
TAM	: Technology Acceptance Model
TCK	: Technological Content Knowledge
TK	: Technological Knowledge
TPACK	: Technological Pedagogical Content Knowledge
TPK	: Technological Pedagogical Knowledge
VLEs	: Virtual Learning Environments

INTRODUCTION

In recent years, there has been substantial development and heightened interest in artificial intelligence (AI) owing to its evident potential to transform various facets of daily life. Although AI is defined in multiple ways, it can be succinctly described as a system designed to emulate human thought processes and behaviors, thereby exhibiting human-like characteristics (Akerkar, 2014). This capability has catalysed a profound reform across multiple domains, prompting growing attention to AI applications in educational contexts (AIED) (Hwang et al. 2020). Paek and Kim (2021) argue that the transformative power of AI lies in its ability to prompt a reconsideration of education's purpose, restructure its content, and introduce innovative teaching methods. Grand View Research (2021) reports that the global AIED market, valued at approximately USD 1.82 billion in 2021, is expected to expand at a compound annual growth rate of 36% from 2022 to 2030. In addition, Forbes (2025) highlights that 60% of teachers currently integrate AI and AI applications into their teaching practices. Consequently, AI represents a significant emerging area of research, particularly regarding its impact on education, which warrants further investigation.

The effects of AI in English as a Foreign Language (EFL) settings have attracted considerable attention as well, particularly as noted by Muslimin (2024), due to the increased need for technology integration in language teaching following the COVID-19 pandemic. During this period, tools such as video conferencing platforms (e.g., Zoom) and learning management systems (e.g., Blackboard) became widely integrated into EFL classrooms, making them more technology-rich than before (Layali and Al-Shlowiy, 2020). Subsequently, various AI technologies have been increasingly adopted in EFL education, including Machine Learning (ML), Natural Language Processing (NLP), Intelligent Tutoring Systems (ITSs), and Adaptive Learning Systems (ALS). While ML and NLP function as foundational tools for data analysis and natural language processing, ITSs and ALS leverage these technologies to provide personalized and targeted learning experiences. Collectively, these technologies and applications have transformed traditional approaches to language teaching and learning. A growing body of literature suggests that AI offers numerous benefits for language learning and teaching, including the potential to improve language outcomes and teaching efficacy (Al-Khresheh, 2024; Almeahadi et al., 2024; Dehghani & Mashhadi, 2024; Özkan et al., 2024; Jeon, 2024), enhance students' motivation (Chen et al., 2021; Sumakul et al. 2022; Wei, 2023), and provide personalized learning experiences (Al-Khresheh, 2024; Elmahdi et al., 2024; Hieu & Thao, 2024; Kemelbekova et al. 2024; Moybeka et al., 2023; Jiang, 2022). AI tools enable both students and teachers to engage in targeted learning pathways by utilizing large amounts of data to gather information about students' learning preferences, pace, and style. Through this data collection and

analysis, AI can deliver customized content and exercises that address individual students' strengths and weaknesses. Moreover, several studies have demonstrated that AI in language teaching is highly beneficial for teachers, as it reduces workload (Fassbender, 2024; Guo & Wang, 2023; Hieu & Thao, 2024; Özdemir et al., 2024; Sütçü & Sütçü, 2023) and saves time in administrative tasks (Ghafouri et al., 2024; Moorhouse, 2024; Ulla et al., 2023), highlighting the importance of integrating AI into language teaching. However, AI is not without risks and concerns. A substantial body of research has also examined potential pedagogical and ethical issues related to AI applications in the EFL context. Among the primary pedagogical risks are the potential for student over-reliance (Akyıldız, 2024; Alqaed, 2024), as well as possible negative impacts on critical thinking (Kemelmekova et al., 2024; Ulla et al., 2023) and creativity (Dakakni & Safa, 2023; Kartal, 2024). Ethical concerns include data privacy and security (Fassbender, 2024; Kohnke et al., 2023) and academic integrity (Cong-Lem et al., 2024; Dakakni & Safa, 2023; Fassbender, 2024; Ghafouri et al., 2024; Kohnke et al., 2023). Taken together, the benefits and the pedagogical and ethical concerns surrounding AI in the EFL context underscore the need to further investigate EFL teachers' perceptions and readiness levels. Assessing teachers' readiness is crucial for the successful implementation of AI tools to maximize their benefits, while understanding their perceptions regarding potential concerns can help establish a balanced approach and identify areas requiring further training and support.

CHAPTER ONE

1. FRAMEWORK OF THE STUDY

1.1. Statement of the Problem

With the rapid involvement of AI and AI-based tools in education, particularly within the EFL context, it has become significant to assess teachers' readiness and perceptions toward these emerging technologies. Teachers' readiness levels and perceptions play a crucial role in ensuring the sound and successful integration of AI into instructional practices, as they directly influence the adoption and effective utilization of such tools in language teaching. The given significance is echoed in literature in terms of AI being an extensively studied topic, especially in the last few years. However, the majority of these studies have primarily focused on students' perceptions of AI, both in international contexts (An et al., 2023; Darwin et al., 2023; Wei, 2023; Xu & Li, 2024; Zhi & Wang, 2024) and within the Turkish context specifically (Aydın & Zeinolabedini, 2024; Orhan et al., 2024; Kırarak, 2024; Yılmaz & Üstünel, 2025). Assessing EFL teachers' perceptions, therefore, represents a notable gap in the literature. Moreover, the majority of the studies that have addressed EFL teachers' perspectives have primarily concentrated on higher education instructors (Alharbi, 2024; Aljabr & Al-Ahdal, 2024; Alsalem, 2024; Mudawy, 2024; Parviz, 2024; Sutcu & Sutcu, 2023; Ulla et al., 2023; Yao & Huang, 2024) and pre-service teachers (Balatero et al., 2024; Chung & Jeong, 2024; Kim, 2023; Mustroph & Steinbock, 2024; Pokrivcakova, 2023; Wulandari & Purnamaningwulan, 2024; Yetkin & Özer-Altinkaya, 2024) leaving in-service teachers largely underrepresented. Investigating the perceptions of in-service teachers is particularly significant, as it provides a more comprehensive understanding of AI applications in lower levels of language education.

The issue of in-service EFL teachers' readiness for AI applications in language instruction, similar to the topic of perceptions, presents a significant gap in the literature. Most existing studies have primarily concentrated on the readiness levels of higher education instructors (Cao, 2025; Ly, 2025; Mehdaoui, 2024) and pre-service teachers (Karataş & Ataç, 2024; Ozdemir & Mede, 2024; Yetkin & Özer-Altinkaya, 2024), leaving the readiness of in-service teachers largely underexplored. This gap is particularly evident in studies employing the TPACK model, which is crucial for gaining a more in-depth understanding of teachers' preparedness to integrate AI into language instruction. To date, there are little to no studies that specifically investigate Turkish in-service EFL teachers' readiness levels through the lens of the TPACK framework. Therefore, this study aims to address

this gap by providing a comprehensive overview of in-service EFL teachers' readiness and perceptions regarding the integration of AI in language education.

1.2. Purpose of the Study

One of the primary aims of this study is to assess in-service EFL teachers' readiness levels toward the integration of artificial intelligence into language instruction based on the TPACK model, with a particular focus on three core components of the framework: technological knowledge (TK), technological pedagogical knowledge (TPK), and technological content knowledge (TCK) (Mishra & Koehler, 2006). Secondly, the study aims to examine in-service EFL teachers' perceptions of AI through the lens of the Technology Acceptance Model (TAM) (Davis, 1986), particularly their perceived advantages and disadvantages of its use in educational contexts. In addition, the study seeks to explore the relationship between teachers' familiarity with digital tools and their TPACK-based readiness, as well as the connection between their readiness levels and overall perceptions of AI. Finally, the research intends to contribute to the existing literature by providing insights into the current state of AI readiness and perceptions, while also investigating the relationship between EFL teachers' readiness and demographic factors such as age, gender, educational background, teaching experience, teaching level, and current employment status.

1.3. Research Questions

To achieve the stated aims of the study, the following research objectives were established.

RQ1: What is the TPACK readiness level of EFL teachers regarding the implementation of AI tools into language learning and teaching?

RQ2: Is there a correlation between EFL teachers' readiness level and familiarity with digital tools?

RQ3: Is there a correlation between EFL teachers' readiness and perceptions?

RQ4: To what extent does AI readiness vary among foreign language teachers based on demographic factors?

- Is there a significant difference in AI readiness among EFL teachers based on age?
- Is there a significant difference in AI readiness among EFL teachers based on gender?
- Is there a significant difference in AI readiness among EFL teachers based on their years of teaching experience?
- Is there a significant difference in AI readiness among EFL teachers based on educational background?

- Is there a significant difference in AI readiness among EFL teachers based on the teaching level?
- Is there a significant difference in AI readiness among EFL teachers based on the type of educational institution in which they are employed?

RQ5: What are the perceptions of EFL teachers regarding the implementation of AI tools into the classroom?

1.4. Significance of the Study

The 21st century has ushered in significant transformations in education driven by technological advancements, fundamentally altering both pedagogical methods and learning processes. By profoundly transforming the educational landscape and its implementation, AI is anticipated to become a pivotal advancement in learning environments (Dei, 2024; Dulundu, 2024; Hussain et al., 2024; Li, 2024; Sumakul et al., 2022). EFL represents a crucial focus within these discussions, as noted by Mohamed (2023), English is acknowledged as the predominant language for global communication; consequently, proficiency in both spoken and written English is deemed essential for success across a wide range of academic and professional domains. The incorporation of AI and AI-integrated tools has been transforming the domain of EFL due to its potential to enhance the quality of language learning and teaching (Guo & Wang, 2024; Parviz, 2024). Therefore, it is of paramount importance for EFL teachers to remain up to date with technological advancements, as demanded by contemporary education, and to equip their students with essential 21st-century skills. Assessing the impact of AI from the perspective of EFL teachers is particularly significant since, as Özdemir et al. (2024) emphasize, teachers act as the primary decision-makers regarding the integration of such tools. Hence, conducting an in-depth analysis of their perceptions and readiness levels will not only provide valuable insights for curriculum designers and policymakers but also contribute meaningfully to the existing body of literature.

CHAPTER TWO

2. LITERATURE REVIEW

In recent years, AI has emerged as a significant focal point in various fields. Consequently, AI-integrated tools have increasingly been implemented in English language classrooms to enhance the quality of language instruction. This chapter endeavors to provide a concise review of the existing literature on AI, presenting essential information to facilitate a deeper understanding of the subject. The first section of this chapter addresses key topics, including the definition of artificial intelligence, the role of AIED, and the potential benefits and challenges associated with AIED. Additionally, it explores the application of AI within the EFL context, examining the advantages of AI in EFL instruction, the barriers to AI integration in teaching, and psychological and pedagogical concerns related to AI in EFL settings. The second section delineates the theoretical framework underpinning this study, focusing on the models employed: the TPACK Model and the TAM. Finally, the concluding section reviews prior studies conducted in the EFL context, specifically addressing the perceptions and readiness levels of EFL teachers regarding AI integration.

2.1. Artificial Intelligence (AI)

Technological advancements profoundly influence our daily lives, particularly as the pace of innovation accelerates, making its impact increasingly undeniable. Throughout history, numerous technological waves have emerged, and the current wave is characterized by the development of AI. The effects of AI span a wide range of fields, such as “computer science, cybernetics, information theory, neurophysiology, psychology, philosophy, linguistics, and other disciplines” (Bin & Mandal, 2019, p. 1). Thus, over the past 65 years, this concept has been extensively discussed among scientists. Despite the integral role of AI in our comprehension of technology through smart devices, facial recognition systems, sophisticated algorithms, and so on, there appears to be widespread confusion regarding the fundamental mechanisms underlying AI and the true nature of AI itself.

As a distinct field of study, AI emerged with the advent of computers in the 1940s and 1950s (Warwick, 2013). The inception of AI can be traced back to Alan Turing's publication of the article now recognized as the Turing Test, which sought to determine whether structured machines can exhibit behaviour comparable to that of humans (Almulhim & Aramco, 2024). However, the term was first coined by one of the pioneers in the field of AI, John McCarthy, in 1956. McCarthy et al. (2006) investigated the means and possibility of tasks— language use, the capacity of solving

difficult questions, and establishing abstractions and constructs— being performed by a machine, which traditionally has been performed by human beings. They further explored whether these specified machines possess the capability for self-improvement (McCarthy et al., 2006). The foundation of AI arises from inquiry into the feasibility of such a concept and, if feasible, the mechanisms by which it could be achieved. Since the time of McCarthy and his colleagues, multiple definitions have been proposed to characterize AI. In its most concise and straightforward form, AI can be defined as a program designed to emulate human behavior (Abdulov, 2020; Grassini, 2023; Mitchell, 2019; Sindermann et al., 2020). In a more comprehensive view, Mohamed (2023) states that AI is a discipline within computer science dedicated to the development of autonomous systems that display intelligent behavior across a variety of tasks. AI aims to develop capabilities typically associated with the human mind, such as language comprehension, learning, logical reasoning, and problem-solving (Saveliev & Zhurenkov, 2020). Thus, it is suggested that AI focuses on machines that “think and act like humans” (Zhang & Chen, 2021, p. 6). Nonetheless, the concept of AI has grown increasingly complex and nuanced due to recent rapid advancements and methodologies. Thus, AI is no longer merely a means of replicating human intelligence; rather, it possesses a form of intelligence of its own (Warwick, 2013).

In order to further our comprehension of this complex phenomenon first the terms “artificial” and “intelligence” should be analyzed in the context of AI. As Dreyfus (1992) posits, the term “artificial” does not signify an endeavor to create a complete imitation of human intelligence; rather, it aims to exhibit intelligent behaviors within a digital environment, distinct from a biological setting. In a similar vein, Fetzer (2012) highlights that the artificial nature of the concept is intrinsically linked to its origins as a human creation rather than stemming from evolutionary processes. While distinguishing between artificial (inanimate) objects and their non-artificial counterparts may be relatively straightforward, the categorization of intelligence presents a more intricate challenge due to the ambiguity surrounding its definition (Fetzer, 2012). Furthermore, a significant obstacle in fully defining intelligence lies in our insufficient understanding of certain attributes associated with the term (McCarthy, 1998). Thus, the definition of intelligence varies from field to field with a specific focus on different merits, however, the most common definition of intelligence is “the ability to learn or understand or to deal with new or trying situations: the ability to apply knowledge to manipulate one's environment or to think abstractly as measured by objective criteria” (Merriam-Webster, n.d). Upon examining this definition, it becomes evident that the fundamental aspects that contribute to intelligence extend beyond mere possession of knowledge; they encompass one’s ability to apply that knowledge effectively in pursuit of specific objectives and to solve problems. By executing intelligent behaviors that are closely linked to human beings, AI plays a pivotal role in societal advancement by providing transformative improvements in labor productivity, decreasing labor costs, optimizing human resource structures, and introducing non-traditional job requirements (Duan et al., 2019). Consequently, it has gradually become an indispensable component of our everyday lives. As noted by Burgsteiner et al. (2016), a significant proportion of the technological tools we

utilize daily incorporate features that are fundamentally based on AI. Examples include virtual assistants such as Siri, smart home devices, smartphones, Alexa, and the application of AI in gaming (Touretzky et al., 2019).

Despite the pervasive presence of AI in various aspects of our daily routines, it is important to recognize that it should not be regarded as a singular concept, as it encompasses different types within. In terms of their ability to perform complex tasks, as well as their levels of self-awareness and capacity for self-improvement, three types of AI can be identified: (1) *Artificial Narrow Intelligence (ANI)*, (2) *Artificial General Intelligence (AGI)*, and (3) *Artificial Super Intelligence (ASI)*.

Artificial Narrow Intelligence (ANI): Commonly referred to as *Narrow Intelligence*, ANI represents the most prevalent form of AI. The majority of currently utilized AI systems have been specifically developed to execute a limited set of tasks. (Jiang et al., 2022). These systems can address a singular problem and are capable of performing one specific task (Almulhim & Aramco, 2024). According to Babu and Banana (2024), ANI is unable to demonstrate authentic intelligence beyond its pre-defined operational parameters while lacking self-awareness. Damar et al. (2024) elaborate on the fundamental characteristics of ANI by examining its underlying mechanisms. They emphasize that ANI learns from substantial datasets to identify patterns and principles, thereby facilitating decision-making and task execution. Babu and Banana (2024) categorize the tools that function under the principle of ANI as follows: “1. Machine learning, 2. Ethical AI and Bias Mitigation Tools, 3. Natural Language Processing (NLP) Tools, 4. Computer Vision Tools, 5. Virtual Assistants and Chatbot Platforms, 6. Recommendation Systems, 7. Robotics and Automation Tools, 8. Image Recognition and Object Detection Libraries, 9. Speech Recognition and Synthesis Tools, 10. Data Analytics and Visualization” (p:212). The majority of AI tools utilized in daily life are derived from ANI and are widely prevalent in their application. For instance, smart assistant technologies such as Siri and Alexa utilize NLP and fall under the category of ANI.

Artificial General Intelligence (AGI): In the sense used today, AGI is defined as AI that possesses “human-like cognitive abilities” (Latif et al., 2023, p. 4). These abilities have a diverse range of domains, including but not limited to language and image processing. (Almulhim & Aramco, 2024). Similarly, Voss (2007) suggests that the ultimate aim of the AGI system is to create systems that possess a deep understanding of the human condition and exhibit functional similarities to human intelligence. The distinction between ANI and AGI is evident in their respective purposes. While ANI is designed to execute specific tasks by learning from predefined datasets, AGI is intended to replicate human cognitive abilities. While contemporary ANI systems primarily function as tools to assist humans, an AGI system would possess the capability to operate autonomously and learn independently, without requiring human guidance (Torres, 2019). According to Legg et al. (2007), AGI will reach a limit of comprehending, learning, and executing given intellectual tasks

that are within the capacity of a human being. Torres (2019) goes further by asserting that AGI is a system in which an agent has the potential to significantly surpass human intelligence.

Artificial Super Intelligence (ASI): ASI represents the subsequent step beyond AGI (Almulhim & Aramco, 2024). ASI refers to machines with cognitive abilities that surpass those of humans, exhibiting a level of intelligence that is significantly superior to human capabilities (Aithal, 2024; Almulhim & Aramco, 2024; Barrett & Baum, 2016; Wogu et al., 2018). Despite the current infeasibility of the presented technology (Barrett & Baum, 2016), depending on its design, ASI posits a potential to be either significantly advantageous or extremely detrimental (Baum et al., 2017). The concerns regarding this wave in AI specifically focus on social structures, economy, employment, professions, governmental implications, and democracy (Gill, 2016). The implications of utilizing machines that possess the capability to enhance their own functionality (Almulhim & Aramco, 2024) and operate autonomously from their creators (Aithal, 2024) remain unclear.

2.2. Artificial Intelligence in Education (AIEd)

AI has fundamentally altered our lives across multiple dimensions, including education (Bates et al., 2020; Kabudi et al., 2021; Kamalov et al., 2023; Wangdi, 2024). As AI has begun to alter our traditional perspectives, its effects have also become firmly established in educational settings, permanently transforming various aspects of education (Soundarya et al., 2024). At the outset of the 1970s, the adoption of “microcomputers, and by extension personal computers” began to emerge (Chen et al., 2020, p. 75265). Since that time, the utilization of computers has become widespread across various aspects of our lives and in diverse fields. In light of these advancements in computer science, the use of computers and technology-integrated programs has increasingly been adopted in educational settings. The current trend of technology integration in education is exemplified by the emergence of AI. Artificial Intelligence in Education (AIEd) has gained significant attention over the last twenty-five years (Roll & Wylie, 2016). According to Hwang et al. (2020), the growing significance of AI in educational settings can be attributed to its potential for making predictions, diagnoses, recommendations, and decisions through the application of specific algorithms. These specified technologies have the potential to enhance the quality of teaching and learning and to change traditional methods of teaching and learning by personalizing learning experiences (Karmakar & Das, 2024; Kamalov et al., 2023; Wangdi, 2024), an automated grading system (Dulundu, 2024), delivering real-time feedback (Kamalov et al., 2023).

As AI has emerged as a prominent topic of discussion in the field of education, understanding the mechanisms through which it is implemented is crucial for enhancing our comprehension of the subject. The most frequently encountered technologies in the context of AIEd are ML and NLP. From a technical standpoint, Yahaya et al. (2024) define ML as “a subset of AI that helps or teaches computers how to learn and make intelligent decisions from previous data (p.119). In the context of

education, this involves the utilization of algorithms and models that analyze data related to the educational process and adapt based on the information collected (Ersozlu et al., 2024). One of the most significant aspects of ML is its capacity to establish a personalized learning environment (Patel et al., 2023; Rabie, 2023; Yahaya et al., 2024). Although each student possesses unique needs, learning styles, and cognitive paces, these factors are often not effectively addressed in practice. As Luan and Tsai (2021) argue, it is highly unlikely that a teacher can design a course that equally appeals to all students. In this context, ML and the tools that operate based on ML principles present significant opportunities to personalize the learning experience for students, thereby enhancing engagement in the educational process. ML applications in education entail Intelligent Tutoring Systems (ITSs) (Piramuthu, 2005; Rabie, 2023; Razualla, 2022), automatic grading (Ka'bi, 2023), recommendation systems (Yahaya et al., 2024), adaptive assessment (Ersozlu et al., 2024), Chatbots (Ka'bi, 2023), and predictive analytics (Patel et al., 2023). Consequently, the quality of education is increasing (Shah et al., 2021).

In addition to ML, a noteworthy technology closely associated with AI in the field of education, specifically in language learning, is NLP. As a subset of AI, NLP specifically examines the interactions between computers and human language (Peng, 2024; Zhang & Hu, 2024). Zhang and Hu (2024) further state that there are mainly three major applications of NLP, which are “automated grammar checking, automated scoring systems, and dialogue systems” (p. 12). NLP tools assist students in developing language skills, namely reading, writing, and speaking, by providing automated evaluations of their output. For example, these tools can assess written work by analyzing linguistic aspects such as grammatical structures and organizational structures (Litman, 2016). Furthermore, dialogue technologies (Chatbots) foster a tutoring-like experience for learners (Litman, 2016). NLP can also cater to the diverse needs of both educators and students; for instance, NLP tools can generate learning materials tailored to individual student requirements or facilitate the creation of educational resources (Litman, 2016).

In the realm of AIED, the most prevalent tools utilized in educational environments are Intelligent Tutoring Systems (ITSs) and Adaptive Learning Systems (ALS). Although they share many similarities, for instance, both systems rely on ML technologies for their operation. They also differ in terms of their categorization. Primarily, ALS can be considered an umbrella term under which ITSs are categorized (Clarebout et al., 2014). All ITSs function within the framework of ALSs; however, not all ALSs are classified as ITSs. In other words, ALSs encompass ITSs as well as other tools that modify the overall learning experience based on data, while ITSs specifically focus on tutoring. Both systems are designed to tailor the content of education based on the learning style and capacity of the students (Hadbi et al., 2024). Furthermore, both systems aim to enhance engagement, motivation, and overall learning outcomes by adapting the learning environment to align with students' individual needs and learning styles, thereby improving the educational process (Karmakar & Das, 2024). Although the objectives of the two systems align, they differ in their focus on

achieving these goals. While ALSs focus on the personalization of the learning process by identifying students' strengths and weaknesses (Karmakar & Das, 2024) and personal needs (Ksemidov & Abgaryan, 2024), ITSs focus more on providing tailored tutoring (Gounder et al., 2024).

ITSs are programs that provide students with access to personalized content, support, and guidance, which are delivered through an AI-generated simulation of a human-like tutor (Hasanov et al., 2019). ITSs can offer personalized learning processes based on the individual needs (Maity & Deroy, 2024), ability, and learning style (Hawari & Oktavia, 2024) of the given student. They further have the capacity to offer immediate feedback (Maity & Deroy, 2024; Mohammadzadeh & Sarkhosh, 2018) and establish an interactive learning environment (Chen, 2022; Umar, 2024) to increase engagement (Rahim et al., 2023) and overall learning outcomes (Hadbi et al., 2024). In a similar vein, ALSs are designed to enhance educational quality by creating personalized content and individualized learning pathways, whereby lessons are customized according to each student's specific needs and proficiency level (Brusilovsky, 2001). These systems utilize AI (Hadbi, 2024), alongside data analysis and ML algorithms (Gupta, 2024). The systems are structured to collect data from learners, which is subsequently analyzed to assess their progress and, furthermore, based on this assessment, the systems recommend appropriate learning activities and deliver personalized feedback tailored to individual learners (Wang et al., 2020). Consequently, the capabilities of these systems have the potential to transform the traditional educational framework, making the learning process more engaging and effective (Sweta, 2021).

2.2.1. The Potential Benefits and Drawbacks of AIEd

AI and AI-integrated tools play a pivotal role in education, offering numerous advantages for both students and educators. Through the deployment of technologies such as ML and NLP (Arya, 2024), a principal advantage of AI in the educational setting is its capacity to personalize the learning process (Arya & Verma, 2024; Bit et al., 2024; Singh et al., 2024; Karroum et al., 2024; Wangdi, 2024). AI possesses the capacity to generate tailored educational content for students by analyzing their individual characteristics (Maghsudi et al., 2021). This capability to tailor educational content to meet the distinct needs of each student has the potential to address diverse learning styles and rates of progress, thereby facilitating more effective learning outcomes. (Harry & Sayudin, 2023).

In recent years, there has been an increasing amount of literature on the relationship between AI and student motivation. AI-integrated tools function by analyzing data collected from students, enabling them to identify individual preferences, likes, and dislikes. This capability subsequently allows for the customization of the educational environment to align with the distinct characteristics of each student. Thus, integration of AI into classroom settings enhances motivation (Altinay et al., 2024; Artemova, 2024; Mohamed et al., 2024; Moybeka et al., 2023; Nabhani et al., 2024). The implementation of AI-integrated tools in the classroom has been positively associated with

heightened motivation, demonstrating a notable increase in student engagement. Research indicates that AI enhances the interaction between students and teachers (Altinay et al., 2024) and increases the behavioral, cognitive, and emotional engagement of students (Zhou & Hou, 2024). For instance, interactive tools such as gamification tools that work under the principles of AI, and Chatbots have been shown to increase students' engagement (Alenezi, 2023; Neji & Ziadi, 2023).

AI presents several additional advantages that warrant consideration. AI-integrated systems can provide automated feedback based on students' task performance. This immediate feedback enables students to adjust their learning processes accordingly. Gnanaprakasam & Lourdasamy (2024) state that immediate feedback allows students to correct their mistakes quickly and better their understanding of the topic, which establishes “a more efficient and continuous learning process” (p.138). They further elucidate the connection between students' overall motivation and immediate feedback by asserting that the feedback provided by AI tools is not only more rapid but also customized to align with individual needs, and the interactive nature of AI feedback enhances students' sense of involvement, thereby increasing their engagement (Gnanaprakasam & Lourdasamy, 2024). Numerous studies have examined the relationship between the immediate feedback capabilities of AI and its effects on education, concluding that AI-integrated immediate feedback enhances the educational experience (Arya, 2024; Karmakar & Das, 2024; Tubino & Adachi, 2022).

Another key aspect of the utilization of AI in education is its capacity to automatically monitor students' performance. By utilizing ML and natural NLP technologies, AI can analyze large datasets, providing accurate and usable information, in contrast to conventional monitoring methods (Habib et al., 2023). This aspect of AI helps in the identification of students who may be regarded as academically at risk (Khan et al., 2021), and it assists teachers in offering customized instructional materials that cater to the distinct needs of each student (Rivera & McKeithan, 2022). Substantially alleviating teachers' workload enables them to concentrate more on student engagement and support (Bobro, 2024). Similarly, Gnanaprakasam & Lourdasamy (2024) argue that teachers often manage extensive amounts of data related to grading, which is both time-consuming and labor-intensive, however, the integration of AI streamlines this process, thereby allowing educators to devote more time to enhancing the quality of education through activities such as developing lesson plans, engaging in one-on-one interactions with students, and refining their teaching methodologies.

The incorporation of AI and AI-integrated tools plays a significant role in enhancing educational quality across multiple dimensions by providing students with a conducive learning environment that fosters motivation. Additionally, it presents educators with valuable opportunities to streamline their professional responsibilities. Nevertheless, the application of AI in educational contexts has prompted extensive debate, particularly regarding ethical implications.

The primary disadvantages associated with AI have been discussed to be privacy and security concerns (Harry & Sayudin, 2023), and algorithm bias (Hwang et al., 2020). AI necessitates extensive data on learners and educational environments to operate effectively (Chen et al., 2020). However, this raises significant concerns regarding the potential misuse, disclosure, or unauthorized access to students' personal information (Zhai et al., 2021). Moreover, this gives rise to issues of transparency concerning the use of AI in educational contexts, given the lack of clarity regarding how student data is collected, stored, and utilized (Mohamed, 2024). Resulting from biased algorithms, another significant concern regarding the integration of AI in education is its potential to perpetuate discrimination and present a disadvantageous learning environment for specific groups of students (Bulut et al., 2024). AI has the potential to introduce cultural bias by mirroring the beliefs of its developers since the individuals who design these algorithms possess the ability to embed their own personal perspectives (Akgun & Greenhow, 2021). Given that AI systems function based on the data on which they are trained, a lack of diverse representation of minority groups within this data can lead to conclusions that are not only flawed but also perpetuate existing gender and race-based biases. For instance, in their study on racial bias in education, Bird et al. (2024) observed that the current administrative data less accurately predicts the performance of African American students in comparison to White students due to the lack of data collection efforts regarding the success of students from diverse backgrounds. In a more comprehensive study in terms of focusing on both the racial and gender-based algorithm bias, Anderson et al. (2019) investigated several algorithms which predict six-year college graduation rates among different racial and ethnic groups and different gender groups. They reported higher false negative rates for Latino students, suggesting that the models frequently mis predicted their likelihood of graduation, leading to an erroneous assumption that they would not graduate when, in fact, they would. They furthermore found that the algorithms had higher false negative rates for male students, meaning the models were more likely to incorrectly predict that a male student would not graduate when they actually would. This suggests that the algorithms underestimated male students' success, potentially affecting decisions related to academic support and resource allocation.

Another prominent issue associated with the use of AI in education is its potential impact on academic integrity. This concern has garnered significant attention and has led to considerable discussion, particularly regarding the AI application ChatGPT. (Al-Sofi, 2024; Du & Tate, 2024; Gao, 2024; Sullivan et al., 2023; Tlili et al., 2023). ChatGPT and similar AI tools offer students considerable advantages, including access to an extensive network of information, the ability to address complex inquiries, the simplification of intricate subjects, and assistance in composing essays and completing assignments, among other benefits. However, the inappropriate and unethical utilization of these tools may undermine academic integrity (Sok & Heng, 2023), as students can readily employ tools like ChatGPT to produce text, which increases the risk of plagiarism. The concern lies in students' intention to utilize AI tools not for assistance but rather to complete assignments and submit them as though they were independently crafted despite being entirely

generated by AI. A further concern is that student's ability to utilize AI for the completion of nearly all assignments may lead to an overreliance on these tools for academic tasks, thereby cultivating a reluctance to engage in deep learning (Zhai, 2022), reduction in critical thinking (Cong-Lem et al., 2024; Konnelly & Sanders, 2024; Liang, 2023; Pum & Sok, 2024) and in creativity (Liang, 2023) thereby obstructing students' effective educational development (Rane et al., 2024).

In conclusion, the incorporation of AI in education offers multiple advantages for both educators and students, particularly concerning the efficiency of the learning process. Research indicates that the integration of AI enhances student motivation and engagement by allowing for the customization of learning experiences tailored to the distinct characteristics of each individual. Moreover, it fosters an environment where students can progress at their own pace, aligning with their strengths and weaknesses. AI also facilitates a continuous and dynamic learning atmosphere by providing immediate feedback, which can significantly enhance students' learning effectiveness. Additionally, AI presents several benefits for teachers by alleviating their workload, thereby enabling them to allocate more effort toward improving the overall quality of education. Nonetheless, the application of AI is not without its drawbacks. Ethical concerns related to privacy and algorithmic bias, alongside issues regarding academic integrity, have surfaced as significant challenges. It has been proposed that overreliance on AI may lead to a decline in deep learning, critical thinking, and creativity, ultimately undermining the overall effectiveness of the educational experience.

2.3. The Age of Digital Tools and AI in EFL

Since the 1960s, coinciding with the initial introduction of computers into language instruction, researchers and educators have explored the integration of computer technology into language teaching methodologies (Jafarian et al., 2012). Computer-Assisted Language Learning (CALL) represents a distinct area within Information and Communication Technology (ICT) that emphasizes the integration of computers and related technologies into the educational process to facilitate language acquisition. In the realm of language learning and instruction, CALL encompasses a variety of applications and methodologies (Beatty, 2013; Shokrpour et al., 2019). As one of the applications, Virtual Learning Environments (VLEs) have garnered considerable attention. VLEs involve the utilization of virtual classrooms and videoconferencing platforms, including Zoom, Google Meet, and Microsoft Teams. VLEs provide opportunities for students situated in remote locations to engage in educational pursuits; additionally, they facilitate student participation in a variety of learning activities within a computer-based environment (Santiana et al., 2024). VLEs have become particularly significant following the rapid proliferation of the Coronavirus disease (COVID-19), as many institutions, including schools, were compelled to close and education needed to transition to a virtual format (Yaguara et al., 2022). Consequently, online learning and instruction have experienced a worldwide transformation facilitated by the internet and various technologies applicable in educational settings (Dincher & Wagner, 2021). This transition in teaching

methodologies necessitated that educators incorporate digital tools into their pedagogy to facilitate remote instruction (Cahyono et al., 2024). EFL teachers were required to cultivate technical skills for effective language instruction during the pandemic by utilizing digital tools that had previously been underutilized (Cerdeira et al., 2024).

Another widely employed method in language education is Mobile-Assisted Language Learning (MALL), which includes applications such as Duolingo, Quizlet, and Kahoot, among others. There is a large volume of published studies describing the role of MALL in language education. It has been demonstrated that integrating mobile apps into language education enhances grammatical accuracy (Vu et al., 2023; Wang et al., 2021), speaking skill (Hwang et al., 2024; Phetsut & Waemusa, 2022; Putri & Degeng, 2024; Wang & Gunaban, 2023), listening skill (Hamid et al., 2024; Li & Singh, 2024; Vu et al., 2024), reading skill (Chandran & Ismail, 2023; Li, 2022; Sudiatama et al., 2023; Xiaoli, 2024) and writing skill (Pingmuang & Koraneekij, 2022; Shavkatovna et al., 2024; Wang & Gunaban, 2023; Zalani et al., 2024). Furthermore, it has been concluded that the integration of MALL in language education significantly increases students' motivation (Akman & Karahan, 2023; Alharthi & Altarjami, 2024; Hwang et al., 2024; Suherman et al., 2024), and autonomy (Akman & Karahan, 2023; Hazaea & Alzubi, 2018). Consequently, it seemed essential to examine EFL teachers' perceptions and levels of readiness regarding the integration of MALL into language classrooms. This is due to the significant role that teachers' perceptions and readiness play in the successful incorporation of technology into the educational process. A number of studies have tried to demonstrate the perception of EFL teachers towards MALL and concluded that EFL teachers have an overall positive attitude towards the integration of MALL into the language classroom (Gönen & Zeybek, 2022; Hafour, 2022; Halepoto, 2022; Khan et al., 2018; Oz, 2015; Sari & Sulisty, 2022; Wu et al., 2012). Another crucial factor influencing the choice to utilize applications such as MALL is the readiness level of EFL teachers. It is essential for teachers to comprehend the fundamental operations of the respective applications to ensure their effective use. The literature presents a contradictory perspective regarding the readiness of EFL teachers to implement MALL applications. While some studies indicate that EFL teachers possess the requisite readiness to employ MALL effectively (Dashtestani, 2013; Khan et al., 2018; Linh, 2021), other research suggests that EFL teachers may lack the necessary readiness for the successful application of such tools (Gönen & Zeybek, 2022; Rachmawati et al., 2021).

The integration of technology into language education, particularly its importance for enhancing the quality of EFL instruction, is a well-established topic, as previously highlighted. The current trend in technology adoption within language education is closely associated with AI, evidenced by the widespread use of tools such as Automatic Evaluation Systems (AESs) and AI Chatbots, which are among the most commonly applied technologies in the EFL context.

- **Automatic Evaluation Systems:** AESs utilize ML and NLP technologies to analyze components such as speech recognition and semantic interpretation, thereby facilitating automated feedback and revision recommendations (Cotos, 2023). These systems are predominantly applied within EFL contexts for writing and speaking (Jiang, 2022). Research indicates that these systems are particularly effective in identifying lexical, grammatical, and detail-oriented errors (Tang, 2024) and in notably improving the writing quality of lower-proficiency EFL learners (Tungka, 2024). For example, Grammarly, a prominent AESs tool, has been shown to advance EFL learners' writing skills by delivering prompt feedback on task fulfillment, coherence, cohesion, vocabulary use, and grammatical precision, thereby fostering enhanced writing competence (Wei, 2023). Another frequently utilized AESs tool in the context of EFL is QuillBot, which has been shown to enhance the writing abilities of EFL students by improving clarity, readability, and paraphrasing skills (Bensalah, 2024). This tool not only bolsters students' abilities to paraphrase but also fosters enthusiasm and provides valuable insights into their learning processes (Mohammad et al., 2023). Overall, QuillBot contributes to an increase in students' literacy skills and motivation, thereby streamlining and optimizing the learning experience (Thohir et al., 2024). Furthermore, through the application of automatic speech recognition, AESs have demonstrated efficacy in improving learners' speaking skills, with participants noting advancements attributed to the varied textual feedback and practical recommendations offered by AI programs (Ahn & Lee, 2016; Zou et al., 2023). However, it is important to acknowledge that these systems often lack detailed, content-specific feedback (Chen et al., 2023) and have limitations in addressing higher-level macro-discourse elements such as text structure (Tang, 2024), highlighting the essential role of human intervention in maximizing educational outcomes (Aldosemani et al., 2023).
- **AI Chatting Robots:** In recent years, AI chatbots have been introduced and implemented in English language education to enhance and transform teaching practices (Chuah & Kabilan, 2021). Since their inception, they have attracted considerable attention within the field of language education due to their numerous advantages in making the language learning process more effective and accessible. Also known as conversational agents, AI chatbots are sophisticated computer programs (Wu & Yu, 2024) that utilize advanced artificial intelligence techniques, including NLP, ML, and Deep Learning (DL) (Siderska et al., 2023). The primary objective of chatbots is to engage users in interactions that mimic natural language, thereby facilitating meaningful conversations (Alrajhi, 2024). Users interact with AI chatbots by posing questions or making comments, to which the chatbot responds with answers, comments, or introduces new topics. Furthermore, AI chatbots can simulate conversational partners, providing learners with real-time feedback and opportunities for linguistic experimentation in a low-pressure environment, distinct from traditional classroom settings (Mushaddiq et al., 2024). Several AI chatbots are readily

available to both students and the general public, including Apple's Siri, Amazon's Alexa, Google Assistant, and OpenAI's ChatGPT. Additionally, platforms like Duolingo also exemplify the application of chatbot technology within the realm of language acquisition (Yuan & Liu, 2024).

The implementation of chatbots in language education presents numerous significant advantages. AI chatbots create a safe environment for EFL students to explore linguistic experimentation (Mushaddiq et al., 2024) and further provide communicative authenticity (Liu et al., 2022). Consequently, chatbots hold the potential to alleviate speaking anxiety and enhance oral proficiency (Muthmainnah, 2024). The interactive characteristics of chatbots facilitate real-time feedback, which is essential for the development of pronunciation and fluency (Yang & Chang, 2024). Moreover, chatbots contribute positively to the development of listening skills by simulating conversational partners, thereby assisting students in improving their listening abilities through engaging dialogues (Du & Daniel, 2024). The utilization of AI-driven systems has also been shown to bolster students' comprehension of spoken English, as these systems can adapt to various speaking styles and accents (Yang & Chang, 2024). With regard to writing skills, AI chatbots provide immediate, personalized feedback, promote learner autonomy, and accommodate diverse learning styles, thereby enhancing writing proficiency in EFL contexts (Pitychoutis, 2024). Additionally, in terms of reading skill, they empower students to select reading materials autonomously, encourage active out-of-class reading, and help learners navigate reading challenges while effectively promoting self-regulated reading strategies (Pan et al., 2024). Furthermore, AI chatbots significantly improve EFL students' vocabulary acquisition, enhancing both receptive and productive vocabulary (Zhang, 2023). Overall, these tools contribute to increased student confidence, engagement, and motivation, thereby accelerating the English language learning process (Du & Daniel, 2024).

2.3.1. Benefits of AI in EFL Contexts

The incorporation of technology into language education has emerged as an increasingly significant and pressing concern over recent decades. As a result, advancements in AI and other technological innovations have enhanced the accessibility, affordability, and effectiveness of language learning tools (Mohamed, 2023). AI tools offer flexibility and accessibility for learners of all ages, promoting self-paced learning opportunities that can be accessed anytime and anywhere (Gligorea et al., 2023). AI technologies possess the capability to adapt to diverse learning styles and proficiency levels, thereby providing personalized educational experiences (Busso & Sanchez, 2024) and delivering real-time feedback that allows students to progress at their own pace (Umar, 2024). Additionally, the use of AI makes language learning more interactive and enjoyable (Yolchiyeva et al., 2024), ultimately improving language skills by fostering motivation, engagement, and autonomy of students. Customizing learning experiences for each student, tailored to their learning styles, paces, and language proficiency levels, has demonstrated a positive effect on motivation and

engagement (Mohamed, 2023). Research has shown that the application of artificial intelligence can significantly enhance learners' motivation (Ma & Dong, 2021; Moybeka et al., 2023; Winkler & Soellner, 2018), foster engagement (Al-Raimi et al., 2024; Cizrelioğlu & Aydın, 2024; Dilzhan, 2024; Umar, 2024), and furthermore promote autonomy (Kim & Sim, 2024; Losi et al., 2024; Szabó & Szoke, 2024).

While it is evident that AI exerts a positive influence on language education overall, it is essential to investigate each specific language skill and evaluate the impact of AI and AI-integrated tools within particular contexts. Among these tools, chatbots—software applications designed for dialogue that engage with users and interpret their inputs using natural language (Huang et al., 2021)—have attracted considerable attention for their role in fostering the development of speaking skills in language education. Chatbots have been shown to provide effective support (Huang, 2021), deliver real-time feedback (Yang & Chang, 2024), and create individualized and interactive practice opportunities (Ahn et al., 2024; Yang & Chang, 2024). These features can help alleviate anxiety (Bao, 2019; Du & Daniel, 2024; Muthmainnah, 2024) and, as a result, significantly enhance speaking skills in EFL contexts (Barabad & Anwar, 2024; Duong & Suppasetserree, 2024; Shan et al., 2024).

Writing, as a productive skill, has also undergone substantial changes with the incorporation of artificial intelligence into language education. This integration has produced several benefits for improving writing proficiency, particularly through AI tools such as ChatGPT and Grammarly, which have been shown to positively influence writing outcomes (Barrot, 2024; Fitria, 2021; Oktarina et al., 2024; Jamshed et al., 2024). ChatGPT, as an AI-integrated tool, "analyzes the content, grammar, vocabulary, and coherence of the text to provide immediate feedback" (Dilzhan, 2024, p. 23). Similarly, Grammarly employs algorithms that offer students prompt suggestions and corrections for their writing (Fitria, 2021). This real-time feedback enables individuals to swiftly identify and rectify errors, thereby streamlining the revision process (Pratama & Sulistiyo, 2024). Furthermore, these AI-driven tools improve writing skills in areas such as grammar, sentence structure, and vocabulary (Rafida et al., 2024). Additionally, AI-integrated writing tools personalize learning experiences, leading to a reduction in common writing errors and enhancement of grammatical accuracy when compared to traditional teacher feedback methods (Jamshed et al., 2024). They also analyze students' writing patterns and provide tailored resources and exercises that address individual needs, thereby increasing engagement and motivation (Devasena, 2024).

While the majority of existing literature has predominantly concentrated on speaking and writing skills, the impact of AI on reading and listening skills has also been explored. Regarding reading skills, AI-integrated reading tools have been shown to enhance reading proficiency by promoting autonomous learning and increasing student engagement (Hsiao & Chang, 2023). Moreover, the use of personalized AI-generated texts, particularly for low and intermediate-proficiency learners (Sudin, 2024), has been found to improve reading abilities. This improvement

may be attributed to the adaptive nature of AI, which allows for the customization of content that resonates with learners, thereby fostering a deeper connection to the material (Daweli & Moqbel Mahoub, 2024). AI technologies, including mobile applications, have revolutionized the learning experience by offering interactive and user-friendly platforms for EFL students (Fatima et al., 2024). Tools such as Duolingo have been reported to significantly enhance listening and speaking skills, enabling students to practice at their convenience, thus making the learning process more engaging and effective, ultimately improving comprehension and practical listening abilities (Azzahra et al., 2024; Fatima et al., 2024).

The integration of AI and AI-enhanced tools has profoundly altered the landscape of language education, presenting numerous benefits for learners. Moreover, these technologies support EFL teachers across several aspects of their professional endeavors. By offering a variety of resources, such as educational materials and suggestions for classroom activities (Dilzhan, 2024), the AI tool ChatGPT alleviates the administrative burdens on teachers, enabling them to concentrate on personalized instruction and support (Amin, 2023). Furthermore, AI contributes to EFL educators by creating personalized learning environments, improving student engagement, providing rapid feedback mechanisms, and allowing the customization of course materials. It also helps EFL teachers to access high-quality resources, identify knowledge gaps and learning styles, and facilitate adaptive learning (Eldin, 2024).

2.3.2. Barriers to AI Integration in EFL Teaching

Like all technological tools throughout history, any educational technology must be adapted, modified, and effectively implemented by its users to achieve true pedagogical value. Technology alone does not guarantee meaningful learning outcomes; rather, its impact depends on how educators integrate it into teaching strategies, customize it to fit learners' needs, and align it with educational objectives. If it is integrated appropriately, technology can enhance learning by fostering engagement, personalizing instruction, and promoting better understanding. However, if misused or inadequately implemented, it can become a distraction, reinforce ineffective teaching methods, or even widen educational gaps. Since educators play a vital role in the integration of emerging technologies within the classroom context, influencing its impact both positively and negatively, it is imperative to identify the common challenges encountered by EFL teachers when adopting new technologies, such as AI, as these obstacles may lead to a reduction or limitation in their usage of such tools.

The difficulties faced by teachers in incorporating AI into the language teaching process are closely related to the broader barriers they encounter when integrating technology into their classrooms. Ertmer (1999) classifies these barriers into two primary categories: "first-order and second-order barriers" (p. 48). First-order barriers pertain to external factors that influence the extent

of technology integration, including insufficient equipment, time constraints, and lack of training and support. In contrast, second-order barriers are related to intrinsic factors, such as teachers' overarching beliefs regarding the specific application of technology. Although a large body of literature suggests that EFL teachers perceive AI integration in language teaching as highly beneficial (An et al., 2022; Chounta et al., 2021; Dilzhan, 2024; Allali & El Ghouati, 2025; Elmahdi et al., 2024; Slamet, 2024), it is essential to consider other factors that may contribute significantly to teachers' resistance, despite their recognition of AI's potential to enhance student learning. While educators may conceptually accept the use of AI, their actual classroom practices may not always match this belief. Many teachers tend to revert to traditional teaching methods as they provide a sense of familiarity and security, reducing the uncertainties associated with AI-driven instruction. Factors such as lack of confidence, inadequate training, or concerns over losing control in the classroom can lead teachers to maintain conventional approaches, even when they acknowledge AI's benefits. Therefore, bridging the gap between perception and implementation requires targeted support, professional development, and institutional encouragement to foster a smoother transition toward AI integration in language teaching.

The existing literature identifies several obstacles to the integration of AI in language education. Notably, insufficient training and a lack of AI literacy among teachers and students represent significant challenges. In their systematic review, AlTwijri & Alghizzi (2024) underline that the application of AI technologies in EFL contexts remains nascent, suggesting a potential deficiency in AI literacy among both educators and students. Consequently, due to their limited technological proficiency, language teachers and learners may struggle to effectively employ AI systems and tools within language education (De la Vall & Araya, 2023). This emphasizes the necessity for educators to acquire the essential technical competencies required for the effective use of AI tools, thus underscoring the importance of ongoing professional development to ensure they are well-prepared (Elmahdi et al., 2024; Dilzhan, 2024; Zhou et al., 2024). Furthermore, it indicates that teachers necessitate sufficient support to improve their efficiency and effectiveness in instructional practices (Chounta et al., 2021), as inadequate training programs for educators foster resistance toward the integration of AI due to feelings of unpreparedness in utilizing these technologies effectively (Mehdaoui, 2024).

Another critical obstacle to the implementation of AI in EFL classrooms is the technical challenges associated with the language teaching process. For the successful integration of AI in language instruction, the availability of appropriate infrastructure, including reliable internet access, necessary classroom equipment, and other essential resources, is of paramount importance. As noted by Mehdaoui (2024), insufficient resources, slow internet connectivity, and outdated technology substantially hinder the incorporation of AI in educational settings. Moreover, Nagpal and Murugesan (2024) emphasize additional infrastructural factors, including rigid curricular structures, insufficient technical support, and inadequate funding for technology integration initiatives, which

are critical challenges that can significantly obstruct language education. For instance, access to proper infrastructure and reliable internet connectivity poses significant challenges to the implementation of AI in language education, particularly in developing nations like Nigeria (Ahmed, 2024).

Concerning second-order barriers related to educators' beliefs, mindsets, and attitudes towards specific technological applications, one of the most common challenges is resistance to change. As noted by Hamlaoui (2021), many educators, particularly those with greater experience, exhibit reluctance to transition from traditional text-based pedagogical methods to technology-enhanced teaching practices. Given that AI represents a new frontier in technology that is only beginning to be integrated into language education, teachers may feel apprehensive about altering their established teaching methodologies or may feel overwhelmed by the learning curve associated with adopting new tools (Holden & Rada, 2011). Another barrier that may impede the adoption of AI in language education is the apprehension associated with job loss or the fear of being overwhelmed by these technologies. While the integration of AI in language education presents numerous benefits for both students and educators, improving the efficiency and ease of the language learning and teaching processes, it has also raised concerns about the potential diminishment of job security for EFL teachers (Aljabr & Al-Ahdal, 2024; Rus et al., 2024; Tiwari, 2024).

2.3.3. Psychological and Pedagogical Concerns Regarding AI in EFL

The integration of AI into language education has given rise to a number of pedagogical concerns. While the adoption of AI applications in language learning and teaching enhances students' access to language-related resources, it concurrently leads to a reduction in human interaction and engagement within the educational experience, resulting in a dehumanized approach to language education. This mechanistic perspective, as noted by Ebadi & Amini (2022), may impede the essential emotional and cultural connections that students need to foster in their language learning journey. Furthermore, it can adversely impact the dynamics between students and teachers. In her study involving pre-service teachers, Pokrivcakova (2023) found that a significant proportion of EFL educators are apprehensive that AI might weaken the personal aspects of teaching, thereby negatively affecting the teacher-student relationship. This, consequently, may undermine students' social-emotional development (Dilzhan, 2024; Parviz, 2024). Additionally, educators have expressed concerns that technology could replace traditional instructional approaches (Akyıldız, 2024). Similarly, Aljabr & Al-Ahdal (2024) assert that AI has the potential to negatively influence conventional teaching methodologies, and they further assert that AI may complicate the roles of teachers in classroom management.

As previously discussed, a critical concern related to AI in education pertains to its ethical implications, which extend to the context of EFL. Numerous studies have indicated that EFL teachers

express apprehension regarding the potential adverse effects of AI on academic integrity in language education, emphasizing the necessity for the establishment of clear ethical guidelines and the enhancement of awareness surrounding this issue (Cong-Lem et al., 2024; Elmahdi et al., 2024; Nazim, 2024; Neff et al., 2024; Tiwari, 2024). In particular, the issue of plagiarism has raised significant concerns regarding students' writing skills. Perkins (2023) posits that while Large Language Models (LLMs) like ChatGPT can improve students' writing capabilities in formal assessments, they simultaneously provoke serious worries about academic integrity. Nonetheless, the challenge resides not solely in the utilization of these tools but in their improper application (Alammar & Amin, 2023). This misuse manifests as students' inclination to present AI-generated content as their original work. Consequently, there is a pressing need for explicit policies that delineate acceptable use and mitigate instances of plagiarism (Perkins, 2023). Additionally, a critical challenge remains in the detection of AI-generated material (Tian, 2024). To develop effective solutions, it is essential to consider the underlying reasons prompting students to engage in plagiarism. Cong-Lem et al. (2024) found that educators believe students resort to plagiarism due to deficiencies in original thought, low motivation, and inadequate linguistic abilities.

Another critical concern regarding the use of AI in language education is the excessive reliance on such tools. Numerous scholars have contended that while AI tools offer several advantages, they can also lead to dependency among students (Darwin et al., 2023; Hading et al., 2024; Singh et al., 2023; Yilin et al., 2023). Given that language acquisition requires students to engage in creative and critical thinking, an over-reliance on AI presents a significant challenge, as it may inhibit the development of these essential skills (Akyıldız, 2024; Cong-Lem et al., 2024; Hieu & Thao, 2024; Marrone, 2022). Singh et al. (2023) voice apprehensions, noting that while AI tools like ChatGPT facilitate tasks for students, they may also constrain original thought and disrupt writing proficiency. This concern underscores the necessity for balanced and responsible use of AI (Darwin et al., 2023; Hading et al., 2024; Marrone, 2022), with strategies such as encouraging independence, promoting group discussions, and implementing project-based learning being recommended to enhance critical thinking skills (Yilin et al., 2023).

In conclusion, while AI has significant promise in EFL teaching and learning through tailored support, greater access to learning resources, increased engagement, and access to automated technological devices and programs, the practical use of AI in EFL teaching hinges on numerous interrelated hurdles. Fundamental barriers such as a lack of adequate training, poor infrastructure, and insufficient support from the institution/s can affect practical implementation. At the same time, primary barriers, such as educators' personal and professional attitudes, reluctance to change, and fears of a diminished professional role, have an impact on the AI readiness in the classroom. In addition, the psychological and pedagogical aspects, including lack of face-to-face contact, human interaction, and over-dependence, along with ethical aspects such as AI systems enabling students to circumvent academic integrity standards (plagiarism), necessitate the development of formal

frameworks and strategies that incorporate ongoing training and intentional reflective teaching. Thus, the effective application of artificial intelligence in EFL contexts requires a comprehensive solution that combines adequate infrastructure, ethical oversight, pedagogical responsibility, and ongoing structural support for educators, in which AI serves as a supplement, not a substitute, to support learners in achieving the goal of liberating, unequalled, and ethical access to language learning in all its dimensions.

2.4. Theoretical Framework

2.4.1. The Technological Pedagogical and Content Knowledge (TPACK) Model

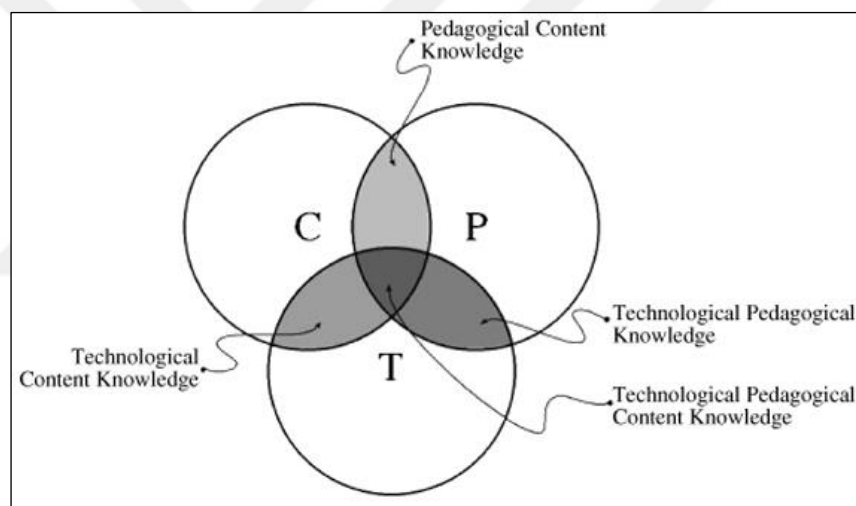
The incorporation of technology into education has consistently been a primary concern for all stakeholders involved in the educational process, particularly in recent years. Technological advancements have significantly influenced the methods of educational delivery. The incorporation of technology in educational environments has become essential in curricula designed for language learning and teaching (Macaro et al., 2011). As a result, a growing body of literature has concentrated on the integration of technology and its effects within the context of EFL. Research has demonstrated that the integration of ICT into language classrooms substantially enhances language learning outcomes (Cheng, 2024; Shamshiri & Esfahani, 2023; Vafayi & Meihami, 2024). The efficacy and extent of technology integration into the educational process are strongly associated with teachers' readiness and perceptions. As a fundamental factor influencing technology integration, teachers' AI-readiness refers to the extent to which educators are prepared to effectively integrate AI into their teaching methodologies (Luckin, 2022). It is essential to equip teachers with the requisite training not only on how to effectively utilize specific technologies but also on how to select the most appropriate technology for teaching a particular subject (Tondeur et al., 2011). In instances where teachers lack the necessary training (readiness level), it would be unrealistic to expect them to effectively integrate such technology into their pedagogical practices (Park & Son, 2020).

The readiness of EFL teachers to incorporate technology into their classrooms has been a persistent topic of discussion, particularly since the introduction of computers in language education in the 1960s. Since that time, various models have been proposed to assess teachers' levels of readiness and perceptions regarding technology integration. One such model is the Technological Pedagogical and Content Knowledge (TPACK) framework (Mishra & Koehler, 2006). Teachers' readiness to incorporate technology into their teaching and learning methodologies is a multifaceted phenomenon (Cuhadar, 2018). TPACK, thus, offers a comprehensive knowledge base that facilitates a deeper understanding of subject matter and fosters a broader perspective.

TPACK is a framework that facilitates the evaluation of teachers' capabilities in integrating technology into educational practices (Bostancıoğlu & Handley, 2018). The foundation of the

framework is rooted in recognizing the intricate nature of education and the existence of various forms of knowledge that influence this phenomenon (Koehler & Mishra, 2006). TPACK, as a framework, extends Shulman's (1986, 1987) concept of Pedagogical Content Knowledge (PCK) to elucidate effective technology integration by emphasizing teachers' comprehension of technology, pedagogical approaches, and subject matter knowledge (Koehler & Mishra, 2009). The TPACK framework assists educators in comprehending how to effectively instruct content by selecting suitable pedagogical methods and appropriate technological resources, all within the context of a specific teaching scenario (Tseng, 2017). Consequently, TPACK encompasses not only the ability to utilize technology but also the capacity to discern its relevance to the subject matter being taught and to determine the most effective pedagogical strategies for its implementation (Park & Son, 2020). The framework (see Figure 1) centers around three main facets of knowledge: "Content, Pedagogy and Technology" (Koehler et al., 2005, p. 742).

Figure 1: Technological Pedagogical Content Knowledge (Koehler & Mishra, 2006, p. 1025)



Content knowledge (CK) pertains to the subject matter intended for instruction, while technological knowledge (TK) encompasses the tools utilized for delivering that content, ranging from traditional resources such as books and blackboards to more advanced technologies like the internet and digital videos. Lastly, pedagogical knowledge (PK) involves the methods and strategies selected by educators, including lesson planning, conceptual teaching, and student assessment (Koehler et al., 2005). However, they emphasize that the framework does not regard content, pedagogy, and technology as distinct entities. Rather, it highlights the interplay among these three components and their mutual influence in enhancing teaching and learning outcomes (Koehler et al., 2005). The interplay among these concepts manifests itself in four further areas of knowledge: Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), Pedagogical Content Knowledge (PCK), and Technological, Pedagogical, and Content Knowledge (TPACK) (Mishra & Koehler, 2006). TCK refers to the comprehension of how technology can

facilitate the instruction of specific content areas (e.g., employing online tools for teaching grammar), TPK involves the ability to utilize technology to enhance instructional methods (e.g., utilizing video calls for facilitating group discussions), and PCK pertains to the understanding of how to effectively teach specific content (e.g., selecting the most appropriate teaching method for elucidating a challenging grammar rule) (Taopan & Sumardi, 2020). Lastly, TPACK encompasses the knowledge that educators require to facilitate student learning in a particular subject through the effective integration of appropriate teaching methods and technology (Nazari et al., 2020). Consequently, it was deemed appropriate to assess EFL teachers' readiness levels for integrating AI and AI-integrated tools based on the foundational principles of the specified model.

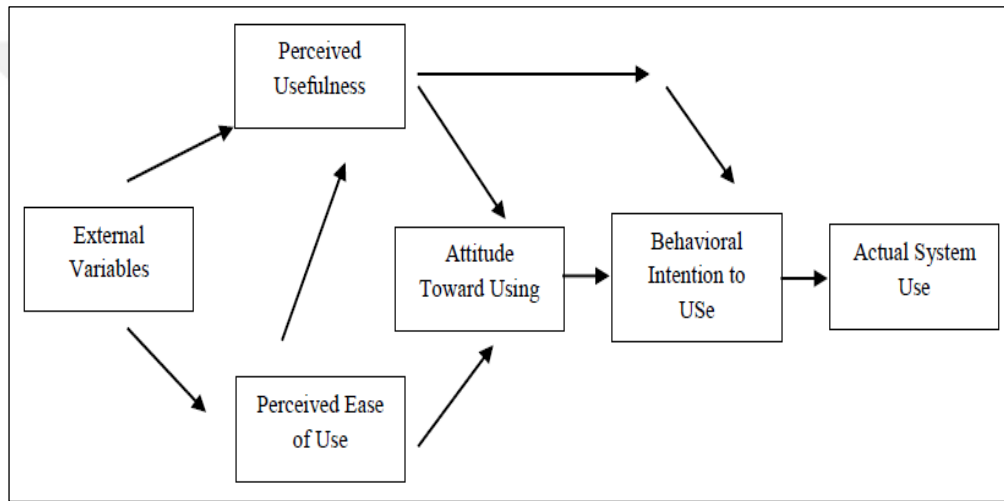
2.4.2. Technology Acceptance Model (TAM)

The rapid advancements in AI are increasingly influencing the contemporary educational landscape. Educators, students, and various stakeholders have recognized the implications of these developments. This swift technological progress underscores the crucial role of teachers in integrating technology, particularly AI, into classroom settings. As previously noted, the willingness of teachers to adopt technology in this context is significantly associated with their readiness and perceptions regarding its implementation. While TPACK model is chosen to analyze the readiness level ELF teachers towards AI, The Technology Acceptance Model (TAM), which was first introduced by Davis (1989), provides a valuable framework for examining users' perceptions, attitudes, and actual usage behaviors, as it elucidates the factors that may lead to either the acceptance or rejection of technology by users (Yang & Appleget, 2024).

Although various theories have been advanced to clarify technology acceptance and behavioral usage (Silva, 2015), TAM, established three decades ago, remains notably relevant and widely utilized in the field of technology acceptance, particularly for comprehending the predictors of human behavior regarding the potential acceptance or rejection of technology (Granić & Marangunić, 2019). TAM builds upon the Theory of Reasoned Action (TRA) proposed by Fishbein & Ajzen in 1975 (Al-Suqri & Al-Kharusi, 2015). TRA is a framework that explains human behavior by focusing on the relationship between attitudes, intentions, and actions (Davis, 1989). It posits that behavior can be predicted based on an individual's intention to engage in that behavior (Al-Suqri & Al-Kharusi, 2015). Similarly, TAM centers around three two theoretical concepts: perceived usefulness (PU), perceived ease of use (PEOU) (Davis, 1989). While Davis (1989) defines PU as "the degree to which a person believes that using a particular system would enhance his or her job performance," he further defines PEOU as "the degree to which a person believes that using a particular system would be free of effort" (p.320). TAM is a framework that examines perceived ease of use and perceived usefulness as key factors influencing behavioral intention, ultimately determining actual technology usage (Silva, 2015). While the framework primarily centers on two key constructs, there exists an interconnected relationship among concepts such as Attitude (A), Behavioral Intention (BI),

and Actual System Use (ASU). Williams (1996) elucidates this relationship as follows: (1) PU and PEUO are distinct perceptions users have regarding technology, and these perceptions significantly influence users' A, (2) consequently, if the user views a system as useful and easy to use, they are likely to develop a positive attitude toward it, and (3) users' BI—namely, their intent to use the system—is influenced by their attitude and perceived usefulness, if users feel positively about the system and see it as beneficial, it will likely lead to an increase in ASU. (see Figure 2). Similarly, Sumakul et al. (2022) state that teachers' perceptions regarding the usability and utility of technology significantly influence their intention to adopt such tools, which in turn affects the manner in which they integrate technology into their instructional practices.

Figure 2: Technology Acceptance Model (Davis, 1989, p. 319)



To investigate EFL teachers' perceptions of AI integration in education, the present study employed the TAM (Davis, 1989) as its theoretical foundation. According to TAM, PU and PEOU serve as the primary determinants of technology adoption. Within this framework, the perceptions of Turkish EFL teachers regarding AI were explored through both qualitative and quantitative methods. The survey developed for this study concentrated primarily on the perceived advantages and disadvantages of AI. The advantages were conceptualized through PU, which reflects the extent to which teachers believe that AI can improve teaching effectiveness (Venkatesh & Davis, 2000). At the same time, the survey also incorporated potential drawbacks of AI, particularly negative attitudes, risks, and concerns associated with its use. Issues such as diminished critical thinking, challenges to academic integrity, and risks of plagiarism, widely emphasized in prior research (Alammar & Amin, 2023; Akyıldız, 2024; Cong-Lem et al., 2024; Hieu & Thao, 2024; Marrone, 2022; Perkins, 2023) were therefore included as essential components of the perception scale. These specified concerns were framed as external factors that would potentially affect teachers' PU. The PEOU construct, on the other hand, was assessed through external factors such as infrastructural readiness, reflecting teachers' perceptions of barriers to implementing AI-based tools. As Venkatesh and Bala (2008)

argue, inadequate infrastructure, particularly the absence of necessary technological resources, negatively influences teachers' perceptions of the ease of use of such innovations.

2.4.3. Previous Studies on EFL Teachers' Perceptions Towards AI

Teachers are instrumental in shaping the use of technology in educational settings, as their decisions regarding adoption, guidance, frequency of use, and purpose significantly affect the effectiveness of technology integration in the classroom, underscoring the importance of understanding their perceptions (Sumakul et al., 2022). The perceptions of EFL teachers regarding AI and AI-integrated tools in language education, thus, have become a prominent subject of discussion, resulting in an expanding body of literature examining the given topic. Nonetheless, the predominant body of current literature examining the perceptions of EFL teachers places significant emphasis on higher education and pre-service educators.

A considerable number of studies have been conducted to investigate the perceptions of EFL teachers within higher education settings (Alharbi, 2024; Aljabr & Al-Ahdal, 2024; Alsalem, 2024; Mudawy, 2024; Parviz, 2024; Ulla et al., 2023; Yao and Huang, 2024). These investigations have generally indicated a favorable perception of AI and its applications in higher education. For example, Aljabr and Al-Ahdal (2024) emphasized the pedagogical benefits of AI in enhancing teaching and learning outcomes in language education among Iranian EFL instructors. Furthermore, educators have recognized the user-friendliness and practical utility of these technologies (Yao & Huang, 2024). In alignment with Yao and Huang (2024), Parviz (2024) also underscored the diverse applications of AI, including lesson planning and the development of language activities. He further concluded that EFL teachers in higher education perceive AI as a valuable tool, particularly in fostering students' social-emotional development and enhancing higher-order cognitive skills. However, the studies also highlight significant concerns regarding the implementation of AI in higher education, particularly issues related to the reliability and trustworthiness of AI technologies (Aljabr & Al-Ahdal, 2024) and the potential for students to become overly dependent on AI applications (Alsalem, 2024).

A substantial body of research has been conducted to examine the perceptions of pre-service EFL teachers regarding AI and its application in language learning and teaching (Balatero, 2024; Chung & Jeong, 2024; Kim, 2023; Mustroph & Steinbock, 2024; Pokrivcakova, 2023; Wulandari & Purnamaningwulan, 2024; Yetkin & Özer-Altınkaya, 2024). Similar to the perceptions held by EFL educators in higher education, these studies indicate that pre-service EFL teachers generally maintain positive perception towards AI and its applications in language education. For instance, Chung and Jeong (2024) found that pre-service English teachers in China perceive generative AI tools, such as ChatGPT, as advantageous for improving teaching efficiency, particularly in the areas of grammar and writing. Correspondingly, Balatero (2024) concluded that pre-service teachers view ChatGPT

favorably as a writing aid, acknowledging its effectiveness. Moreover, Wulandari and Purnamaningwulan (2024) reported that Indonesian EFL pre-service teachers hold positive perceptions of AI, citing benefits such as improved brainstorming, efficient lesson preparation, and the capacity to develop customized instructional materials. In a study focusing on AI-based machine translation systems, Kim (2023) also found that pre-service EFL teachers regard these systems positively, recognizing their potential to enhance English writing and reading skills. However, the research has also highlighted significant concerns regarding the integration of AI in language education, particularly issues related to plagiarism (Balatero, 2024), over-reliance on technology (Chung & Jeong, 2024), diminished personal interaction in teaching (Pokrivcakova, 2023), ethical concerns (Wulandari & Purnamaningwulan, 2024), and the potential adverse effects on critical thinking skills (Chung & Jeong, 2024).

Several studies have been undertaken to evaluate the perceptions of EFL teachers concerning the integration of artificial intelligence into language learning and teaching. These studies have predominantly concentrated on lower levels of education, specifically middle school, lower secondary school, and upper secondary school (high school). A study by Elmahdi et al., (2024) which aimed at exploring EFL teachers' perspectives on the use of AI tools for instructional purposes, learning activities, and assessment practices. This study employed a sample of 150 EFL teachers from various educational contexts and levels. Using mixed-methods research design, the teachers participated in an online survey specifically designed to gather data on their experiences with AI applications in education. The results indicated that, although educators generally perceive the potential advantages of AI positively, they also articulated concerns pertaining to interpersonal interactions, privacy considerations, and algorithmic bias. Participants viewed AI as a means of personalizing instruction to address individual student needs and providing additional practice opportunities. Additionally, educators recognized AI as a valuable supplementary resource that can enhance pedagogical practices; however, they did not believe that AI would replace teachers. Instead, they emphasized the importance of teachers maintaining control over the content delivered by AI to ensure effective classroom management. Concerns were also raised regarding student data privacy and potential algorithmic biases, which could result in discriminatory outcomes against certain student groups. Overall, teachers underscored the need for more comprehensive guidelines and training to facilitate the effective integration of AI in language education.

In a separate study that concentrates specifically on EFL teachers' perceptions of AI in lesson planning, Setyaningsih et al. (2024) conducted a case study involving 38 high school teachers in Indonesia. Consistent with prior research on EFL educators, participants perceived AI usage as highly advantageous for substantially reducing their workload. They further argued that employing AI tools in lesson planning can promote personalized instruction and creativity. Nonetheless, the authors observed a deficiency in readiness to use these tools effectively and efficiently within lesson planning, highlighting the need for additional targeted training to support teachers' professional

development and facilitate more effective pedagogical practice. The study also emphasized a balanced perspective on the use of AI, arguing that AI should complement language education rather than supplant the teacher's central role as an educator.

In a study focused on Estonian K-12 educators, Chounta et al. (2021) explored teachers' perceptions of AI as a supportive tool within language education. The findings of this survey revealed that Estonian teachers generally regard AI as a valuable aid in various administrative tasks, including grading assignments, streamlining lesson planning, content creation, student monitoring, providing personalized feedback and instructions, and developing educational materials. However, participants also expressed several concerns regarding the integration of AI, notably the potential reduction of human interaction and the diminution of the inherently human aspects of learning—such as empathy, creativity, and flexibility. Furthermore, they emphasized the importance of maintaining transparent and contextually appropriate communication with stakeholders to facilitate the ethical and effective incorporation of AI in the classroom. This approach is crucial to address teachers' needs while safeguarding the essential elements of the educational process.

As one of the most widely utilized AI tools, ChatGPT has become a focal point for investigating the perceptions of EFL teachers. In her master's dissertation, Dilzhan (2024) conducted a focused investigation on ChatGPT. The study aimed to explore how EFL teachers in Kazakhstan perceive and utilize ChatGPT in their pedagogical practices. The study examined the perceptions of 11 EFL teachers from diverse backgrounds. This qualitative research categorized the findings into three primary themes: benefits, challenges, and training needs. The results indicated that the majority of participants held a positive view of ChatGPT, particularly appreciating its ability to generate innovative ideas for lesson integration, alleviate teachers' workloads, and enhance student engagement. However, participants also expressed significant concerns regarding the use of ChatGPT in language education, including the risk of over-reliance on technology, questions about the accuracy of its prompts and instructions, and the potential for academic misuse. Furthermore, the study emphasizes the importance of providing teachers with comprehensive training to effectively leverage the potential of ChatGPT and successfully integrate it into their teaching practices.

In a study similar to that of Dilzhan (2024), Slamet (2024) conducted an investigation focusing on the AI tool ChatGPT, adopting a more comprehensive approach by exploring the perceptions of both students and teachers. This cross-sectional survey involved 80 EFL teachers and 46 EFL students from Indonesia. The findings indicated that the majority of participating teachers regard ChatGPT as a valuable resource that can support language acquisition and proficiency among EFL learners. Additionally, the results suggest that teachers believe ChatGPT has the potential to increase student engagement and motivation in language learning activities, while also fostering autonomous learning and providing access to authentic language resources and knowledge. However, concerns were also expressed regarding the accuracy and reliability of the language generated by ChatGPT for

educational purposes. The study underscores the importance of meticulous planning, teacher training, and technical support to ensure the effective integration of ChatGPT into language education.

In a subsequent study focusing on ChatGPT, Allali and El Ghouati (2025) employed the TAM as a theoretical framework to examine the perceptions of seventy high school EFL teachers in Morocco. The research adopted a sequential mixed-methods design, with data collected through an 18-item questionnaire. The findings suggested that EFL teachers perceive ChatGPT as both user-friendly and advantageous. Participants reported viewing ChatGPT as a valuable tool for reducing administrative workload, particularly in tasks such as testing, homework, and lesson plan development, thereby functioning as a time-saving resource. Moreover, teachers believed that ChatGPT could alleviate their workload, providing them with more time to dedicate to student engagement. The results further indicated a significant, strong positive correlation between PEOU and PU, as well as a willingness to incorporate ChatGPT into their future instructional practices. Nonetheless, participants identified several obstacles to effective integration, including infrastructural deficiencies such as limited access to computers and internet connectivity, as well as a lack of digital literacy. The study emphasizes the need for additional training aimed at fostering effective use and integration of ChatGPT to enhance teachers' digital competencies and facilitate its adoption in educational settings.

In a similar vein to Allali and El Ghouati (2025), Dehghani and Mashhadi (2024) conducted an extensive investigation with 234 Iranian in-service EFL teachers, employing the TAM. Unlike the former study, however, this research specifically examined both external and internal factors influencing teachers' acceptance of ChatGPT, while also exploring their perceptions regarding its pedagogical applications. The quantitative analysis, consistent with Allali and El Ghouati (2025), revealed that PEOU had a positive effect on PU, suggesting that teachers who considered ChatGPT user-friendly were more likely to recognize its utility. Moreover, PEOU was found to significantly influence BI, indicating that teachers perceiving ChatGPT as easy to use expressed a stronger intention to adopt it in their future teaching practices. Nevertheless, the study also highlighted that operating ChatGPT posed challenges for teachers, suggesting that PEOU alone was not a sufficient predictor of actual usage. Rather, teachers appeared more motivated by the perceived potential of ChatGPT to enhance language instruction.

In conclusion, a growing body of research has examined EFL teachers' perceptions of AI integration in education. The majority of these studies converge on the view that AI offers substantial benefits. For teachers, it functions as a supportive tool by reducing administrative workload and facilitating lesson planning, material development, and assessment practices. For students, its pedagogical potential is often highlighted, particularly in terms of fostering engagement, improving language learning outcomes, and enabling personalized learning environments. At the same time, however, the literature also emphasizes several risks, including the danger of overreliance on AI, the

potential erosion of students' critical and creative thinking skills, and concerns related to data privacy and security. Furthermore, there is a consensus that targeted professional training is essential to equip teachers with the necessary skills for the effective and responsible implementation of AI in educational contexts.

2.4.4. Readiness Levels of EFL Teachers Towards AI

AI presents EFL teachers with opportunities to enhance their instruction by automating administrative tasks, personalizing learning experiences, and providing data-driven insights, which can lead to increased efficiency and improved lesson quality (Chun, 2020). Therefore, it is essential to assess the extent to which EFL teachers are prepared to utilize AI tools and to equip them with the necessary skills, training, and support for the effective integration of these tools into their classrooms (Luckin et al., 2022).

Several studies have been conducted to determine the readiness level of EFL teachers in terms of being fully prepared to implement AI in language classrooms. For instance, in their study aimed at assessing teachers' readiness to integrate AI into English language teaching practices, Chan et al. (2024) utilized the TPACK model to examine the issue from the perspectives of 16 pre-service EFL teachers. This quantitative research involved data collection via an online questionnaire. The findings indicated that pre-service English teachers exhibit an overall readiness to incorporate AI tools into the English language classroom, particularly in the areas of Information Literacy (IL), TK, and TPK. However, the study also highlighted the need for further instruction for these pre-service teachers in TCK and Technological TPACK, which refer to their readiness for effective integration of suitable teaching methods and technology for specific content delivery. In other words, although participants possess the necessary readiness level for the implementation of AI tools, they need further training in terms of content-specific implementation of AI language tools.

In a recent study conducted in Türkiye, Özdemir and Mede (2024) aimed to explore the readiness and perceptions of in-service EFL teachers regarding the integration of AI educational tools into their professional practices. The research involved 27 English language instructors teaching at a preparatory school in a private university located in Ankara, Türkiye. Employing a qualitative interpretive approach, the researchers collected data through an AI readiness survey, semi-structured interviews, and reflection papers. The findings revealed that the teachers exhibited a moderate level of readiness for AI integration, along with a moderate level of anxiety concerning its implementation. Additionally, the participants reported moderate access to appropriate hardware and software resources. While the teachers acknowledged the potential benefits of AI in education for enhancing productivity and effectiveness, they voiced significant concerns regarding access to suitable resources and infrastructure. Notably, there was an underlying apprehension regarding the use of AI in educational settings. Consequently, the study advocates for educational institutions to invest in

essential resources and provide ongoing technical support to facilitate a successful transition to AI-enhanced teaching.

In a study employing the TPACK model to evaluate EFL teachers' readiness for AI applications, Karataş and Ataç (2024) conducted a quantitative cross-sectional survey with 304 preservice ELT teachers. The findings, in a similar vein to the findings of Chan et al. (2024), revealed that while preservice teachers demonstrated strong TK and TPK, their overall readiness in integrating this knowledge into pedagogy (TPACK) was comparatively low. Secondly, the study showed that preservice teachers had a moderate to high level of readiness regarding AI, with the highest scores in TK, reflecting strong technological proficiency, and the lowest scores in ethics. Thirdly, demographic variables such as gender and prior AI experience were found to significantly influence AI-TPACK readiness; male preservice teachers and those with prior AI experience outperformed their female counterparts and those without prior experience. Moreover, a strong positive correlation was identified between traditional TPACK readiness and AI-TPACK readiness, suggesting that the development of one dimension supports the growth of the other. Finally, the study emphasized the importance of providing further training, particularly in AI-integrated knowledge and ethical considerations related to AI.

In a study investigating the readiness of higher education EFL teachers to integrate AI into their teaching practices through the TPACK model, Pham (2025) employed a mixed-methods design with 13 EFL teachers. The findings indicated that teachers demonstrated an overall high level of AI-TPACK readiness, aligning with the results of Karataş and Ataç (2024) and Chan et al. (2024). However, the study also revealed a particular need for more targeted training in the area of technological pedagogical knowledge (TPK). This suggests that, although teachers were generally ready to utilize AI in language instruction, they lacked sufficient knowledge in identifying which AI tools are most appropriate for specific instructional goals and how to implement these tools in ways that meaningfully support teaching and learning from a pedagogical perspective.

In conclusion, the existing literature reveals a noticeable gap in assessing the readiness levels of in-service EFL teachers within the framework of the TPACK model. Although several studies have addressed this issue, the majority have predominantly focused on pre-service teachers and higher education instructors. Therefore, examining the readiness of in-service teachers in relation to their TK, TPK, and TCK would provide a more comprehensive understanding. Regarding teachers' perceptions of AI integration, literature presents a variety of studies conducted with higher education instructors, preservice teachers, and in-service teachers. However, within the context of Türkiye, there is little to no research that combines both perceptions and readiness levels of in-service EFL teachers, particularly grounded in both the TAM and the TPACK framework. Investigating in-service teachers' readiness and perceptions through the lens of these theories would not only bridge this gap but also generate deeper insights into the effective integration of AI in language education.

CHAPTER THREE

3. METHODOLOGY

This chapter provides an overview of the study's overall design, including the research approach, participants, setting, sampling procedures, data collection instruments, data analysis methods, and the measures implemented to ensure validity and reliability.

3.1. Research Design

To evaluate Turkish EFL teachers' readiness and perceptions regarding AI, the present study employs an explanatory sequential mixed-method research design. Creswell and Clark (2018) characterize mixed-methods research as a methodological approach that involves collecting and integrating both qualitative and quantitative data to facilitate comprehensive analysis and interpretation. The choice of this particular research design is grounded in the inherent advantage of mixed-method approaches, which is as Cohen et al. (2017) note, is its ability to obtain a comprehensive and deeper understanding of the core domains under investigation. The explanatory sequential component, as further described by Creswell and Clark (2018), refers to a research strategy wherein quantitative findings are initially generated and subsequently elaborated upon through a follow-up qualitative phase, allowing for a more nuanced understanding of the results. As Dörnyei (2007) indicates, the nature of mixed-method research design offers the flexibility to integrate different approaches at various stages, particularly during data collection and analysis. In the present study, both of these integrative approaches were employed, involving the collection of both qualitative and quantitative data, as well as the implementation of both types of analysis (further details are provided later in this section). This mixed-method design enabled a comprehensive investigation through data triangulation, integrating survey results with interview data to enrich the overall analysis.

To gather quantitative data, the researcher designed a five-point Likert-scale survey entitled "Perceptions and Readiness Level of EFL Teachers Towards Artificial Intelligence." This instrument was developed based on the Technological Pedagogical and Content Knowledge (TPACK) model (Mishra & Koehler, 2006) to assess teachers' AI readiness, and the Technology Acceptance Model (TAM) (Davis, 1989) to evaluate teachers' perceptions. The survey consists of five sections: (1) Demographic Information, (2) Use of AI, (3) Familiarity with Digital and AI Tools in Language Teaching, (4) EFL Teachers' Readiness Level Toward AI, and (5) Perceptions of EFL Teachers

Toward AI. For qualitative data, semi-structured interviews with ten questions were conducted to deepen insights from the survey and explore teachers' perceptions of AI in education.

Regarding participant selection and sampling methods, the study encompassed a total of 90 teachers from Türkiye who completed the survey online. Participants were recruited via social media platforms (such as Facebook, Twitter, Instagram, WhatsApp, etc.), employing a convenience sampling strategy to facilitate access to willing respondents. To collect qualitative data, participants were invited to partake in follow-up interviews; those who expressed interest by providing their email addresses were subsequently contacted by the researcher. Semi-structured interviews were conducted with 10 EFL teachers selected through convenience sampling to enable an in-depth exploration of the research topic. These interviews were conducted via social media platforms and subsequently transcribed for analysis.

Quantitative data analysis was carried out using SPSS 27.0 and Microsoft Excel. The levels of AI readiness and perceptions among EFL teachers were evaluated through descriptive statistics. Furthermore, the relationship between AI readiness and familiarity with digital tools, as well as perceptions, was examined using Spearman's rho correlation coefficient. To analyze the relationship between AI readiness and demographic variables, both descriptive statistics and Kruskal-Wallis H tests were employed. For the qualitative data, a thematic analysis was conducted by the researcher and one field expert to ensure reliability and validity.

3.2. Participants

The study includes a total of 90 EFL teachers from Türkiye. The distribution of participants across various demographic categories is detailed in Table 1 below.

Table 1: Characteristics of the Participant

Demographic Information	Category	Number of Participants
Age	23-30	36
	31-40	42
	41-50	10
	51-60	2
Gender	Female	55
	Male	34
	Prefer not to say	1
Years of Teaching Experience	0-5	29
	6-10	23
	11-15	18
	15+	20

Table 1: (Continued)

Demographic Information	Category	Number of Participants
Current Employment	Public	66
	Private	24
Teaching Level	Primary School	17
	Middle School	29
	High School	44
Educational Background	ELT (English Language Teaching)	44
	ELL (English Language and Literature)	38
	ETI (Translation and Interpretation)	2
	ACL (American Culture and Literature)	0
	Other	3

As illustrated in the table above, a total of 90 participants completed the questionnaire. Of these, 36 respondents were aged between 23 and 30, 42 fell within the 31-40 age range, 10 were between 41 and 50 years old, and only 2 participants were aged 51 to 60. Regarding gender distribution, 55 participants identified as female, 34 as male, and one participant chose not to specify their gender. In terms of teaching experience, 29 teachers reported having between 0 and 5 years of experience, 23 had 6 to 10 years, 18 had 11 to 15 years, and 20 had more than 15 years of teaching. Concerning current employment, 66 respondents indicated working at public schools, while 24 were employed at private institutions. Regarding the participants' teaching levels, the majority—44 teachers—were teaching at the high school level, 29 at the middle school level, and 17 at the primary school level. In terms of academic background, 44 participants graduated from the English Language Teaching department, 38 from the English Language and Literature department, and only 2 from the Translation and Interpretation department. Notably, no participants reported graduating from the American Culture and Literature program. Additionally, three respondents indicated that they had graduated from other departments.

3.3. Setting

This study was implemented through an online digital survey administered via Google Forms. The questionnaire was distributed across various social media platforms and online communication channels, enabling participants to respond at their convenience from any location. The sampling was not restricted to a specific institution or geographic area; consequently, no particular school or organization was designated as the target population during the data collection process. However, as previously mentioned, a convenience sampling strategy was employed for participant selection. Consequently, individuals who were more readily accessible to the researcher have specifically been those currently employed in the Black Sea Region. Especially participants from Trabzon, where the

researcher resides and is pursuing her Master's degree, and Rize, where she has been employed as an English teacher for two years.

3.4. Sampling

To gather both quantitative and qualitative data, a convenience sampling strategy was employed since it was feasible and practical to reach an available population. According to Dörnyei (2007), “convenience sampling involves selecting members of the target population based on practical criteria such as geographical proximity, availability at a specific time, ease of access, or willingness to participate” (p. 99). The study involved a total of 90 EFL teachers. The survey was distributed to participants via social media platforms, and responses were received from those who volunteered to take part. For the qualitative component, participants who expressed interest in participating in follow-up interviews were contacted by the researcher.

3.5. Data Instrument

3.5.1. Perceptions and Readiness Level of EFL Teachers Towards Artificial Intelligence Scale

This study employed both qualitative and quantitative methodologies. Quantitative data were collected via a five-point Likert-scale survey titled "Perceptions and Readiness Level of EFL Teachers Towards Artificial Intelligence," which was specifically developed by the researcher (see Appendix A). The structure of the survey instrument employed in this study is grounded in two complementary theoretical models: the TPACK framework and the TAM model. These models provide a robust foundation for exploring both the readiness and the perceptions of EFL teachers toward integrating AI tools into their language teaching practices. Further details regarding the theoretical basis are provided in the literature review section. The survey comprises six sections with a total of 55 items, divided into two main parts. A comprehensive overview of the survey's structure is presented in Table 2 below.

Table 2: Overview of the Survey “Perceptions and Readiness Level of EFL Teachers”

Sections	Content	Question Type(s)
Part A: Q1, Q2, Q3, Q4, Q5, Q6	Demografic information	Multiple Choice Short Open-ended
Part B: Q1, Q2, Q3,	The use of AI	Yes/No question Open-ended Multiple Choice
Part C: Q1, Q2, Q3, Q4, Q5	Familiarity with digital tools and AI tools in language teaching	10-point likert scale

Table 2: (Continued)

Sections	Content		Question Type(s)
Part D:	Q1, Q2, Q3, Q4	Content knowledge readiness	5-point likert scale
	Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13	Pedagogical knowledge readiness	
	Q14, Q15, Q16, Q17, Q18	Technological knowledge readiness	
Part E:	Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14	Perceived Usefulness	5-point likert scale
	Q15, Q16, Q17, Q18	Perceived Negative Attitude	
	Q19, Q20, Q21	Perceived Risks and Concerns	
Part G: Q1		Recommondations	Open-ended

Table 3.2 provides a detailed overview of the structure of the survey used in this study, including the section divisions, the specific content focus of each section, and the corresponding question types. Part A contained six questions designed to collect demographic information such as gender, age, educational background, teaching level, current employment, and years of teaching experience. These questions employed multiple-choice and short open-ended formats, depending on the nature of the information sought.

Part B focused on participants’ prior experience with AI such as whether they have ever used any AI tools in their practice and if they they, their frequency of usage and if they have not they have been asked to state their reasoning for not using in an open-ended form question using a combination of yes/no, open-ended, and multiple-choice items to capture both quantitative and qualitative data.

Part C examined participants’ familiarity with digital, specifically with online learning platforms, multimedia, mobile apps, virtual classrooms or videoconferencing, and AI tools in the context of language teaching, using a 10-point Likert scale to measure levels of familiarity.

Drawing on TPACK, the survey was designed to assess teachers' knowledge in three key domains: content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK). Part D of the questionnaire addresses CK and PK through items focusing on language content and pedagogical strategies, while both Part C and the latter half of Part D explore TK by measuring familiarity with digital tools and AI technologies. This multidimensional approach reflects the integrative nature of TPACK, emphasizing not only teachers' competencies but also their ability to synthesize these knowledge areas to effectively implement AI in their instruction.

In parallel, the TAM model guided the development of survey sections examining teachers' perceptions toward the use of AI. Specifically, Part E includes items related to Perceived Usefulness, Perceived Advantages, and Attitude Toward Use (negative), which align directly with core TAM constructs. Additionally, items assessing Perceived Risks and Concerns (Q19–Q21) were included to reflect potential barriers that might inhibit adoption, as discussed in more recent TAM-related research. These components offer insight into how teachers cognitively evaluate the relevance and utility of AI tools in achieving professional teaching goals, a central aspect of TAM's theoretical proposition.

3.5.2. Instrument Development

The following steps were taken in order to develop and validate the instrument developed for the current study. First, the researcher had a series of discussions with EFL to generate an initial item pool for the instrument. Then, a thorough examination of the relevant literature was carried out on teachers' perceptions and readiness level towards AI.

The researcher followed the six-step questionnaire development process outlined by Anderson (1990), which involves: (1) identifying the general research questions, (2) listing sub-questions, (3) designing questionnaire items, (4) ordering the items, (5) organizing the questionnaire structure, and (6) conducting a preliminary implementation.

In line with the first step, the researcher conducted a systematic investigation into the problem statement and thoroughly analyzed the research topic. At this stage, the general and specific research questions were formulated, and hypotheses were developed accordingly. Particular attention was given to identifying the key variables to be examined and the types of data needed to investigate them. This step also involved analyzing the sub-problems related to the main research problem and identifying the conceptual and theoretical relationships between them. The variables were framed according to the theoretical underpinnings of the TPACK framework and the TAM model, which provided a comprehensive structure for categorizing the constructs of teacher readiness and perceptions.

In the item development phase, the researcher conducted an extensive review of the literature related to AI in language education, EFL teacher readiness, and technology integration in teaching. Based on findings from previous empirical studies. Furthermore, in line with Dörnyei's (2010) guidelines for creating valid and reliable questionnaires, series of discussions was held via social media platforms, and face-to-face interviews with 10 EFL teacher from currently practicing English language teachers from various institutions in order to collect qualitative data. Teachers were asked about their usage of AI in their practice, their overall observations regarding AI applications, and lastly, their perceived advantages and disadvantages regarding AI in language teaching. By means of insights gathered from these discussions led to the inclusion of additional items that reflected the lived experiences and needs of practicing EFL professionals, particularly in relation to the use of AI in classroom contexts. For instance, although not one of the core domains of the TPACK model. Based on the insights received from the teachers about the significance of infrastructure readiness to apply the given AI-tools into their practice, items investigating the readiness level of institutions the EFL teachers are currently working was included into survey (Part D: Q17, 18, 19), however, it is considered a contextual sub-dimension influencing teachers' Technological Knowledge (TK), as access to tools and infrastructure may directly affect one's ability and confidence in using technology, however, analysed separately later on.

To ensure content validity, expert opinions were sought at different stages of the instrument refinement process. Initial feedback was obtained from the researcher's academic supervisor, which resulted in revisions including item rewording, deletions, and restructuring. The revised questionnaire was then reviewed by a second expert from the researcher's home university, focusing on item clarity, logical sequencing, and alignment with the research objectives. Further revisions were made to improve the wording and order of the items based on this feedback.

In the final validation stage, the questionnaire was evaluated by a group of graduate students in Applied Linguistics at Karadeniz Technical University, who provided additional feedback on the clarity, comprehensibility, and coherence of the overall instrument. Based on these discussions, minor modifications were made, and the instrument was finalized for implementation.

Through this rigorous and multi-stage process, the researcher ensured that the questionnaire was both theoretically grounded and practically relevant, offering a valid and reliable tool for exploring EFL teachers' readiness for and perceptions of AI use in educational settings.

3.5.3. Piloting of the Survey

This step involves a pilot study to verify the clarity, readability, and relevance of the questionnaire items before conducting the actual full-scale survey. As literature indicates (Dörnyei,

2007), clarity, item wording, and flow of the entire questionnaire structure are enhanced through piloting. In particular, when the goal is to gauge subjective constructs like perception and attitude, this step becomes crucial.

In the initial phase of piloting, a draft questionnaire was administered to a sample of ten English language teachers who currently teach in different educational institutions. These participants were given a comprehensive brief so they could not only complete the survey but also give feedback on its clarity, layout, length, and the overall time estimation for completion. Feedback on the reasonableness of the survey was critical to improving the structure of the survey. Participants also provided feedback, which highlighted problematic or unclear items. For example, several participants pointed out that certain negatively worded items were hard to make sense of at first glance. With the bolding and underlining of negative expressions like 'not' or 'never,' respondents would not miss the visual expressions and misunderstand them, thus increasing the face validity of the instrument.

In the second phase of pilot testing, the revised questionnaire was administered to a focus group consisting of three postgraduate students from the MA in Applied Linguistics program at Karadeniz Technical University. These academic participants, who had both theoretical and practical knowledge of educational research, provided critical feedback on the order and design of the survey. One major concern that came up in this round was related to the use of particular references to AI tools as examples in parentheses in the Likert-scale items. Based on the feedback, some participants found these examples to be needlessly complicated or misleading because referring to multiple tools suggested that all participants were expected to know them. This misunderstanding posed the risk of invalidating answers consented to by participants who were indeed familiar, albeit with only one or two tools. To address this issue, an explanatory note was provided in the introduction of the pertinent part of the survey. The participants were assured that they could only be acquainted with any of the tools that were given, or some similar tool they had come across, and that was adequate (see Appendix A).

The design of the survey was progressively improved throughout this iterative piloting process to enhance its usability, accessibility, and validity. The researcher received constructive feedback from practitioners and peer reviewers that informed her, in addition to having formal academic training. This collaboration greatly improved the effectiveness and reliability of the data collection tool. All these refinements made the survey acceptable for wider use among EFL teachers and improved it through these alterations.

3.5.4. Interview Questions

To gather qualitative data, the researcher formulated ten semi-structured, open-ended questions aimed at eliciting comprehensive insights into teachers' perceptions of AI in language education. Semi-structured interviews were subsequently conducted with 10 EFL teachers. Participants for this phase were selected using convenience sampling. At the conclusion of the survey, respondents were asked if they were willing to participate in a follow-up interview; those who expressed interest were asked to provide their email addresses for further contact. Following the quantitative phase of the study, the researcher reached out to participants who had provided their contact information to confirm their willingness to partake in the interviews. Interviews were conducted exclusively with those who consented to participate. The questions were designed to facilitate a deeper understanding of the issue and to enable comparison and contrast with the quantitative findings, thereby providing data triangulation to support the derivation of meaningful conclusions. It was deemed more practical to form the questions in Turkish, participants' mother tongue, so that participants could understand the questions clearly and give detailed answers. The specific focus of each question is summarized in Table 3 below. (see Appendix B).

Table 3: Content of Interview Questions

Questions	Content
Q1	The role of AI in education
Q2	Advantages of AI in language teaching
Q3	AI's contribution to students
Q4	Potential disadvantages of AI
Q5	Ethical considerations
Q6	Example of implementing an AI tool
Q7	Challenges faced while integrating
Q8	The future of AI
Q9	Teachers professional development
Q10	Further remarks

3.6. Data Collection Procedure

The survey was developed using Google Forms, and the survey link was distributed to participants through various social media platforms, including Facebook, Twitter, Instagram, and WhatsApp. The online data collection period spanned six months, commencing in November 2024 and concluding in May 2025. Following the collection of quantitative data, participants who expressed a willingness to partake in subsequent interviews and provided their email addresses were contacted by the researcher. Interviews were scheduled based on the participants' availability. The interview questions were transmitted via social media, with participants subsequently responding through voice recordings. This method was chosen to accommodate participants' preferences, as they reported feeling more comfortable and found it easier to respond in this manner. With participants'

consent, the voice recordings were obtained and subsequently downloaded. These recordings were carefully and rigorously listened to multiple times, allowing for accurate transcription. To ensure participant anonymity, each participant was assigned a code, and their names were not disclosed in the transcription process. Lastly, Ethical approval for the data collection process was obtained from the Ethics Committee of Karadeniz Technical University, Institute of Social Sciences. All ethical principles regarding voluntary participation, informed consent, confidentiality, and data protection were strictly observed throughout the study.

3.7. Data Analysis Procedure

Both quantitative and qualitative methods were employed to analyze the data. Since the semi-structured interview questions were developed in accordance with the results of the quantitative data, the analysis began with the quantitative data. In order to analyse the quantitative data, SPSS 27.0 was used. Initially, a normality test was performed to assess the distribution of the data, revealing that it did not follow a normal distribution ($p < 0.05$). Consequently, non-parametric statistical methods and descriptive statistics were utilized. As outlined previously, the survey comprised two primary sections—(1) readiness level and (2) perceptions of EFL teachers toward AI—and three supplementary sections, including demographic information, AI usage, digital tool familiarity, and additional remarks. The first section contained demographic questions such as age, gender, years of teaching experience, current employment, teaching level, and educational background. These were analyzed using descriptive statistics to provide an overview of the dataset's main features and to summarize sample characteristics and measures. The second and third sections, concerning AI usage and digital tool familiarity, respectively, were also analyzed through descriptive statistics. For the fourth section, which assessed teachers' readiness levels toward AI, descriptive statistics were used to determine the overall readiness scores and to analyze each item individually, providing a detailed view of participants' readiness. The same approach was applied to the fifth section, which explored teachers' perceptions. Additionally, to examine the correlation between variables, Spearman's rho correlation analysis was conducted. Finally, to investigate the relationship between demographic variables and AI readiness, both descriptive statistics and the Kruskal-Wallis H test were employed. For the specific variable of current employment status, the Mann-Whitney U test was performed.

For the qualitative data, thematic analysis was used. As Braun and Clarke (2016) state, given analysis “is a method for identifying, analyzing, and interpreting patterns of meaning (‘themes’) within qualitative data” (p:79). They further identify six steps in order to conduct a thematic analysis, which are namely “(1) Familiarizing yourself with your data (2) Generating initial codes, (3) Searching for themes, (4.) Reviewing themes, (5) Defining and naming themes, and (6) Producing the report” (Braun & Clarke, 2006, p:87). In accordance with the outlined steps, the researcher initially began the analysis by conducting a meticulous line-by-line examination of the transcribed and organized interview data. To familiarize oneself more thoroughly with the dataset, the researcher

repeatedly read the transcripts, actively seeking patterns and meaningful insights, while taking detailed notes. Once familiar with the data, the researcher proceeded to the next stage, which involved generating initial codes. These codes were developed manually, guided by the research questions and the results of the quantitative data. To facilitate visual identification, each code was color-coded. Following the initial coding process, potential themes emerged by grouping related codes that represented similar content. At this stage, the researcher clustered several codes under suitable overarching themes. After establishing the preliminary set of themes, the researcher reviewed the themes and the codes associated with each to evaluate whether the codes coherently fit within their respective themes. Subsequently, each theme was assigned an appropriate descriptive title. Finally, the analysis incorporated the exploration of interrelationships between codes as well as between codes and themes, culminating in a comprehensive interpretation of the data (Braun & Clarke, 2006).

3.8. Validity and Reliability

In this study, the survey has three main parts. The first part is demographic questions consisting of variables such as gender, age, teaching experience etc., The second part includes the teachers' AI readiness scale, and the third section includes EFL teachers' perceptions regarding AI. The scale utilized to measure teachers' readiness level and perceptions has been analyzed separately in terms of reliability. Cronbach's alpha scores and number of items for main sections and sub-sections are shown in Tables 4 and 5 respectively.

Table 4: Cronbach's Alpha Score for AI-Readiness

	Cronbach's Alpha	N of Items
Technological Content Knowledge	,822	4
Technological Pedagogical Knowledge	,867	9
Technological Knowledge	,716	6
Total	,907	19

As shown in the table above, the AI-readiness of EFL teachers section consists of 19 items in total and received a high Cronbach's alpha score of .933, ensuring that there is a strong correlation between the items of the scale, and they consistently measure the same underlying construct. When each sub-category of the questionnaire was examined, it showed that the sub-category, the technological content knowledge category, consists of 4 items in total and received a Cronbach's alpha score of .822, the technological pedagogical knowledge section consists of 9 items in total, receiving a .867 Cronbach's alpha score. And last sub-category, technological Knowledge, consisting of 6 items, received the lowest Cronbach's alpha score of .716.

The second primary component of the scale, concerning EFL teachers' perceptions, comprised two subcategories: perceived advantages and perceived disadvantages. The perceived disadvantages

sub-category initially consisted of 8 items and yielded a Cronbach's alpha coefficient of .526, which falls below the generally accepted reliability threshold of .700 in social science research (Nunnally, 1975). Subsequently, the researcher utilized the 'if item deleted' function within SPSS and identified item 16 as the source of the low reliability. The removal of this item resulted in an increase in Cronbach's alpha from .526 to .712, indicating improved internal consistency. Consequently, item 16 was excluded from further analysis to preserve the questionnaire's overall reliability and validity. This issue suggests that the item was either not comprehended by participants or was misaligned with the content domain. The reliability analysis results for the refined subscale are presented in Table 5 below.

Table 5: Cronbach's Alpha Score for EFL Teachers' Perceptions

	Cronbach's Alpha	N of Items
Perceived Advantages	,926	14
Perceived Disadvantages	,712	7
Total	,855	21

The section of the survey assessing EFL teachers' perceptions towards AI yielded an overall Cronbach's Alpha coefficient of .855. The first subcategory, perceived advantages, comprised 14 items and demonstrated a high internal consistency with a Cronbach's Alpha of .926. The perceived disadvantages subcategory received a Cronbach's Alpha of .712, indicating moderate, however, acceptable reliability.

As previously noted, this study utilized both qualitative and quantitative methods to enhance the validity of the findings and enable data triangulation. To establish the content validity of the semi-structured interview questions, expert consultation and evaluation by three EFL teachers were conducted. The initial draft of the questions was revised based on feedback from the researcher's academic supervisor, resulting in modifications such as the removal, addition, and clarification of items. Additional feedback was then gathered from three EFL teachers, focusing on the questions' comprehensibility, clarity, and coherence.

Moreover, informed consent forms were distributed to participants, detailing the study's title, researcher information, purpose, and procedures. The consent forms also explained what participation entailed, including expected activities, approximate time commitment, and the method of session recordings. Participants were assured of the confidentiality and anonymity of their responses. It was explicitly stated that participation was entirely voluntary, and individuals could withdraw at any time without any repercussions.

3.8.1. Researcher Stance

As previously mentioned, this study adopts a mixed-methods approach, encompassing both quantitative and qualitative data collection. In the qualitative phase, the researcher is regarded as the primary tool for data collection and analysis. Therefore, it is essential to acknowledge the researcher's positionality, particularly how their “social background, location and assumptions affect their research practice” (Hesse-Biber, 2007, p. 17). Thus, as a researcher and an English teacher who integrates AI tools into her practices, this process of writing the given thesis has presented me with several advantages and disadvantages.

I was appointed as an English teacher by the Turkish Ministry of National Education two years ago. Currently, I am employed at a public high school, teaching ninth-grade students. Prior to this appointment, I lacked extensive long-term teaching experience. As a novice educator, my personal and academic journey is directly pertinent to my choice of this research topic, as I have personally experienced both the benefits and challenges associated with integrating new technologies into language teaching.

My interest in the integration of AI in language education emerged early in my teaching career. I quickly noticed that my students showed significant curiosity and enthusiasm toward AI applications. Consequently, I began integrating AI tools such as Chatbots and Gemini into my lesson plans. I observed that these tools greatly increased student motivation and engagement, prompting me to use them more frequently. Additionally, I employed AI in materials development and lesson planning, effectively making it a personal assistant. Over time, these positive experiences led me to view AI as a valuable educational resource, both in the classroom and for my professional development. This motivated me to explore how I can maximize its potential further.

Although my initial focus was on the benefits of AI, I remained aware of its possible drawbacks. This awareness was reinforced by negative experiences, such as students completing homework assignments solely through AI tools and submitting them as their own work. As someone with both positive and negative encounters with AI, I recognize that my personal beliefs may unconsciously influence my interpretation of the data. To mitigate this bias, I endeavored to maintain objectivity during data analysis and interpretation. Furthermore, to enhance the reliability of my findings, I sought feedback from my supervisor to ensure that participants' responses were analyzed accurately and honestly.

As an insider—an English teacher conducting interviews with colleagues—this positionality provided advantages, such as facilitating easier access to participants and establishing rapport. Moreover, sharing similar professional experiences helped me understand my colleagues' perspectives more readily, and it minimized potential power dynamics between researcher and

participants. Nonetheless, I prioritized participant comfort by scheduling interviews according to their availability, and I distributed the questions beforehand to allow them to familiarize themselves with the content. I emphasized that there were no right or wrong answers and encouraged participants to respond freely. I also assured them that participation was entirely voluntary, that they could withdraw at any time, and that all responses would remain completely anonymous.

To ensure the trustworthiness of the data analysis, I employed several reflexive strategies. Throughout the process, I repeatedly reviewed the transcripts, first establishing initial codes, then reevaluating and refining these codes and themes. Additionally, I shared the data and preliminary findings with my supervisor to obtain feedback, ensuring that the coding accurately reflected the data set as a whole.



CHAPTER FOUR

4. FINDINGS

This section focuses on the data gathered from the questionnaire and semi-structured interview. Initially, the first section of the questionnaire, in which the demographic information of the participants was gathered, was analyzed in order to establish a general sense of the participants in the study. Secondly, the second section of the questionnaire, which investigated the use of AI by the participants, was analyzed in order to draw a picture of participants' usage of AI in language learning and teaching. Lastly, each research question was individually addressed based on the data gathered through quantitative and qualitative analysis. The quantitative analysis was conducted through SPSS 27.0, and for qualitative data, the qualitative data were analyzed via thematic analysis.

4.1. Demographic Information

The study contains 90 EFL teachers from Türkiye. In order to get more information, some demographic questions were asked, including their age, gender, years of teaching experience, current employment, teaching level, and educational background. The analysis of these demographic data, frequencies, and percentages of each item is shown in Table 6.

Table 6: Demographic Information about Participants

Variable	Category	Frequency	Percentage %
Age	23-30	36	40.0
	31-40	42	46.7
	41-50	10	11.1
	51-60	2	2.2
Gender	Female	55	61.1
	Male	34	37.8
	Prefer not to say	1	1.1
Years of Teaching Experience	0-5	29	32.2
	6-10	23	25.6
	11-15	18	20.0
	15+	20	22.2
Current Employment	Public	66	73.3
	Private	24	26.7
Teaching Level	Primary School	17	18.9
	Middle School	29	32.2
	High School	44	48.9

Table 6: (Continued)

Variable	Category	Frequency	Percentage %
Educational Background	ELT (English Language Teaching)	44	52.2
	ELL (English Language and Literature)	38	42.2
	ETI (Translation and Interpretation)	2	2.2
	ACL (American Culture and Literature)	0	0
	Other	3	3.3

90 participants answered the questionnaire, and of those 90 participants, 40.0 % (n=36) ranged from 23 and 30, 46.7 % (n=42) of them were within the 31-40 age range, while 11.1% (n=10) were between the ages of 41-50. Only 2 (2.2 %) of the respondents were between 51 and 60. 61.1% (n=55) of participants were female, 37.8% (n=34) were male, and only one participant (1.1 %) preferred not to state his/her gender. The observed gender disparity in participant numbers may be attributed to the fact that, within the domain of foreign language instruction, as stated by the Ministry of National Education in Türkiye, female teachers predominantly occupy teaching positions, with the number of female English teachers surpassing that of their male counterparts (MoNE, 2023). Teaching experiences of the participants were also categorized according to the years that they had been working. Many of the respondents, 32.2 % (n=29), had between 0 to 5 years of teaching experience. 25.6 % (n=23) of teachers had 6 to 10 years of teaching experience. 20.0 % (n=18) had 11 to 15 years of teaching experience, while 22.2% (n=20) of teachers had more than 15 years of teaching experience.

A large percentage, 73.3% (n=66) of respondents reported being employed at public schools, while 26.7% (n=24) of respondents stated their current employment as public schools. As for participants' teaching level, the majority of the teachers, 48.9 % (n=44), had been teaching at the high school level. 32.2% (n=29) of them had been teaching at middle school, and 18.9 % (n=17) at the primary level. More than half of the participants had graduated from the English Language Teaching department, 52.2% (n=44). 42.2 (n=38) of the teachers responded that they had graduated from the English Language and Literature department. Only 2 (2.2%) of the teachers had graduated from the Translation and Interpretation department. Among 90 participants, there were no teachers who had graduated from the American Culture and Literature department. 3.3% (n=3) of the participants stated that they graduated from other departments of the faculty.

In the second section of the questionnaire, participants were queried regarding their engagement with AI technologies. Specifically, they were asked to indicate, through dichotomous yes/no responses, whether they had ever employed AI tools in their language teaching and learning processes. Participants who reported no prior use of AI tools were subsequently prompted with an open-ended question to elucidate their reasons for non-utilization. Conversely, those who indicated

prior use of AI tools were asked to specify the frequency of their usage, as well as to identify the particular AI tool they used most extensively, through a short-answer format. The data gathered from each question in this section is explained in detail in the following tables. The following is Table 7 which shows the frequency and percentage of the first item in the given section.

Table 7: The Use of AI

Question	Category	Frequency	Percentage %
Have you ever used one of the AI tools in language learning/teaching specified below (or any other AI tools) in your classroom?	YES	80	88.9
ChatGPT Grammarly QuillBot DeepL Duolingo, Mondly Preply	NO	10	11.1

As illustrated in the table above, a majority of participants, constituting 88.9% (n=80), reported utilizing AI tools in their language learning and teaching activities at least once. Conversely, 10 out of 90 participants (11.1%) stated that they have never employed AI tools in their instructional practices. For those who have never used AI tools, a subsequent question was posed to explore their reasons for non-utilization. The responses to this question are presented in Table 8 below.

Table 8: The Reasons for Non-Utilization of AI

Item	Category	Frequency	Percentage %
If you said "No" to the previous question, please specify your reasons for not using AI in your classroom below.	Other Applications <i>"I prefer other applications."</i> <i>"I prefer another application."</i> <i>"Mondly"</i> <i>"I don't need to use them. I have other web apps to use in my classrooms."</i> <i>"I use other interactive teaching resources, that's why I don't use AI in the classroom"</i>	5	5.5
	Don't Use/Don't Know How to Use <i>"KULLANMIYORUM"</i> <i>"I don't know how I can use them."</i>	2	2.2
	Time Constraint <i>"I think it is not useful in classroom atmosphere because the curriculum that we have to follow is very intense, and we do not have enough time to finish it."</i>	1	1.1
	Crowded Classroom <i>"I have crowded classes and I 5 use a textbook in my classes."</i>	1	1.1

Of the ten participants who responded negatively to the preceding question, nine provided reasons for their non-utilization of AI tools. The majority of respondents, accounting for 5.5% (n=5),

indicated that they opt not to use AI tools due to a preference for alternative applications such as web-based platforms and interactive teaching resources. Additionally, 2.2% (n=2) of participants cited lack of familiarity with AI tools or a personal preference to avoid their use. One participant (1.1%) attributed their non-use to time constraints, citing adherence to a specific curriculum, while another participant (1.1%) mentioned classroom crowding as the primary reason for refraining from employing AI tools. Conversely, with those who responded negatively, the participants who responded positively to the question of whether they used any AI tools were asked a follow-up question inquiring about the frequency of their usage of AI tools. Table 9 shows the frequency and percentage of the given item.

Table 9: The Frequency of AI Usage

1	Always		Usually		Often		Sometimes		Rarely		Never		M
	F	%	F	%	F	%	F	%	F	%	F	%	
How often do you use AI tools for your language class?	7	7.8	13	14.4	15	16.7	28	31.1	19	21.1	6	6.7	3.35
Total	88												
Missing	2												

Table 9 above presents the distribution of EFL teachers' frequency of AI tool utilization in language instruction and learning. The computed mean score for this item was $\bar{x} = 3.35$, suggesting that, overall, participants intermittently to frequently employ AI tools within their language teaching practices, with a slight inclination toward occasional use. The majority of respondents, 31.1% (n=28), indicated that they occasionally use AI tools. Additionally, 16.7% (n=15) reported frequent use, while 14.4% (n=13) described their usage as usual, and 7.8% (n=7) indicated consistent, always use. Conversely, teachers exhibiting hesitance toward AI tool adoption comprised 21.1% (n=19), who reported rarely using these tools, and 6.7% (n=6), who reported never employing them in their practice.

Participants who indicated using AI tools in their practice were asked to specify the names of the applications they utilized. This aimed to identify the most frequently employed AI tools. The results, presented in Table 10 depict the frequency and percentage distribution of the reported applications.

Table 10: The Most Used AI Tools

AI Tools	Frequency	Percentage %
ChatGPT	38	42.2
Duolingo	15	16.7
Grammarly	2	2.2
Quillbolt	2	2.2
Kahoot	3	3.3

Table 10: (Continued)

AI Tools	Frequency	Percentage %
Mondly	1	1.1
Others	3	3.3
Total	64	
Missing	26	

The majority of participants, 42.2% (n=38), reported utilizing ChatGPT as their primary AI tool. The second most frequently employed AI application was Duolingo, used by 16.7% (n=15) of respondents. Following this, Kahoot was identified as the next most common tool, with a usage rate of 3.3% (n=3). Additionally, an equal proportion of participants reported using Grammarly and Quillbot, each with a usage rate of 2.2% (n=2). Lastly, a subset of participants indicated employing various other AI applications, collectively accounting for 3.3% (n=3) of the reported tools.

4.2. Analysis of Research Questions

4.2.1. Findings of Quantitative Data Regarding Readiness

In this section, the quantitative data were examined through descriptive statistics and non-parametric tests. Before proceeding with the primary analysis, a normality assessment was performed, which revealed that the data did not follow a normal distribution ($p < 0.05$). As a result, non-parametric statistical methods—including the Kruskal-Wallis's test, Spearman's correlation, and the Mann-Whitney U test—were utilized to accurately analyse the research questions.

RQ1: *What is the TPACK readiness level of EFL teachers regarding the implementation of AI tools into language learning and teaching?*

The first research question of this study aims to assess teachers' readiness level concerning the integration of AI in language education. The readiness level of EFL. The TPACK framework emphasizes three core domains of readiness: TCK, TPK, and TK. In this study, infrastructure readiness is considered a contextual sub-dimension influencing teachers' TK, as access to tools and infrastructure may directly affect one's ability and confidence in using technology; thus, included in the Technological Knowledge domain, however, analysed separately. These domains were subsequently analysed. The data gathered for technological content knowledge readiness of EFL teachers is shown in Table 11 below.

Table 11: Technological Content Knowledge (TCK) Readiness of EFL Teachers

Items	SD		D		N		A		SA		M
	F	%	F	%	F	%	F	%	F	%	
*Technological Content Knowledge (TCK)											
1. I am aware of the use of AI tools in various aspects of my daily life (e.g., voice assistants, virtual assistants, facial recognition, etc.,).	1	1.1	5	5.6	11	12.2	49	54.4	21	23.3	3,96
2. I have sufficient understanding of basic AI concepts (e.g., machine learning, natural language processing, etc.,).	1	1.1	7	7.8	18	20.0	40	44.4	22	24.4	3,86
3. I am knowledgeable about various AI tools (e.g., ChatGPT, Preply, Duolingo, etc.,) used in language teaching.	-	-	5	5.6	16	17.8	44	48.9	23	25.6	3,97
4. I can identify specific AI tools that are effective for language teaching.	-	-	4	4.4	15	16.7	48	53.3	21	23.3	3,98
Total	3,93										

(SD=Strongly Disagree D=Disagree N=Neutral A=Agree SA=Strongly Agree)

As illustrated in the preceding table, Turkish EFL teachers exhibited a high level of content readiness concerning AI, with a mean score of $\bar{x}=3.93$. Nearly all participants (77.7%) indicated awareness of various AI applications in daily life. Regarding the use of AI in educational contexts, EFL teachers also demonstrated considerable content readiness, particularly in their knowledge of diverse AI tools employed in language instruction, with 74.5% reporting familiarity. Furthermore, 76.6% of teachers expressed confidence in their ability to identify AI tools capable of enhancing language teaching effectiveness. The lowest average score, $\bar{x}=3.86$, was observed in item 2, which assessed teachers' understanding of fundamental AI concepts such as machine learning and natural language processing; 68.8% of teachers reported understanding these concepts. In summary, while EFL teachers possess a substantial understanding of AI applications both in everyday life and in language teaching, their comprehension of core AI concepts underlying these technologies appears to be comparatively limited.

The second domain examined was the technological pedagogical knowledge of EFL teachers. Table 12 below presents a descriptive analysis of participants' responses concerning their readiness for integrating AI in language instruction.

Table 12: Technological Pedagogical Knowledge (TPK) Readiness of EFL Teachers

Items	SD		D		N		A		SA		M
	F	%	F	%	F	%	F	%	F	%	
*Technological Pedagogical Knowledge (TPK)											
5. I am able to use AI-based writing assistants (e.g., Grammarly, QuillBot, DeepL, ChatGPT, TinyWow, LangoTalk, TutorLily, etc.,).	-	-	8	8.9	18	20.0	43	47.8	19	21.1	3,83
6. I am able to use AI-based chatbots for language practice (e.g., ChatGPT, DuoLingo, Mondly, Preply TalkPal, Character.ai, etc.,).	-	-	6	6.7	18	20.0	45	50.0	19	21.1	3,88
7. I am able to use AI-based tools to teach vocabulary (e.g., Pi.AI, Babbel, DeepL, etc.,).	3	3.3	15	16.7	29	32.2	29	32.2	12	13.3	3,36
8. I am able to use AI-based tools to practice listening (e.g., Duolingo, TutorLily, Eigo.AI, Lango Talk, etc.,).	3	3.3	9	10.0	23	25.6	38	43.3	14	15.6	3,59
9. I am able to use AI in the assessment process to evaluate grammar, structure, and vocabulary usage. (e.g., Pi.ai, ChatGPT, DeepL, etc.,).	2	2.2	11	12.2	29	32.2	33	36.7	13	14.4	3,50
10. I am able to use AI-based tools to practice reading comprehension (e.g., Univerbal, Eigo.ai, Kippy.ai, Lango Talk, Tutor AI, etc.,).	3	3.3	14	15.6	29	32.2	32	35.6	12	13.3	3,42
11. I am able to use AI-based tools in order to provide students with materials (e.g., educational games, reading comprehension materials, listening activities, writing prompts, etc.,).	-	-	7	7.8	10	11.1	44	48.9	27	30.0	4,03
12. I am able use AI for professional development purposes (e.g., creating lesson plans, preparing materials, etc.,)	1	1.1	7	7.8	11	12.2	44	48.9	25	27.8	3,96
13. I know how to integrate AI tools into my lesson plans.	3	3.3	20	22.2	47	52.2	18	20.0	18	20.0	3,91
Total	3.68										

(SD=Strongly Disagree D=Disagree N=Neutral A=Agree SA=Strongly Agree)

Table 12 illustrates the analysis of EFL teachers' readiness in pedagogical knowledge related to AI integration. The overall mean score for pedagogical knowledge readiness among EFL teachers was calculated at $\bar{x}=3.68$, indicating a moderate to high level of readiness. Item 11 achieved the highest mean score of $\bar{x}=4.03$, suggesting that Turkish EFL teachers predominantly utilize AI tools to provide students with educational materials. A total of 78.9% of participants reported confidence

in employing AI to enhance their teaching practices. Item 12 received the second-highest mean score of $\bar{x}=3.96$, with 76.7% of teachers indicating they are capable of using AI tools for professional development purposes. Item 14 obtained one of the highest mean scores of $\bar{x}=3.91$, implying that approximately 40% of participants perceive themselves as capable of integrating AI tools into their lesson plans. Regarding AI readiness in domain-specific language teaching skills, 71.1% of teachers expressed confidence in using AI tools focused on language practice, with a mean score of 3.88. In the context of teaching specific skills, AI usage in writing instruction yielded a mean score of $\bar{x}=3.83$, with 68.9% of participants reporting proficiency in utilizing AI-assisted writing tools. Furthermore, 58.9% of respondents considered themselves capable of employing AI tools tailored to listening skills ($\bar{x}=3.59$). In terms of assessment capabilities—specifically evaluating grammar and vocabulary—less than half of the teachers, 48.9%, reported using AI tools for this purpose ($\bar{x}=3.50$). The lowest scores were observed in the areas of reading comprehension and vocabulary instruction, with mean scores of $\bar{x}=3.42$ and $\bar{x}=3.36$, respectively. Specifically, 48.9% of participants felt competent in using AI tools for reading comprehension, while 45.5% reported they could employ AI for vocabulary teaching. In summary, while the data indicates a relatively high level of pedagogical readiness among EFL teachers, particularly in using AI to deliver educational content and for professional development, their capacity to apply these tools in specific language skills, especially vocabulary instruction and reading comprehension, remains comparatively limited.

The final domain within the TPACK framework evaluates readiness from a technological knowledge perspective. This section of the survey examines EFL teachers' readiness to incorporate AI, based on their technological proficiency and infrastructural readiness. The findings are detailed in Table 13 and Table 14, respectively.

Table 13: Technological Knowledge (TK) Readiness

Items	SD		D		N		A		SA		M
	F	%	F	%	F	%	F	%	F	%	
*Technological Knowledge											
14.I am comfortable in my abilities to use AI tools.	1	1.1	3	3.3	25	27.8	39	43.3	20	22.2	3.84
15. My knowledge of the AI tools is insufficient.	6	6.7	14	15.6	17	18.9	38	42.2	13	14.4	3.43
16. I find AI-based language tools difficult to use.	4	4.4	6	6.7	18	20.0	41	45.6	19	21.1	3.73
Total	3.67										

(SD=Strongly Disagree D=Disagree N=Neutral A=Agree SA=Strongly Agree)

The overall mean score for technological knowledge readiness among EFL teachers was $\bar{x}=3.67$, indicating a moderately high level of readiness. Conversely, 50% of participants expressed a neutral stance. Half of the participants selected the neutral response (e.g., "Neither Agree nor

Disagree"), reflecting ambivalence or uncertainty about their technological knowledge readiness. Neutral responses do not imply negativity; they suggest a lack of strong conviction either way. This highlights a split in confidence, where a significant portion of teachers may need targeted support to transition from neutrality to confidence. Item 13 also achieved a high mean score of $\bar{x}=3.84$, reflecting that 65.5% of teachers feel confident in their general ability to utilize AI tools. Items 15 and 16, which are reverse-coded, received mean scores of $\bar{x}=3.43$ and $\bar{x}=3.73$, respectively. Over half of the participants (56.6%) believe their knowledge of AI tools is sufficient, while 66.7% find the usage of AI tools to be easy. Overall, EFL teachers exhibit a high level of technological readiness for employing AI tools, however, their readiness in terms of actual usage remains moderate to high.

As a sub-category within technological knowledge readiness, infrastructural readiness was also analyzed. Table 14 below displays the frequencies and percentages related to the external infrastructural readiness of the schools where the participants are employed.

Table 14: Infrastructure Readiness

Items	SD		D		N		A		SA		M
	F	%	F	%	F	%	F	%	F	%	
*Infrastructure Readiness											
16. I have access to the internet via a smart board and/or computer.	1	1.1	-	-	4	4.4	38	42.2	45	50.0	4.43
17. The school I work for provides me with sufficient classroom equipment (e.g., a smartboard, internet access, computers and/or tablets, etc.,).	1	1.1	6	6.7	6	6.7	38	42.2	37	41.1	4.18
18. The school I work for provides me with the necessary AI resources (e.g., software, training materials, etc.,).	9	10.0	18	20.0	17	18.9	28	31.1	16	17.8	3.27
Total	3.96										
Readiness Level	3.75										

(SD=Strongly Disagree D=Disagree N=Neutral A=Agree SA=Strongly Agree)

Regarding infrastructural readiness, EFL teachers generally perceive their schools to possess a high level of readiness for integrating AI tools into the classroom, with a mean score of $\bar{x}=3.96$. Nearly all participants reported having internet access (92.2%, $\bar{x}=4.43$). Similarly, the majority indicated that their schools provide the necessary equipment (83.3%, $\bar{x}=4.18$). The lowest mean score within this section was observed in item 20 ($\bar{x}=3.27$), which assessed whether the schools offer adequate AI resources. Approximately 30% of participants stated this was not the case, while 20% expressed a neutral stance. In summary, although teachers believe their schools are well-equipped in terms of internet access and essential devices, perceptions of infrastructural readiness specifically related to AI resources remain moderate to low.

Overall, based on the findings concerning AI readiness among EFL teachers within the framework of the TPACK model, participants exhibited a moderate to high level of AI preparedness, with an average score of 3.75. Among the sub-domains, the highest mean score was observed in Technological Content Knowledge (TCK), suggesting that teachers feel most confident in their ability to identify and integrate AI tools into language content. Conversely, in the areas of Technological Pedagogical Knowledge (TPK) and Technological Knowledge (TK), participants demonstrated comparable but lower levels of AI readiness. This indicates that their confidence in applying AI tools pedagogically and their technological proficiency in practice are comparatively limited.

RQ2: *Is there a correlation between EFL teachers' readiness level and familiarity with digital tools?*

The third research question investigates the relationship between Turkish EFL teachers' AI readiness and digital tool familiarity. Table 15 shows the Spearman's rho analysis of the data.

Table 15: Spearman rho Coefficient Between AI Readiness and Digital Tool Familiarity

			AI Readiness	Digital Tool Familiarity
Spearman's rho	AI Readiness	Correlation Coefficient	1.000	.607**
		Sig. (2-tailed)	.	.000
		N	90	88
	Digital Tool Familiarity	Correlation Coefficient	.607**	1.000
		Sig. (2-tailed)	.000	.
		N	88	88

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4.12 presents the pretest analysis of the estimated coefficient examining the relationship between AI readiness and digital tool preparedness. The Spearman's rho correlation coefficient indicated a moderate, statistically significant positive association ($r = .607$, $p < 0.001$) between Turkish EFL teachers' AI readiness and their familiarity with digital tools. These findings suggest that instructors with greater familiarity with digital tools are more likely to perceive themselves as prepared to incorporate AI technologies into their teaching practices.

RQ3: *Is there a correlation between EFL teachers' readiness and perceptions?*

The fourth research question focuses on the relationship between EFL teachers' AI readiness and their perceptions of AI, in terms of perceived usefulness, negative attitude, and perceived risks

and concerns associated with the implementation of AI tools in language teaching practices. Table 16 shows the Spearman's rho analysis of the data.

Table 16: Spearman Rho Coefficient Between AI Readiness and Perceptions

			AI-Readiness	PU	PNA	PRC
Spearman's rho	AI Readiness	Correlation Coefficient	1.000	.638**	-.060	.040
		Sig. (2-tailed)	.	.000	.580	.711
		N	90	88	88	88
	Perceived Usefulness	Correlation Coefficient	.638**	1.000	.081	.123
		Sig. (2-tailed)	.000	.	.453	.255
		N	88	88	88	88
	Perceived Negative Attitude	Correlation Coefficient	-.060	.081	1.000	.378**
		Sig. (2-tailed)	.580	.453	.	.000
		N	88	88	88	88
	Perceived Risks and Concerns	Correlation Coefficient	.040	.123	.378**	1.000
		Sig. (2-tailed)	.711	.255	.000	.
		N	88	88	88	88

** . Correlation is significant at the 0.01 level (2-tailed).

Table 16 presents the pretest analysis of the estimated coefficient examining the relationship between AI readiness and perceptions of EFL teachers. In terms of correlation between AI readiness and perceived usefulness, Spearman's rho correlation coefficient indicated a strong, statistically significant positive association ($r = .638$, $p < 0.001$), indicating that EFL teachers who perceive AI tools beneficial and effective are more ready to adopt and integrate given tools into their practice. The correlation between AI readiness and perceived negative attitude was weak and not statistically significant ($r = -.060$, $p > 0.001$), indicating that teachers' negative attitude toward AI applications does not have a meaningful association with their self-reported AI readiness. Lastly, the relationship between AI-readiness and perceived risks and concerns regarding AI application, Spearman's rho correlation coefficient indicated a moderate positive relationship ($r = .040$, $p > 0.001$), indicating that teachers whose readiness level is higher are more aware of the possible risks, such as academic dishonesty and reduced critical thinking.

RQ4: To what extent does AI readiness vary among foreign language teachers based on demographic factors?

a. Is there a significant difference in AI readiness among EFL teachers based on age?

The first demographic information examines the relationship between the age of the participants and AI readiness. The descriptive statistics and Kruskal-Wallis H test were conducted to address this research question. The results are shown in Table 17. and 18 respectively.

Table 17: Descriptives of EFL Teachers' AI Readiness Scores by Age

Age	N	Mean	Std. Dev	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower Bound	Upper Bound		
23-30	36	3.8468	.56863	.09477	3.6544	4.0392	2.74	5.00
31-40	42	3.6591	.72699	.11218	3.4326	3.8857	1.00	4.79
41-50	10	3.8579	.53677	.16974	3.4739	4.2419	3.00	4.89
51-60	2	3.7105	.33495	.23684	.7012	4.2419	3.47	3.95
Total	90	3.7574	.64031	.06749	3.6233	3.8916	1.00	5.00

Table 17 presents the descriptive statistics for AI readiness among EFL teachers segmented by four age groups. The overall mean score was calculated as $\bar{x}=3.75$ (SD = 0.64031), suggesting a moderate to high level of AI readiness among participants. The highest mean was observed within the 41-50 age group ($\bar{x}=3.85$, SD = 0.53677), closely followed by the 23-30 age group ($\bar{x}=3.84$, SD = 0.56863). Conversely, the 31-40 age cohort demonstrated the lowest mean score ($\bar{x}=3.65$, SD = 0.72699). Although the 51-60 age group exhibited a relatively higher mean score ($\bar{x}=3.71$, SD = 0.33495), the limited sample size ($n = 2$) constrains the reliability of this result. In summary, participants within the 23-30 and 41-50 age brackets displayed moderately high levels of AI readiness, whereas the 31-40 group reported comparatively lower levels.

In order to determine whether statistically significant differences in AI readiness exist among the age groups, a Kruskal-Wallis H test was conducted. The results are presented in Table 18 below.

Table 18: The Difference between EFL Teachers' AI Readiness Score Based on Age

	Groups	<i>n</i>	Mean Rank	<i>H</i>	<i>p</i>
Readiness	23-30	36	48.18	.905	.824
	31-40	42	43.07		
	41-50	10	47.30		
	51-60	2	39.25		
Total		90			

The results revealed that age is not a statistically significant factor in terms of affecting AI readiness among EFL teachers ($p>.05$).

b. Is there a significant difference in AI readiness among EFL teachers based on gender?

The second demographic information examines the relationship between the gender of the participants and AI readiness. The descriptive statistics and Kruskal-Wallis H test were conducted to address this research question. The results are shown in Tables 19 and 20, respectively.

Table 19: Descriptives of EFL Teachers' AI Readiness Scores by Gender

					95% Confidence Interval for Mean			
Gender	N	Mean	Std. Dev	Std. Error	Lower Bound	Upper Bound	Min.	Max.
Female	55	3.8299	.58673	.07911	3.6713	3.9885	2.26	5.00
Male	34	3.6563	.71701	.12297	3.4062	3.9065	1.00	5.00
Total	90	3.7636	.64126	.06797	3.6233	3.8916	1.00	5.00

Table 19 presents the descriptive statistics of AI readiness across gender groups. The sample comprised three categories: female, male, and individuals who preferred not to disclose their gender. However, only one participant selected the "prefer not to say" option; thus, no statistical analysis was performed for this group, and it was subsequently excluded from the analysis. Therefore, the descriptive statistics pertain to two groups only. The overall mean AI readiness score was computed as $\bar{x}=3.76$ ($SD = 0.64126$), indicating a moderate to high level of AI readiness among the participants. When comparing the two groups, female participants demonstrated a higher mean score ($\bar{x}= 3.82$, $SD = 0.58673$) compared to male participants ($M = 3.65$, $SD = 0.71701$), indicating a comparatively higher readiness level towards AI.

Kruskal-Wallis H test was conducted to determine whether statistically significant differences in AI readiness exist among the gender groups. The results are presented in Table 20 below.

Table 20: The Difference between EFL Teachers' AI Readiness Score Based on Gender

	Groups	<i>n</i>	Mean Rank	<i>H</i>	<i>p</i>
Readiness	Female	55	48.15	2.275	.321
	Male	34	42.03		
	Prefer not to say	1	18.00		

The results revealed that the gender of the participants is not a statistically significant factor in terms of affecting AI readiness among EFL teachers ($p>.05$).

c. Is there a significant difference in AI readiness among EFL teachers based on their years of teaching experience?

The third demographic information examines the relationship between participants' years of experience on teaching and AI readiness. The descriptive statistics and Kruskal-Wallis H test were conducted to address this research question. The results are shown in Tables 21 and 22, respectively.

Table 21: Descriptives of EFL Teachers' AI Readiness Scores by Years of Teaching Experience

Years of Teaching Experience	N	Mean	Std. Dev	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower Bound	Upper Bound		
0-5	36	3.9728	.57803	.10734	3.7529	4.1926	2.74	5.00
6-10	42	3.4920	.68598	.14304	3.1954	3.7886	1.00	4.37
11-15	10	3.7398	.64295	.15154	3.4200	4.0595	2.26	4.58
15+	2	3.7664	.59745	.13359	3.4868	4.0460	2.74	4.89
Total	90	3.7574	.64031	.06749	3.6233	3.8916	1.00	5.00

Table 21 displays the descriptive statistics for AI readiness among EFL teachers, segmented by four different years of experience groups. The overall mean score was $\bar{x}=3.75$ ($SD = 0.64031$), indicating a moderate to high level of AI readiness among the participants. The highest mean score was observed in the group 0-5 years of experience ($\bar{x}=3.97$, $SD = 0.57803$), followed by the 15+ years group ($\bar{x}=3.76$, $SD = 0.59745$); however, the small sample size ($n = 2$) limits the reliability of these findings. Teachers with 11-15 years of teaching experience exhibited a level of AI readiness comparable to those with more than 15 years, both demonstrating a moderate to high level of AI readiness. Conversely, the group with 6-10 years of experience recorded the lowest mean score of $\bar{x}=3.49$ ($SD = 0.68598$), indicating a low level of AI-readiness. In summary, teachers with 0-5 years of experience exhibited a higher AI readiness, but as years of teaching experience increased, the level of AI readiness appeared to decline.

A Kruskal-Wallis H test was performed to assess whether statistically significant differences in AI readiness exist across the groups segmented by years of teaching experience. The findings are summarized in Table 22 below.

Table 22: The Difference between EFL Teachers' AI Readiness Score Based on Years of Experience

	Groups	n	Mean Rank	H	p
Readiness	0-5	36	54.74	7.389	.060
	6-10	42	35.09		
	11-15	10	45.89		
	+15	2	43.73		

The analysis indicated that the duration of teaching experience among participants does not significantly influence AI readiness among EFL teachers, as the results were not statistically significant ($p > .05$).

d. Is there a significant difference in AI readiness among EFL teachers based on educational background?

The fourth demographic variable pertains to the educational background of EFL teachers, specifically their university department of graduation. This variable was categorized into four groups: ELT (English Language Teaching), ELL (English Language and Literature), ETI (English Translation and Interpretation), and ACL (American Culture and Literature). Descriptive statistics and a Kruskal-Wallis H test were performed to examine this variable in relation to AI readiness. The results are presented in Tables 23 and 24, respectively.

Table 23: Descriptives of EFL Teachers' AI Readiness Level by Educational Background

Educational Background	N	Mean	Std. Dev	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower Bound	Upper Bound		
ELT	47	3.7660	.58729	.08567	3.5935	3.9384	2.26	4.79
ELL	38	3.7773	.72041	.11687	3.5405	4.0141	1.00	5.00
ETI	2	3.5263	.22330	.15789	1.5201	5.5326	3.37	3.68
ACL	3	3.5263	.73684	.42542	1.6959	5.3567	2.79	4.26
Total	90	3.7574	.64031	.06749	3.6233	3.8916	1.00	5.00

Table 4.23 presents the descriptive statistics for AI readiness among EFL teachers segmented by four different educational background groups. The overall mean score was $\bar{x}=3.75$ ($SD = 0.64031$), suggesting a moderate to high level of AI readiness among the participants. The highest mean scores were observed within the ELL group ($\bar{x}= 3.77$, $SD = 0.72041$), closely followed by the ELT group ($\bar{x}= 3.76$, $SD = 0.58729$). The lowest mean scores were found in the ETI ($\bar{x}=3.52$, $SD = 0.22330$) and ACL ($\bar{x}=3.52$, $SD = 0.73684$) groups; however, the limited sample sizes for these groups ($n = 2$ and $n = 3$, respectively) restrict the reliability of these findings. In summary, while participants with an ELL background exhibited marginally higher levels of AI readiness, the differences across groups appear minimal.

Table 24: The Difference between EFL Teachers' AI Readiness Level Based on Educational Background

	Groups	n	Mean Rank	H	p
Readiness	ELT	47	45.61	1.301	.729
	ELL	38	47.00		

Table 24: (Continued)

	Groups	n	Mean Rank	H	p
	ETI	2	30.00		
	ACL	3	35.17		

The analysis revealed that the participants' academic department of graduation does not have a statistically significant effect on AI readiness among EFL teachers ($p > .05$).

e. Is there a significant difference in AI readiness among EFL teachers based on the teaching level?

The fifth demographic variable concerns the participants' current teaching level. This research question is considered significant because, depending on the teaching level, various external factors—such as differing needs and opportunities for technology integration, as well as students' profiles and expectations—may influence AI readiness. To examine this variable in relation to AI readiness, both descriptive statistics and a Kruskal-Wallis H test were performed. The detailed findings are presented in Tables 25 and 26, respectively.

Table 25: Descriptives of EFL Teachers' AI Readiness Level by Teaching Level

					95% Confidence Interval for Mean			
Teaching Level	N	Mean	Std. Dev	Std. Error	Lower Bound	Upper Bound	Min.	Max.
High School	44	3.6821	.53216	.08023	3.5203	3.8439	2.26	4.89
Middle School	29	3.7096	.82665	.15350	3.3952	4.0241	1.00	5.00
Primary School	17	4.0341	.47183	.11444	3.7915	4.2766	3.16	4.79
Total	90	3.7574	.64031	.06749	3.6233	3.8916	1.00	5.00

Table 25 displays the descriptive statistics for AI readiness among EFL teachers, segmented by four teaching levels. The overall mean score was $\bar{x} = 3.75$ ($SD = 0.64031$), indicating a moderate to high level of AI readiness among the participants. The highest mean score was recorded within the primary level group ($\bar{x} = 4.0$, $SD = 0.47183$), suggesting a high level of AI readiness. The middle school group followed with a mean of $\bar{x} = 3.70$ ($SD = 0.82665$), also reflecting a moderate to high level of AI readiness. Conversely, the highest mean scores were observed in the primary level, while the lowest were in the high school level ($\bar{x} = 3.68$, $SD = 0.53216$), indicating a comparatively lower level of AI readiness at this level. In summary, participants currently engaged in teaching at lower educational levels exhibited higher levels of AI readiness, whereas those teaching at the high school level demonstrated comparatively lower levels of AI readiness.

Table 26: The Difference between EFL Teachers' AI Readiness Level Based on Teaching Level

	Groups	n	Mean Rank	H	p
Readiness	High School	44	41.07	4.401	.111
	Middle School	29	45.66		
	Primary School	17	56.71		
	Total	90			

The analysis indicated that the participants' current teaching level does not exert a statistically significant influence on AI readiness among EFL teachers ($p > .05$).

f. Is there a significant difference in AI readiness among EFL teachers based on the type of educational institution in which they are employed?

The sixth and final demographic variable pertains to the participants' current employment status and aims to explore potential differences in AI readiness between teachers working in private versus public schools. This research question is considered significant, given that public and private institutions may differ in areas such as resource availability, technological integration policies, and teacher motivation and initiative. To analyze this variable in relation to AI readiness, both descriptive statistics and a Mann-Whitney U test were conducted. The results are presented in Tables 27 and 28, respectively.

Table 27: Descriptives of EFL Teachers' AI Readiness Level by Current Employment

					95% Confidence Interval for Mean			
Current Employment	N	Mean	Std. Dev	Std. Error	Lower Bound	Upper Bound	Min.	Max.
Public	66	3.7035	.66604	.08198	3.5398	3.8673	1.00	5.00
Private	24	3.9057	.54916	.11210	3.6738	4.1376	2.95	5.00
Total	90	3.7574	.64031	.06749	3.6233	3.8916	1.00	5.00

Table 27 displays descriptive statistics for AI readiness among EFL teachers, segmented by their current employment status across two groups. The overall mean score was $\bar{x} = 3.75$ ($SD = 0.64031$), indicating a moderate to high level of AI readiness. Teachers employed in private schools demonstrated a higher mean score ($\bar{x} = 3.90$, $SD = 0.54916$), reflecting a moderate to high level of AI readiness, compared to their counterparts working in public schools, who had a mean score of $\bar{x} = 3.70$ ($SD = 0.66604$) indicating that teachers who are engaged in teaching English in private institutions are relatively more ready to integrate AI-tools into their practices.

Table 28: The Difference between EFL Teachers' AI Readiness Level Based on Current Employment

	Groups	n	Mean Rank	U	p
Readiness	Public	66	43.64	915.000	.261
	Private	24	50.63		
	Total	90	45.5		

Based on the Mann-Whitney U test, the analysis indicated that the participants' current employment institute does not exert a statistically significant influence on AI readiness among EFL teachers ($p > .05$).

In summary, this study investigated EFL teachers' readiness and perceptions toward AI within the framework of the Technological Pedagogical Content Knowledge (TPACK) model. Concerning AI readiness, participants exhibited moderate to high levels, particularly in Technological Content Knowledge (TCK), indicating strong confidence in utilizing AI tools within language instruction. Regarding perceptions, respondents held highly positive views of AI, especially regarding its perceived usefulness, suggesting that they regard AI as a valuable resource for both student learning and their professional development. However, concerns were also expressed about potential drawbacks, such as the reduction of critical thinking skills and risks to academic integrity. Correlation analyses revealed that familiarity with digital tools was generally associated with higher AI readiness. Furthermore, a significant positive correlation was observed between perceived usefulness and AI readiness, implying that teachers who recognize AI as beneficial and effective are more inclined to adopt and integrate AI tools into their instructional practices. Conversely, negative perceptions and concerns regarding risks appeared to have minimal or no significant impact on their readiness.

Finally, demographic factors such as age, gender, years of teaching experience, educational background, teaching level, and current employment status did not show statistically significant differences across groups. However, descriptive analyses indicated some notable patterns: participants aged 23–30 and 41–50 demonstrated higher levels of AI readiness; female teachers exhibited higher mean scores compared to males; teachers with 0–5 years of experience showed greater readiness, with a tendency for this to diminish as years of experience increased. Those with an ELL educational background slightly outperformed others in AI readiness. Additionally, teachers working at lower educational levels displayed higher levels of readiness compared to their counterparts at the high school level. Moreover, instructors employed in private educational institutions reported greater preparedness to incorporate AI tools into their practices.

4.2.2. Findings of Quantitative Data Regarding Perceptions

RQ5: What are the perceptions of EFL teachers regarding the implementation of AI tools into the classroom?

The second research question explores EFL teachers' perceptions regarding the use of AI tools in language teaching and learning. Tables 29 and 30 present teachers' perspectives concerning the advantages and disadvantages of AI, respectively. Table 29 below presents EFL teachers' perceived advantages of AI tools in terms of their perceived usefulness.

Table 29: Perceived Advantages of EFL Teachers Towards AI

Items	SD		D		N		A		SA		M
	F	%	F	%	F	%	F	%	F	%	
*Perceived Advantages *Perceived Usefulness	-	-	-	-	8	8.9	51	56.7	29	32.2	4.24
1. AI-based language tools can raise students' motivation.	-	-	-	-	8	8.9	51	56.7	29	32.2	4.24
2. AI-based language tools can enhance students' engagement.	-	-	-	-	9	10.0	52	57.8	27	30.0	4.20
3. AI-based language tools can make the learning process more enjoyable for students.	-	-	2	2.2	7	7.8	40	44.4	39	43.3	4.32
4. AI-based language tools can make the language learning process more effective.	-	-	1	1.1	11	12.2	40	44.4	36	40.0	4.26
5. AI-based language tools enhance autonomy among students.	-	-	6	6.7	24	26.7	37	41.1	21	23.3	3.83
6. AI-based language tools are beneficial in terms of offering immediate feedback.	-	-	-	-	10	11.1	52	57.8	26	28.9	4.18
7. AI tools can help students understand their strengths and weaknesses.	1	1.1	2	2.2	24	26.7	43	47.8	18	20.0	3.85
8. AI tools (e.g., chatbots, virtual assistants, etc.) can help students improve their speaking skills.	2	2.2	2	2.2	14	15.6	46	51.1	24	26.7	4.00
9. AI tools (e.g., PLai, Babbel, etc.) can help students improve their vocabulary.	-	-	1	1.1	15	16.7	46	51.1	26	28.9	4.10
10. AI tools (e.g., ChatGPT, Grammarly, etc.) can help students improve their writing skills.	-	-	6	6.7	13	14.4	49	54.4	20	22.2	3.94
11. AI tools (e.g., Univerbal, TutorLily, etc.) can help students improve their reading skills.	-	-	2	2.2	17	18.9	48	53.3	21	23.3	4.00
12. AI tools (e.g., Duolingo, Eigo.ai, etc.) can help students improve their listening skills.	-	-	2	2.2	13	14.4	44	48.9	29	32.2	4.14
13. AI tools make teachers' jobs easier in terms of planning the class.	1	1.1	2	2.2	15	16.7	38	42.2	32	35.6	4.11
14. AI tools make it easier for teachers to grade students' performance.	1	1.1	8	8.9	12	13.3	42	46.7	24	26.7	3.92
Total	4.07										

(SD=Strongly Disagree D=Disagree N=Neutral A=Agree SA=Strongly Agree)

Turkish EFL teachers demonstrated a highly favourable perceived usefulness toward the integration of AI into language instruction, with an overall mean score of $\bar{x}=4.07$, indicating that EFL teachers perceive AI tools as highly useful for both students and their self-development. Nearly all participants concurred that AI tools enhance student motivation (88.9%) and engagement (87.8%). Interrelated with these findings, item 3 received the highest mean score of $\bar{x}=4.32$, reflecting a strong belief among educators that AI contributes to making learning more enjoyable for students (87.7%). Regarding AI's role in increasing instructional efficacy, the majority of teachers ($\bar{x}=4.26$, 84.4%) agreed that AI tools augment the effectiveness of the learning process. Similarly, item 6 garnered a high mean score of $\bar{x}=4.18$, indicating that most teachers (86.7%) perceive AI as beneficial in providing immediate feedback. Conversely, the lowest mean scores were observed in items 5 and 7, with values of $\bar{x}=3.83$ and $\bar{x}=3.85$, respectively. Although these still suggest a moderately positive attitude, particularly in terms of fostering learner autonomy (64.4%) and aiding students in identifying their strengths and weaknesses (67.8%), these perceptions are comparatively limited. Regarding specific advantages related to skill instruction, the majority of participants agreed that AI tools, such as chatbots, support skill development: speaking ($\bar{x}=4.00$, 77.8%), listening ($\bar{x}=4.14$, 81.1%), vocabulary acquisition ($\bar{x}=4.10$, 80%), and reading ($\bar{x}=4.00$, 76.6%). The lowest effect observed was on writing skills, with a mean of $\bar{x}=3.94$ (76.6%). In terms of professional practice, 77.8% of teachers agreed that AI facilitates lesson planning ($\bar{x}=4.11$), and 73.4% concurred that AI simplifies grading performance ($\bar{x}=3.92$).

The second main section of this section of the survey, under the main title, perceived disadvantages, negative attitude towards AI, and perceived risks and concerns reflecting AI's pedagogical limitations are analysed. Table 30 below shows the descriptive statistics in detail.

Table 30: Perceived Disadvantages of EFL Teachers Towards AI

Items	SD		D		N		A		SA		M
	F	%	F	%	F	%	F	%	F	%	
*Perceived Disadvantages *Negative Attitude 15. AI tools lack the ability to personalize lessons based on students' specific needs.	5	5.6	13	14.4	25	27.8	31	34.4	14	15.6	3.41
16. The lack of face-to-face interaction in AI language learning is a disadvantage for students.	3	3.3	16	17.8	26	28.9	32	35.6	11	12.2	3.36
17. AI tools make students dependent on technology.	2	2.2	12	13.3	26	28.9	36	40.0	12	13.3	3.50
18. Integrating AI tools into class is hard in crowded classes.	3	3.3	11	12.2	19	21.1	37	41.1	18	20.0	3.64
Total	3.47										

Table 30: (Continued)

Items	SD		D		N		A		SA		M
	F	%	F	%	F	%	F	%	F	%	
*Perceived Risks and Concerns											
19. Relying on AI tools may cause a lack of critical thinking among students.	-	-	9	10.0	28	31.1	35	38.9	16	17.8	3.66
20. Using AI tools incorrectly harms academic honesty.	-	-	5	5.6	27	30.0	32	35.6	24	26.7	3.85
21. The usage of AI encourages students to cheat.	1	1.1	18	20.0	24	26.7	26	28.9	19	21.1	3.50
Total	3.67										

(SD=Strongly Disagree D=Disagree N=Neutral A=Agree SA=Strongly Agree)

While the overall mean score for negative attitude associated with the implementation of AI in language instruction was estimated at $\bar{x}=3.47$, reflecting a moderate consensus among participants, an estimated mean score for perceived risks and concerns was at $\bar{x}=3.67$, indicating a relatively high level of agreement among participants. Specifically, item 20 received the highest mean score of $\bar{x}=3.85$, indicating that a significant proportion of Turkish EFL teachers (62%) believe that the use of AI tools undermines academic integrity. Additionally, respondents expressed considerable concern regarding AI's potential to impair students' critical thinking skills ($\bar{x}=3.66$, 56%). There was also notable apprehension about the application of AI in crowded classroom settings, with an average score of $\bar{x}=3.64$, suggesting that teachers (61.1%) perceive this context as potentially challenging. Items 17 and 21 each attained a mean score of $\bar{x}=3.50$, signifying that over half of the participants agree that AI usage may foster student dependence on technology (53.3%) and possibly encourage academic dishonesty (50%). Furthermore, item 15 yielded a moderately high mean score of $\bar{x}=3.41$, indicating that approximately half of the teachers believe AI lacks the capacity to personalize instruction according to students' individual needs. Conversely, the lowest mean score in this section was observed for item 16, with values of $\bar{x}=3.36$, suggesting that fewer than half of the participants (47.8%) perceive the absence of face-to-face interaction as a significant disadvantage for students.

In summary of the second research question, regarding EFL teachers' perceptions of the use of AI tools in language instruction, participants exhibited a highly favorable attitude, viewing AI applications as significantly beneficial for both student learning and their own professional development. However, despite their positive outlook, teachers also expressed concerns regarding the potential disadvantages of AI tools, highlighting perceived risks and challenges associated with their implementation. This suggests that, while teachers recognize the utility of AI, they are concurrently aware of and cautious about its possible negative implications in language teaching.

4.2.3. Findings of Qualitative Data Regarding Perceptions

This study adopted a mixed-methods approach, integrating both quantitative and qualitative data collection strategies. In this section, qualitative data was obtained through semi-structured interviews conducted with ten EFL teachers. To facilitate a comprehensive exploration of teachers' perceptions of AI, the interviews comprised ten carefully designed questions. The first question aimed to investigate teachers' perceptions regarding the role of AI in education. The second focused on perceived advantages of AI, while the third addressed AI's overall contribution to the language learning process. The fourth question explored perceived disadvantages, and the fifth examined ethical considerations related to AI implementation. In the sixth question, participants were asked to provide specific examples of instances where they employed AI tools in their teaching practice. The seventh addressed potential barriers to the integration of these tools. The eighth question teachers were asked about their perspectives on the future of AI in education, and the ninth inquired about how AI contributes to their professional development. Finally, the tenth question provided an opportunity for participants to share any additional thoughts or comments.

The interviews were analyzed using thematic analysis. Following familiarization with the interview transcripts, initial codes were identified. These codes were subsequently organized into relevant categories and, ultimately, distilled into overarching themes. Four major themes were identified: (1) perceived advantages of AI for teachers, (2) pedagogical advantages of AI, (3) perceived disadvantages of AI, and (4) the future role and impact of AI in EFL education. The related categories and codes identified for each theme are shown in Tables 31, 32, 33, and 34.

4.2.3.1. Perceived Advantages of AI for Teachers

Table 31: Perceived Advantages of AI for Teachers

Theme	Category	Code
Perceived Advantages of AI for Teachers	Supportive Tool	Idea generation (P3, P4, P6)
		Efficiency in lesson planning (P1, P2, P3, P6)
		Efficiency in material preparation (P2, P3, P5, P6, P9)
	Professional Development	Being up to date (P2, P5, P8, P9)

AI as a Supportive Tool

Regarding perceived benefits for EFL teachers, particularly in reducing their workload through the use of AI tools to save time on administrative tasks and enhance the efficiency of their teaching practices, two principal categories were identified: AI as a supportive tool and professional development. Within the first category, four specific codes emerged. The initial code pertained to

AI's ability to rapidly generate ideas for language teaching, thereby facilitating teachers' tasks. Three participants emphasized that AI tools assist them in developing classroom activities or games, reducing the effort and time required compared to traditional methods of lesson planning. The capability of AI to produce novel ideas for classroom activities within seconds is regarded as a valuable resource for educators. Concerning this, the participants provided the following examples:

AI helps me develop ideas more easily. For instance, when I need to find new ideas for classroom activities or games, AI is very helpful. It also saves time- after thinking for half an hour about what game to play, I ask AI, and within a minute, I have many ideas. P4
AI can suggest ideas instantly, within 2-3 seconds. P6
When I ask for suggestions, it gives genuine, useful ideas, P3

The second code within this category was related to enhanced efficiency in lesson planning. Four participants reported that AI tools facilitate more efficient lesson preparation by providing prompt assistance and enabling rapid development of lesson plans. In support of this, participants offered the following illustrative examples:

Because we can prepare lesson plans at any time, suddenly and quickly. P3
It can also create lesson plans. Especially if you are using paid tools like ChatGPT, or different apps like Defeat, or even Canva P6
I think AI greatly contributes to lesson planning (...) P2
I think they (AI tools) make things easier, whether in lesson planning or in increasing students' participation. P1

The third and last code within the given category pertained to AI's potential benefit in assisting teachers with the preparation of instructional materials. Five participants emphasized that they utilize AI to generate teaching materials, which significantly reduces the effort put into material preparation traditionally and saves time. Concerning this code P2, P3, and P5 further elaborated with the following comments:

Integrating AI tools into English language education offers practical and diverse teaching techniques for teachers, saves time on materials (...) P2
For example, if there is an unforeseen issue during the lesson, I can instantly prepare a worksheet for my students. P3
Unlike in the past, when children or learners spent a lot of time on a material or a language element, the time spent now is very different. AI is one of the tools that makes this practical. P5

Professional Development

One of the prominent benefits highlighted by participants was AI's potential to support teachers' professional development by helping them stay informed about the latest technological advancements. Teachers emphasized that AI could facilitate their engagement with emerging technologies, pedagogical strategies, and approaches. Specifically, they noted that AI tools enable them to stay current with educational trends and access updated materials, thus positioning AI as a

valuable resource for professional development. Within this category, two codes were identified. The first code relates to AI's capacity to assist teachers in enhancing teachers' awareness of current and innovative technologies, thereby contributing to their professional development as EFL educators. Three participants indicated that AI technologies enable them to stay abreast of rapidly evolving technological advancements and remain informed about and utilize various pedagogical methods, thereby enhancing the quality of language instruction. Regarding this code, participants P5, P8 and P9 elaborated with the following comments:

Honestly, I think they could help me develop more creative, different, or up-to-date ideas for lesson planning, material preparation, activities for all age groups, and teaching approaches and methods. P5

Thanks to AI tools, I stay updated, try different teaching strategies, and increase my productivity in the profession. P8

To stay in sync with students' changing interests and adapt to their daily developments, I need to constantly update myself. I believe that the best way to do this is through technology, especially AI, which can help me stay current and enhance my profession. P9

Overall, when analyzing the theme of the advantages of AI for teachers and the related codes within each category, it was observed that EFL teachers perceive AI as a valuable tool for both their professional development and as an assistant for their administrative tasks. They emphasized that AI is a major resource for idea generation, especially when they face difficulties in finding interesting or engaging topics for lessons or activities, and they turn to AI for support. Additionally, they seek assistance with preparing materials and planning lessons, which significantly saves time and effort. Participants particularly highlighted AI's contribution to their teaching practices, emphasizing its potential to save time and resources.

4.2.3.2. Pedagogical Advantages of AI

Table 32: Pedagogical Advantages of AI

Theme	Category	Code
Pedagogical Advantages of AI	Personalization and Adaptivity	Personalized feedback (P2, P6)
		Personalized lesson planning (P4, P10)
		Personalized materials (P6, P10)
		Instant feedback (P2, P4, P6)
	Affective Factors in Learning	Motivation (P2, P6, P7, P8, P10)
		Engagement (P1, P8, P2)
		Confidence (P8, P9, P4)
		Fun (P1, P2, P4, P9, P5)
	Effective Learning and Skill Development	Autonomous learning (P1, P6)
		Effective learning (P2, P4, P10, P9)
		Speaking practice (P3, P6, P5, P4, P9)
		Other areas of language (P2, P3, P4, P5, P6, P8, P10)

Personalization and Adaptivity

Concerning the pedagogical advantages of AI, three primary categories were identified: (1) personalization and adaptivity, (2) affective factors in learning, and (3) effective learning and skill development. Within the first category, four specific codes emerged. The initial code identified was the capacity of AI to provide personalized feedback. Two participants, P2 and P6, regarded AI's ability to deliver individualized feedback to students as particularly significant. In relation to this code, both participants elaborated with the following comments:

I think the biggest advantage is in differentiated instruction — providing personalized feedback to students or creating tailored materials P6

I think AI greatly contributes to lesson planning and material development, offering more innovative learning methods and providing personalized feedback to students—both now and in the future. P2

The second code identified within this category was AI's capacity to develop personalized lesson plans based on students' strengths and weaknesses, as well as tailoring instruction to match individual learning paces, ultimately aiming to enhance motivation. Regarding this code, participants P4 and P10 elaborated with the following comments:

I believe that through AI-supported platforms, we can analyze students' strengths and weaknesses and prepare personalized lesson plans and exercises for them. P10

First, since each student learns at different levels, AI can create personalized learning plans. Because students' progress at their own pace, it can be more effective. For example, it can boost students' confidence during speaking practice. It also provides quick, immediate feedback, allowing students to recognize and correct their mistakes instantly. P4

The third code identified was AI's ability to prepare tailored learning materials. Two participants expressed that the provision of personalized materials by AI represents a valuable advantage for students, particularly in terms of enhancing the quality of education. Regarding this code, participants P6 and P10 elaborated with the following comments:

I think the biggest advantage is in differentiated instruction — providing personalized feedback to students or creating tailored materials. P6

I believe AI tools enable me to create personalized lesson materials tailored to each student's language level and interests. This can make my lessons more effective and engaging” P10

Lastly, the capacity of AI to provide students with instant feedback was underscored as a significant advantage, as it facilitates a continuous and synchronous learning process. This enables students to immediately recognize their mistakes and access real-time opportunities to correct them. Regarding this code, participants P6, P4, and P10 elaborated with the following comments:

AI can provide instant feedback to individual learners. We know that the most effective way to learn is through immediate feedback — correcting mistakes quickly without reinforcing errors — and AI facilitates that. P6

It also provides quick, immediate feedback, allowing students to recognize and correct their mistakes instantly. P4

I think AI-supported tools can instantly detect students' mistakes in pronunciation, grammar, and other areas, and show them the correct forms. P10

Affective Factors in Learning

Regarding the pedagogical advantages of AI as perceived by teachers, the second category pertains to affective factors in learning, emphasizing students' emotional responses to AI. The first code within this category is AI's contribution to student motivation. Five participants observed that integrating AI tools into language classrooms enhances students' motivation to learn languages. Specifically, participants highlighted that AI's ability to personalize learning, along with its capacity to make learning more visual and gamified, directly increases motivation and helps prevent learning helplessness, thereby fostering a more motivated learning environment. In relation to this code, participants P8, P2, and P6 elaborated with the following comments:

Personalized feedback, increased practice opportunities, and accessibility contribute to helping students learn more independently and with greater motivation. P8

It increases learning efficiency. AI-assisted teaching becomes more visual and gamified, making it more fun, which boosts motivation and participation, thereby supporting learning. P2

Basically, what I mean is that AI can enable students to learn at their own pace. This prevents learning helplessness because the child doesn't feel overwhelmed, which helps maintain motivation. P6

The second affective code identified was students' engagement in class. Three participants noted that the integration of AI into the classroom enhances student engagement, as students in the digital age tend to be more interested in technology-based tools. Additionally, AI contributes to making the class more gamified and enjoyable, which ultimately increases and supports overall language learning success. In relation to this, P1 and P2 elaborated with the following comments:

Since they are born into this digital age, they find it easier to adapt. I believe this will increase their engagement, which can lead to improved success. P1

It increases learning efficiency. AI-assisted teaching becomes more visual and gamified, making it more fun, which boosts motivation and participation, thereby supporting learning. P2

The third code identified was AI's effect on students' confidence levels. Three participants noted that specific features and benefits of AI ultimately enhance students' confidence. Regarding this code, P8, P4, and P9 are elaborated with the following comments:

These benefits make it easier for students to review, boost their confidence, and relate the language to real-life contexts. P8

Because students' progress at their own pace, it can be more effective. For example, it can boost students' confidence during speaking practice. P4

First and foremost, it saves time. It makes the learning environment more engaging, boosts students' confidence. P9

The integration of AI tools into language classrooms was perceived by teachers to be enjoyable for students. Five participants stated that the features of AI make learning fun for students. Regarding this code, P2, P5, and P4 elaborated with the following statements:

AI-assisted teaching becomes more visual and gamified, making it more fun, which boosts motivation and participation, thereby supporting learning. P2
Also, it is a fun tool for many areas, whether for children or young people. P5
In my classroom, I used AI for a word-guessing game. I asked AI to give a random word and also told it the students' names. I assigned each student a word or a few words randomly. It was fun, attracted students' attention, and I noticed that they learned the words more quickly. P4

Effective Learning and Skill Development

The last category identified within the theme of pedagogical advantages of AI was effective learning and skill development. The first code within this category was AI's integration into language education and its impact on learners' autonomous learning. Two participants stated that AI applications foster greater autonomy among learners, providing them with opportunities to monitor their own learning process and assume more responsibility for their progress. Concerning this, P1 and P6 presented the statements below:

As they see the benefits of adapting AI into language learning, I think they will also incorporate these tools into their self-study outside of class, leading to autonomous learning. P1
I think that students can individually handle certain aspects of their learning. Specifically, I believe that students who are at an intermediate level of English — say from B1 level onwards — can benefit from AI tools. P6

The second code within this category was AI's overall effect on language education. Three participants stated that AI applications make language learning more effective by offering students various features that support their progress. Regarding this, P2, P4, and P10 provided the following statements:

With features like speech and pronunciation practice and instant feedback, it offers a more effective learning experience. P2
AI can create personalized learning plans. Because students' progress at their own pace, it can be more effective. P4
I believe AI tools enable me to create personalized lesson materials tailored to each student's language level and interests. This can make my lessons more effective and engaging. P10

In terms of skill development, participants discussed several areas of language learning. However, developing speaking skills with the help of AI tools was the most noteworthy. Half of the participants stated that AI is a valuable resource for students to practice speaking, receive immediate feedback, and consequently achieve greater success in this skill. Regarding this P3, P5, P4, and P9 presented the statements below:

Because students can practice all these skills and receive feedback. P3
For example, you could practice speaking English, simulate chatting, or receive help in preparing study plans for certain activities. It seems there are no limits. P5
AI is ready at any moment to help practice speaking. P4
Tools like Gemini facilitate conversational practice, leading to happier, more confident students who are eager to communicate in English. P9

Lastly, the final code relates to AI's influence on other areas of language development. Seven participants emphasized AI's contribution to the four major language domains: speaking, listening, reading, and writing. P3 stated that AI plays a significant role in developing these four key skills. P8 specifically focused on AI's impact on writing, highlighting that, particularly through ChatGPT, usage in writing activities has increased students' motivation based on personal experience. P2 emphasized the benefit of AI's instant feedback feature and its positive effect on speaking and pronunciation. P5 and P6 noted that AI helps students improve their grammar and vocabulary.

AI to improve their vocabulary, grammar, or various deficiencies. P5
With features like speech and pronunciation practice and instant feedback, it offers a more effective learning experience P2
Not just for speaking practice, but for other areas such as grammar, where some students may struggle, or vocabulary, where others may need to expand their knowledge. P6
I also believe it plays a major role in developing the four language skills: listening, speaking, reading, and writing. P3
I used ChatGPT for writing activities. Students drew inspiration from creative examples, and it increased their enthusiasm and participation in the writing process. P8

Overall, within the theme of pedagogical advantages of AI, three main categories were identified. When analyzing the codes related to these themes separately, it was concluded that EFL teachers perceive AI as a valuable tool for students' pedagogical development. Participants specifically highlighted AI's capacity to personalize the learning process, particularly in terms of tailored feedback, lesson planning, and materials, which has great potential to further enhance students' learning quality. Furthermore, they emphasized that AI's instant feedback feature is highly valuable, as it immediately allows students to correct their mistakes and practice areas that need improvement. In terms of the affective contribution of AI, participants stated that its integration makes learning more enjoyable, ultimately increasing students' motivation, engagement, and confidence. Lastly, participants also noted that integrating AI into students' learning processes fosters greater autonomy and motivates students to take responsibility for their own learning, making the process more effective. When examining each area of language and AI's impact on them, it was concluded that teachers primarily see AI as a valuable tool for speaking practice. Additionally, they highlighted its positive effects on other language skills, such as writing, grammar, listening, reading, pronunciation, and vocabulary.

4.2.3.3. Perceived Disadvantages of AI

Table 33: Perceived Disadvantages of AI

Theme	Categories	Codes
Perceived Disadvantages	Negative Impacts on the Learning Process	Over dependency (P10, P5, P2, P1)
		Laziness (P4, P3, P2)
		Decrease in critical thinking (P10, P8, P7, P3, P2)
		Passiveness in learning (P10, P8, P2)
		Decrease in creativity (P5, P3, P2, P1)
		The lack of face-to-face interaction (P6, P5)
	Technical and Infrastructure Limitations	Time constraint (P1, P7)
		Money constraint (P3, P7)
		Limited technology access (P3, P4, P8, P6, P10)
	Ethical Issues	Issue with data, security, and privacy (P10, P8, P6, P5, P4, P3)
		Academic Dishonesty (P8, P7, P5, P2, P1)

Negative Impacts on the Learning Process

The first category pertains to the potential negative effects of AI on students' learning processes. Within this category, six codes were identified. Initially, four participants expressed concerns regarding the likelihood of students developing an excessive reliance on AI technologies, particularly due to their continuous provision of corrections and suggestions. Additionally, there is a perceived future risk that users may become unable to operate independently from these tools, thereby impairing their capacity to disconnect and function without AI tools' assistance. Concerning this, the participants provided the following examples:

I think students might become overly dependent on AI's constant corrections and suggestions.
P10
If we rely heavily on these kinds of tools, I think we might lose our ability to disconnect from them in the future. P5

Another concern raised by the participants was that, as an inevitable consequence of excessive reliance on these technological tools, AI tools may potentially foster complacency among students. Three participants emphasized that students might become accustomed to AI providing immediate solutions to their problems, thereby reducing the likelihood of exerting the necessary effort to engage in independent learning activities. Concerning this, the participants provided the following examples:

But I also think it can make students lazy; they might get used to instant solutions. P3
Possible disadvantages of AI could include, as observed, developing a sort of laziness among students. Instead of trying to construct sentences themselves, they might ask AI, "What is the English for this?" and just get the answer. Since they receive the information directly without effort, it might not be very practical for learning. P4

The third code identified within the relevant category was a decline in critical thinking skills which is a significant factor especially in terms of learning a new language. Four participants argued that improper use of AI tools could adversely affect the critical reasoning abilities of both students and teachers. Due to the convenience and simplicity of AI applications, individuals may be less inclined to invest substantial cognitive effort in language learning. In this context, participants P3 and P7 further elaborated with the following comments:

Critical thinking might decline when students and teachers don't need to challenge themselves anymore; they can get everything with a click thanks to AI. P3
It seems like we're using our brains less and less and leaving some of the necessary effort behind when learning a language. P7

When queried about the potential drawbacks of incorporating AI into language education, four teachers indicated that such integration might negatively impact students' creative thinking abilities. The participants emphasized the importance of creative thinking skills in language acquisition and expressed concern that reliance on AI tools for task completion—tasks traditionally requiring students' independence, creative effort—could pose significant challenges to the development of these skills. Concerning this code P2, P1, and P5 further elaborated with the following comments:

Particularly, it may negatively affect the development of creative and critical thinking skills P27
For example, I've come across students who, when given an assignment, use ChatGPT—since it's already well-known among middle school students—to complete projects. This could diminish students' creativity over time. P1
However, if not used moderately and in balance, it can also be a destructive tool. Since language is a creative system, for children or students, whether young or adult, there's a need for personal motivation and creativity to use it effectively. Constantly applying AI to develop, correct, or learn can become problematic. P5

The final code identified within this category pertained to AI's deficiency in providing face-to-face interaction and its potential adverse effects on the learning process. Two participants highlighted the risk of diminished human communication, which could negatively influence language acquisition by increasing speaking anxiety or fostering a tendency to avoid interpersonal interaction altogether. Participant P6 noted that the conversational nature of AI might be beneficial for some shy students, as it eliminates the pressures associated with human interaction. However, it is also emphasized that the absence of human interaction equates to a lack of real-time feedback, such as facial expressions and other non-verbal cues. Furthermore, genuine human expressions and emotional responses are fundamental to effective communication; their absence may hinder students' ability to adapt to authentic conversational contexts. Concerning this code P2, P1, and P5 further elaborated with the following comments:

I think we might lose our ability to disconnect from them in the future or reduce normal human communication. Some people might develop anxiety, such as speaking anxiety, and prefer to avoid real human interactions altogether, turning instead to AI. P5

Because, after all, AI is still just AI, not human. For example, a very shy student might be able to speak confidently in front of AI, but with AI, there's no real facial expression to show if they make a mistake. When faced with a real person, however, they might encounter different facial expressions and possibly feel demotivated or discouraged if they see a negative reaction. With AI, since it mostly provides positive feedback, the student might get used to that. Also, students need to experience how real human reactions work, which AI alone can't fully provide. The reactions of real people, the expressions, and the emotional responses are important. I believe students also need to practice in more natural environments. P6

Technical and Infrastructure Limitations

The second category focused on the barriers to implementing AI in educational settings and real-world learning experiences. Three codes emerged within this category, the first of which was time constraints. Two participants indicated that the limited time allocated within school curricula makes the integration of such tools challenging. Regarding this code P1, and P7 further elaborated with the following comments:

One challenge is that sometimes students have a continuous desire to use these tools. This can cause problems, especially since we don't always have time to accommodate it. P1
Students have limited time: typically, 4 hours a week in 9th grade, and 2 hours in 10th, 11th, and 12th grades. Due to this limited time, we primarily use traditional methods. P7

The second theme within this category was financial constraints, referring to individuals' limited access to AI tools and their functionalities due to economic barriers. Two participants mentioned that fully utilizing the features of an AI tool often requires purchasing a premium version, which could pose a significant obstacle. Regarding this issue, participants P3, P10 and P7 provided additional insights with the following comments:

One challenge is that some of these tools require a premium version, which I think is a major drawback because I can't access all the features. P3
For instance, some applications—like Grammarly (I don't know if it's an ad)—when you write an article and use the free version without paying, it tells you about your mistakes. But it doesn't specify which mistake needs correction. P7
Students with limited financial resources and restricted access to technology couldn't benefit fully from AI tools. P10

The final code within this category was limited access to technology, identified by half of the participants as a significant barrier to the implementation of AI in educational settings. Participants highlighted infrastructural deficiencies, such as limited internet connectivity and the lack of necessary technological devices, such as computers and tablets, as factors that hinder students from fully benefiting from AI tools. In this context, participants P6, P8, and P3 offered further elaboration with the following comments:

Due to the limited technological access within the school, I couldn't incorporate AI as thoroughly as I wanted. If all my students had tablets, I could have had them write their essays or speaking tasks on their tablets, then get instant feedback from ChatGPT or other tools. This would help

them improve their language skills independently. But current infrastructural limitations make it difficult to fully utilize AI tools in the classroom. P6

There can be technological inequalities in classrooms without internet access. P8

I haven't experienced this firsthand, but many of my colleagues have had issues related to infrastructure, like lacking sufficient internet at certain locations, which prevents proper use of these devices. P3

Ethical Issues

As the final category within the theme of perceived disadvantages of AI, a total of two codes were identified. The first code, "Issues related to data, security, and privacy," was highlighted by more than half of the participants. These participants expressed concerns regarding the ethical implications of integrating AI into education, specifically emphasizing data security issues, the potential for unauthorized dissemination of information without user or source permission, and the overall risk to students' security and privacy. Concerning this, the participants provided the following examples:

Privacy violation could be a concern, especially since we see that many social media platforms sell user data. If AI applications do this as well, there might be privacy and security risks, possibly violating personal data regulations like KVKK. P4

I haven't personally experienced this, but I saw on social media recently that the permissions we give unconsciously can grant access to a lot of our personal data, including our phones. It's important to check these settings carefully for both education and daily life. P3

And maybe students don't always realize what they're writing or saying to AI; they might not be aware of how their data is being used. P6

I believe there could be problems related to personal data, privacy, and security" P10

The real ethical concern is that we don't know where AI, such as ChatGPT, gets its data from. You don't really know the sources it's drawing from. P6

The second and final code identified within this category was academic dishonesty. Five participants expressed concerns regarding the potential misuse of AI tools by students, particularly regarding their use of assignments instead of serving as learning aids. Additionally, they highlighted issues related to inadequate provision of sourcing information, which could lead to instances of plagiarism. Participants supported these concerns with the following examples:

If children rely on AI instead of their own original expressions for homework or English tasks, that could be problematic. P5

I became more sensitive to these issues after checking a composition a student copied from ChatGPT. P8

From an ethical perspective, when we write an article, we should cite the sources or indicate where we got the ideas or data. But I think ChatGPT doesn't provide sources which can raise ethical concerns. P7

In summary, several noteworthy concerns were raised regarding the disadvantages of AI. These concerns were categorized into three main categories: Negative Impacts on the Learning Process, Technical and Infrastructure Limitations, and Ethical Issues. Regarding the first category, participants contended that excessive reliance on AI might impede students' development of critical

and creative language skills, potentially fostering laziness and passivity. Furthermore, reduced face-to-face interaction could negatively affect overall communication skills. Concerning the second category, barriers related to the implementation of AI in educational settings were discussed. Participants highlighted constraints such as time and monetary resources, as well as limited access to necessary technology, including inadequate internet connectivity and a lack of appropriate devices, which hinder the effective utilization of AI tools by both teachers and students. Lastly, ethical issues pertaining to data privacy and security, as well as the potential for academic dishonesty, were also identified as significant concerns.

4.2.3.4. The Future Role and Impact of AI in EFL Education

Table 34: The Future Role and Impact of AI in EFL Education

Theme	Category	Code
The Future Role and Impact of AI in EFL Education	Areas of AI Use	A supportive role in personalized learning (P2, P6, P8)
	The Impact of AI in Teaching Roles	AI's future role (P3, P8)
		Teachers' future role (P3, P6)
	Quality of Education	Quality improvement via AI (P2, P4, P5)
	Integrating AI into Educational System	Curriculum integration (P5, P9)
		Further training (P2, P7, P6)

Areas of AI Use

The final theme identified pertains to the prospective role and influence of AI in EFL education, specifically focusing on educators' perceptions regarding AI's future contributions. Based on the data, four categories were delineated. The first category concerns the functions and applications of AI, within which one code was established that investigates AI's supportive role in personalized learning. Participants highlighted that AI will be an effective tool for enhancing individualized learning experiences, thereby transforming the conventional educational system. Specifically, participants stated that AI is expected to facilitate the identification of students' errors through the use of algorithms and provide opportunities for targeted practice. Regarding this code, participants P2, P6, and P8 elaborated with the following insights:

It will become a part of education, possibly changing traditional teaching systems to make interactions more personalized. P2
The algorithm can provide targeted practice based on those errors. I believe AI will play the biggest role here in helping this process. P6
I believe AI will become more of an assistant that makes teachers' jobs easier and supports personalized learning. P8

The Impact of AI in Teaching Roles

The second category identified pertains to the impact of AI on teaching roles. Within this category, two codes were developed. The first code relates to AI's role in future teaching practices. Participants expressed the view that AI will function as a valuable resource, supporting and guiding educators in forthcoming instructional settings. It is anticipated to serve as a beneficial assistant for teachers in the future. Regarding this code, participants P3 and P8 provided further elaboration with the following remarks:

I believe AI will be a significant support and guide for teachers in the future—an assistant. P3
I believe AI will become more of an assistant that makes teachers' jobs easier. P8

The second code within this category concerns the future role of teachers in the educational process. Participant P6 indicated that teachers will increasingly function as guides or mentors, demonstrating to students how to utilize AI, particularly in terms of AI literacy, which may diminish traditional teaching roles. Conversely, participant P3 emphasized that the emotional support and motivation provided by teachers will remain essential, asserting that AI will not replace the pedagogical and relational roles of educators in the future. Regarding this code, participants P3 and P6 offered further insights with the following statements:

I see teachers as coaches, guides, and mentors. Teachers' roles will decrease somewhat — they will more likely act as guides, showing students how and where to use AI, and how to get feedback. P6
I don't think it will replace teachers entirely (...) I don't see it replacing the discipline a teacher maintains in the classroom or the emotional motivation a teacher provides. P3

Quality of Education

The third identified category pertains to AI's role in enhancing the quality of education. Within this category, a single code was established, focusing on the quality improvement facilitated by AI. Participants indicated that the integration of AI into language instruction has the potential to elevate educational standards. Participant 4 remarked that utilizing AI in educational settings can enhance learning outcomes for the younger generation and increase their engagement through technological tools. Participant 5 highlighted that AI's supportive functions can optimize the learning process by reducing both time and costs, positioning it as a valuable resource. Additionally, participants P2, P4, and P5 provided further insights and elaborations on this theme.

AI tools can make education even higher in quality. P2
Even without premium membership, we can truly learn a language with AI. I think we need to integrate AI into English teaching more because younger generations learn better and focus more when using technological tools. P4
If AI is used just as a supportive tool—to help enhance the learning process by reducing effort, time, and cost—then it will be a very useful and beneficial tool in English teaching. P5

Integrating AI into Educational System

The final category identified within this theme concerns the integration of AI into the education system and its associated requirements. Within this category, two codes were developed. The first code examined participants' perceptions regarding the inclusion of AI within the curriculum. Two participants expressed the view that AI should be integrated into educational curricula. Participant 9 elaborated further, emphasizing that AI tools should be selected by educational authorities, such as the Ministry of National Education (MeNO), and that these tools should be made accessible to all teachers and students. Additionally, participant 9 suggested that the tools should be incorporated into interactive platforms.

Of course, work can be done to include this in the curriculum. P5
AI tools should be selected by the Ministry of Education and made accessible to all teachers and students within a framework of protocols—similar to EVA—and should be integrated into textbooks. P9

The final code identified within this category pertains to the need for additional training. Three participants emphasized the importance of providing further instruction to teachers and students to maximize the benefits of AI technologies, particularly in enhancing digital literacy. They argued that such training is essential to improve the overall quality of education. Regarding this theme, participants P2, P6, and P7 offered further insights and elaborations, highlighting the significance of ongoing professional development and capacity building to effectively integrate AI into educational practices.

Providing teachers with training on the effective use of AI tools can make education even higher quality. P2
If we receive proper training on this, indeed, people who comprehensively explore AI's use could benefit from it. P7
We need to incorporate this into education, teach digital literacy, and guide students on when and how to use these tools. P6

In conclusion, EFL teachers have provided valuable insights regarding the prospective role of AI in language education. They emphasized AI's increasing significance in facilitating personalized learning and its impact on students' learning processes. Furthermore, they indicated that the integration of AI applications has the potential to enhance the overall quality of education. When queried about the future of AI in language teaching, teachers generally concurred that AI will play a substantial role, predominantly as an assistive tool for educators. Although some participants acknowledged that traditional teacher roles may undergo transformation, they underscored that AI is unlikely to replace educators entirely, given the continued need for emotional support provided by teachers. Finally, participants offered meaningful remarks on the importance of integrating AI into curriculum design and highlighted the necessity for ongoing training to maximize its benefits.

CHAPTER FIVE

5. DISCUSSION

The present study sought to examine the level of readiness and perceptions of EFL teachers regarding the integration of AI in language education. To achieve this, data were collected from a sample of 90 EFL in-service teachers spanning primary, middle, and high school levels. The investigation of teachers' readiness and perceptions was conducted through an online survey developed by the researcher, informed by the TPACK framework (Mishra & Koehler, 2006) for assessing readiness, and the TAM (Davis, 1989) for evaluating perceptions. The perceptions of EFL teachers were further analyzed qualitatively to provide a more in-depth analysis. Quantitative data were analyzed using descriptive statistics to determine levels of readiness and perceptions among teachers. Additionally, Spearman's rho correlation analysis was conducted to explore the relationships between variables. To examine the influence of demographic factors on AI readiness, both descriptive statistics and the Kruskal-Wallis H test were employed; specifically, the Mann-Whitney U test was utilized to assess differences related to current employment status. For the qualitative data, thematic analysis was applied to identify underlying themes and patterns. In this chapter, each predetermined research question is analyzed in sequence.

5.1. Discussion of EFL Teachers' AI Readiness Level

The current study examines the readiness of EFL teachers to integrate AI, employing the TPACK framework. The findings indicate that EFL teachers possess a moderately high overall TPACK readiness towards AI usage in language instruction, aligning with the results of Saharuddin et al. (2025) and Rafiq et al. (2022). In contrast, Hava and Babayiğit (2025) reported that Turkish teachers, despite high digital competencies, exhibited AI-TPACK readiness below average. This discrepancy may reflect the study's narrower focus on EFL teachers, whereas Hava and Babayiğit (2025) surveyed a broader cohort of educators from multiple departments who may not share the same level of AI-related knowledge and exposure in educational contexts.

Within the TPACK framework, the TCK domain produced the highest mean score, indicating that participants are most confident in understanding how technology and content knowledge mutually influence instructional practice (Mishra & Koehler, 2006). However, these results diverge from prior research (Hava & Babayiğit, 2025; Koh et al., 2010; Rafiq et al., 2022; Saharuddin et al., 2025), which reported the highest means in the TPK and TK domains, suggesting greater confidence

in pedagogical and technological facets of AI-infused instruction than in CK alone. This discrepancy may be attributable to the relatively limited availability of professional development opportunities focused on AI pedagogy in language education, particularly in Türkiye, specifically with in-service teachers. Consequently, systematic training and support to bolster TPK and TK are essential to enable EFL teachers to translate content familiarity into effective AI-enabled pedagogy. Targeted professional development would facilitate a transition from CK-based confidence to more robust AI-TPK and AI-TK readiness.

Infrastructure readiness constitutes a significant determinant of EFL teachers' overall preparedness, as suboptimal internet connectivity and a lack of essential hardware can impede AI-enabled education. In the present study, teachers exhibited a high level of infrastructural readiness, suggesting confidence that their schools possess adequate internet access and essential devices for language instruction. However, perceptions of infrastructural readiness specifically pertaining to AI resources—such as software, training materials, and related tools—remain at moderate to low levels. In their systematic literature review, Kundu and Bej (2025) contend that in developing countries, such as India, deficiencies in infrastructure, insufficient training, and low levels of digital literacy hinder the adoption of AI technologies in education. This conclusion aligns with Özdemir and Mede (2024), who observed that while in-service teachers recognize the potential benefits of integrating AI into language education, they raise substantial concerns about access to appropriate resources and the adequacy of infrastructure readiness. Accordingly, these findings underscore the critical importance of robust institutional infrastructure and effective support and training to facilitate the implementation of AI tools.

The second research question explored the association between EFL teachers' readiness for AI integration and their familiarity with digital tools. The present study identified a moderate, statistically significant positive correlation between Turkish EFL teachers' AI readiness and their digital tool familiarity, suggesting that teachers who are more proficient with digital technologies are more inclined to perceive themselves as prepared to integrate AI applications into their instructional practices. This finding aligns with Kasinidou et al. (2025), who reported a positive association between digital competence and AI literacy, indicating that higher levels of digital capability are associated with improved AI literacy. Regarding TPACK readiness, Hava and Babayigit (2024) conducted a study involving 401 teachers across multiple Turkish disciplines and, in a similar vein, concluded that digital proficiency serves as a strong predictor of AI-TPACK readiness.

With regard to the third research question—exploring the relationship between teachers' AI readiness and their perceptions of AI among EFL instructors—the present study identifies a strong, statistically significant positive association between AI readiness and perceived usefulness (PU). This result suggests that EFL teachers who view AI tools as beneficial and efficacious are more inclined to adopt and integrate such tools into their instructional practices. This finding is consistent

with Granström and Oppi (2025), who reported that perceived usefulness is the strongest predictor of AI tool implementation in educational settings. It also aligns with the TAM model, which designates perceived usefulness as a central determinant of actual usage (Silva, 2015). Furthermore, the data also revealed a moderate positive relationship between AI readiness and perceived risks and concerns surrounding AI applications, indicating that higher readiness is associated with greater awareness of potential risks. This pattern corroborates the study by Zhang et al. (2024), which found that pre-service teachers' perceptions of risks and concerns negatively influenced their intention to use AI-based educational tools. Similarly, Wut et al. (2025) concluded that perceived risks associated with AI can impede technology acceptance and adoption. Collectively, these findings indicate that teachers with higher readiness and greater knowledge of AI are not only more inclined to implement AI but also more cognizant of its potential risks.

The present study also explored the relationship between EFL teachers' readiness to adopt AI and several demographic variables, including age, gender, years of teaching experience, educational background, teaching level, and current employment. With regard to age, the results indicated no statistically significant differences; nonetheless, participants aged 23–30 and 41–50 exhibited relatively higher AI readiness. It is important to note that the 41–50 age group consisted of a small sample ($n = 10$), which limits the reliability of this particular finding. When the age groups with adequate sample sizes (23–30: $n = 36$; 31–40: $n = 42$) were examined descriptively, the 23–30 cohort demonstrated greater readiness for AI integration than older colleagues. This pattern aligns with prior research (Karataş & Ataş, 2024; Saharuddin et al., 2025; Senger, 2024), which reported that younger EFL teachers perceive themselves as more prepared to incorporate AI or digital tools into their instructional practices. Similarly, Karataş and Ataş (2024) asserted that younger teachers showed higher levels of TK and TPK. Moreover, Yue et al. (2024), in a broader study including K–12 educators from diverse backgrounds, found that younger teachers outperformed their older counterparts in AI-PK and AI-TK. This pattern supports the notion that younger teachers, having greater exposure to digital tools from an early age, are more proficient and comfortable with integrating AI into the classroom. However, as Üretmen-Karaoğlu and Doğan (2025) note, these advantages underscore the need for ongoing professional development and lifelong learning opportunities to narrow the readiness gap between younger and older teachers.

The second demographic variable considered was gender. Similar to the age variable, the present study did not identify a statistically significant difference between the sexes. The given finding aligns with the findings of Castéra et al. (2020) and Saharuddin et al. (2025). Descriptive analyses of AI readiness by gender revealed, however, that female teachers exhibited higher mean scores than male teachers; while these findings collaborate with the findings of Ortega-Sanchez and Gomez-Trigueros (2019), they also diverge from prior research. For instance, Chan and Tang (2024) reported that male preservice teachers achieved higher mean levels of TK than their female counterparts. Likewise, Chai et al. (2010) concluded that male teachers possess greater technological

readiness than female teachers. Regarding affective states, which influence overall AI readiness, Hopcan et al. (2023) found that female teachers experience greater anxiety related to integrating AI tools into classroom practice. One potential explanation for the current result of the study, particularly in the context of foreign language instruction, is that female teachers predominate in teaching positions in Türkiye; the Ministry of National Education (MoNE, 2023) notes that the number of female English teachers exceeds that of males. Consequently, female EFL teachers in Türkiye may occupy relatively more influential instructional roles, potentially contributing to greater preparedness for AI tool integration in education.

Regarding participants' years of experience and their role as a determinant of AI readiness, no statistically significant difference was detected. This result corroborates prior research (Üretmen-Karaoğlu & Doğan, 2025; Mahdi & Al-Dera, 2013; Yue et al. 2024). Descriptively, however, the data suggested that teachers with 0–5 years of experience exhibited higher levels of readiness than their more experienced counterparts, a pattern consistent with Üretmen-Karaoğlu and Doğan (2025). Similarly, Cao (2025) found among EFL teachers in Macao universities that novice instructors are more inclined to and confident in employing AI tools. This finding aligns with the age-related demographic factor, indicating that younger teachers tend to feel more prepared to implement AI in their classrooms.

Regarding the educational background of the EFL teachers, no statistically significant differences were observed across the institutions from which the participants graduated. Nevertheless, in line with Üretmen-Karaoğlu and Doğan (2025), teachers who graduated from an ELL program exhibited mean scores that slightly surpassed those of teachers who graduated from an ELT department. Similarly, the teaching experience level of EFL teachers did not yield statistically significant differences between groups, which is consistent with prior research (Üretmen-Karaoğlu & Doğan, 2025; Yue et al., 2024). Descriptive analysis, however, demonstrated that compared to their higher-level colleagues, primary-level teachers showed higher readiness. This finding is in line with the findings of Yue et al. (2024) reported that teachers currently teaching at the primary level demonstrated a higher propensity to adopt AI in their instructional practices than those teaching at the secondary or high school levels. This can be attributed to the fact that primary school teachers, since they work with younger students, may be more inclined to integrate AI in order to design engaging, gamified, and interactive classroom environments, whereas teachers at higher grade levels tend to adopt more traditional instructional approaches. Based on these findings, it can be concluded that the demographic characteristics of students, particularly their age, may influence teachers' perceptions and, consequently, their level of readiness to adopt AI applications.

The final demographic variable considered was the current employment status of EFL teachers and whether those employed in private versus public schools differed in AI readiness. No statistically significant difference was detected between private- and public-school teachers. Nevertheless,

teachers affiliated with private institutions demonstrated a greater propensity to integrate AI into their instructional practices. A plausible explanation is that, while the Ministry of National Education (MoNE) has markedly expanded internet access and online tools across schools, private schools may enjoy more readily available access to these resources, thereby enhancing the AI readiness of their teachers.

5.2. Discussion of the Perceptions of EFL Teachers Towards AI

The last research question investigates EFL teachers' perceptions concerning the integration of AI tools within language teaching and learning. This inquiry was addressed through a mixed-methods approach, employing both quantitative and qualitative analyses. The triangulation of the results exhibited a notable concordance between the two datasets. Consistent with prior research (Chounta et al., 2021; Elmahdi et al., 2024; Dilzhan, 2024; Slamet, 2024), both qualitative and quantitative findings collectively indicate a generally positive attitude towards the incorporation of AI in language education. The perceptions of EFL teachers were examined in four major categories: (1) perceived advantages of AI for teachers, (2) pedagogical advantages of AI, (3) perceived disadvantages of AI, and (4) the future role and impact of AI in EFL education.

This study, consistent with prior research, suggests that EFL teachers perceive AI as markedly advantageous, particularly with regard to efficiency in lesson planning (Ghafouri et al., 2024; Kartal, 2024; Octavio et al., 2024; Sumakul et al., 2022; Sütçü & Sütçü, 2023; Ulla et al., 2023). Chounta et al. (2021) contend that AI aids teachers in devising lesson plans that alleviate workload. A further notable advantage posited for AI is its capacity to streamline material preparation, aligning with prior work on AI's possible contributions to creating and checking materials (Moorhouse, 2024), supplying ready-to-use learning materials (Novawan, 2024), and offering a diverse array of instructional resources within a short time frame (Kasneci et al., 2023). Moreover, the present study highlights AI's potential to facilitate grading by simplifying the process, a finding that corroborates previous research on AI's role in enhancing language education through assessment (Gayed, 2025; Nazim & Alzubi, 2025; Nguyen, 2025; Novawan et al., 2024; Sumakul et al., 2022). Nevertheless, as Alsalem (2024) and Uddin et al. (2024) caution, some teachers question the reliability of AI-generated grading. Consequently, while AI tools can streamline grading, it is prudent to remain cognizant of potential reliability limitations in the results produced.

In interviews, several participants also highlighted AI's capacity for idea generation to support the development of classroom activities or games, thereby reducing effort and time compared with traditional lesson-planning methods. This aligns with Setyaningsih's (2024) findings on AI's value in lowering workloads and generating diverse instructional ideas. Finally, EFL teachers indicated that AI contributes to their professional development, corroborating Alrishan's (2023) observation

that AI serves as a valuable resource for material development and for providing access to diverse resources that enhance professional knowledge and skills.

Regarding EFL teachers' perceptions of AI and its potential impact on students' development as well as the overall quality of language education, the majority of EFL instructors emphasized the importance of AI in enhancing the efficacy of language instruction, contributing to improved educational outcomes. This finding is consistent with prior research (Al-Khresheh, 2024; Dehghani & Mashhadi, 2024; Hazaymeh et al., 2024), with teachers arguing that the quality of education would be enhanced through the use of AI. A predominant theme identified by participants is AI's personalization and adaptability capabilities. In line with earlier studies (Amin, 2023; Al-Khresheh, 2024; Hieu & Thao, 2024; Yeh, 2024), the present study concludes that EFL teachers regard AI's ability to offer students personalized learning opportunities as a key pedagogical advantage. In particular, AI's capacity to provide individualized feedback (AbdAlgane & Othman, 2023; Chounta et al., 2021; Ghafouri et al., 2024; Hazaymeh et al., 2024; Kemelbekova et al., 2024; Kohnke et al., 2023; Novawan et al., 2024) and instant feedback (Dong, 2023). Thus, it can be concluded that EFL teachers perceive the application of AI in language learning as highly beneficial, not only for enhancing students' language outcomes but also for fostering more adaptive and personalized learning experiences.

In terms of perceived pedagogical advantage of AI regarding students' affective state, this study—consistent with prior research—found that EFL teachers view AI and AI-powered tools as highly beneficial for enhancing student motivation (Hazaymeh et al., 2024; Hieu & Thao, 2024; Sumakul et al., 2022; Slamet, 2024), fostering greater engagement (AbdAlgane & Othman, 2023; Ghafouri et al., 2024; Hazaymeh et al., 2024; Hieu & Thao, 2024; Novawan, 2024), and contributing to a more enjoyable learning experience (Yolchiyeva et al., 2024). However, these findings appear to conflict with AbdAlgane and Othman (2023), who contended that AI can induce boredom and diminish student motivation. This can be attributed to several factors, including differentiation in context and the grade level at which the tool is used. Secondly, when AI is employed for interactive and creative activities, it can be engaging and enjoyable; however, for repetitive drills, it may become demotivating. The manner of implementation is also crucial. Purposeful and well-planned integration of AI tools can be engaging and fun, while superficial or poorly planned integration can lead to reduced engagement. It is also important to consider the characteristics of students, since each learner has different learning styles and expectations from the learning process.

In terms of effective learning and skill development, the results of the study indicate that EFL educators regard AI as a valuable instrument for promoting learner autonomy. This finding aligns with prior research (Kim & Sim, 2024; Losi et al., 2024; Slamet, 2024), which has demonstrated that the incorporation of AI technologies into language instruction effectively enhances students' autonomous learning capabilities. Moreover, AI and AI-based tools are perceived as highly useful

by teachers in terms of developing language skills. In line with previous studies, the present study found that EFL teachers perceive AI as a useful tool for practicing speaking (Kemelmekova et al., 2024; Özkan et al. 2024). Compared to other areas of language learning, teachers particularly emphasized AI's contribution to the development of speaking skills. This finding is consistent with the literature, where the relationship between AI-based tools and speaking proficiency has been more extensively examined. Based on this, however, it can be concluded that while Turkish EFL teachers acknowledge the overall benefits of AI in developing language learning skills, they appear to lack sufficient knowledge regarding AI's potential contributions to other areas of language instruction, namely grammar, writing, reading, listening, and vocabulary.

In summary, the present study finds that EFL teachers perceive AI as a beneficial instrument in language education for both their teaching practices and for students' pedagogical development. These findings align with the PU component of the TAM (Davis, 1989), which emphasizes the advantageous attributes of technological tools. Building on the assertion by Venkatesh and Davis (2000) that teachers are more likely to adopt a tool when they believe it enhances efficiency and educational quality, the demonstrated benefits of AI in language education appear to contribute significantly to teachers' positive attitudes toward its adoption.

Although AI offers numerous benefits for both students and teachers, it also presents several disadvantages highlighted by participants. Regarding AI's negative impact on the learning process, several notable drawbacks were identified. A principal concern among EFL teachers is AI's potential to render students overly dependent on such technologies. This concern echoed with prior findings (Akyıldız, 2024; Kartal, 2024; Özkan et al., 2024; Sütçü & Sütçü, 2023), which similarly indicate that EFL teachers perceive AI as a tool that could potentially lead to students' overreliance. Thus, as Akyıldız (2024) argues, it is essential to deploy AI in a manner that complements traditional instruction rather than substitutes it. Additionally, Özkan et al. (2024) emphasize the importance of adequate teacher training to mitigate the risk of student over-reliance.

Another concern expressed by Turkish EFL teachers was AI's potential to foster laziness among students, a view that has also been highlighted in previous research (Dakakni & Safa, 2023; Kartal, 2024; Novawan, 2024). Consequently, in line with earlier studies, it was noted that such overreliance and laziness may, in turn, undermine students' critical thinking skills (Al-Khresheh, 2024; Dakakni & Safa, 2023; Hieu & Thao, 2024; Moorhouse, 2024; Ulla et al., 2023) as well as their creativity (Dakakni & Safa, 2023; Ghafouri et al., 2024; Kartal, 2024). These views contrast with some balanced perspectives (e.g., Hieu & Thao, 2024), which acknowledge that AI can both foster and hinder creativity. Moreover, concerns have been raised about AI's lack of face-to-face interaction and its potential negative consequences for education more broadly. This point is supported by Amin (2023), who underscores the importance of human interactions in developing interpersonal skills in language education. Collectively, these concerns underscore the importance of

prudent and well-considered use of AI in education, one that fosters critical thinking and creativity rather than encouraging overreliance or complacency among students.

In conclusion, although Turkish EFL teachers perceive AI as a highly beneficial language learning tool, indicating high PU, they also raised several significant concerns regarding its applications in language education. These include AI's potential to foster overreliance and laziness among students. Moreover, it was noted that, in the long term, AI use may hinder students' creativity and critical thinking skills. Such concerns may negatively affect teachers' overall PU toward AI and influence their attitudes, as well as their BI to use AI, as suggested by Williams (1996), who posited that teachers' intention to use a given system is shaped by their attitudes and perceived usefulness.

Regarding barriers to integrating AI into language classrooms, several notable concerns have been raised. Educators contend that the deployment of AI in language education hinges on adequate technological access and that institutions must furnish the requisite devices. Participants emphasized a perceived lack of infrastructural readiness in regard to AI applications. This view is corroborated by prior research conducted in developing countries, such as Türkiye. For example, studies involving in-service Vietnamese EFL teachers by Hieu and Thao (2024) and Saudi EFL teachers by AbdAlgane and Othman (2023) highlighted the inherent limitations associated with AI integration in these contexts. According to the Turkish Statistical Institute (TÜİK), access to adequate internet connectivity and essential digital devices presents a barrier, particularly for students residing in rural areas and those from lower socioeconomic backgrounds (2020). Çelik and Aytin (2014) highlighted that governmental internet restrictions constrain teachers' use of digital educational tools, thereby limiting their capacity to integrate these resources into English language instruction. Time constraints emerged as another salient concern. EFL teachers reported that the integration of AI in the classroom is time-intensive, and the limited time allocated within school curricula complicates the adoption of such tools. This view is corroborated by Liang (2021), who observed that school scheduling frequently acts as a barrier to the deployment of digital technologies. In addition, the financial dimension of employing AI tools was identified as a concern by teachers. These findings are supported by AbdAlgane and Othman (2023) and Hazaymeh et al. (2024), who emphasize that ongoing technology maintenance is hindered by high costs. Consequently, to achieve effective integration of AI into language education, infrastructural considerations must be addressed to ensure equal learning opportunities for all students. According to the TAM model, PEOU is the degree to which a person perceives that engaging with a specific system would be free of effort (Davis, 1989). However, infrastructural constraints—such as lack of necessary devices, internet restrictions, and time and money limitations pose barriers to the ease of applying AI in language education. These constraints negatively impact EFL teachers' perceptions of ease of use (Venkatesh & Bala, 2008). Thus, this may generate a degree of hesitation among EFL teachers.

A prominent concern surrounding the use of AI in language education concerns its ethical implications. EFL teachers largely emphasize that AI-assisted activities in language classrooms may compromise academic integrity and facilitate plagiarism. This issue is corroborated by multiple studies (Cong-Lem et al., 2024; Dakakni & Safa, 2023; Fassbender, 2024; Ghafouri et al., 2024; Kohnke et al., 2023; Mohammadkarimi, 2023; Novawan et al., 2024; Ulla et al., 2023). This concern is rooted in the challenge of detecting AI misuse (Mohammadkarimi, 2023). Consequently, as proposed by Chan (2024), innovative approaches to address academic misconduct should be endorsed by teachers and institutions, leveraging targeted tools developed specifically for this purpose. Another perceived disadvantage raised by participants in the current study concerns data privacy associated with AI-based tools. Effective operation of AI tools often requires collecting substantial amounts of data about students; however, questions remain regarding how this data is used and where it is stored. This concern has been echoed by several EFL teachers in prior research (Fassbender, 2024; Kemelbekova et al., 2024; Kohnke et al., 2023). Consequently, it is imperative to educate students about data privacy, making them aware of potential misuse of information they provide via these apps and encouraging greater vigilance.

The present study highlights several notable considerations regarding the prospective role and impact of AI in language education. EFL teachers agreed that AI is likely to assume a substantial role, primarily as an assistive tool for educators. Some participants acknowledged that the traditional roles of teachers might evolve; nevertheless, they stressed that AI is unlikely to supplant educators entirely. This viewpoint aligns with prior research (An et al., 2023; Sumakul et al., 2022). However, it diverges from more pessimistic perspectives, such as those of Sumakul et al. (2022) and Sütçü and Sütçü (2023), which posit that AI could replace teachers and diminish employment opportunities. Furthermore, EFL teachers underscored the importance of integrating AI into curriculum design. This stance is corroborated by Özkan et al. (2024), who argue that AI has the potential to provide students with ubiquitous access to tools of their choosing, and that incorporating AI into the curriculum can enhance student motivation. Nevertheless, participants highlighted the necessity for ongoing professional development to optimize AI benefits.

CHAPTER SIX

6. CONCLUSION

6.1. Conclusion and Pedagogical Implications

The present study aimed to examine EFL teachers' readiness levels within the framework of the TPACK model, alongside their perceptions aligned with the TAM model concerning the use of AI in language education. The study engaged 90 EFL teachers from primary, secondary, and high school levels. In pursuit of this overarching objective, a sequential explanatory mixed-methods design was employed, integrating both qualitative and quantitative data. Readiness was evaluated via an online survey, while perceptions were explored through both qualitative and quantitative analyses to yield a more comprehensive understanding.

Readiness level of EFL teachers was assessed along three core components of the TPACK framework: TCK, TPK, and TK. The results provide meaningful insights into EFL teachers' preparedness. Specifically, the findings indicate that Turkish EFL teachers exhibit a moderately high overall AI-TPACK readiness. When the components were analyzed individually, TCK emerged as the strongest dimension, suggesting that teachers feel more confident in aligning AI tools with language content. In contrast, TPK and TK were comparatively constrained, implying that although teachers possess adequate content knowledge, they face challenges in integrating these tools into pedagogy and in mastering the technical aspects of the tools themselves. These findings underscore the necessity for targeted guidance and professional development programs that enhance both pedagogical and technical competencies related to AI, thereby supporting more effective adoption and implementation in language classrooms. Additionally, perceived infrastructural readiness was evaluated. The findings indicate that EFL teachers believe their institutions provide the essential equipment and internet connectivity necessary to integrate digital tools into education. However, regarding infrastructural readiness for AI applications, teachers demonstrated a moderate to low level of readiness. This suggests that, although schools in Türkiye appear to be infrastructurally prepared for general digital applications, further investment is required to enhance readiness for AI. Specifically, there is a need for access to additional software, training materials for both students and teachers, and broader institutional support to support the effective adoption of AI-based approaches in language education.

The second research question investigated the relationship between the AI readiness of EFL teachers and their familiarity with digital tools. The findings indicate that digital tool familiarity plays a central and potentially causal role in AI readiness, suggesting a positive relationship: higher levels of digital familiarity are associated with greater readiness to adopt AI applications. From a pedagogical perspective, these results underscore the importance of developing digital tool competencies among teachers to enhance the effective use of AI in language education. Consequently, teacher education and professional development programs should prioritize digital competency as a foundational prerequisite, thereby establishing a basis for future AI competence. This foundation is likely to support the integration of AI into instruction in pedagogically meaningful and substantively sufficient ways.

The third research question examined the relationship between EFL teachers' perceptions and their readiness. The study yielded valuable information regarding teachers' perceived usefulness and perceived risks and concerns. Teachers who perceived AI as useful were more likely to adopt and integrate AI into their practices. Furthermore, greater readiness was associated with heightened awareness of AI's potential risks, indicating that teachers who are more knowledgeable about AI may exercise greater caution in integrating AI into their practices. These findings indicate that teachers with greater AI expertise are more likely to adopt AI and, at the same time, are more cautious about its challenges. This underscores the necessity for effective training and professional development to mitigate AI-related risks and to equip teachers with the skills to leverage AI's potential advantages. Such progress is achievable only by adopting a balanced and informed approach, whereby teachers become proficient practitioners who maximize AI applications without succumbing to fear or abandoning use due to perceived risks.

The fourth research question examined whether there is a statistically significant difference between EFL teachers' readiness to adopt AI and various demographic variables, including age, gender, years of teaching experience, educational background, teaching level, and current employment. No significant differences were observed across these demographic factors. However, descriptive analyses of each demographic variable revealed informative patterns. Specifically, younger and novice EFL teachers exhibited higher readiness levels. This finding underscores the need for lifelong education programs and targeted development for older teachers in relation to AI. Policymakers should address this issue by investigating the underlying reasons for the observed gap and identifying potential solutions. Developmental program initiatives could offer training tailored to older teachers to narrow the readiness gap between younger and older educators, thereby ensuring that all EFL teachers, regardless of age, can become skilled practitioners of AI. In terms of the gender variable, female EFL teachers showed greater readiness, indicating that they are more inclined to use AI in their practice. This finding, however, can be due to female predominance in Türkiye in language teaching. Thus, it is significant for male teachers to become more aware of the usage of AI in language instruction, therefore ensuring a more balanced adaptation across genders. Additionally,

teachers who are currently teaching at the primary level exhibited a higher propensity to adopt AI in their instructional practices than those teaching at the secondary or high school levels. These findings suggest that teachers of younger students may be more inclined to integrate AI to create engaging, gamified, and interactive classroom environments, whereas higher-grade teachers may prefer more traditional instructional approaches. Consequently, it is important to provide training for teachers across all grade levels to enable the use of age-appropriate AI applications, broaden AI's benefits across all levels, and raise awareness among higher-grade teachers that AI benefits extend beyond the gamification of lessons.

Furthermore, teachers employed in private schools appeared to be more prepared to implement AI in their classrooms. This may relate to the previously noted issues surrounding insufficient infrastructure readiness for AI applications. For Türkiye's public schools, in collaboration with the Ministry of Education (MEB), there is a need to allocate more time and resources to provide public school teachers with adequate training and to ensure institutional support, thereby improving the technical infrastructure of public schools and enabling equitable learning opportunities for all students.

The final research question examined EFL teachers' perceptions of AI. These findings were supported by both qualitative and quantitative data and were organized into two main categories: perceived advantages and perceived disadvantages of AI. Regarding perceived advantages, the study found that Turkish EFL teachers view AI as highly useful for both their teaching practices and students' pedagogical development. Teachers highlighted AI's benefits in terms of workload reduction through assistance with lesson planning, material preparation, and grading. They also noted using AI as a tool for idea generation for their classes and as support for their professional development. In terms of pedagogical advantages, teachers emphasized that AI enhances language instruction, offers personalization and adaptability, and increases student autonomy. Additionally, AI's potential to influence students' affective states by raising motivation and engagement was underscored. With respect to skill development, teachers specifically highlighted AI's contribution to developing speaking skills. This, however, indicates that AI in Türkiye is predominantly used or expected to be used for developing speaking skills, while its potential applications in other areas of language remain underutilized. Policymakers should establish clear guidelines for AI usage across additional language domains, including writing, reading, listening, grammar, vocabulary teaching, and pronunciation. It would be beneficial to train teachers in AI-based applications that support instruction across multiple language skills, not only speaking.

With regard to the drawbacks of AI in language education, educators highlighted several concerns. These include potential over-reliance on AI-based tools, the possibility that AI may undermine critical thinking and creativity, and the risk of fostering passivity among students. Additionally, the absence of face-to-face interaction was noted as detrimental to the development of

interpersonal skills essential for language learning. Ethical considerations were also raised, including potential threats to academic integrity and an increased inclination toward plagiarism among students. Finally, data security and privacy issues associated with AI were identified as significant disadvantages. These concerns highlight the imperative for well-defined ethical frameworks that regulate the appropriate application of AI in education. First, to mitigate the risk of student over-reliance, teacher training programs should emphasize the use of AI as a supplementary instructional resource rather than a replacement for human interaction, thereby ensuring that learners remain active agents in their own educational process. Second, educators must receive guidance and support in designing instructional materials and activities that cultivate critical thinking and creativity. With regard to ethical issues, institutional policies should be established to protect students' personal data. Additionally, promoting responsible AI use among students is essential, particularly in fostering awareness of academic integrity and plagiarism. Both teachers and learners should be explicitly informed about what constitutes plagiarism, while policymakers should further invest in the development of advanced plagiarism-detection tools and applications.

Finally, with regard to the future of AI, Turkish EFL teachers emphasized the importance of incorporating AI into curriculum design and stressed the need for continuous professional development to optimize its pedagogical potential. They generally perceived AI as an assistive tool that can support, rather than replace, educators. While some participants acknowledged that the traditional role of teachers may undergo transformation, the consensus was that AI cannot substitute for teachers, as the interpersonal dimension of teacher–student relationships and the provision of emotional support remain central to effective language learning. This further necessitates the development of policies that establish a foundation for integrating AI into language education in ways that complement, rather than undermine, the teacher's role, thereby safeguarding the integrity of the student–teacher relationship.

As both a researcher and an EFL teacher, I have been interested in the role of AI in education for several years. When I first began teaching, I initially used AI primarily to reduce my workload, particularly in preparing lesson plans and developing instructional materials. Over time, however, I began exploring a wider range of AI-based tools that could facilitate learning in my classroom. I also observed a similar trend among my colleagues, as increasing numbers of teachers around me gradually adopted AI in their own practice. Although we welcomed the advantages these tools provided, my colleagues and I frequently engaged in extensive discussions regarding the implications of AI—both for our professional practices and for the future of teaching. These conversations, often held informally in the teachers' lounge, inspired me to investigate the topic further and to seek insights from other EFL teachers about their perceptions.

From my own experience, I can confidently state that the findings of this study resonate strongly with my personal views, although I hold a somewhat more cautious and even pessimistic

outlook regarding the future role of teachers in relation to AI. I have witnessed firsthand that the integration of AI tools into language education can significantly enhance students' motivation and engagement. Lessons incorporating such tools were consistently more enjoyable for both me and my students. At the same time, however, I also encountered challenges, such as students relying on AI to complete assignments, raising concerns about academic integrity. Nonetheless, I firmly believe that AI will inevitably become an indispensable component of education, regardless of individual perspectives. This underscores the need for the establishment of sound policies that safeguard the quality of education while ensuring that AI is integrated in constructive, rather than exclusionary, ways. One of the primary motivations for conducting this study was to raise awareness of these issues and to amplify the voices of my fellow colleagues. I am grateful for the opportunity to reach out to other EFL teachers and to bring their perspectives on this relatively new issue to light.

In my view, my study makes a meaningful contribution to the existing body of literature in terms of focusing on in-service teachers and combining readiness and perceptions of EFL teachers. This study, thus, offers a more comprehensive overview of the utilization of AI. Furthermore, this research draws upon two comprehensive models—the TPACK framework and the TAM model—to provide deeper insights into the issue. Consequently, it is believed that this study will contribute to a deeper understanding of the issue among the relevant stakeholders.

6.2. Limitations and Suggestions for Future Studies

While the present study provides valuable insights into Turkish EFL teachers, it is not without certain limitations. In light of these limitations, several recommendations can be proposed for future research. The following section discusses these limitations and corresponding suggestions in a systematic, itemized manner.

- The first limitation of the current study concerns the sample size. The study was conducted with 90 EFL teachers from primary, secondary, and high school levels via an online survey. Consequently, the sample may provide a limited representation of the broader population. For instance, the distribution of teachers across age categories was uneven, with 10 participants in the 41–50 age range and only 2 in the 51–60 range, which may have affected the reliability of the findings. Therefore, future studies are recommended to pay careful attention to sample size and ensure a more balanced distribution across demographic variables.
- Secondly, the sampling strategy of the study represents another limitation. Although participation was not restricted to a specific institution or geographic area, a convenience sampling method was employed. As a result, participants were primarily drawn from the Black Sea Region, particularly Trabzon, where the researcher resides and is pursuing her

Master's degree, and Rize, where she has worked as an English teacher for two years. This may have influenced the findings, especially regarding teachers' infrastructural readiness, as rural areas in Turkey often face greater challenges related to internet connectivity and access to the necessary devices for integrating digital tools into language instruction. Therefore, for a better representation of the population, inspiring researchers may put special emphasis on this issue.

- Thirdly, continuing on the methodological limitations of the study, the study employed a sequential mixed-methods design. Although this design was specifically chosen to enable a more in-depth analysis of the research topic, a different method design may be used. For instance, in the Turkish context, there is a gap in the literature regarding the investigation of EFL teachers' perceptions of AI using case study methodologies. Thus, future insights may be made based on this shortcoming.
- Fourthly, regarding the theoretical limitations of the study, although it was grounded in the TPACK and TAM models, certain modifications were made based on the predetermined research questions. For example, in assessing teachers' readiness using the TPACK framework, the study focused only on the main components, namely TCK, TPK, and TK. Future research could incorporate additional TPACK components to provide more comprehensive insights into teachers' readiness. Similarly, in terms of teachers' perceptions, the survey primarily examined PU and negative attitudes, while other components, such as PEOU and BI, were addressed only through qualitative data. Consequently, future studies may consider explicitly including these components to gain a fuller understanding of teachers' perceptions and intentions regarding AI integration.
- Lastly, one of the major challenges encountered in this study was data collection. As AI is a relatively recent topic in the Turkish context, while this enhances the value of the study in contributing to the literature, it also limits its scope. There was a noticeable reluctance among some EFL teachers to participate in the survey. Consequently, most participants were already familiar with or actively using AI, which may have influenced the findings. Therefore, future research should take this into consideration to obtain a more representative understanding of teachers' perceptions and experiences.

REFERENCES

- AbdAlgane, Mohammed and Othman, Khalid Abdurrahman Jabir (2023), "Utilizing Artificial Intelligence Technologies in Saudi EFL Tertiary-level Classrooms", **Journal of Intercultural Communication**, 23(1), 92-99. <https://doi.org/10.36923/jicc.v23i1.124>
- Abdulov, Rafael (2020), "Artificial Intelligence as an Important Factor of Sustainable and Crisis-Free Economic Growth", **Procedia Computer Science**, 169(2020), 468–472. <https://doi.org/10.1016/j.procs.2020.02.223>
- Ahmed, Umar (2024), "Harnessing Digital Transformation with AI to Improve the Teaching and Learning of English as a Second Language in Nigeria", **International Journal of Literature Language and Linguistics**, 7(3), 35–44. <https://doi.org/10.52589/Ijlll-G5nohamk>
- Ahn, Jieun et al. (2024), "ChatGPT in ELT: Disruptor? or Well-Trained Teaching Assistant?", **ELT Journal**, 78(3), 345–355. <https://doi.org/10.1093/elt/ccae017>
- Ahn, Tae Youn and Lee, Sangmin-Michelle (2016), "User Experience of a Mobile Speaking Application with Automatic Speech Recognition for EFL Learning", **British Journal of Educational Technology**, 47(4), 778–786. <https://doi.org/10.1111/bjet.12354>
- Aithal, Poornaprajna (2024), "Super-Intelligent Machines - Analysis of Developmental Challenges and Predicted Negative Consequences", **International Journal of Applied Engineering and Management Letters (IJAEML)**, 7(3), 1-32. <https://doi.org/10.2139/ssrn.4683700>
- Akerkar, Rajendra (2014), **Introduction to Artificial Intelligence**, 2nd Ed., Prentice-Hall.
- Akgun, Selin and Greenhow, Christine (2021), "Artificial Intelligence in Education: Addressing Ethical Challenges in K-12 Settings", **AI Ethics**, 2(3), 431–440. <https://doi.org/10.1007/s43681-021-00096-7>
- Akman, Ezgi and Karahan, Pinar (2023), "ELT Students' Perceptions toward Mobile-Assisted Language Learning (MALL): Exploring its Effects on Motivation and Learner Autonomy", **International Journal of Educational Researchers**, 14(2), 1–20. <https://doi.org/10.29329/ijer.2023.565.1>
- Akyıldız, Seçil Tümen (2024), "Enhancing or Hindering? AI's Role in Sparking Creativity in Language Teaching: Insights from Private High School EFL Teachers", **International E-Journal of Educational Studies**, 8(18), 234–254. <https://doi.org/10.31458/iejes.1502509>
- Granström, Mikko and Oppi, Piret (2025), "Assessing Teachers' Readiness and Perceived Usefulness of AI in Education" **Frontiers in Education**, 10. <https://doi.org/10.3389/feduc.2025.1622240>

- Alammar, Ammar and Amin, Eman Abdel-Reheem (2023), "EFL Students' Perception of Using AI Paraphrasing Tools in English Language Research Projects", **Arab World English Journal**, 14(3) 166-181. <https://Dx.Doi.Org/10.24093/Awej/Vol14no3.11>
- Aldosemani, Tahani et al., (2023), "Automated Writing Evaluation in EFL Contexts", **International Journal of Computer-Assisted Language Learning and Teaching**, 13(1), 01-19. <https://Doi.Org/10.4018/Ijcallt.329962>
- Alenezi, Abdullah (2023), "Teacher Perspective on AI-Driven Gamification: Impact on Student Motivation, Engagement, and Learning Outcomes", **Information Technologies and Learning Tools**, 97(5), 138–148. <https://Doi.Org/10.33407/Itlt.V97i5.5437>
- Alharbi, Mohammed (2024), "The Role of Artificial Intelligence in Advancing English as a Foreign Language Teaching at Saudi Universities", **World Journal on Educational Technology Current Issues**, 16(3), 181–200. <https://Doi.Org/10.18844/Wjet.V16i3.9311>
- Alharthi, Thamer and Altarjami, Mohammed (2024), "The Use of MALL EFL Students at School Level Perceptions and Challenges", **Edelweiss Applied Science and Technology**, 8(6), 2862–2886. <https://Doi.Org/10.55214/25768484.V8i6.2574>
- Aljabr, Fahad and Al-Ahdal, Arif Ahmed Mohammed Hassan (2024), "Ethical and Pedagogical Implications of AI in Language Education: An Empirical Study at Ha'il University", **Acta Psychologica**, 251, 104605. <https://Doi.Org/10.1016/J.Actpsy.2024.104605>
- Al-Khresheh, Mohammed (2024), "Bridging Technology and Pedagogy from a Global Lens: Teachers' Perspectives on Integrating ChatGPT in English Language Teaching", **Computers and Education; Artificial Intelligence**, 6, 1-12. <https://doi.org/10.1016/j.caeai.2024.100218>
- Allali, Sarah and El Ghouati, Azize (2025), "EFL Classroom: Teachers' Perceptions and Intention to Use ChatGPT for Language Teaching", **Journal of Applied Language and Culture Studies**, 8(1), 189-209. <https://Revues.Imist.Ma/Index.Php/JALCS/Article/View/53549/27733>
- Almehmadi, Wesam Saad (2024), "Exploring the Potential of AI Techniques in Teaching English as a Foreign Language: A Systematic Literature Review", **Asian Journal of Social Sciences and Management Studies**, 11(2), 22–31. <https://doi.org/10.20448/ajssms.v11i2.5576>
- Almulhim, Abdulaziz and Aramco, Saudi (2024), "Introduction to Artificial Intelligence", **International Journal of Innovative Science and Research Technology (IJISRT)**, 9(7), 2619–2621. <https://Doi.Org/10.38124/Ijsrt/Ijsrt24jul1895>
- Alqaed, Mai Abdullah (2024), "AI in English Language Learning: Saudi Learners' Perspectives and Usage" **Advanced Education**, 12(25), 125–142. <https://doi.org/10.20535/2410-8286.318972>

- Al-Raimi, Mohammed et al., (2024), "To What Extent Has Artificial Intelligence Impacted EFL Teaching and Learning? A Systematic Review", **Arbitrer: Scientific Journal of Linguistics Society of Indonesia**, 11(3), 399–412. <https://Doi.Org/10.25077/Ar.11.3.399-412.2024>
- Alrajhi, Assim (2024), "Artificial Intelligence Pedagogical Chatbots as L2 Conversational Agents", **Cogent Education**, 11(1), 1-18. <https://Doi.Org/10.1080/2331186x.2024.2327789>
- Alrishan, Amal Mohammad Husein (2023), "Determinants of Intention to Use ChatGPT for Professional Development Among Omani EFL Pre-service teachers. International Journal of Learning", **Teaching and Educational Research**, 22(12), 187-209. <https://doi.org/10.26803/ijlter.22.12.10>
- Alsalem, Mashael Salem (2024), "EFL Teachers' Perceptions of the Use of an AI Grading Tool (Cograder) in English Writing Assessment at Saudi Universities: An Activity Theory Perspective", **Cogent Education**, 11(1), 1-18. <https://Doi.Org/10.1080/2331186x.2024.2430865>
- Al-Sofi, Bakr Bagash Mansour Ahmed (2024), "Artificial Intelligence-Powered Tools and Academic Writing: To Use or Not to Use ChatGPT", **Saudi Journal of Language Studies**, 4(3), 145-161. <https://Doi.Org/10.1108/Sjls-06-2024-0029>
- Al-Suqri, Mohammed Nasser and Al-Kharusi, Rahma Mohammed (2015), "Ajzen and Fishbein's Theory of Reasoned Action (TRA) (1980). In **Information Seeking Behavior and Technology Adoption: Theories and Trends** (pp. 188–204). <https://Doi.Org/10.4018/978-1-4666-8156-9.Ch012>
- Altinay, Zehra et al., (2024), "Factors Influencing AI Learning Motivation and Personalization Among Pre-Service Teachers in Higher Education", **MIER Journal of Educational Studies Trends & Practices**, 14(2), 462–481. <https://Doi.Org/10.52634/Mier/2024/V14/I2/2714>
- AlTwijri, Lujain and Alghizzi, Talal Musaed (2024), "Investigating the Integration of Artificial Intelligence in English as Foreign Language Classes for Enhancing Learners' Affective Factors: A Systematic Review", **Heliyon**, 10(10), e31053. <https://doi.org/10.1016/j.heliyon.2024.e31053>
- Amin, Momen Yaseen (2023), "AI and ChatGPT in Language Teaching: Enhancing EFL Classroom Support and Transforming Assessment Techniques", **International Journal of Higher Education Pedagogies**, 4(4), 1–15. <https://Doi.Org/10.33422/Ijhep.V4i4.554>
- An, Xin et al. (2023), "Modelling Students' Perceptions of Artificial Intelligence-Assisted Language Learning", **Computer Assisted Language Learning**, 38(5-6), 1–22. <https://doi.org/10.1080/09588221.2023.2246519>.

- _____ (2022), “Modelling English Teachers’ Behavioural Intention to Use Artificial Intelligence in Middle Schools”, **Education and Information Technologies**, 28(5), 5187–5208. <https://Doi.Org/10.1007/S10639-022-11286-Z>
- Anderson, Henry (2019), “Assessing the Fairness of Graduation Predictions”, **Proceedings of the 12th International Conference on Educational Data Mining**, 488–491. <https://tls.tc/rUens>
- Artemova, Inna (2024), “Bridging Motivation and AI in Education: An Activity Theory Perspective”, **Digital Education Review**, 45(2024), 59–67. <https://Doi.Org/10./Der.2024.45.59-67>
- Arya, Ritu and Verma, Ashish (2024), “Role of Artificial Intelligence in Education”, **International Journal of Advanced Research in Science Communication and Technology**, 4(2), 589–594. <https://Doi.Org/10.48175/Ijarsct-19461>
- Aydın, Selami and Zeinolabedini, Maryam (2024), “Integrating Artificial Intelligence into Foreign Language Learning: Learners’ Perspectives”, Şenel Poyrazlı (Ed.), **XI International Eurasian Educational Research Congress**. Turkey: Kocaeli, 121-126. <https://eric.ed.gov/?id=ED662814>
- Azzahra, Naziha et al. (2024), “A Study on English Students’ Perception Regarding the AI Implementation on Listening and Speaking Skills”, **Indonesian Journal of Innovation and Applied Sciences**, 4(2), 113–120. <https://Doi.Org/10.47540/Ijias.V4i2.1466>
- Babu, Sowri and Banana, Krishna (2024), “A Study on Narrow Artificial Intelligence—An Overview”, **International Journal of Engineering Science and Advanced Technology (IJESAT)**, 24(4), 210-219. https://Www.Ijesat.Com/Ijesat/Files/V24I0428_1714383466.Pdf
- Balatero, Lea Me et al. (2024), “ESL Pre-Service Teachers’ Literacy and Acceptance of CHATGPT as a Generative AI Tool for Writing: A Sequential Explanatory Study”, **Journal of Tertiary Education and Learning**, 2(3), 13–29. <https://Doi.Org/10.54536/Jtel.V2i3.3365>
- Bao, M. (2019). Can Home Use of Speech-Enabled Artificial Intelligence Mitigate Foreign Language Anxiety – Investigation of a Concept. *Arab World English Journal*, 5, 28–40. <https://Doi.Org/10.24093/Awej/Call5.3>
- Barabad, Majid Ghaleb and Anwar, Muhammad Bilal (2024), “Exploring ChatGPT’s Role in English Learning for EFL Students: Insights and Experiences”, **International Journal of Innovative Science and Research Technology**, 9(9), 755–766. <https://Doi.Org/10.38124/Ijisrt/Ijisrt24sep347>
- Barrett, Anthony and Baum, Seth (2016), “A Model of Pathways to Artificial Superintelligence Catastrophe for Risk and Decision Analysis” **Journal of Experimental & Theoretical Artificial Intelligence**, 29(2), 397–414. <https://doi.org/10.1080/0952813x.2016.1186228>
- Barrot, Jessie Saraza (2020), “Integrating Technology into ESL/EFL Writing Through Grammarly”, **RELC Journal**, 53(3), 764–768. <https://Doi.Org/10.1177/0033688220966632>

- Bates, Tony et al. (2020), “Can Artificial Intelligence Transform Higher Education”, **International Journal of Educational Technology in Higher Education**, 17(1), 1-12. <https://Doi.Org/10.1186/S41239-020-00218-X>
- Beatty, Ken (2013). **Teaching & Researching: Computer-Assisted Language Learning**, 2nd Ed., Routledge, London.
- Bensalah, Hiba (2024), “Exploring the Potential Synergy of Quill Bot as a Natural Language Processing Tool in Demystifying Academic Writing”, **Artificial Intelligence and Education and Online Learning**, 5(3), 80–96. <https://Doi.Org/10.70091/Atras/Ai.5>
- Bin, Yi and Mandal, Durbadal (2019), “English Teaching Practice Based on Artificial Intelligence Technology”, **Journal of Intelligent & Fuzzy Systems**, 37(3), 3381–3391. <https://Doi.Org/10.3233/Jifs-179141>
- Bird, Kelli et al. (2024), “Are Algorithms Biased in Education? Exploring Racial Bias in Predicting Community College Student Success”, **Journal of Policy Analysis and Management**, 44(2). <https://Doi.Org/10.1002/Pam.22569>
- Bit, Dipanwita et al. (2024), “The Impact of Artificial Intelligence in the Educational System”, **International Journal of Scientific Research in Science and Technology**, 11(4), 419–427. <https://Doi.Org/10.32628/Ijsrst2411424>
- Bobro, Natalia (2024), “Advantages and Disadvantages of Implementing Artificial Intelligence in the Educational Process”, **Young Scientist**, 4 (128), 72-76. <https://Doi.Org/10.32839/2304-5809/2024-4-128-38>
- Bostancıoğlu, Ali and Handley, Zoe (2018), “Developing and Validating a Questionnaire for Evaluating the EFL ‘Total Package’: Technological Pedagogical Content Knowledge (TPACK) for English as a Foreign Language (EFL)”, **Computer Assisted Language Learning**, 31(5–6), 572–598. <https://Doi.Org/10.1080/09588221.2017.1422524>
- Braun, Virginia and Clarke, Victoria (2006), “Using Thematic Analysis in Psychology”, **Qualitative Research in Psychology**, 3(2), 77–101. <https://Doi.Org/10.1191/1478088706qp063oa>
- Brusilovsky, Peter (2001), “Adaptive Hypermedia”, **User Modeling and User-Adapted Interaction**, 11(1/2), 87–110. <https://doi.org/10.1023/a:1011143116306>
- Bulut, Okan et al. (2024), “The Rise of Artificial Intelligence in Educational Measurement: Opportunities and Ethical Challenges”, **Chinese/English Journal of Educational Measurement and Evaluation**, 5(3), 1-34. <https://Doi.Org/10.59863/MiBulutql7785>
- Burgsteiner, Harald et al. (2016), “Irobot: Teaching the Basics of Artificial Intelligence in High Schools”, **Proceedings of the AAAI Conference on Artificial Intelligence**, 30(1), 4126-4127. <https://Doi.Org/10.1609/Aaai.V30i1.9864>

- Busso, Alexsis and Sanchez, Becky (2024), “Advancing Communicative Competence in the Digital Age: A Case for AI Tools in Japanese University EFL Programs”, **Technology in Language Teaching & Learning**, 6(3), 1–17. <https://doi.org/10.29140/Tltl.V6n3.1211>
- Cahyono, Bambang (2024), “Revisiting Technological Tools Used in EFL Speaking Classes During the COVID-19 Pandemic: What Are the Implications for the Post-Pandemic?”, **The JALT CALL Journal**, 20(2), 1–21. <https://doi.org/10.29140/Jaltcall.V20n2.1054>
- Cao, Leyi (2025), “A Study on the Readiness of English Teachers in Macao Universities in the Era of AI”, **Asian Education and Development Studies**, 14(4), 680–699. <https://doi.org/10.1108/aeds-12-2024-0314>
- Castéra, Jérémy et al. (2020), “Self-reported TPACK of Teacher Educators Across Six Countries in Asia and Europe”, **Education and Information Technologies**, 25(4), 3003–3019. <https://doi.org/10.1007/s10639-020-10106-6>
- Çelik, Servet and Aytin, Kübra (2014), “Teachers' Views on Digital Educational Tools in English Language Learning: Benefits and Challenges in the Turkish Context”, **The Electronic Journal for English as a Second Language**, 18(2), 1-18. <https://eric.ed.gov/?id=EJ1045127>
- Cerda, Jazmín Guillén et al. (2024), “COVID-19 Educational Side Effects: Pre-Service EFL Teachers’ Use of Digital Education Tools”, **Revista Educación** 48(2), 1-20. <https://doi.org/10.15517/Revedu.V48i2.58581>
- Chai, Ching Sing et al. (2010), “Facilitating Preservice Teachers’ Development of Technological, Pedagogical, and Content Knowledge (TPACK)”, **Educational Technology and Society**, 13(4), 63-73. <http://www.jstor.org/stable/jeductechsoci.13.4.63>
- Chan, Cecilia Ka Yuk (2024), “Students’ Perceptions of ‘AI-giarism’: Investigating Changes in Understandings of Academic Misconduct”, **Education and Information Technologies**, 30, 8087–8108. <https://doi.org/10.1007/s10639-024-13151-7>
- Chan, Kevin Kai-Wing and Tang, William Ko-Wai (2024), “Evaluating English Teachers’ Artificial Intelligence Readiness and Training Needs with A TPACK-Based Model”, **World Journal of English Language**, 15(1), 129. <https://doi.org/10.5430/Wjel.V15n1p129>
- Chandran, Thanussha Nair and Ismail, Hanita Hanim (2023), “Exploring Mobile Assisted Language Learning in Enhancing Reading Skill Among ESL Learners: A Concept Paper”, **International Journal of Academic Research in Business and Social Sciences**, 13(12), 3240-3249. <https://doi.org/10.6007/Ijarbss/V13-I12/20193>
- Hsiao, Jo-Chi and Chang, Jason (2023), “Enhancing EFL Reading and Writing Through AI-Powered Tools: Design, Implementation, and Evaluation of an Online Course”, **Interactive Learning Environments**, 32(9), 1–16. <https://doi.org/10.1080/10494820.2023.2207187>

- Chen, Binbin et al. (2023), “A Multi-Strategy Computer-Assisted EFL Writing Learning System with Deep Learning Incorporated and Its Effects on Learning: A Writing Feedback Perspective”, **Journal of Educational Computing Research**, 61(8), 60–102. <https://doi.org/10.1177/07356331231189294>
- Chen, Ching-Huei et al. (2021), “Virtual reality in Problem-Based Learning Contexts: Effects on the Problem-Solving Performance, Vocabulary Acquisition, and Motivation of English language Learners”, **Journal of Computer Assisted Learning**, 37(3), 851–860. <https://doi.org/10.1111/jcal.12528>
- _____ (2020), “A Chatbot for Learning Chinese: Learning Achievement and Technology Acceptance”, **Journal of Educational Computing Research**, 58(6), 1161–1189. <https://doi.org/10.1177/0735633120929622>
- Chen, Ping (2022), “Design and Construction of an Interactive Intelligent Learning System for English Learners in Higher Education Institutions”, **Advances in Multimedia**, 2022(1), 1–8. <https://doi.org/10.1155/2022/6364796>
- Chen, Xieling et al. (2020), “Application and Theory Gaps During the Rise of Artificial Intelligence in Education” **Computers and Education Artificial Intelligence**, 2020(1), 1-20. <https://doi.org/10.1016/J.Caeai.2020.100002>
- Cheng, Ruzhang (2024), “Examining the Impact of Online Help-Seeking Strategies on Promoting EFL Learners’ Self-Regulated and Collaborative Learning Skills, Language Learning Outcomes, and Perceptions in CALL Environments”, **Journal of Educational Computing Research**, 63(1). <https://doi.org/10.1177/07356331241301226>
- Chounta, Irene-Angelica (2021), “Exploring Teachers’ Perceptions of Artificial Intelligence as a Tool to Support their Practice in Estonian K-12 Education”, **International Journal of Artificial Intelligence in Education**, 32(3), 725–755. <https://doi.org/10.1007/s40593-021-00243-5>
- Chuah, Kee-Man and Muhammad Kamarul (2021), “Teachers’ Views on the Use of Chatbots to Support English Language Teaching in a Mobile Environment”, **International Journal of Emerging Technologies in Learning (IJET)**, 16(20), 223. <https://doi.org/10.3991/Ijet.V16i20.24917>
- Chun, Hyeon-ju (2020), “Searching for the Coexistence Paradigm of Human Translator and Machine Translation: Focusing on PBL-Based Translation Practicum Class with AI Machine Translation Tools”, **The Journal of Interpretation and Translation Education**, 18(4), 59–96. DOI: 10.23903/kaited.2020.18.4.003
- Chung, Ji Young and Jeong, Seung-Hoon (2024), “Exploring the Perceptions of Chinese Pre-Service Teachers on the Integration of Generative AI in English Language Teaching: Benefits,

- Challenges, and Educational Implications”, **Online Journal of Communication and Media Technologies**, 14(4), 1-10. <https://Doi.Org/10.30935/Ojcm/15266>
- Cizrelioğlu, İdil and Aydın, Selami (2024), “Using Artificial Intelligence in EFL Learning Among Multilingual Young Learners”, **Advances in Educational Technologies and Instructional Design Book Series**, 303–322. <https://Doi.Org/10.4018/979-8-3693-7255-5.Ch013>
- Clarebout, Geraldine et al. (2014). Support Device Usage. In Michael Spector, David Merrill, Jan Elen, and M. J. Bishop (Eds.), **Handbook of Research on Educational Communications and Technology**, 4th Ed., (pp. 519–26). Springer.
- Cohen, Louis et al. (2017), **Research Methods in Education**, 8th Ed., Routledge Ebooks. <https://Doi.Org/10.4324/9781315456539>
- Cong-Lem, Ngo et al. (2024), “Academic Integrity in the Age of Generative AI: Perceptions and Responses of Vietnamese EFL Teachers”, **Teaching English with Technology**, 24(1), 28–47. <https://Doi.Org/10.56297/FSYB3031/MXNB7567>
- Cotos, Elena (2023), “Automated feedback on writing”, In Otto Kruse, Christian Rapp, Chris Anson, Kalliopi Benetos, Ellena Cotos, Ann Devitt, and Antonette Shibani (Eds.), **Digital writing technologies in higher education: Theory, research, and practice** (pp. 347–364). Springer. https://doi.org/10.1007/978-3-031-36033-6_22
- Creswell, John Ward and Plano Clark, Vicki (2018), **Designing and Conducting Mixed Methods Research**, 3rd Ed., Sage.
- Cuhadar, Cem (2018), “Investigation of Pre-Service Teachers’ Levels of Readiness to Technology Integration in Education”, **Contemporary Educational Technology**, 9(1), 61-75. <https://dergipark.org.tr/en/pub/cet/issue/34282/378831>
- Dakakni, Deema and Safa, Nehme (2023), “Artificial Intelligence in the L2 Classroom: Implications and Challenges on Ethics and Equity in Higher Education: A 21st-Century Pandora’s Box”, **Computers and Education: Artificial Intelligence**, 5, 1-10. <https://doi.org/10.1016/j.caeai.2023.100179>
- Damar, Muhammet et al. (2024), “Super AI, Generative AI, Narrow AI, and Chatbots: An Assessment of Artificial Intelligence Technologies for the Public Sector and Public Administration”, **Journal of AI**, 8(1), 83–106. <https://Doi.Org/10.61969/Jai.1512906>
- Darwin, Negeri et al. (2023), “Critical Thinking in the AI Era: An Exploration of EFL Students’ Perceptions, Benefits, and Limitations”, **Cogent Education**, 11(1), 1-18. <https://doi.org/10.1080/2331186x.2023.2290342>
- Dashtestani, Reza (2013), “Implementing Mobile-Assisted Language Learning (MALL) in an EFL Context: Iranian EFL Teachers' Perspectives on Challenges and Affordances”, **JALT CALL Journal**, 9(2), 149-168. <https://Files.Eric.Ed.Gov/Fulltext/EJ1108023.Pdf>

- Davis, Fred (1986). **A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results** [Doctoral Dissertation, Massachusetts Institute of Technology]. MIT Sloan School of Management.
- _____ (1989), “Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology”, **MIS Quarterly**, 13(3), 319. <https://doi.org/10.2307/249008>
- Daweli, Talal Waleed and Moqbel Mahoub, Rain Abdulrhman (2024), “Exploring EFL Learners’ Perspectives on Using AI Tools and Their Impacts in Reading Instruction: An Exploratory Study”, **Arab World English Journal**, 160-171. <https://doi.org/10.24093/Awej/Call10.11>
- De la Vall, Roxana Rebolledo Font and Araya, Fabián González (2023), “Exploring the Benefits and Challenges of AI-Language Learning Tools”, **International Journal of Social Sciences and Humanities Invention**, 10(1), 7569–7576. <https://doi.org/10.18535/ijsshi/v10i01.02>
- Dehghani, Hooria & Mashhadi, Amir (2024), “Exploring Iranian English as a Foreign Language Teachers’ Acceptance of ChatGPT in English Language Teaching: Extending the Technology Acceptance Model”, **Education and Information Technologies**, 29, 19813–19834. <https://doi.org/10.1007/s10639-024-12660-9>
- Dei, Maryna (2024), “The Impact of AI on The Adaptation of Educational Materials and Teaching Methods to the Needs of Each Student” **Latia**, 3 (124), 1-8. <https://doi.org/10.62486/Latia2025124>
- Devasena, R. (2024), “Artificial Intelligence in Education: An Alternative to Traditional Learning”, **Journal of English Language Teaching**, 66(1), 13–21. <https://journals.eltai.in/index.php/jelt/article/download/JELT660103/1055>
- Dilzhan, Balnur (2024), **Teaching English and Artificial Intelligence: EFL teachers’ Perceptions and Use of ChatGPT** [Preprint]. OSF. <https://doi.org/10.35542/osf.io/fwy92>
- Dincher, Matthias and Wagner, Valentin (2021), “Teaching in Times of COVID-19: Determinants of Teachers’ Educational Technology Use” **Education Economics**, 29(5), 461–470. <https://doi.org/10.1080/09645292.2021.1920000>
- Dong, Yifan (2023), “Revolutionizing Academic English Writing Through AI-powered Pedagogy: Practical Exploration of Teaching Process and Assessment” **Journal of Higher Education Research**, 4(2), 52-57. <https://doi.org/10.32629/jher.v4i2.1188>
- Dornyei, Zoltan (2007), **Research Methods in Applied Linguistics**, Oxford: Oxford University Press, London.
- Dornyei, Zoltan (2010), **Questionnaires in Second Language Research: Construction, Administration and Processing**, Routledge.

- Dreyfus, Hubert (1992). **What Computers Still Can't Do: A Critique of Artificial Reason**. MIT Press.
- Du, Jinming and Daniel, Ben Kei (2024), "Transforming Language Education: A Systematic Review of AI-Powered Chatbots for English as a Foreign Language Speaking Practice", **Computers and Education Artificial Intelligence**, 6, 100230. <https://doi.org/10.1016/j.caeai.2024.100230>
- Du, Qian and Tate, Tamara (2024), "ChatGPT, Plagiarism, and Multilingual Students' Learning to Write" **The CATESOL Journal**, 35(1). <https://doi.org/10.5070/B5.34831>
- Duan, Na et al. (2019), "Classification of Multichannel Surface-Electromyography Signals Based on Convolutional Neural Networks", **Journal of Industrial Information Integration**, 15(2019), 201–206. <https://doi.org/10.1016/j.jii.2018.09.001>
- Dulundu, Alp (2024), "AI In Education: Benefits and Concerns" **Next Generation**, 8(1). <https://doi.org/10.62802/3fr4f412>
- Duong, Tam and Suppasetsee, Suksan (2024), "The Effects of an Artificial Intelligence Voice Chatbot on Improving Vietnamese Undergraduate Students' English-Speaking Skills", **International Journal of Learning, Teaching and Educational Research**, 23(3), 293–321. <https://doi.org/10.26803/Ijlt.23.3.15>
- Ebadi, Saman & Amini, Asieh (2022), "Examining the Roles of Social Presence and Human-Likeness on Iranian EFL Learners' Motivation Using Artificial Intelligence Technology: A Case of CSIEC Chatbot", **Interactive Learning Environments**, 32(2), 655–673. <https://doi.org/10.1080/10494820.2022.2096638>
- Eldin, Ahmed Hassan Seif (2024), "Using Artificial Intelligence in EFL Teacher Education Programs", **Deleted Journal**, 2(1), 26–35. <https://doi.org/10.21608/seg.2024.272816.1004>
- Elmahdi, Omer Elsheikh Hago et al. (2024), "AI's Role in EFL: Optimizing Opportunities while Mitigating Risks", **International Journal of Linguistics, Literature and Translation**, 7(10), 21–37. <https://doi.org/10.32996/ijllt.2024.7.10.4>
- Ersozlu, Zara et al. (2024), "A Review of Machine Learning Methods Used for Educational Data", **Education and Information Technologies**, 29(16), 22125–22145. <https://doi.org/10.1007/S10639-024-12704-0>
- Ertmer, Peggy (1999), "Addressing First- and Second-Order Barriers to Change: Strategies for Technology Integration", **Educational Technology Research and Development**, 47(4), 47–61. <https://doi.org/10.1007/BF02299597>
- Fassbender, William Joseph (2024), "I Can Almost Recognize its Voice": AI and its Impact on Ethical Teacher-Centaur Labor, **English Teaching**, 23(1), 104-117. <https://doi.org/10.1108/etpc-08-2023-0101>

- Fatima, Paiker et al. (2024), "Teaching Listening Skills to EFL Students Using AI-Driven Technology-Based Media", **Evolutionary Studies in Imaginative Culture**. <https://Doi.Org/10.70082/Esiculture.Vi.1610>
- Fetzer, James (2012), **Artificial Intelligence: Its Scope and Limits**, Springer Science & Business Media.
- Fitria, Tira Nur (2021), "Grammarly As AI-Powered English Writing Assistant: Students' Alternative for Writing English" **Metathesis Journal of English Language Literature and Teaching**, 5(1), 65. <https://Doi.Org/10.31002/Metathesis.V5i1.3519>
- Forbes (2025), "AI in Education: Why Teachers Need Tools, Time and Training", <https://www.forbes.com/sites/sarahhernholm/2025/06/19/ai-in-education-why-teachers-need-tools-time-and-training/> (19. 06.2025).
- Gao, Lulu (2024), "Impact of ChatGPT on Academic Integrity and Assessment Effectiveness for E-Learning in Higher Education: The Need for Redesigning Assessment Practices", **Communications in Humanities Research**, 45(1), 40–44. <https://Doi.Org/10.54254/2753-7064/45/20240084>
- Gayed, John Maurice (2025), "Educators' Perspective on Artificial Intelligence: Equity, Preparedness, and Development", **Cogent Education**, 12(1). <https://doi.org/10.1080/2331186x.2024.2447169>
- Ghafouri, Mohammad et al. (2024), "From Virtual Assistant to Writing Mentor: Exploring the Impact of a ChatGPT-Based Writing Instruction Protocol on EFL Teachers' Self-Efficacy and Learners' Writing Skill", **Language Teaching Research**, 1-23. <https://doi.org/10.1177/13621688241239764>
- Gill, Karamjit (2016), "Artificial Super Intelligence: Beyond Rhetoric", **AI & Society**, 31(2), 137–143. <https://Doi.Org/10.1007/S00146-016-0651-X>
- Gligorea, Ilie et al. (2023), "Adaptive Learning Using Artificial Intelligence in E-Learning: A Literature Review", **Education Sciences**, 13(12). <https://Doi.Org/10.3390/Educsci13121216>
- Gnanaprakasam, Johnbenedic and Lourdusamy, Ravi (2024), "The Role of AI in Automating Grading: Enhancing Feedback and Efficiency", In Seifedine Kadry (Ed.), **Artificial Intelligence and Education Shaping the Future of Learning** (pp. 133- 150). Bod – Books on Demand.
- Gönen, Safiye İpek & Zeybek, Gülin (2022), "Training on Multimodal Mobile-Assisted Language Learning: A Suggested Model for Pre-Service EFL Teachers", **Computer Assisted Language Learning**, 37(7), 2202–2223. <https://Doi.Org/10.1080/09588221.2022.2157016>

- Gounder, Novashnee et al. (2024), "Integrating Adaptive Intelligent Tutoring Systems into Private Higher Educational Institutes", **2021 IST-Africa Conference (IST-Africa)**, 1–13. <https://doi.org/10.23919/ist-africa63983.2024.10569565>
- Grand View Research. (2021), "AI in Education Market Size, Share & Trends Analysis Report. Grand View Research", <https://www.grandviewresearch.com/industry-analysis/artificial-intelligence-ai-education-market-report>
- Granić, Andrina and Marangunić, Nikola (2019), "Technology Acceptance Model in Educational Context: A Systematic Literature Review", **British Journal of Educational Technology**, 50(5), 2572–2593. <https://Doi.Org/10.1111/Bjet.12864>
- Grassini, Simone (2023), "Development and Validation of the AI Attitude Scale (AIAS-4): A Brief Measure of General Attitude Toward Artificial Intelligence", **Frontiers in Psychology**, 14(2023), 1-12. <https://Doi.Org/10.3389/Fpsyg.2023.1191628>
- Guo, Yumeng and Wang, Yongliang (2024), "Exploring the Effects of Artificial Intelligence Application on EFL Students' Academic Engagement and Emotional Experiences: A Mixed-Methods Study", **European Journal of Education**, 60 (1), 1-15. <https://Doi.Org/10.1111/Ejed.12812>
- Gupta, Tarang (2024), "Adaptive Learning Systems: Harnessing AI To Personalize Educational Outcomes", **International Journal for Research in Applied Science and Engineering Technology**, 12(11), 458–464. <https://Doi.Org/10.22214/Ijaset.2024.65088>
- Habib, Husna et al. (2023), "From Assessment to Empowerment: The Role of AI in Special Education Progress Monitoring", **Journal of Multidisciplinary Research (JOMR)**, 9(1), 67–98. <https://Jomresearch.Com/Index.Php/Jomr/Article/View/41>
- Hadbi, Atmane et al. (2024), "Design and Implementation of an Adaptive Tutoring System for Enhanced E-Learning", **Data & Metadata**, 4(2025), 1-9. <https://Doi.Org/10.56294/Dm2025469>
- Hading, Eka Fatmawati et al. (2024), "EFL Students' Perceptions on the Integration of AI in Fostering Critical Thinking Skills", **Global English Insights Journal**, 2(1), 1–10. <https://Doi.Org/10.61220/Glens.V2i1.466>
- Hafour, Marwa (2022), "The Effects of MALL Training on Preservice and In-Service EFL Teachers' Perceptions and Use of Mobile Technology", **Recall**, 34(3), 274–290. <https://Doi.Org/10.1017/S0958344022000015>
- Halepoto, Aqsa et al. (2022), "Educators' Perceptions Towards Mobile Assisted Language Learning (MALL)", **Global Language Review**, 7(2), 257–266. [https://Doi.Org/10.31703/Glr.2022\(Vii-Ii\).22](https://Doi.Org/10.31703/Glr.2022(Vii-Ii).22)

- Hamid, Abdul et al. (2024), “The Effect of the Use of Mobile Learning Applications on Students’ Listening Skills”, **Journal of Pedagogi**, 1(5), 99–108. <https://doi.org/10.62872/78841557>
- Hamlaoui, Sihem (2021), “Teachers’ Resistance to Educational Change and Innovations in the Middle East and North Africa: A Case Study of Tunisian Universities”, In Rachid Ouaisa, Friederike Pannewick, and Alena Strohmaier (Eds.), **Re-Configurations**, (pp. 171–184). Springer VS. https://doi.org/10.1007/978-3-658-31160-5_11
- Han, Daeun (2021), “An Analysis of Korean EFL Learners’ Experience on English Classes Using AI Chatbot”, **J-Institute: Robotics & AI Ethics**, 6(3), 1–9. <https://doi.org/10.22471/ai.2021.6.3.01>
- Harry, Alexandra and Sayudin, Sayudin (2023), “Role of AI in Education”, **Interdisciplinary Journal and Humanity (INJURY)**, 2(3), 260–268. <https://doi.org/10.58631/Injury.V2i3.52>
- Hasanov, Aziz et al. (2019), “A Survey of Adaptive Context-Aware Learning Environments”, **Journal of Ambient Intelligence and Smart Environments**, 11(5), 403–428. <https://doi.org/10.3233/Ais-190534>
- Hava, Kevser and Babayiğit, Özgür (2024), “Exploring the Relationship Between Teachers’ Competencies in AI-TPACK and Digital Proficiency”, **Education and Information Technologies**, 30, 3491–3508. <https://doi.org/10.1007/s10639-024-12939-x>
- Hawari, Nubli & Oktavia, Tanty (2024), “Design of an Intelligent Tutoring System – Student Model: Predicting Learning Style”, **Engineering Mathematics and Computer Science (EMACS) Journal**, 6(1), 45–53. <https://doi.org/10.21512/Emacsjournal.V6i1.10938>
- Hazaea, Abduljalil Nasr and Alzubi, Ali Abbas (2018), “Impact of Mobile Assisted Language Learning on Learner Autonomy in EFL Reading Context”, **Journal of Language and Education**, 4(2), 48–58. <https://doi.org/10.17323/2411-7390-2018-4-2-48-58>
- Hazaymeh, Wafa et al. (2024), “EFL Instructors’ Perspective on Using AI Applications in English as a Foreign Language Teaching and Learning”, **Emerging Science Journal**, 8, 73-87. <https://doi.org/10.28991/esj-2024-sied1-05>
- Hesse-Biber, Sharlene Nagy (Ed.) (2007), **Handbook of Feminist Research: Theory and Praxis**, Thousand Oaks, CA: Sage Publications Inc.
- Hieu, Hua Hong and Thao, Le Thanh (2024), “Exploring the Impact of AI in Language Education: Vietnamese EFL Teachers’ Views on Using ChatGPT for Fairy Tale Retelling Tasks”, **International Journal of Learning, Teaching and Educational Research**, 23(3), 486–503. <https://doi.org/10.26803/ijlter.23.3.24>
- Holden, Heather and Rada, Roy (2011), “Understanding the Influence of Perceived Usability and Technology Self-Efficacy on Teachers’ Technology Acceptance”, **Journal of Research on**

Technology in Education, 43(4), 343–367.
<https://doi.org/10.1080/15391523.2011.10782576>

- Hopcan, Sinan et al. (2023), “Exploring the Artificial Intelligence Anxiety and Machine Learning Attitudes of Teacher Candidates”, **Education and Information Technologies**, 29(6), 7281–7301. <https://doi.org/10.1007/s10639-023-12086-9>
- Huang, Weijiao et al. (2021), “Chatbots for Language Learning—Are They Really Useful? A Systematic Review of Chatbot-Supported Language Learning”, **Journal of Computer Assisted Learning**, 38(1), 237–257. <https://doi.org/10.1111/Jcal.12610>
- Hussain, Muhammad Athar et al. (2024), “Role of Artificial Intelligence in Education”, **International Journal of Social Science & Entrepreneurship**, 4(3), 148–164. <https://doi.org/10.58661/Ijsse.V4i3.306>
- Hwang, Gwo-Jen et al. (2024), “Enhancing EFL Learners’ Speaking Skills, Foreign Language Enjoyment, and Language-Specific Grit Utilising the Affordances of a MALL App: A Microgenetic Perspective”, **Computers & Education**, 214, 105015. <https://doi.org/10.1016/J.Compedu.2024.105015>
- _____ (2020), “A Fuzzy Expert System-based Adaptive Learning Approach to Improving Students’ Learning Performances by Considering Affective and Cognitive Factors”, **Computers and Education Artificial Intelligence**, 1, 100003. <https://doi.org/10.1016/j.caeai.2020.100003>
- Hwang, Gwo-Jen et al. (2020), “Vision, Challenges, Roles and Research Issues of Artificial Intelligence in Education”, **Computers and Education Artificial Intelligence**, 1, 100001. <https://doi.org/10.1016/J.Caeai.2020.100001>
- Jafarian, Koorosh et al. (2012), “The Effect of Computer-Assisted Language Learning (CALL) on EFL High School Students’ Writing Achievement”, **European Journal of Social Sciences**, 27(2), 138-148. <https://L24.Im/Tmqv>
- Jamshed, Mohammad et al. (2024), “The Impact of ChatGPT on English Language Learners’ Writing Skills”, **International Journal of Interactive Mobile Technologies**, 18(19), 18–36. <https://doi.org/10.3991/Ijim.V18i19.50361>
- Jeon, Jaeho (2021), “Exploring AI Chatbot Affordances in the EFL Classroom: Young Learners’ Experiences and Perspectives”, **Computer Assisted Language Learning**, 37 (1-2), 1-26. <https://doi.org/10.1080/09588221.2021.2021241>
- Jiang, Ruihong (2022), “How Does Artificial Intelligence Empower EFL Teaching and Learning Nowadays? A Review on Artificial Intelligence in the EFL Context”, **Frontiers in Psychology**, 13. <https://doi.org/10.3389/fpsyg.2022.1049401>

- Jiang, Yuchen et al. (2022), “Quo Vadis Artificial Intelligence?”, **Discover Artificial Intelligence**, 2(1). <https://Doi.Org/10.1007/S44163-022-00022-8>
- Ka’bi, Amin Al (2023), “Proposed Artificial Intelligence Algorithm and Deep Learning Techniques for the Development of Higher Education”, **International Journal of Intelligent Networks**, 4, 68–73. <https://Doi.Org/10.1016/J.Ijin.2023.03.002>
- Kabudi, Tumaini et al. (2021), “AI-Enabled Adaptive Learning Systems: A Systematic Mapping of Literature”, **Computers and Education Artificial Intelligence**, 2, 100017. <https://Doi.Org/10.1016/J.Caeai.2021.100017>
- Kamalov, Firuz et al. (2023), “New Era of Artificial Intelligence in Education: Towards a Sustainable Multifaceted Revolution”, **Sustainability**, 15(16), 12451. <https://Doi.Org/10.3390/Su151612451>
- Karataş, Fatih & Ataç, Bengü Aksu (2024), “When TPACK Meets Artificial Intelligence: Analyzing TPACK and AI-TPACK Components Through Structural Equation Modelling”, **Education and Information Technologies**, 30(2024), 8979–9004. <https://doi.org/10.1007/s10639-024-13164-2>
- Karmakar, Santu and Das, Tapash (2024), “Effect of Artificial Intelligence on Education” In Irfan Ali, Umar Muhammad Modibbo, Asaju La’aro Bolaji and Harish Garg (Eds), **Optimization and Computing using Intelligent Data-Driven Approaches for Decision-Making**, 1st Ed., (pp. 198–211). <https://Doi.Org/10.1201/9781003536796-8>
- Karroum, Sarah Youssef Abou et al. (2024), “Exploring the Role of Artificial Intelligence in Education: Assessing Advantages and Disadvantages for Learning Outcomes and Pedagogical Practices”, **International Journal of Innovative Research in Engineering & Multidisciplinary Physical Sciences**, 12(4), 1-14. <https://Doi.Org/10.37082/Ijirmps.V12.I4.231000>
- Kartal, Galip (2024), “The Influence of ChatGPT on Thinking Skills and Creativity of EFL Student Teachers: A Narrative Inquiry”, **JET. Journal of Education for Teaching/Journal of Education for Teaching**, 50(4), 1-16. <https://doi.org/10.1080/02607476.2024.2326502>
- Kasinidou, Maria et al. (2025), “Cypriot Teachers’ Digital Skills and Attitudes Towards AI”, **Discover Education**, 4, 1-23. <https://doi.org/10.1007/s44217-024-00390-6>
- Kasneci, Enkelejda et al. (2023), "ChatGPT for Good? On Opportunities and Challenges of Large Language Models for Education”, **Learning and Individual Differences**, 103, 102274. <https://doi.org/10.1016/j.lindif.2023.102274>
- Kemelbekova, Zada et al. (2024), “AI in Teaching English as a Foreign Language: Effectiveness and Prospects in Kazakh Higher Education”, **XLinguae**, 17(1), 69-83. <https://doi.org/10.18355/xl.2024.17.01.05>

- Khan, Ijaz et al. (2021), “An Artificial Intelligence Approach to Monitor Student Performance and Devise Preventive Measures”, **Smart Learning Environments**, 8(17). <https://doi.org/10.1186/S40561-021-00161-Y>
- Khan, Raja Muhammad Ishtiaq et al. (2018), “EFL Instructors’ Perceptions on the Integration and Implementation of MALL in EFL Classes”, **International Journal of Language Education and Applied Linguistics**, 8(2), 39–50. <https://doi.org/10.15282/Ijleal.V8.299>
- Kim, Chae-Eun (2023), “Perceptions of an AI-Based Translator and Its Application by Pre-Service EFL Teachers”, **Korean Journal of Teacher Education**, 39(3), 49–65. <https://doi.org/10.14333/Kjte.2023.39.3.03>
- Kim, Eunhyun and Sim, Juyoun (2024), “Incorporating AI into English Language Learning: An Experimental Study Focusing on Autonomous Learning”, **English Language Teaching**, 17(10), 82. <https://doi.org/10.5539/Elt.V17n10p82>
- Kivrak, Cansel (2024), “Exploring Different Proficiency Level EFL Students’ Perceptions of Using ChatGPT as a Complementary Tool in Writing Classes”, **Language Education & Technology (LET Journal)**, 4(2), 170–180. <https://www.langedutech.com/letjournal/index.php/let/article/view/83>
- Koehler, Matthew and Mishra, Punya (2009), “What is Technological Pedagogical Content Knowledge?”, **Contemporary Issues in Technology and Teacher Education**, 9(1), 60-70.
- Koehler, Matthew et al. (2005), “Tracing the Development of Teacher Knowledge in a Design Seminar: Integrating Content, Pedagogy and Technology”, **Computers & Education**, 49(3), 740–762. <https://doi.org/10.1016/J.Compedu.2005.11.012>
- Koh, J. et al. 2010), “Examining the Technological Pedagogical Content Knowledge of Singapore Pre-service Teachers with a Large-Scale Survey”, **Journal of Computer Assisted Learning**, 26(6), 563–573. <https://doi.org/10.1111/j.1365-2729.2010.00372.x>
- Kohnke, Lucas et al. (2023), “Exploring Generative Artificial Intelligence Preparedness Among University Language Instructors: A Case Study”, **Computers and Education, Artificial Intelligence**, 5, 1-8. <https://doi.org/10.1016/j.caeai.2023.100156>
- Konnolly, Lex and Sanders, Nathan (2024), “AI Hype in the Classroom”, **Proceedings of the Linguistic Society of America**, 9(3). <https://doi.org/10.3765/Plsa.V9i3.5852>
- Ksemidov, Boris and Abgaryan, Karine Karlenovna (2024), “Adaptive Intelligent Tutoring System”, **Modelling and Data Analysis**, 14(2), 152–165. <https://doi.org/10.17759/Mda.2024140211>
- Kundu, Arnab and Bej, Tripti (2025), “Transforming EFL Teaching with AI: A Systematic Review of Empirical Studies”, **International Journal of Artificial Intelligence in Education**, 1-34 <https://doi.org/10.1007/s40593-025-00470-0>

- Latif, Ehsan et al. (2023), “AGI: Artificial General Intelligence for Education”, arXiv. <https://doi.org/10.48550/arXiv.2304.12479>
- Layali, Khaled and Al-Shlowiy, Ahmed (2020), “Students' Perceptions of E-Learning for ESL/EFL in Saudi Universities at the Time of Coronavirus: A Literature Review”, **Indonesian EFL Journal**, 6, 97–108. doi: 10.25134/ieflj.v6i2.3378
- Legg, Shane & Hutter, Marcus (2007), “A Collection of Definitions of Intelligence”, In Ben Goertzel and Pei Wang (Eds.), **Advances in Artificial General Intelligence: Concepts, Architectures and Algorithms** (pp. 17–24). IOS Press. <https://doi.org/10.3233/978-1-58603-758-1-17Li>
- Li, Jimei & Singh and Charanjit Kaur Swaran (2024), “Integrating Mobile Assisted Language Learning in English Listening: A Synthetic Review”, **English Education Journal**, 15(2), 88–104. <https://Doi.Org/10.24815/Eej.V15i2.36618>
- Li, Rui (2022), “Effects of Mobile-Assisted Language Learning on EFL/ESL Reading Comprehension”, **Educational Technology & Society**, 25(3), 15–29. <https://www.jstor.org/stable/48673721>
- Li, Weixi (2024), “The Influence of Artificial Intelligence on the Education System”, **Lecture Notes in Education Psychology and Public Media**, 65(1), 137–142. <https://Doi.Org/10.54254/2753-7048/65/20240158>
- Liang, Weijun (2021), “University Teachers’ Technology Integration in Teaching English as a Foreign Language: Evidence from a Case Study in Mainland China”, **SN Social Sciences**, 1(8). <https://doi.org/10.1007/s43545-021-00223-5>
- Liang, Yihe (2023), “Balancing: The Effects of AI Tools in Educational Context”, **Frontiers in Humanities and Social Sciences**, 3(8), 7–10. <https://Doi.Org/10.54691/Fhss.V3i8.5531>
- Linh, Vo Thuy (2021), “EFL Teachers’ Abilities to Use Mobile Technology in their English Teaching”, **Hue University Journal of Science: Social Sciences and Humanities**, 130(6), 71–84. <https://doi.org/10.26459/hueunijssh.v130i6d.6276>
- Litman, Diane (2016), “Natural Language Processing for Enhancing Teaching and Learning”, **Proceedings of the AAAI Conference on Artificial Intelligence**, 30(1). 4170–4176. <https://Doi.Org/10.1609/Aaai.V30i1.9879>
- Liu, Chen-Chung et al. (2022), “An Analysis of Children’s Interaction with an AI Chatbot and Its Impact on Their Interest in Reading”, **Computers & Education**, 189, 104576. <https://Doi.Org/10.1016/J.Compedu.2022.104576>
- Losi, Rizky Vita et al. (2024), “Using Artificial Intelligence (AI) To Improve EFL Students’ Writing Skill”, **International Journal of English and Applied Linguistics (IJEAL)**, 4(1), 62–70. <https://Doi.Org/10.47709/Ijeal.V4i1.3694>

- Luckin, Rosemary et al. (2022), “Empowering Educators to Be AI-Ready”, **Computers and Education Artificial Intelligence**, 3, 100076. <https://doi.org/10.1016/J.Caeai.2022.100076>
- Pham, Ngoc Khanh Ly (2025), “Are You on Board? “University EFL Instructors’ Readiness for Integrating AI-Powered Tools in Teaching”, **VNU Journal of Foreign Studies**, 41(3), 74–91. <https://doi.org/10.63023/2525-2445/jfs.ulis.5524>
- Ma, Jie and Dong, Pan (2021), “Chinese College Students’ L2 Motivational Self System in the Context of Artificial Intelligence”, In Zhengbing Hu, Sergey Petoukhov, Ivan Dychka and Matthew He (Eds.), **Advances in Computer Science for Engineering and Education IV: ICCSEEA 2021 (Lecture Notes on Data Engineering and Communications Technologies, Vol. 83)**, Cham: Springer, 411–422. <https://doi.org/10.1007/978-3-030-80472>
- Macaro, Ernesto et al. (2011), “A Systematic Review of CALL in English as a Second Language: Focus on Primary and Secondary Education”, **Language Teaching**, 45(1), 1–43. <https://doi.org/10.1017/S0261444811000395>
- Maghsudi, Setareh et al. (2021), “Personalized Education in the Artificial Intelligence Era: What to Expect Next”, **IEEE Signal Processing Magazine**, 38(3), 37–50. <https://doi.org/10.1109/Msp.2021.3055032>
- Mahdi, Hassan Saleh and Al-Dera, Abdullah Sa'ad (2013), “The Impact of Teachers’ Age, Gender and Experience on the Use of Information and Communication Technology in EFL Teaching”, **English Language Teaching**, 6(6). <https://doi.org/10.5539/elt.v6n6p57>
- Maity, Subhankar and Deroy, Aniket (2024), “Generative AI and Its Impact on Personalized Intelligent Tutoring Systems”, **arXiv**. <https://doi.org/10.48550/arXiv.2410.10650>
- Marrone, Rebecca et al. (2022), “Creativity and Artificial Intelligence—A Student Perspective”, **Journal of Intelligence**, 10(3), 65. <https://doi.org/10.3390/Jintelligence10030065>
- McCarthy, John (1998), “What is artificial intelligence?”, Unpublished manuscript. Retrieved from <http://jmc.stanford.edu/articles/whatisai/whatisai.pdf>
- McCarthy, John et al. (2006), “A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence”, **AI Magazine**, 27(4), 12–14. <https://doi.org/10.1609/Aimag.V27i4.1904>
- Mehdaoui, Ahmed (2024), “Unveiling Barriers and Challenges of AI Technology Integration in Education: Assessing Teachers’ Perceptions, Readiness and Anticipated Resistance”, **Futurity Education**, 4(4), 95–108. <https://doi.org/10.57125/fed.2024.12.25.06>
- Merriam-Webster. (n.d.), “Intelligence”, In Merriam-Webster.com Dictionary. Retrieved December 8, 2024, from <https://www.merriam-webster.com/dictionary/intelligence>
- Ministry Of National Education [Mone]. (2023), “National Education Statistics: Formal Education 2022/’23”. Ankara: Mone Publications. Retrieved From <https://www.meb.gov.tr>

- Mishra, Punya and Koehler, Matthew (2006), “Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge”, **Teachers College Record the Voice of Scholarship in Education**, 108(6), 1017–1054. <https://Doi.Org/10.1111/J.1467-9620.2006.00684.X>
- Mitchell, Melanie (2019), “Artificial Intelligence: A Guide for Thinking Humans”, Penguin.
- Mohamed, Amir (2023), “Exploring the Potential of an AI-Based Chatbot (ChatGPT) in Enhancing English as a Foreign Language (EFL) Teaching: Perceptions of EFL Faculty Members”, **Education and Information Technologies**, 29(3), 3195–3217. <https://Doi.Org/10.1007/S10639-023-11917-Z>
- Mohamed, Amir et al. (2024), “Empowering the Faculty of Education Students: Applying AI’s Potential for Motivating and Enhancing Learning”, **Innovative Higher Education**, 50, 587–609. <https://Doi.Org/10.1007/S10755-024-09747-Z>
- Mohamed, Mohamed Sitheeqe Peer (2024), “Exploring Ethical Dimensions of AI-Enhanced Language Education: A Literature Perspective”, **Technology in Language Teaching & Learning**, 6(3), 1813. <https://Doi.Org/10.29140/Tltl.V6n3.1813>
- Mohammad, Taj et al. (2023), “EFL Paraphrasing Skills with Quillbot: Unveiling Students' Enthusiasm and Insights”, **Journal of Pedagogical Research**, 7(5), 359-373. <https://Doi.Org/10.33902/Jpr.202324645>
- Mohammadkarimi, Ebrahim (2023), “Teachers’ Reflections on Academic Dishonesty in EFL Students’ Writings in the Era of Artificial Intelligence”, **Journal of Applied Learning & Teaching**, 6(2). <https://doi.org/10.37074/jalt.2023.6.2.10>
- Mohammadzadeh, Ahmad and Sarkhosh, Mehdi (2018), “The Effects of Self-Regulatory Learning Through Computer-Assisted Intelligent Tutoring System on The Improvement of EFL Learners’ Speaking Ability”, **International Journal of Instruction**, 11(2), 167–184. <https://Doi.Org/10.12973/Iji.2018.11212a>
- Moorhouse, Benjamin Luke (2024), “Beginning and First-Year Language Teachers’ Readiness for the Generative AI Age”, **Computers and Education. Artificial Intelligence**, 6, 1-8. <https://doi.org/10.1016/j.caeai.2024.100201>
- Moybeka, Adolfina et al. (2023), “Artificial Intelligence and English Classroom: The Implications of AI Toward EFL Students’ Motivation”, **Edumaspul - Jurnal Pendidikan**, 7(2), 2444–2454. <https://Doi.Org/10.33487/Edumaspul.V7i2.6669>
- Mudawy, Ammar Mohammed Ahmed (2024), “Investigating EFL Faculty Members’ Perceptions of Integrating Artificial Intelligence Applications to Improve the Research Writing Process: A Case Study at Majmaah University”, **Arab World English Journal (AWEJ)**, 169-183. <https://Doi.Org/10.24093/Awej/Chatgpt.11>

- Mushaddiq, Mushaddiq et al. (2024), “Exploring EFL Students’ Creativity and Engagement with AI Chatbot in Web-Based English Course”, **Global English Insights Journal**, 2(1), 19–27. <https://Doi.Org/10.61220/Glens.V2i1.591>
- Muslimin, Afif Ikhwanul (2024), “Bibliometric Analysis of Artificial Intelligence Integration in English as a Foreign Language Education: Trends and Patterns”, **JET ADI BUANA**, 9(01), 79–92. <https://doi.org/10.36456/jet.v9.n01.2024.8867>
- Mustroph, Claudia and Steinbock, Jeanine (2024), “ChatGPT in Foreign Language Education - Friend or Foe? A Quantitative Study on Pre-Service Teachers’ Beliefs”, **Technology in Language Teaching & Learning**, 6(1), 1–17. <https://Doi.Org/10.29140/Tltl.V6n1.1133>
- Muthmainnah, Muthmainnah (2024), “AI-Cicibot as Conversational Partners in EFL Education, Focusing on Intelligent Technology Adoption (ITA) to Mollify Speaking Anxiety”, **Journal of English Language Teaching and Applied Linguistics**, 6(4), 76–85. <https://Doi.Org/10.32996/Jeltal.2024.6.4.8>
- Nabhani, Fatema Al et al. (2024), “Learning Motivation Via Artificial Intelligence: A Bibliometric and Systematic Literature Analysis”, **International Journal of Academic Research in Business and Social Sciences**, 14(7), 952–972. <https://Doi.Org/10.6007/Ijarbss/V14-I7/22107>
- Nagpal, Pooja and Murugesan, RameshKumar (2024), “Navigating Teachers’ Adoption of Artificial Intelligence in English Foreign Language: Uncovering Inhibitors and Drivers”, **SPAST Reports**, 1(2). <https://Doi.Org/10.69848/Sreports.V1i2.4960>
- Nazari, Naghmeh et al. (2020), “The Impact of an Online Professional Development Course on EFL Teachers’ TPACK”, **DOAJ (DOAJ: Directory of Open Access Journals)**, 4(1), 59-86. <https://Doi.Org/10.22051/Lghor.2020.29892.1248>
- Nazim, Mohd (2024), “Exploring EFL Teachers’ Insights Regarding Artificial Intelligence Driven Tools in Student-Centered Writing Instructions”, **International Journal of English Linguistics**, 14(3), 90. <https://Doi.Org/10.5539/Ijel.V14n3p90>
- Nazim, Mohd and Alzubi, Ali Abbas Falah (2025), “Empowering EFL Teachers’ Perceptions of Generative AI-Mediated Self-Professionalism”, **PLoS ONE**, 20(6), e0326735. <https://doi.org/10.1371/journal.pone.0326735>
- Neff, Joel et al. (2024), “EFL Students’ and Teachers’ Perceptions of the Ethical Uses of AI Tools”, **Technology in Language Teaching & Learning**, 6(3), 1–19. <https://Doi.Org/10.29140/Tltl.V6n3.1714>
- Neji, Wissal et al. (2023), “Exploring New AI-Based Technologies to Enhance Students’ Motivation”, **Issues in Informing Science and Information Technology**, 20, 95–110. <https://Doi.Org/10.28945/5149>

- Nguyen, Nguyen Thi Thu (2023), "EFL Teachers' Perspectives Toward the Use of ChatGPT in Writing Classes: A Case Study at Van Lang University", **International Journal of Language Instruction**, 2(3), 1–47. <https://doi.org/10.54855/ijli.23231>
- Tungka, Novalita Fransisca (2024), "Enhancing Writing Skills of EFL Learners Through Automated Feedback: An Empirical Investigation", **Jurnal Ilmiah Spectral**, 10(1). <https://doi.org/10.47255/Gymtcf78>
- Novawan, Adriadi et al. (2024), "The New Face of Technology-Enhanced Language Learning (TELL) with Artificial Intelligence (AI): Teacher Perspectives, Practices, and Challenges", **Journal of English in Academic and Professional Communication**, 10(1), 1-18. <https://doi.org/10.25047/jeapco.v10i1.4565>
- Nunnally, Jum (1975), "Psychometric Theory— 25 years ago and now. Educational Researcher", **Educational Researcher**, 4(10), 7–21. <https://doi.org/10.3102/0013189x004010007>
- Oktarina, Irene Brainnita et al. (2024), "Leveraging Chatgpt to Enhance Students' Writing Skills, Engagement, and Feedback Literacy", **Edelweiss Applied Science and Technology**, 8(4), 2306–2319. <https://doi.org/10.55214/25768484.V8i4.1600>
- Orhan, Ali et al. (2024), "Assessing EFL Learners' Attitudes on Generative Artificial Intelligence: Development and Validation of Generative Artificial Intelligence Attitude Scale for EFL Learners (GenAIAS)", **Journal of Research on Technology in Education**, 1–21. <https://doi.org/10.1080/15391523.2024.2437744>
- Ortega-Sanchez, Delfin and Gomez-Trigueros, Isabel María (2019), "MOOCs and NOOCs in the Training of Future Geography and History Teachers: A Comparative Cross-Sectional Study based on the TPACK Model", **IEEE Access**, 8, 4035–4042. <https://doi.org/10.1109/access.2019.2963314>
- Oz, Huseyin (2015), "An Investigation of Preservice English Teachers' Perceptions of Mobile Assisted Language Learning", **English Language Teaching**, 8(2), 22-34. <https://doi.org/10.5539/Elt.V8n2p22>
- Özdemir, Nihal & Mede, Enisa (2024), "Exploring EFL Teachers' Readiness for the Generative AI Age", **International Journal of Research in Teacher Education (IJRTE)**, 15(4), 60-77. DOI: 10.29329/Ijrte. 2024.1104.04
- Özkan, Elif Kadriye et al. (2024), "A Systematic Review of EFL Teachers' Perspectives on Artificial Intelligence Technologies" **Ihlara Eğitim Araştırmaları Dergisi** 9(2), 150-168. <https://doi.org/10.47479/ihead.1535035>
- Paek, Seungsu and Kim, Namhyoung (2021), "Analysis of Worldwide Research Trends on the Impact of Artificial Intelligence in Education", **Sustainability**, 13(14), 7941. <https://doi.org/10.3390/su13147941>

- Pan, Mengru et al. (2024), "Using Artificial Intelligence Chatbots to Support English-As-A-Foreign-Language Students' Self-Regulated Reading", **RELC Journal**, <https://Doi.Org/10.1177/00336882241264030>
- Park, Moonyoung and Son, Jeong-Bae (2020), "Pre-Service EFL Teachers' Readiness in Computer-Assisted Language Learning and Teaching", **Asia Pacific Journal of Education**, 42(2), 320–334. <https://Doi.Org/10.1080/02188791.2020.1815649>
- Parviz, Muhammed (2024), "The Double-Edged Sword: AI Integration in English Language Education from the Perspectives of Iranian EFL Instructors", **Complutense Journal of English Studies**, (32), 1-19. <https://Doi.Org/10.5209/Cjes.97261>
- Patel, Hiral et al. (2023), "Impact of Machine Learning in Education", In Praveen Kumar Shukla, Himanshu Mittal and Andries Engelbrecht (Eds), **Computer Vision and Robotics**, Springer, Singapore, 93–106. https://doi.org/10.1007/978-981-99-4577-1_8
- Peng, Jiale (2024), "A Comprehensive Review of the Application of NLP Technology in Language Learning", **Applied and Computational Engineering**, 92(1), 163–168. <https://Doi.Org/10.54254/2755-2721/92/20241735>
- Perkins, Mike (2023), "Academic Integrity Considerations of AI Large Language Models in The Post-Pandemic Era: ChatGPT and Beyond", **Journal of University Teaching and Learning Practice**, 20(2), 1-24. <https://Doi.Org/10.53761/1.20.02.07>
- Phetsut, Piyaporn and Waemusa, Zainee (2022), "Effectiveness of Mobile Assisted Language Learning (MALL)-Based Intervention on Developing Thai EFL Learners' Oral Accuracy", **International Journal of Technology in Education**, 5(4), 571–585. <https://Doi.Org/10.46328/Ijte.271>
- Pingmuang, Pawarit and Koraneekij, Prakob (2022), "Mobile-Assisted Language Learning Using Task-Based Approach and Gamification for Enhancing Writing Skills in EFL Students", **The Electronic Journal of E-Learning**, 20(5), 623–638. <https://Doi.Org/10.34190/Ejel.20.5.2339>
- Piramuthu, Selwyn (2005), "Knowledge-Based Web-Enabled Agents and Intelligent Tutoring Systems", **IEEE Transactions on Education**, 48(4), 750–756. <https://Doi.Org/10.1109/Te.2005.854574>
- Pitychoutis, Konstantinos (2024), "Harnessing AI Chatbots for EFL Essay Writing: A Paradigm Shift in Language Pedagogy", **Arab World English Journal (AWEJ)**, 197-209. <https://Doi.Org/10.31235/Osf.Io/Xrvth>
- Pokrivcakova, Silvia (2023), "Pre-Service Teachers' Attitudes Towards Artificial Intelligence and Its Integration into EFL Teaching and Learning", **Journal of Language and Cultural Education**, 11(3), 100–114. <https://Doi.Org/10.2478/Jolace-2023-0031>

- Pratama, Aryawira and Sulistiyo, Urip (2024), "A Systematic Review of Artificial Intelligence in Enhancing English Foreign Learners' Writing Skill", **PPSDP International Journal of Education**, 3(2), 170–181. <https://doi.org/10.59175/Pijed.V3i2.299>
- Pum, Mengkorn and Sok, Sarin (2024), "Leveraging AI in Education in Cambodia: A Review of Perceived Concerns and Associated Benefits", **Asian Journal of Distance Education**, 19(2), 157-167. Retrieved From <https://Asianjde.Com/Ojs/Index.Php/Asianjde/Article/View/794>
- Putri, Nanda Allya and Degeng, Putu Dian Danayanti (2024), "Utilizing Mobile-Assisted Language Learning (MALL) to Alleviate Speaking Anxiety Among EFL Students", **English Review: Journal of English Education**, 12(1), 125–136. <https://doi.org/10.25134/erjee.v12i1.9352>
- Rabie, Reham Mahmoud (2023), "The Future of Education with Artificial Intelligence and Machine Learning in the Arab World: A Systematic Review", **Educational Sciences**, 31(3), 1–35. <https://doi.org/10.21608/ssj.2023.344574>
- Rachmawati, Benita et al. (2021), "Pre-Service Teachers' Readiness on the Use of Mobile-Assisted Language Learning During Online Classes", **Journal of English Language and Education**, 6(2), 138–148. <https://doi.org/10.31004/jele.v6i2.133>
- Rafida, Tien et al. (2024), "EFL Students' Perception in Indonesia and Taiwan on Using Artificial Intelligence to Enhance Writing Skills", **Jurnal Ilmiah Peuradeun**, 12(3), 987. <https://doi.org/10.26811/Peuradeun.V12i3.1520>
- Rafiq, Karmila Rafiqah et al. (2022), "Re-envisioning Technological Pedagogical Content Knowledge and Online Teaching Readiness of English for Foreign Language Pre-service Teachers in Language Teacher Education", **Frontiers in Psychology**, 13. <https://doi.org/10.3389/fpsyg.2022.927835>
- Rahim, Siti Khatijah Nor Abdul eta l. (2023), "Intelligent Tutoring System: New Criteria and Evaluation to Measure Students' Degree of Mastery", **Journal of ICT in Education**, 10(2), 113–131. <https://doi.org/10.37134/Jictie.Vol10.2.7.2023>
- Rane, Nitin Liladhar et al (2024), Artificial Intelligence, ChatGPT, and the New Cheating Dilemma: Strategies for Academic Integrity, In **Artificial Intelligence and Industry in Society 5.0** (pp. 1-23). Deep Science Publishing. https://doi.org/10.70593/978-81-981271-1-2_1
- Rivera, Mabel and McKeithan, Glennda (2022), "Progress Monitoring of Language Acquisition and Academic Content for English Learners", **Learning Disabilities Research and Practice**, 37(3), 216–225. <https://doi.org/10.1111/Ldrp.12290>
- Roll, Ido and Wylie, Ruth (2016), "Evolution and Revolution in Artificial Intelligence in Education", **International Journal of Artificial Intelligence in Education**, 26(2), 582–599. <https://doi.org/10.1007/S40593-016-0110-3>

- Rus, Dana et al. (2024), "Navigating the Digital Frontier: Teacher Attitudes Towards AI in Language Education", In Liviu Moldovan and Adrian Gligor (Eds), **The 17th International Conference Interdisciplinarity in Engineering**, Springer, Cham, 449–458. https://doi.org/10.1007/978-3-031-54671-6_33
- Saharuddin, Haziq et al. (2025), "Exploring Teachers' Technological Pedagogical Content Knowledge in Utilizing Artificial Intelligence (AI) for Teaching", **International Journal of Learning Teaching and Educational Research**, 24(1), 136–151. <https://doi.org/10.26803/ijlter.24.1.7>
- Santiana, Santiana et al. (2024), "Students' Attitudes Toward the Use of CANVAS in the EFL Virtual Learning Environment", **International Journal of Language Education**, 8(2), 267-290. <https://doi.org/10.26858/Ijole.V8i2.30813>
- Sari, Nara and Sulisty, Teguh (2022), "EFL Teachers' Perspectives on Mobile-Assisted Language Learning (MALL) Resources for Vocational High School Students", **Journey: Journal of English Language and Pedagogy**, 5(1), 80–90. <https://doi.org/10.33503/journey.v5i1.1772>
- Saveliev, Anton & Zhurenkov, Denis (2020), "Artificial Intelligence and Social Responsibility: The Case of the Artificial Intelligence Strategies in the United States, Russia, and China", **Kybernetes**, 50(3), 656–675. <https://doi.org/10.1108/K-01-2020-0060>
- Senger, Şükriye (2024), **K-12 Teachers' Awareness and Perceptions of Artificial Intelligence in Education** [Master's thesis, Bahçeşehir University].
- Setyaningsih, Endang et al. (2024), "Exploring High School EFL Teachers' Experiences with Magic School AI in Lesson Planning: Benefits and Insights", **Voices of English Language Education Society**, 8(3), 685-700. <https://doi.org/10.29408/veles.v8i3.27700>
- Shah, Dhruvil et al. (2021), "Exploiting the Capabilities of Blockchain and Machine Learning in Education", **Augmented Human Research**, 6(1), 1-14. <https://doi.org/10.1007/S41133-020-00039-7>
- Shamshiri, Fatemeh et al. (2023), "Models of Assessment in the Classroom: A Comparative Research of CALL-Based Vs. Traditional Assessment on Vocabulary Learning Among Iranian EFL Learners", **Language Testing in Asia**, 13(1), 1-22. <https://doi.org/10.1186/S40468-023-00259-9>
- Shan, Shan et al. (2024), "AI Chatbots: Developing English Language Proficiency in EFL Classroom", **Arab World English Journal**, 292-305. <https://doi.org/10.24093/Aweej/Chatgpt.20>
- Shavkatovna, Dilfuza Khamraeva et al. (2024), "Mobile Learning for Transforming English Writing Skills", **International Journal of Interactive Mobile Technologies (Ijim)**, 18(19), 4–17. <https://doi.org/10.3991/Ijim.V18i19.47729>

- Shokrpour, Nasrin et al. (2019), “Learning Vocabulary Electronically: Does Computer Assisted Language Learning (CALL) Instruction Have Any Impacts on Iranian EFL Learners?”, **Cogent Education**, 6(1), 1-20. <https://doi.org/10.1080/2331186x.2019.1702827>
- Siderska, Julia et al. (2023), “Towards Intelligent Automation (IA): Literature Review on the Evolution of Robotic Process Automation (RPA), Its Challenges, and Future Trends”, **Engineering Management in Production and Services**, 15(4), 90-103. <https://doi.org/10.2478/Emj-2023-0030>
- Silva, P. (2015), “Davis' Technology Acceptance Model (TAM) (1989)”, In Mohammed Nasse Al-Suqri and Ali Saif Al-Aufi (Eds.), **Information Seeking Behavior and Technology Adoption: Theories and Trends** (pp. 205-219). IGI Global Scientific Publishing. <https://doi.org/10.4018/978-1-4666-8156-9.ch013>
- Sindermann, Cornelia et al. (2020), “Assessing the Attitude Towards Artificial Intelligence: Introduction of a Short Measure in German, Chinese, and English Language”, **KI - Künstliche Intelligenz**, 35(1), 109–118. <https://doi.org/10.1007/S13218-020-00689-0>
- Singh, Pragma et al. (2023), “Student’s Perception of Chat GPT”, **2019 International Conference on Electrical, Communication, and Computer Engineering (ICECCE)**, 1–6. <https://doi.org/10.1109/icecce61019.2023.10442033>
- Singh, Monica et al. (2025), “AI and Education: Bridging the Gap to Personalized, Efficient, and Accessible Learning”, In Mariya Ouaisa, Mariyam Ouaisa, Hanane Lamaazi, Mahmoud El Hamlaoui, and Kishor Kumar Reddy C. (Eds.), **Internet of Behavior-Based Computational Intelligence for Smart Education Systems** (pp. 131-160). IGI Global Scientific Publishing. <https://doi.org/10.4018/979-8-3693-8151-9.ch005>
- Slamet, Joko (2024), “Potential of ChatGPT as a Digital Language Learning Assistant: EFL Teachers’ and Students’ Perceptions”, **Discover Artificial Intelligence**, 4(46). <https://doi.org/10.1007/S44163-024-00143-2>
- Sok, Sarin and Heng, Kimkong (2023), “Opportunities, Challenges, and Strategies for Using ChatGPT in Higher Education: A Literature Review”, **Journal of Digital Educational Technology**, 4(1), 3-11. <https://doi.org/10.30935/Jdet/14027>
- Soundarya, Murugan et al. (2025), “Applications of Artificial Intelligence Techniques in Education”, In Gürhan Durak & Serkan Çankaya (Eds.), **Integrating Micro-Credentials with AI in Open Education** (pp. 429-450). IGI Global Scientific Publishing. <https://doi.org/10.4018/979-8-3693-5488-9.ch017>
- Sudiatama, et al. (2023), “The Efficacy of Mobile-Assisted Language Learning in Improving Learners’ Reading Skills in Relation to Metacognitive Strategy”, **Journal of Language and Literature Studies**, 3(1), 53–66. <https://doi.org/10.36312/Jolls.V3i1.992>

- Sudin, Valencia De Kumang and Swanto, Suyansah (2024), “Enhancing ESL Learners Reading Comprehension and Motivation Via Ai-Generated Personalised Reading Texts”, **International Journal on E-Learning Practices**, 7(1). <https://Doi.Org/10.51200/Ijelp.V7i1.5440>
- Suherman, La Ode Achmad et al. (2024), “Leveraging MALL in Higher Education: A Study on Duolingo’s Efficacy in Enhancing Language Learning Motivation”, **ELSYA Journal of English Language Studies**, 6(3), 231–243. <https://Doi.Org/10.31849/Elsya.V6i3.22843>
- Sullivan, Miriam et al. (2023), “ChatGPT in Higher Education: Considerations for Academic Integrity and Student Learning”, **Journal of Applied Learning & Teaching**, 6(1), 1-10. <https://Doi.Org/10.37074/Jalt.2023.6.1.17>
- Sumakul, Dian Toar et al. (2022), “Artificial Intelligence in EFL Classrooms: Friend or Foe?”, **LEARN Journal: Language Education and Acquisition Research Network**, 15(1), 232–256. retrieved from <https://so04.tci-thaijo.org/index.php/LEARN/article/view/256723>
- Sumardi, Endang et al. (2024), “Exploring High School EFL Teachers’ Experiences with Magic School AI in Lesson Planning: Benefits and Insights”, **VELES (Voices of English Language Education Society)**, 8(3), 685-700. <https://doi.org/10.29408/veles.v8i3.27700>
- Sütçü, Selim Soner and Sütçü, Elif (2023), “English Teachers' Attitudes and Opinions Towards Artificial Intelligence”, **International Journal of Research in Teacher Education**, 14(3), 183-193. <https://ijrte.inased.org/makale/4071>
- Sweta, S. (2021), “Adaptive E-Learning System”, In **Modern Approach to Educational Data Mining and Its Applications. Springer Briefs in Applied Sciences and Technology**, 13-24. Springer. https://Doi.Org/10.1007/978-981-33-4681-9_2
- Szabó, Fruzsina and Szoke, Jonna (2024), “How Does Generative AI Promote Autonomy and Inclusivity in Language Teaching?”, **ELT Journal**, 78(4), 478–488. <https://Doi.Org/10.1093/Elt/Ccae052>
- Tang, Zhuolin (2024), “An Investigation into the Feedback of Automated Writing Evaluation System on EFL Learners’ Writing”, **Study in English Language Teaching**, 12(4). <https://Doi.Org/10.22158/Selt.V12n4p1>
- Taopan, Lita Liviani et al. (2020), “TPACK Framework: Challenges and Opportunities in EFL Classrooms”, **Research and Innovation in Language Learning**, 3(1), 1-22. <https://Pdfs.Semanticscholar.Org/D46f/E3b543515526a10629923b19c2f00b99a959.Pdf>
- Thohir, Lalu et al. (2024), “The Effectiveness of Integrating Quillbot for Paraphrasing in Writing Instruction”, **Journal of Languages and Language Teaching**, 12(4), 2112-2122. <https://Doi.Org/10.33394/Jollt.V12i4.12780>

- Tian, Chaun (2024), "The Influence of Generative AI Technologies on Academic Writing in EFL Education", **Journal of Education, Humanities and Social Sciences**, 28, 575–584. <https://Doi.Org/10.54097/Xv0rbq11>
- Tiwari, Hari Prasad (2024), "Artificial Intelligence in the Classroom: Revolutionizing English Language Teaching", **Journal of English Teaching and Linguistics Studies**, 6(1), 42-59. <https://Doi.Org/10.55215/Jetli.V6i1.9757>
- Tlili, Ahmed et al. (2023), "What If the Devil is My Guardian Angel: ChatGPT as a Case Study of Using Chatbots in Education", **Smart Learning Environments**, 10(1). <https://Doi.Org/10.1186/S40561-023-00237-X>
- Tondeur, Jo et al. (2011), "Preparing Pre-Service Teachers to Integrate Technology in Education: A Synthesis of Qualitative Evidence", **Computers & Education**, 59(1), 134–144. <https://Doi.Org/10.1016/J.Compedu.2011.10.009>
- Torres, Phil (2019), "The Possibility and Risks of Artificial General Intelligence", **Bulletin of the Atomic Scientists**, 75(3), 105–108. <https://Doi.Org/10.1080/00963402.2019.1604873>
- Touretzky, David et al. (2019), "A Year in K–12 AI Education", **AI Magazine**, 40(4), 88–90. <https://Doi.Org/10.1609/Aimag.V40i4.5289>
- Luan, Hui & Tsai, Chin-Chung (2021), "A Review of Using Machine Learning Approaches for Precision Education", **Educational Technology & Society**, 24(1), 250–266. <https://www.jstor.org/stable/26977871>
- Tseng, Jun-Jie (2017), "Exploring TPACK-SLA Interface: Insights from the Computer-Enhanced Classroom", **Computer Assisted Language Learning**, 31(4), 390–412. <https://Doi.Org/10.1080/09588221.2017.1412324>
- Tubino, Laura and Adachi, Chie (2022), "Developing Feedback Literacy Capabilities Through an AI Automated Feedback Tool", **ASCILITE Publications**, E22039. <https://Doi.Org/10.14742/Apubs.2022.39>
- Turkish Statistical Institute (2020), *Bilgi Toplumu İstatistikleri*. Ankara: Türkiye İstatistik Kurumu Yayınları.
- Uddin, Sharif et al. (2024), "University EFL Teachers' Perceptions About the Effectiveness of AI-Enhanced E-Assessments in Bangladesh: A Phenomenological Study", **Bulletin of Advanced English Studies**, 9(2), 71–82. <https://doi.org/10.31559/baes2024.9.2.4>
- Ulla, Mark Bedoya et al. (2023), "To Generate or Stop Generating Response: Exploring EFL Teachers' Perspectives on ChatGPT in English Language Teaching in Thailand", **Learning Research and Practice**, 9(2), 168–182. <https://Doi.Org/10.1080/23735082.2023.2257252>

- Umar, Umar (2024), “Advancements in English Language Teaching: Harnessing the Power of Artificial Intelligence”, **Foreign Language Instruction Probe**, 3(1), 29–42. <https://Doi.Org/10.54213/Flip.V3i1.402>
- Üretmen Karaoğlu, Seher and Doğan, Cemile (2025), “EFL Teachers’ Insights on Incorporating AI in Language Education”, **Journal of Theoretical Educational Sciences**, 18(3), 630–657.
- Vafayi, Hamidreza and Meihami, Hussein (2024), “A TPACK-Based Model of EFL Teacher Preparation to Develop Student-Teachers’ Professional Agency in CALL”, **Xlinguae**, 17(4), 336–352. <https://Doi.Org/10.18355/Xl.2024.17.04.20>
- Venkatesh, Viswanath and Bala, Hillol (2008), “Technology Acceptance Model 3 and a Research Agenda on Interventions”, **Decision Sciences**, 39(2), 273–315. <https://Doi.Org/10.1111/J.1540-5915.2008.00192.X>
- Venkatesh, Venkatesh and Davis, Fred (2000), “A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies”, **Management Science**, 46(2), 186–204. <https://Doi.Org/10.1287/Mnsc.46.2.186.11926>
- Voss, Peter (2007), “Essentials of General Intelligence: The Direct Path to Artificial General Intelligence”, In Ben Goertzel and Cassio Pennachin (Eds.), **Artificial General Intelligence** (pp. 131–157). Springer. https://doi.org/10.1007/978-3-540-68677-4_4
- Vu, Nguyen Ngoc et al. (2023), “Exploring the Effect of Learn English Grammar Mobile App on English Language Learners’ Grammatical Competence”, **Rupkatha Journal on Interdisciplinary Studies in Humanities**, 15(1). <https://Doi.Org/10.21659/Rupkatha.V15n1.04>
- Wang, Shuai et al. (2020), “When Adaptive Learning Is Effective Learning: Comparison of an Adaptive Learning System to Teacher-Led Instruction”, **Interactive Learning Environments**, 31(2), 793–803. <https://Doi.Org/10.1080/10494820.2020.1808794>
- Wang, Shufang et al. (2023), “The Efficacy of CALL Glossing on EFL Learners’ Idiom Learning”, **Acta Psychologica**, 241, 104060. <https://Doi.Org/10.1016/J.Actpsy.2023.104060>
- Wang, Xinying et al. (2023), “Effectiveness of Mobile-Assisted Language Learning in Enhancing the English Proficiency”, **Journal of Contemporary Educational Research**, 7(11), 140–146. <https://Doi.Org/10.26689/Jcer.V7i11.5588>
- Wang, Xiao et al. (2021), “Facilitating English Grammar Learning by a Personalized Mobile-Assisted System with a Self-Regulated Learning Mechanism”, **Frontiers in Psychology**, 12. <https://Doi.Org/10.3389/Fpsyg.2021.624430>
- Wangdi, Pema (2024), “Integrating Artificial Intelligence in Education,” **International Journal on Research in STEM Education**, 6(2), 50–60. <https://Doi.Org/10.33830/Ijrse.V6i2.1722>

- Warwick, Kevin (2013), "Artificial Intelligence: The Basics", 1st Ed., Routledge, London.
<https://doi.org/10.4324/9780203802878>
- Wei, Ling (2023), "Artificial Intelligence in Language Instruction: Impact on English Learning Achievement, L2 Motivation, and Self-Regulated Learning", **Frontiers in Psychology**, 14, 01-14. <https://doi.org/10.3389/fpsyg.2023.1261955>
- Williams, M. E. (1996), "User Acceptance of New Information Technology: Theories and Models", **Annual Review of Information Science and Technology**, 14(4), 3-32.
<http://Hdl.Handle.Net/10150/105584>
- Winkler, Rainer and Soellner, Matthias (2018), "Unleashing the Potential of Chatbots in Education: A State-of-the-Art Analysis", **Academy of Management Proceedings**, 2018(1), 15903.
<https://Doi.Org/10.5465/Ambpp.2018.15903abstract>
- Wogu, Ikedinachi Ayodele Power et al. (2018), "Super-Intelligent Machine Operations in Twenty-First-Century Manufacturing Industries: A Boost or Doom to Political and Human Development?", In Shampa Chakraverty, Anil Goel and Sanjay Misra (Eds.), **Towards Extensible and Adaptable Methods in Computing** (pp. 221–236). Springer.
https://doi.org/10.1007/978-981-13-2348-5_16
- Wu, Bo and Zheng, Changlong (2021), "An Analysis of the Effectiveness of Machine Learning Theory in the Evaluation of Education and Teaching", **Wireless Communications and Mobile Computing**, 2021(1). <https://Doi.Org/10.1155/2021/4456222>
- Wu, Rong and Yu, Zhonggen (2024), "Do AI Chatbots Improve Students' Learning Outcomes? Evidence From a Meta-Analysis", **British Journal of Educational Technology**, 55(1), 10–33. <https://Doi.Org/10.1111/Bjet.13334>
- Wu, Wen-Hsiung et al. (2012), "Review of Trends from Mobile Learning Studies: A Meta-Analysis", **Computers & Education**, 59(2), 817–827. <https://Doi.Org/10.1016/J.Compedu.2012.03.016>
- Wulandari, Mega & Purnamaningwulan, Rina Astuti (2024), "Exploring Indonesian EFL Pre-Service Teachers' Experiences in AI-Assisted Teaching Practicum: Benefits and Drawbacks", **LLT Journal, a Journal on Language and Language Teaching**, 27(2), 878–894.
<https://Doi.Org/10.24071/Llt.V27i2.8690>
- Wut, Tai-ming et al. (2025), "Does Perceived Risk of AI Matter? Teachers' AI Literacy and Institutional Support: Perspective from Self-Determination Theory", **Education and Information Technologies**. <https://doi.org/10.1007/s10639-025-13685-4>
- Xiaoli, Yang (2024), "Enhancing Early Language Learning: The Impact of Mobile-Assisted Language Learning (MALL) on Young Learners' Language Proficiency", **Occupation and Professional Education**, 1(5), 71–76. <https://Doi.Org/10.62381/O242512>

- Xu, Jinfen and Li, Juan (2024), "Effects of AI Affordances on Student Engagement in EFL Classrooms: Structural Equation Modelling and Latent Profile Analysis", **European Journal of Education**, 59(4), 1-12. <https://doi.org/10.1111/ejed.12808>
- Yaguara, Jhon Alexander et al. (2022), "Exploring the Implementation of CLIL in an EFL Virtual Learning Environment", **Latin American Journal of Content and Language Integrated Learning**, 14(2), 187–214. <https://Doi.Org/10.5294/Laclil.2021.14.2.1>
- Yahaya, Abdulgaffar Abubakar et al. (2024), "Machine Learning in Education: Recent Trends, Challenges, and Future Perspective", **British Journal of Computer, Networking and Information Technology**, 7(3), 118–131. <https://doi.org/10.52589/BJCNIT-YLJQOCVP>
- Yang, Shuling & Appleget, Carin (2024), "An Exploration of Preservice Teachers' Perceptions of Generative AI: Applying the Technological Acceptance Model", **Journal of Digital Learning in Teacher Education**, 40(3), 159–172. <https://Doi.Org/10.1080/21532974.2024.2367573>
- Yang, Yu-Ting and Chang, Chih-Yung (2024), "Implementing an AI-Driven System and a LINE Bot to Enhance EFL University Students' Oral Skills", **2024 International Conference on Consumer Electronics - Taiwan (ICCE-Taiwan)** 481–482. <https://Doi.Org/10.1109/Icce-Taiwan62264.2024.10674049>
- Yao, Xiaochao and Huang, Xiaojing (2024), "Study on College English Teachers' Attitudes and Acceptance of AI-Driven Language Learning Applications", **International Education Forum**, 2(6), 235–242. <https://Doi.Org/10.26689/Ief.V2i6.7621>
- Yeh, Hui-Chin (2024), "The Synergy of Generative AI and Inquiry-based Learning: Transforming the Landscape of English Teaching and Learning", **Interactive Learning Environments**, 1-15. <https://doi.org/10.1080/10494820.2024.2335491>
- Yetkin, Ramazan and Özer-Altınkaya, Zekiye (2024), "AI in the Language Classroom: Insights from Pre-Service English Teachers", **E-Learning and Digital Media**. <https://Doi.Org/10.1177/20427530241267011>
- Yilin, Wang et al. (2023), "Chances and Challenges of EFL Teaching Powered by CHATGPT on Developing the Students' Critical Thinking", **International Journal of Academic Research in Business and Social Sciences**, 13(12). <https://Doi.Org/10.6007/Ijarbss/V13-I12/20239>
- Yılmaz, Arzu & Üstünel, Eda (2025), "Exploring the Impact of EFL Learners' Perceptions of AI Usage in Language Learning on their Perceived Writing Anxiety: A Correlational Study", **Language Teaching and Educational Research**, 8(1), 49–70. <https://doi.org/10.35207/later.1686314>
- Yolchiyeva, Kanim et al. (2024), "Enhancing ESL Education with AI: Innovations in Teaching Methods and Authentic Materials", **International Journal of Membrane Science and Technology** 7(1), 497-505. <https://Doi.Org/10.15379/Ijmst.V11i1.3687>

- Yuan, Lingjie and Liu, Xiaojuan (2024), “The Effect of Artificial Intelligence Tools on EFL Learners’ Engagement, Enjoyment, and Motivation”, **Computers in Human Behavior**, 162, 108474. <https://doi.org/10.1016/j.chb.2024.108474>
- Yue, Miao et al. (2024), “Understanding K–12 Teachers’ Technological Pedagogical Content Knowledge Readiness and Attitudes Toward Artificial Intelligence Education”, **Educ Inf Technol** 29, 19505–19536. <https://doi.org/10.1007/s10639-024-12621-2>
- Zalani, Mahdi et al. (2024), “The Influence of Mobile-Assisted Critical Writing Instructions on EFL Learners’ Writing Skill in Language Institutes”, **Frontiers in Education**, 9. <https://doi.org/10.3389/feduc.2024.1465765>
- Zhai, Xiaoming (2022), “ChatGPT User Experience: Implications for Education”, **SSRN Electronic Journal**, 1-18. <https://doi.org/10.2139/ssrn.4312418>
- Zhai, Xuesong et al. (2021), “A Review of Artificial Intelligence (AI) in Education From 2010 to 2020”, **Complexity**, 2021(1). <https://doi.org/10.1155/2021/8812542>
- Zhang, Chengming et al. (2024), “Unpacking Perceived Risks and AI Trust Influences Pre-service Teachers’ AI Acceptance: A Structural Equation Modeling-Based Multi-Group Analysis”, **Education and Information Technologies**, 30, 2645–2672. <https://doi.org/10.1007/s10639-024-12905-7>
- Zhang, Jiazhen and Hu, Junhui (2024), “Enhancing English Education with Natural Language Processing: Research and Development of Automated Grammar Checking, Scoring Systems, and Dialogue Systems”, **Applied and Computational Engineering**, 102(1), 12–17. <https://doi.org/10.54254/2755-2721/102/20240956>
- Zhang, Xiaohua and Chen, Lin (2021), “College English Smart Classroom Teaching Model Based on Artificial Intelligence Technology in Mobile Information Systems”, **Mobile Information Systems**, 2021, 1–12. <https://doi.org/10.1155/2021/5644604>
- Zhang, Zhihui (2023), “Promoting L2 Vocabulary Learning Through an Artificial Intelligent Chatbot”, 01-18. <https://doi.org/10.2139/ssrn.4592068>
- Zhi, Ran & Wang, Yongxiang (2024), “On the Relationship Between EFL Students’ Attitudes Toward Artificial Intelligence, Teachers’ Immediacy and Teacher-Student Rapport, and Their Willingness to Communicate”, **System**, 124(2024), 1-15. <https://doi.org/10.1016/j.system.2024.103341>
- Zhou, Changyin and Hou, Fanfan (2024), “Can AI Empower L2 Education? Exploring Its Influence on the Behavioural, Cognitive and Emotional Engagement of EFL Teachers and Language Learners”, **European Journal of Education**, 59(4). <https://doi.org/10.1111/Ejed.12750>

- Zhou, Qing et al. (2024), “Digital Echoes: Crafting Chinese EFL Teacher Identity in the Era of AI-Enhanced Instruction—A Qualitative Exploration”, **Forum for Linguistic Studies**, 6(5), 32–50. <https://doi.org/10.30564/fls.v6i5.6864>
- Zou, Bin et al. (2023), “An Investigation into Artificial Intelligence Speech Evaluation Programs with Automatic Feedback for Developing EFL Learners’ Speaking Skills”, **SAGE Open**. <https://Doi.Org/10.1177/21582440231193818>





APPENDIXES

Appendix 1: Perceptions and Readiness Level of EFL Teachers Towards Artificial Intelligence Scale

Appendix A: The Questionnaire in English

Perceptions and Readiness Level of EFL Teachers Towards Artificial Intelligence

Dear Participant,

As part of my Master's thesis at Karadeniz Technical University, I am conducting a study to explore EFL instructors' perceptions and readiness level regarding the use of AI tools in English Language Teaching. Your participation is completely voluntary, and you can withdraw at any time. Your feedback is extremely valuable and will greatly enhance our understanding of how AI can be integrated into our field. All information you provide will be kept confidential and used solely for this research. The survey will take about 10-15 minutes to complete. If you have any further questions, please feel free to reach out to the researcher, *****
(*****), or the supervising professor, Dr. Mustafa *****
(*****).

Thank you for your time and willingness to contribute to this study.

Best regards,

English Instructor and Master's Student

A. Demographic Information

Please choose the appropriate one.

1. Gender

- ☐ Male
- ☐ Female
- ☐ Do not want to specify

2. Age

.....

3. Years of Teaching Experience

- ☐ 0-5
- ☐ 6-10
- ☐ 11-15
- ☐ 15+

4. School (Current Employment)

- ☐ Public
- ☐ Private

Appendix 1: (Continued)

5. Teaching Level

- ☐ Primary School
- ☐ Middle School
- ☐ High School

6. Educational Background

- ☐ ELT (English Language Teaching)
- ☐ ELL (English Language and Literature)
- ☐ ETI (Translation and interpreting)
- ☐ ACL (American Culture and Literature)
- ☐ Other

B. The Use of AI

Please choose the appropriate one.

1. Have you ever used one of the AI tools in language learning/teaching specified below (or any other AI tools) in your classroom?

ChatGPT Grammarly QuillBot DeepL Duolingo Mondly Preply

- ☐ Yes (If yes, please move on to the next question)
- ☐ No (If no, please specify your reasons for not using AI in your classroom)

.....

2. How often do you use AI tools for your language class?

- ☐ Always
- ☐ Usually
- ☐ Often
- ☐ Sometimes
- ☐ Rarely
- ☐ Never

3. Which AI tool do you use in your teaching practices the most?

.....

Appendix 1: (Continued)

C. Familiarity with Digital Tools and AI Tools in Language Teaching

Please note that the names of the tools provided in parentheses throughout the remainder of the survey are included solely for illustrative purposes. Familiarity with all listed tools is not required. If you are acquainted with at least one of the tools mentioned in parentheses, or with any tool that operates on a similar principle but is not explicitly listed, that is deemed sufficient.

On a scale from 0 (Not at all Familiar) to 10 (Extremely Familiar) how would you rate your familiarity with Digital Tools and AI tools in Language Learning and Teaching?

1. I am familiar with Online Learning Platforms tools (e.g., Google Classroom, EBA, Moodle, Canvas etc.,).

0	1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

2. I am familiar with Multimedia (e.g., Videos, Podcasts, Interactive Content etc.,).

0	1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

3. I am familiar with Mobile Apps (e.g., Duolingo, Quizlet, Kahoot etc.,).

0	1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

4. I am familiar with Virtual Classrooms or Videoconferencing Tools (e.g., Zoom, Microsoft Teams, Google Meet etc.,).

0	1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

5. I am familiar with AI tools used in language learning/teaching (e.g., ChatGPT, Grammarly, Duolingo, Preply etc.,).

0	1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

D. Readiness Level of EFL Teachers Towards AI

To what extent do you agree with the following statements?

Please choose the appropriate answers (strongly disagree=1, disagree=2, neutral=3, agree=4, strongly agree=5).

Appendix 1: (Continued)

Readiness Level of EFL Teachers Towards AI	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Technological Content Knowledge (TCK)					
1. I am aware of the use of AI tools in various aspects of my daily life (e.g., voice assistants, virtual assistants, facial recognition, etc.,).	1	2	3	4	5
2. I have sufficient understanding of basic AI concepts (e.g., machine learning, natural language processing, etc.,).	1	2	3	4	5
3. I am knowledgeable about various AI tools (e.g., ChatGPT, Preply, Duolingo, etc.,) used in language teaching.	1	2	3	4	5
4. I can identify specific AI tools that are effective for language teaching.	1	2	3	4	5
Technological Pedagogical Knowledge (TPK)					
5. I am able to use AI-based writing assistants (e.g., Grammarly, QuillBot, DeepL, ChatGPT, TinyWow, LangoTalk, TutorLily, etc.,).	1	2	3	4	5
6. I am able to use AI-based chatbots for language practice (e.g., ChatGPT, DuoLingo, Mondly, Preply TalkPal, Character.ai, etc.,).	1	2	3	4	5
7. I am able to use AI-based tools to teach vocabulary (e.g., Pi.AI, Babbel, DeepL, etc.,).	1	2	3	4	5
8. I am able to use AI-based tools to practice listening (e.g., Duolingo, TutorLily, Eigo.AI, Lango Talk, etc.,).	1	2	3	4	5
9. I am able to use AI in the assessment process to evaluate grammar, structure, and vocabulary usage. (e.g., Pi.ai, ChatGPT, DeepL, etc.,).	1	2	3	4	5
10. I am able to use AI-based tools to practice reading comprehension (e.g., Univerbal, Eigo.ai, Kippy.ai, Lango Talk, Tutor AI, etc.,).	1	2	3	4	5
11. I am able to use AI-based tools in order to provide students with materials (e.g., educational games, reading comprehension materials, listening activities, writing prompts, etc.,).	1	2	3	4	5
12. I am able use AI for professional development purposes (e.g., creating lesson plans, preparing materials, etc.,)	1	2	3	4	5
13. I know how to integrate AI tools into my lesson plans.	1	2	3	4	5
Technological Knowledge (TK)					
14. I am comfortable in my abilities to use AI tools.	1	2	3	4	5
15. My knowledge of the AI tools is insufficient.	1	2	3	4	5
Infrastructure Readiness					
16. I have access to the internet via a smart board and/or computer.	1	2	3	4	5
17. The school I work for provides me with sufficient classroom equipment (e.g., a smart board, internet access, computers and/or tablets, etc.,).	1	2	3	4	5
18. The school I work for provides me with the necessary AI resources (e.g., software, training materials, etc.,).	1	2	3	4	5

Appendix 1: (Continued)

E. Perceptions of EFL Teachers Towards AI

To what extent do you agree with the following statements?

Please choose the appropriate answers (strongly disagree=1, disagree=2, neutral=3, agree=4, strongly agree=5).

Perceptions of EFL Teachers Towards AI	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Perceived Advantages					
Perceived Usefulness					
1. AI-based language tools can raise students' motivation.	1	2	3	4	5
2. AI-based language tools can enhance students' engagement.	1	2	3	4	5
3. AI-based language tools can make the learning process more enjoyable for students.	1	2	3	4	5
4. AI-based language tools can make the language learning process more effective.	1	2	3	4	5
5. AI-based language tools enhance autonomy among students.	1	2	3	4	5
6. AI-based language tools are beneficial in terms of offering immediate feedback.	1	2	3	4	5
7. AI tools can help students understand their strengths and weaknesses.	1	2	3	4	5
8. AI tools (e.g., chatbots, virtual assistants, etc.) can help students improve their speaking skills.	1	2	3	4	5
9. AI tools (e.g., PLai, Babbel, etc.) can help students improve their vocabulary.	1	2	3	4	5
10. AI tools (e.g., ChatGPT, Grammarly, etc.) can help students improve their writing skills.	1	2	3	4	5
11. AI tools (e.g., Univerbal, TutorLily, etc.) can help students improve their reading skills.	1	2	3	4	5
12. AI tools (e.g., Duolingo, Eigo.ai, etc.) can help students improve their listening skills.	1	2	3	4	5
13. AI tools make teachers' jobs easier in terms of planning the class.	1	2	3	4	5
14. AI tools make it easier for teachers to grade students' performance.	1	2	3	4	5
Perceived Disadvantages					
Negative Attitude					
15. AI tools lack the ability to personalize lessons based on students' specific needs.	1	2	3	4	5
16. The lack of face-to-face interaction in AI language learning is a disadvantage for students.	1	2	3	4	5
17. AI tools make students dependent on technology.	1	2	3	4	5
18. Integrating AI tools into class is hard in crowded classes.	1	2	3	4	5
Perceived Risks and Concerns					
19. Relying on AI tools may cause a lack of critical thinking among students.	1	2	3	4	5
20. Using AI tools incorrectly harms academic honesty.	1	2	3	4	5
21. The usage of AI encourages students to cheat.	1	2	3	4	5

Appendix 1: (Continued)

F. Recommendations

Would you be open to participating in a brief follow-up interview to discuss your perceptions on the use of AI in English Language Teaching in greater detail?

This interview will allow us to delve into your experiences and gather additional insights. The interviews will be recorded for analysis by the researcher, and all recordings will remain anonymous and will only be used for this study. If you are interested, please provide your name and email address below, and the researcher will reach out to you with further information. If you are willing to take part in the second phase of the study and assist with additional analysis, please select the consent option below.

(If you prefer not to participate in the second phase of the study, you may skip this question.)

o I agree to participate.

Please provide your name and e-mail address.

.....

Appendix B: Interview Consent Form

Sayın Katılımcı,

Öncelikle, çalışmamın ikinci safası olan bu mülakata zaman ayırdığınız ve ilginiz için teşekkürlerimi sunmak isterim. Karadeniz Teknik Üniversitesi'ndeki yüksek lisans tezimin bir parçası olarak, Yabancı Dil Olarak İngilizce (EFL) öğretmenlerinin dil öğretiminde yapay zeka araçlarının kullanımına ilişkin algılarını anlamayı amaçlayan bir araştırma yürütüyorum. Görüşleriniz son derece değerlidir ve yapay zekanın disiplinimize entegrasyonunu anlamamızı önemli ölçüde artıracak ve sizin gibi EFL öğretmenlerinin ve müfredat düzenleyicilerinin belirtilen konuyu daha iyi anlamalarına yardımcı olacaktır. Çalışmanın bu aşamasında, anket çalışmasına katılanlar arasından sizin gibi seçilmiş gönüllülerle yarı yapılandırılmış görüşmeler yapılacaktır. Bu görüşmeler, katılımcılar ve araştırmacı arasında karşılıklı olarak kararlaştırılan bir zamanda çevrimiçi olarak gerçekleştirilecektir. Araştırma, akademik bilimsel araştırma standartlarına uygun olarak yürütülmektedir. Karadeniz Teknik Üniversitesi Etik Kurulu'ndan onay alınacaktır. Çalışma sizin için hiçbir olumsuz etki veya risk oluşturmamaktadır. Katılımınız tamamen sizin takdirinize bağlıdır; istediğiniz zaman çalışmayı reddedebilir veya çalışmadan çekilebilirsiniz. Bu araştırma çevrimiçi olarak yürütüleceğinden, kendinizi rahat hissettiğiniz herhangi bir ortamdan katılabilirsiniz. Görüşme yaklaşık olarak 30-35 dakika sürecektir. Çevrimiçi olarak gerçekleştirilecek bu görüşme, araştırmacının katılımcı tarafından belirtilen verilerin toplanması ve analizi için kaydedilecektir. Lütfen görüşmenin kayıt edilme şekline ilişkin isteklerinizi belirtilen ifadenin yanındaki kutucuğu işaretleyerek belirtiniz.

- ☐ Görüntümün ve sesimin kaydedilmesine izin veriyorum.
- ☐ Görüntümün kaydedilmesine izin vermiyorum
- ☐ Sesimin kaydedilmesine izin vermiyorum.
- ☐ Görüntümün ve sesimin kaydedilmesine izin vermiyorum.

Appendix 1: (Continued)

Başlamadan önce araştırmacıya süreç ile ilgili sormak istediğiniz sorularınız varsa çekinmeden sorabilirsiniz. Çalışma bittikten sonra araştırmacıya telefon veya e-posta ile ulaşarak soru sorabilir, sonuçlar hakkında bilgi isteyebilirsiniz.

Saygılarımla,

E-mail:*****

Telefon Numarası:*****

İngilizce eğitmeni ve yüksek lisans öğrencisi

Bu çalışmaya katılmayı onaylıyorum.

...../...../.....

İsim-Soyisim:

İmza:

Appendix B: Interview Questions

- 1.Yapay zekanın (YZ) İngilizce öğretimindeki rolünü nasıl algıyorsunuz?
- 2.Sizce, yapay zeka araçlarını İngilizce dil eğitimine entegre etmenin potansiyel faydaları nelerdir? Neden?
- 3.Belirtilen bu faydaların öğrencilerin genel dil öğrenme sürecine nasıl katkıda bulunduğunu düşünüyorsunuz?
- 4.Sizce, YZ araçlarını İngilizce dil eğitimine entegre etmenin potansiyel dezavantajları nelerdir? Neden?
- 5.İngilizce öğretiminde yapay zekâ teknolojilerinin kullanılmasının etik açıdan bazı sorunlara yol açabileceğini düşünüyor musunuz? Eğer evet ise, bu düşüncenizi şekillendiren bir deneyiminiz oldu mu? Olduysa, bu durumu paylaşabilir misiniz?
- 6.Sınıfınızda bir YZ aracı uyguladığınız belirli bir örneği anlatabilir misiniz? Sonuç ne oldu?
- 7.Varsa, öğretiminizde YZ araçlarını kullanırken ne gibi zorluklarla karşılaştınız?
- 8.YZ'nin İngilizce öğretiminde gelecekteki rolünü nasıl öngörüyorsunuz?
- 9.YZ araçlarının İngilizce öğretmeni olarak mesleki gelişiminize nasıl katkıda bulunabileceğini düşünüyorsunuz?
- 10.YZ araçları ve bunların İngilizce öğretimine entegrasyonu hakkındaki düşüncelerinizle ilgili paylaşmak istediğiniz başka bir şey var mı?

CURRICULUM VITAE

She completed her primary education at Yomra Central Primary School and pursued her secondary education at Şehit Ünal Bıçakçı Vocational and Technical Anatolian High School of Commerce. She earned a bachelor's degree in English Language and Literature from Karadeniz Technical University. Following graduation, she commenced work as an English teacher in Rize in 2023. She subsequently enrolled in the Applied Linguistics master's program at Karadeniz Technical University. Presently, she teaches English at Ekrem Orhon Vocational and Technical Anatolian High School of Tourism.

