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INVESTIGATING ARTIFICIAL INTELLIGENCE SELF-EFFICACY LEVELS OF HIGH SCHOOL EFL TEACHERS

MASTER'S THESIS

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LİSE İNGİLİZCE ÖĞRETMENLERİNİN YAPAY ZEKÂ ÖZ-YETERLİK DÜZEYLERİNİN İNCELENMESİ

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BİLİMSEL ETİĞE UYGUNLUK

Bu çalışmadaki tüm bilgilerin akademik ve etik kurallara uygun bir şekilde elde edildiğini beyan ederim.

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I am ready for the next chapter, chapter VII, Fulbright...

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ÖZET

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Lise İngilizce Öğretmenlerinin Yapay Zekâ Öz-Yeterlik Düzeylerinin İncelenmesi

Bu çalışma, nicel araştırma yaklaşımı kullanarak Türkiye'nin üç ilindeki lise İngilizce öğretmenlerinin mevcut yapay zeka okuryazarlık düzeylerini belirlemek ve bu düzeyin öğretmenlerin öz yeterlilik düzeyleriyle ilişkisini incelemek amacıyla yapılmıştır. Araştırma, mevcut dijital yeterlilik çerçeveleri, özellikle DigComp, DigCompEdu ve UNESCO tarafından öğretmenler için geliştirilen yapay zeka yeterlilik çerçevesi temel alınarak kavramsal olarak tasarlanmıştır. Veri toplama için kullanılan başlıca araç, TAICS adlı yapılandırılmış bir ölçektir. Yazar, toplam 126 öğretmenden veri toplamak için 50'den fazla okulu bizzat ziyaret etmiştir. Toplanan verileri değerlendirmek için hem tanımlayıcı hem de çıkarımsal istatistik yöntemleri kullanılmıştır. Tanımlayıcı istatistikler ve grup karşılaştırma testleri gibi yöntemler kullanılarak YZ okuryazarlığı ve öz yeterlilik düzeyleri incelenmiş, demografik gruplar arasındaki korelasyonlar ve farklılıklar araştırılmıştır. Ayrıca, kullanılan ölçeğin ölçüm modellerini doğrulamak için doğrulayıcı faktör analizi (CFA) yapılmıştır. Sonuçlar, öğretmenlerin orta düzeyde YZ okuryazarlığına sahip olduğunu ve YZ okuryazarlığı ile öz yeterlilik arasında pozitif bir ilişki olduğunu göstermiştir. Bu da, öğretmenlerin modern YZ teknolojisini derslerine entegre etme konusundaki öz yeterliliklerinin, YZ okuryazarlık düzeyleriyle pozitif korelasyon içinde olduğunu göstermektedir. Öğretmenlerin günümüzün sınıflarında YZ araçlarını iyi bir şekilde kullanabilmeleri için, eğitimde politika belirleyicilerin YZ okuryazarlığını, özellikle mesleki gelişim ve akreditasyon programları için öncelik haline getirmeleri gerektiği sonucuna varılmıştır. Çalışma, öğretmenlerin YZ okuryazarlık düzeylerini ölçerek literatürdeki deneysel araştırma boşluğunu doldurmaya yardımcı olmakta ve politika belirleyicilere Türkiye'deki öğretmenler için iyileştirilmiş mesleki gelişim programları geliştirmek için kullanabilecekleri yararlı baz veriler sağlamaktadır. Bakanlık tarafından YZ hakkında birkaç farklı program ve rehber hayata geçirilmiş olsa da 2017 yılında uygulamaya konulan ve hala yürürlükte olan Millî Eğitim Bakanlığı'nın mevcut "Öğretmenlik Mesleği Genel Yeterlilikleri" çerçevesinin, dünya çapındaki gelişmeler ve üretken yapay zekanın yükselişi doğrultusunda güncellenmesi önerilmiştir.

Anahtar Sözcükler: yapay zeka okuryazarlığı - eğitimde yapay zekâ kullanımı - üretken yapay zekâ - eğitim teknolojileri - öğretmen öz yeterliği – makine öğrenmesi – doğal dil işleme – derin öğrenme – yapay sinir ağı – yapay zekâ öz yeterliği –yapay zekâ yetkinliği

ABSTRACT

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Investigating Artificial Intelligence Self Efficacy Levels of High School EFL Teachers

Using a quantitative research approach, this study wanted to determine the levels of current AI literacy levels of high school English language teachers in Turkey's three provinces and how their knowledge relates to their teacher self-efficacy levels. The research was conceptually designed around existing digital competence frameworks, specifically DigComp, DigCompEdu and AI competency framework for teachers by UNESCO. The primary instrument for collecting data was a structured questionnaire called, TAICS. The author personally visited more than 50+ schools to gather data from a total of 126 teachers. Both descriptive and inferential statistical methods were used to evaluate the collected data. A review of AI literacy and self-efficacy levels was given using descriptive statistics, and inferential methods, such as group comparison tests, looking into correlations and differences between demographic groups. Furthermore, in order to validate the measurement models of the scale utilized, confirmatory factor analysis (CFA) was carried out. The results showed that teachers had a moderate level of AI literacy, and that there was a positive association between AI literacy and self-efficacy, suggesting that teachers' self-efficacy in integrating modern AI technology into their lessons is positively correlated with their level of AI literacy. It is concluded that in order for teachers to make good use of AI tools in today's classrooms, educational policymakers should make AI literacy a top priority, especially for professional development and accreditational programs. The study helps fill a gap by measuring AI literacy levels of teachers and provides policymakers with useful base data they can use to develop improved professional development programs for teachers in Türkiye. Although ministry initiated several programs and released guides concerning AI, the existing "General Competencies for Teachers," framework by MoNE, which was put in practice in 2017 should be updated following the worldwide developments and rise of GENAI.

Keywords: AI literacy - AI in education (AIED) - generative artificial intelligence - educational technologies - teacher self-efficacy – machine learning – natural language processing (NLP) – deep learning – neural network – AI self efficacy (AISE) – AI competency

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LIST OF ABBREVIATIONS

AI	: Artificial Intelligence
AIED	: Artificial Intelligence in Education
AGI	: Artificial Generative Intelligence
CAI	: Computer-Assisted Instruction
CAL	: Computer-Assisted Learning
DIGCOMP	: European Digital Competence Framework
DIGCOMPEDU	: European Digital Competence Framework for Educators
GENAI	: Generative Artificial Intelligence
HI	: Human Intelligence
ICT	: Information and Communication Technologies
LTSE	: Language Teacher Self-Efficacy
MoNE	: Ministry of National Education
SE	: Self-Efficacy
TPACK	: Teacher Pedagogical Content Knowledge
SE	: Self-Efficacy
TSE	: Teacher Self-Efficacy
WWW	: World Wide Web

CHAPTER I
INTRODUCTION

This chapter will include the theoretical framework regarding the thesis subjects and main investigation points, artificial intelligence (AI) literacy and teacher self-efficacy (TSE). Besides these concepts, their underlying base concepts such as machine learning and natural language processing for AI and social cognitive and social learning theories for TSE will be mentioned. The theoretical foundation for the specified concepts is first provided, followed by a clarification of the problem statement and research objective. The significance of the investigation is then presented along with research questions and this chapter will be wrapping up with an introduction to the study's assumptions and limitations.

1.1. Background of the Study

1.1.2 Background of Artificial Intelligence Systems as A Concept

Even though artificial intelligence (AI) is an old concept that originated in 1950s with such examples as the field pioneer Alan Turing, the AI field of computer science has been recently flourishing. In his 1950 paper “Computing Machinery And Intelligence” (Turing, 1950) Turing argued that if people utilize accessible data in addition to reason to solve issues and make choices, why can't machines be able to do the same (Anyoha, 2017) in the title of a workshop proposal for the Rockefeller Foundation, John McCarthy, an assistant professor at Dartmouth College at the time, first used the phrase "artificial intelligence" in 1955 (Cope et al., 2021).

Since then, scientists have been looking for ways to make computers or rather, machines, think and act like humans. Recently, due to significant advancements in technology and computer science, AI has evolved into a more complex, interdisciplinary, multipurpose, and worldwide initiative, which is continuously developing (Niemi et al., 2023). In fact, AI is becoming integrated in our lives in different shapes of forms.

AI's use beyond its original domain of computer science has been made possible by recent technical advancements, and its impact has extended to several other areas including engineering, education, healthcare, logistics. In other words, we now have the processing power required to run AI's software, making it practical. A smartphone today possesses a considerable amount of computer capacity that NASA did not have when Neil Armstrong landed on the moon in 1969 (Floridi, 2023). The current time is defined by swift technological advancement that

has influenced many aspects of life (AlKanaan, 2022). AI is the essential component of the modern age and beyond, serving the same function as steam engines did in the Age of Steam, generators did in the Age of Electricity, and computers did in the Age of Information (Jiang et al., 2022).

AI is becoming more than just a catchphrase for marketing purposes; it is becoming a necessary part of everyday life (Kurni et al., 2023). The quick development of AI is altering the way humans interact, communicate, live, learn, and work on a daily basis (Chiu, 2021). Robotics, chatbots, facial recognition, automated mobile device log-in, and manufacturing have all benefited from AI's added value to design, manufacturing, and goods (Niemi et al., 2023). However, experts continue to point out that we are only at the beginning of AI applications, and much more study and advancement will be required to realize AI's full potential (Stone et al., 2016).

Defining AI is a little bit challenging. However, one can argue that since the early days of the concept, the key idea of most definitions propose that a machine can exhibit intelligence by incorporating certain performance attributes similar to those executed by human brains, enabling computer systems to accomplish tasks that typically require human intelligence (Coppin, 2004; Roschelle et al., 2020; Stone et al., 2016; UNESCO, 2021). One of the challenges of defining AI is figuring out what actually it offers and what it doesn't compared to human intelligence (HI). They have lower intelligence than humans and can just computate. However, they outperform humans in speed and handling enormous numbers of data (Cope et al., 2021). Additionally, there are different categories present for AI, which can be categorized as analytical, human-inspired, or humanized based on cognitive, emotional, and social intelligence. It can also be characterized as Artificial Narrow, General, or Super Intelligence based on evolutionary stage (Haenlein & Kaplan, 2019).

Furthermore, Poole and Mackworth (2017) emphasize the importance of intelligent "beings" they call "agents" in AI, describing them as entities that analyze input from their surroundings and choose appropriate behaviors via algorithmic reasoning. If one was to trace the source of this algorithmic reasoning, one would have to go back in history, as throughout history, individuals have utilized technology to create models of themselves. There is evidence of this from ancient China, Egypt, and Greece, proving the universality of this activity (Poole & Mackworth, 2023)

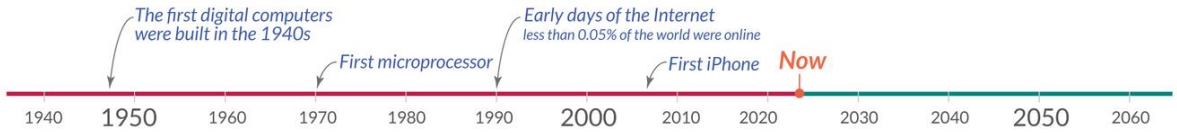
"About 400 years ago people started to write about the nature of thought and reason. Hobbes (1588– 1679), who has been described by Haugeland (1985, p. 85) as the "Grandfather

of AI," espoused the position that thinking was symbolic reasoning like talking out loud or working out an answer with pen and paper." (Poole & Mackworth, 2017, p. 14)

In short, AI is a computer-based technology that mimics and utilizes the human mind, including its beneficial characteristics and strong capabilities and the author will be using this definition throughout this story for the AI concept. Other existing perspectives in the literature regarding the definition of AI will be explored in the following chapter.

Figure 1

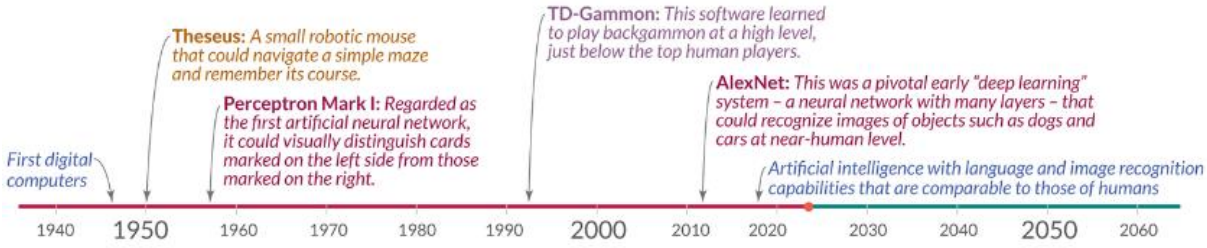
Notable Technological Advancements Timeline (Roser, 2024)



Computers evolved so swiftly and became such a vital part of our daily lives that it's easy to forget how new they are. The Figure 1 above indicates that the first digital computers were invented almost eight decades ago (Roser, 2024). In a similar fashion, generative artificial intelligence (GenAI) gained public attention quickly in late 2022 with the release of ChatGPT, the fastest growing app in history. Broad capacities such as text, images, videos, music and software codes for information processing and knowledge production could have profound implications for education, as they model the higher-order thinking that underpins human learning (Miao & Holmes, 2023)

Figure 2

Notable Artifical Intelligence Systems Timeline (Roser, 2024)



In terms of AI systems timeline, Theseus system is the earliest notable mention. In 1950, Claude Shannon created a remote-controlled mouse that could navigate a labyrinth and recall its path (Klein, 2018). Since then, scientists have anticipated that Artificial General Intelligence

(AGI) systems will be able to mimic human behavior and have cognitive, emotional, and social intelligence within a few years (Haenlein & Kaplan, 2019), thus, one can conclude that today's hype over AI may appear sudden, yet researchers have been working towards this moment since the 1950s (Urmeneta & Romero, 2024). The use of expert systems became widespread in the 1970s. Commercial applications of machine learning technologies emerged in the 1990s (AlKanaan, 2022). Faster processing rates and access to enormous amounts of digital data from multiple sources, have made it easier to create statistical models that accurately anticipate outcomes. Machine learning is widely used in commercial AI applications nowadays (Murphy, 2019). Therefore, according to Razmerita and her colleagues (2022), as AI has become more accessible, the relationship between people and AI has shifted from process automation to a collaborative teamwork built on shared capabilities. This is the exact overlapping point between HI and AI, combining human intuition and imagination and AI's processing power and calculation capabilities which offers a great potential for the future of humanity. Actually, this potential is already evident in other creative fields, such as music composition and performance (Rohrmeier, 2022) and visual generation in which artists have expanded their process of creativity through the use of AI tools (S. L. Kim et al., 2021).

1.2 Statement of the Problem

Recently, the world has been gripped by generative artificial intelligence, or GenAI. in the last year. GenAI has spread to daily conversation through the use of tools like ChatGPT, Midjourney, Stable Diffusion, Bard, DALL-E, and Bing Chat (Mishra et al., 2023), making AI something that everyone should understand about (Long & Magerko, 2020; Ng et al., 2021; Touretzky et al., 2023) because it will eventually impact more areas of human existence than just the computer industry. As AI enters more and more aspects of our everyday lives and educational environments, it is critical that leaders, educators, and students have the abilities and understanding to properly use this technology. Teaching has long been regarded as a highly esteemed profession that passes on social ideals to future generations and serves as a link between knowledge and those pursuing it. The ability to critically comprehend, assess, and utilize AI tools and systems to securely and productively engage in an increasingly digital world is known as AI literacy (Keun-woon et al., 2024; D. T. K. Ng et al., 2021). Despite the fact that literacy was first associated with reading and writing, the term has evolved to refer to the information, abilities, and competences a person needs in order to carry out their roles in any given situation (Stolpe & Hallström, 2024). Furthermore, the idea of literacy has evolved into one that is adaptable and consistent with socio-technical processes over space, time, and

location (Sperling et al., 2024). AI in Education (AIED) is considered a multidisciplinary and heavily reliant on technology area by scholars (Hwang et al., 2020) and due to their lack of understanding or rather AI literacy, the majority of practitioners—including educators—are unable to fully utilize AI in the classroom (Celik et al., 2022; Chiu & Chai, 2020; Chounta et al., 2022; Hwang et al., 2020). In fact, Hwang et al. (2020) state that creating and executing AI-based learning activities that are effective has been seen as quite difficult. This demonstrates how crucial it is to improve teachers' digital literacy and professional learning on AI, as these will ultimately have an impact on raising the level of AI literacy.

Providing individual students with tailored learning assistance or guidance based on their learning status, interests, or personal traits is one of the most important goals of AI in education. However, AI is a relatively new, cutting-edge technology, many educators believe they lack the knowledge and expertise necessary to effectively use or instruct with it in the real world (Hwang et al., 2020). It is crucial to raise instructors' preparation for learning AI in order to solve this problem and provide them with the necessary information and abilities. On the other hand, the majority of present AI applications in education are profit-oriented, which poses a substantial hurdle to the effective integration of AI education. Additionally, AI developers lack expertise in the learning sciences and are not equipped with the pedagogical understanding necessary to effectively integrate AI into the classroom (Luckin & Cukurova, 2019). To increase the AI readiness of educators, we will need clear and concise AI literacy frameworks for educators who are the primary users of AI in education. In their AI competency framework published by UNESCO, Miao and Cukurova (2024) state that to equip teachers to work with AI in an ethical and productive way, national educational authorities must develop suitable capacity-building programs, bolster teacher-training institutions, and dynamically review and redefine teachers' roles and necessary abilities.

However, after thoroughly searching the Turkish Ministry of National Education (MoNE) records, the author of this thesis discovered that even though it contains some updated information, the most recent "General Competencies for Teaching Profession" framework was issued in 2017 (General Directorate of Teacher Training and Development, 2017) which makes it outdated for today’s standard, let alone including AI competencies required for teachers within its suggested areas of study. The "General Qualifications for the Teaching Profession" have been revised and put into effect with the Ministerial Approval dated 01/12/2017 and numbered 20525423. By the ministry, it is said that this was done in accordance with the changes and advancements in the field of education both domestically and internationally, as well as the action of "Updating Teacher Qualifications in line with the Needs" in the Teacher

Strategy Document published in the Official Gazette on June 9, 2017 (General Directorate of Teacher Training and Development, 2017). Even though the framework suggests a good basis, it needs to be updated for today's standards in term of including more technology-related competencies, especially AI literacy. Policymakers should develop pre-service and in-service training programs to stay up with the rapidly evolving AI systems and tools. These programs may offer both teacher trainees and experienced educators vicarious learning opportunities (Oran, 2023). In line with the information so far, this thesis will be aiming to show the AI readiness levels, or rather AI literacy levels of K-12 English language teachers in Türkiye and suggest implications that may have an impact on the teacher education field. Educational stakeholders need to give this subject top priority for the public policy agenda in all circumstances as the world grows more and more AI-powered.

According to one of the reports by UNESCO, titled "Artificial Intelligence in Education: Challenges and Opportunities for Sustainable Development" (Pedro et al., 2019), there are a number of concerns about the use of AI in the classroom which can have implications on the social sciences and the education fields. One of these concerns could be the fact that educators are scared to lose their job and be replaced by AI systems. For instance, The World Economic Forum (WEF) has evaluated the economic impact of automation and AI and their probabilistic study indicates that 20% of current UK occupations may be affected by these technologies (Dwivedi et al., 2021). Therefore, concerns about AI's ability to completely replace teachers have surfaced as its use in education continues to rise. Some contend that AI is more capable of delivering effective instruction and evaluations than human educators are, and that it can work endlessly without becoming biased or worn out (Chan & Tsi, 2023). Conversely, others argue that the essential human elements of education like empathy, mentorship, and the ability to identify and meet students' emotional and social needs are difficult for AI to imitate. Teaching involves more than just imparting knowledge; it also entails assisting pupils in developing their critical thinking, creative, and interpersonal skills that many people don't think AI is fully capable of handling. Educators around the globe have consistently been encouraged to adapt their teaching methodologies by integrating emerging technologies, rather than dismissing them outright. However, even at first glance, the possible alterations brought about by AI suggest a significant shift—what might be referred to as a true paradigm shift (Gentile et al., 2023). While AI won't replace all professions, people with literacy of AI will probably surpass and eventually replace those without it in the workforce (D. T. K. Ng et al., 2021). Therefore, teachers need to embrace AI instead of viewing it as an enemy. This means changing the paradigm from one of a binary relationship between students and teachers to one

of a ternary relationship between students and machines and teachers, where interactions are mediated, altered, and occasionally even started by technology in a way that enhances rather than diminishes learning (Gentile et al., 2023). Assessing educators' levels of AI preparation is crucial to achieving this goal since it can serve as a thorough needs analysis. By identifying knowledge and skill deficiencies, this assessment would make it possible to build treatments that are specifically targeted. Drawing from pre-existing educational and technology frameworks, the assessment's findings can be utilized to create customized AI literacy frameworks that provide educators with the skills they need. With the help of these frameworks, educational environments would become more future-focused by addressing present shortcomings and ensuring that teachers possess the AI literacy and are ready to successfully incorporate AI technologies into their pedagogical practices.

Furthermore, Türkiye ranks third in the world for the reputation of teachers in the community, according to the Global Teacher Status Index which makes the country present among the top nations in the world for the importance attributed to teachers (General Directorate of Teacher Training and Development, 2017). In order to maintain the highly regarded and well-established status of teachers in the Turkish society, teachers must be equipped with required competencies for their profession, which should be updated to keep up with ever-growing AI systems.

Novice educators frequently emulate the methods of their more experienced peers or draw on their own learning experiences to teach. Modeling oneself after successful teachers can enhance self-efficacy and improve teaching abilities. It is critical for teacher educators to understand the cyclical relationship between self-efficacy and teacher performance in order to better support teacher candidates. Novice educators usually mimic the techniques of their more experienced peers or use their own learning experiences to instruct. Improving one's teaching skills and self-efficacy can be achieved by modeling oneself after effective teachers. Understanding the cyclical relationship between self-efficacy and teacher performance is essential for teacher educators to provide teacher candidates with better assistance. Self-efficacy is positioned within social cognitive theory, a more comprehensive theoretical framework. Teacher efficacy—the conviction that one can improve students' learning—has been studied and investigated for more than 25 years, and it has been found to be associated with both professional development and effectiveness. Regarding the impact of individual characteristics on human behavior, Bandura (1997) defines self-efficacy as people's assessments of their capacity to plan and carry out the actions necessary to achieve specific goals. According to Bandura (1977), an individual's perceptions about their capabilities have a direct impact on

behavior initiation and persistence. Additionally, he found that people hold off on taking action when they believe they lack the necessary coping skills to deal with a crisis. Conversely, when they believe they can handle the circumstance, they take action. This means that stronger self-efficacy beliefs lead to improved performance and persistence when facing challenges. Consequently, people's perceived self-efficacy affects how much effort they put out and how long they continue to take action in spite of current obstacles in undesirable circumstances (Bandura & Adams, 1977). As a result, there's a greater chance that teachers will continue learning and effectively build up new teaching abilities if they maintain their strong self-efficacy beliefs throughout their careers. AI's recent rise which can be seen as a key component of the present technology revolution, has significant implications for a wide range of industries, including education, where its adoption is expected to change the way that teaching and learning are conducted.

Adopting and adjusting to AI becomes essential as we go into this new era of technological advancements. There is a great amount of variation in the acceptance of these technologies, which is mostly driven by individual judgments of technological competence, which also serves as a determining element in this process (Agarwal & Karahanna, 2000; Hsu & Chiu, 2004; Morales-García et al., 2024; Pütten & Bock, 2018). In other words, one of the important factors in the acceptance of artificial intelligence is technological self-efficacy, which is formed by previous experiences and the impression of the utility of the technology (Hong, 2022). The concept of self-efficacy is relevant not just in educational contexts, where its direct relationship with performance and student motivation has been demonstrated (Pajares, 1996; Zimmerman, 2000) but also in the acceptance and adaption to new technologies, proposing the concept of "computer self-efficacy" (Compeau & Higgins, 1995). The use of the latest innovations, such as Generative Artificial Intelligence (GENAI), has the potential to boost students' sense of self-efficacy, which in turn can lead to increased cognitive engagement and, as a result, improved academic achievements (Liang et al., 2023). Positive outcomes like this show the importance of carefully integrating AI into educational institutions, balancing their benefits with limitations. Therefore, the concept "AI self-efficacy (AISE)" arises and it can be defined as the confidence and perception of being able to use AI to achieve personal and professional goals (Morales-García et al., 2024). UNESCO (2024) already developed and recommends an AI competency framework for K-12 teachers. The five components of this framework—which is still in draft form—are AI pedagogy, ethics of AI, foundations and applications, human-centered attitude (e.g., influence of AI on society), and AI for professional growth.

The problem is that framework suggested by the MoNE is outdated as of today's standards. With the Ministerial Approval dated 12 January 2017, the "General Competencies for the Teaching Profession" (General Directorate of Teacher Training and Development, 2017) have been updated and implemented. The framework being published in 2017 means that it is no longer relevant to the standards that are currently in effect today, let alone the fact that it does not include the artificial intelligence competencies that are necessary for teachers within its specified fields of study. Before updating the competency framework suggested by MoNE, first of all needs analysis studies need to be done within the Turkish context of education and AISE levels of teachers need to be examined, which we will be focusing on during the study.

1.3 Significance of The Study

AI is gradually becoming integrated into our daily lives. It has already influenced decisions in employment, credit, financing, housing, healthcare, education, taxation, law enforcement, legal procedures, travel, entertainment, digital marketing, social media, news dissemination, content distribution, pricing, and other areas. AI powers GPS maps, detects faces on smartphones, cleans our houses with robotic vacuums, drives autonomous vehicles and tractors, finds relevant information on the web and recommends movies, books, songs.

AI will undoubtedly drive a significant change within this time period of time. In fact, the implications of generative AI applications in education are huge. In the class, the teacher is no longer the exclusive authority or deposit of knowledge, the written assignment is no longer a valid measure of learning, and the classroom is no longer the center of activity (Pratschke, 2024). AI is capable of processing large amounts of information and text, creating new content, identifying patterns in data, and facilitating human decision-making through predictive analysis (Miao & Cukurova, 2024). Besides the negative factors, GAI undoubtedly presents significant opportunities for education, particularly in its capacity to provide personalized learning on a large scale (Nicholson, 2023). However, institutions face considerable challenges, especially those lacking an understanding of digital education. Digital education technologies and strategies enable equal and accessible chances for education, remove barriers to learning, broaden teachers' viewpoints, and improve overall quality (De Bem Machado et al., 2024).

It takes a large time and financial effort to improve the skills of academic and professional staff in order to make the transition from analog to AI. A digital-first mindset is needed. This entails using more agile working methods than are commonly used in large educational institutions (Pratschke, 2024). To become a citizen of data science as coined by Schmarzo (2023), we need frameworks to guide our personal and organizational development

in an AI and data-driven environment. First of all, educators need to be aware of the fact that AI can personalize learning experiences by assessing students' learning patterns and preferences. This ability to adapt includes curriculum, material, and assessments, all of which can be tailored to improve engagement and overall educational success (De Bem Machado et al., 2024). The AI and Data Literacy Framework (Schmarzo, 2023) presented below in the Figure 4 outlines guidelines for responsible and ethical AI model design, development, and administration. It is a structure intended to be equally accessible and understood to everyone. In fact, the aim of stakeholders should be providing equal access to education for all, regardless of age or background, to thrive in an age of AI and data-driven economic growth and personal development.

Figure 3

AI and Data Literacy Framework (Schmarzo, 2023)



The AI and Data Literacy Framework provides a strong foundation for the training of individuals in a variety of different industries. However, given that the purpose of this study is to determine the existing levels of artificial intelligence literacy among English language teachers who teach pupils in grades K-12 in the context of Turkish education, the framework needs to be modified so that it can accommodate the specific needs of the specific group of teachers. Therefore, in order to accomplish this adaptation, empirical studies that allow us to evaluate should be carried out using a variety of scales. In order to survive and flourish in this AI-driven era, AI should be taught to both educators and the students and their AI literacy need to be increased to make them prepared for the real-time AI use. AI literacy refers to the

necessary skills that individuals need to possess in order to live, learn, and work in our digital world through the use of AI-driven technology. This is something that should be taught at the elementary, middle, and high school levels (Steinbauer et al., 2021).

In the future, identifying AI applications will become much more difficult as technology advances toward a more integrated, frictionless user interface. This is connected to the so-called AI effect, which states that once a new AI application has been incorporated and approved in a certain environment, it is no longer considered as AI and will thus be more difficult to identify from non-AI (Geist, 2016). Consequently, digital revolution is altering the necessary skills for success in the modern world (Skilton & Hovsepian, 2018).

In 2015, the World Economic Forum outlined the skills required for the workforce of the twenty-first century. Artificial Intelligence represents the progression of the digital era and will be essential in the procedures of acquisition of skills and teaching (Luckin et al., 2016; Luckin, 2018; Chaudhry & Kazim, 2022; Pratschke, 2024). As a result of the need to take part in an evolving educational landscape, teachers are required to adjust to the unavoidable integration of technology. Furthermore, as previous experiences have demonstrated, the transformations that have an impact on education are unpredictable (Webb et al., 2021). Proficiency in both digital and AI is necessary for the transition to learning as a human-AI collaborative process and the creation of 21st century skills (Pratschke, 2024). An important component influencing the development of students' AI literacy and competency is the level of teacher expertise in AI (Chiu, 2023, 2024).

1.4 Purpose of the Study

The investigation into teacher AI proficiency is in the early stages. Assessing teacher literacy in AI and creating an effective, secure, and conducive learning environment are critical milestones in the shift to AI-driven education (Chiu et al., 2024). AI integration in education, however, also presents practical and ethical issues that need to be properly handled besides its beneficial side (Oran, 2023). Hence, enhancing digital competences and familiarizing teachers with AI are essential measures to optimize its advantages, including individualized learning and increased teaching efficiency (Morales-García et al., 2024). In addition to enabling more individualized instruction, integrating AI into the classroom increases pupil motivation and self-efficacy, particularly in challenging subjects like programming (McDiarmid & Zhao, 2023; Yilmaz & Karaoglan Yilmaz, 2023; Zhai et al., 2021). Huang and Qiao (2024) discovered that students in the experimental group who were trained in AI using the STEAM model had a much higher level of self-efficacy than students in the control group who were not educated by AI.

No studies analyzing the impact of AI on teachers' self-efficacy were found in the literature review. However, various research findings have examined the influence of AI tools on students' self-efficacy. The research conducted by Li and Wang (2021) indicates that the presence of artificial intelligence capabilities in educational institutions of higher learning has been demonstrated to have a favorable impact on the creative and self-efficacious learning performance of students.

Self-efficacy has been recognized as a critical concept in behavioral and educational psychology during the latter half of the 20th century. This term represents the confidence in one's capacity to organize and execute the actions required to manage future circumstances (Morales-García et al., 2024). Students' self-efficacy can be improved by the use of cutting-edge technologies such as Generative Artificial Intelligence (GENAI), which can also encourage a deeper level of cognitive engagement and, as a result, improve their academic achievements (Liang et al., 2023).

It is essential to have expertise in both digital and artificial intelligence in order to make the transition to learning as a human-AI collaborative process and to develop abilities that are appropriate for the 21st century (Pratschke, 2024). Furthermore, self-efficacy in the application of artificial intelligence considerably moderates the association between work overload and job stress (Kim et al., 2024). Researchers need to determine the current levels of artificial intelligence literacy among teachers and then build on their needs in order to eliminate the external threats that are posed to teachers and to ensure that they are always up to date with the necessary skills that will be required for modern classrooms in the future. In light of this, it is more vital than ever before to investigate the connection between TSE and AI literacy as well as the incorporation of AI into the classroom. During the process of examining the existing literature, it was discovered that there were no studies that functioned as a direct assessment of TSE and AI literacy of instructors, much alone in K-12. This may be attributed to the fact that AI and AI literacy frameworks are still in their early stages, therefore they are relatively new. This thesis aims to fill in that gap present in the literature by assessing the current AI literacy levels of English language teachers in Türkiye’s K-12 educational context.

1.5 Limitations

Just like it is the case with almost every other research project, this thesis also has its limitations. In order to provide an appropriate presentation of the limitations of the study, it is necessary to define the potential limits, explain the effects of the limitation, provide practical alternative approaches, and discuss the efforts that were done to mitigate the limitation (Ross

& Bibler Zaidi, 2019). It is crucial to recognize these limitations in order to put the study's findings in context and to help guide future research that may want to expand upon its findings.

The study's sample structure is one of its main limits. High school English language teachers working at Türkiye's Bartın, Bursa, Kastamonu provinces and their respective districts were the only ones who took part in the study. These sites were chosen based on the researcher's residency, academic affiliation and personal background. It should be said that the sample does not adequately represent the diversity of English language teachers across the country, despite the fact that this made it easier for the researcher to access the participants as per convenient sampling method. Therefore, it is important to use caution when drawing conclusion based on these results for the regions outside of this thesis's scope, as the findings may not be applicable to a broader national and educational contexts.

In terms of methodology, the research is based only on quantitative data that was gathered through the use of self-report questionnaires with participants. While this method is useful for the studies with large samples and helpful for the detection of statistical connections, it fails to convey the depth of the personal experiences, views, or contextual challenges that the participants have as individuals. Since this study does not include any qualitative components like interviews or open-ended answers, it is limited to statistical information.

A further limitation is related to the instrument that was utilized in the research, which was the Teacher Artificial Intelligence Competence Self-Efficacy (TAICS) Scale. Despite its alignment with worldwide frameworks like UNESCO's AI Competency Framework for Teachers and its development and validation by Chiu et al. (2024), this instrument was initially developed in a different cultural and educational setting. There is a risk that participants' interpretations of items might be influenced by cultural differences as well as contextual factors that are related to the Turkish education system such as heavy emphasis on standard examinations on the education system. Some items in the scale may not be able to properly convey the different levels of AI competence possessed by Turkish teachers as a consequence of this.

The findings of this study should be viewed as exploratory and suggestive rather than definitive because of the limitations that have been mentioned. These findings offer valuable insights into the current state of AI literacy and teacher self-efficacy among English teachers in specific regions of Türkiye; however, the need for additional research with more diverse, representative datasets and mixed-methods approaches in order to strengthen generalizability and deepen understanding of the concept in Turkish educational context.

1.6. Research Questions

This study seeks to fill a research gap in the recent collection of AI research in education by investigating the current state of AI literacy among English language teachers working at high school level in Turkey and how their levels of AI literacy relate to their self-efficacy beliefs. Thus, the study aims to contribute to the collection of research that might guide adjustments to educational policies, strategies for integrating AI into the Turkish education system, and professional development programs.

The study aims to answer following three research questions as the foundation of this study:

1- What is the current level of artificial intelligence literacy levels of English language teachers working in Türkiye?

2- What are English teachers' self-efficacy beliefs about artificial intelligence and the use of artificial intelligence tools in their classrooms?

CHAPTER II
LITERATURE REVIEW

2.1 Digital Technology and Education

The digital revolution has had a significant impact on everyday life, as seen by the widespread availability of computers, mobile devices and the smooth integration of technology into daily tasks such as going shopping, reading, and finding directions (Anderson, 2016; Horrigan & Anderson, 2016; Suh, 2014). As stated by Valente (1997), the potential that the computer offers as a tool to assist students in learning, in constructing knowledge, and in comprehending what they do constitute a genuine revolution in the process of learning and an opportunity to reform schools. Therefore, over the course of the past few years, educational systems all over the world have increased their investments in the incorporation of information and communication technology (ICT) (Iinuma, 2016; Timotheou et al., 2023). These technologies include mobile devices, smartboards, massive open online courses (MOOCs), tablets, laptops, simulations, dynamic visualizations, and virtual laboratories (Haleem et al., 2022). According to Ng (2015) educational institutions and policymakers use these digital technologies to support learning for successful learning outcomes, develop twenty-first century skills to prepare students for the workplace, and create responsible digital citizens and lifelong learners. However, studies have found that despite the investment made in the integration of technology in schools, the results have not been promising, and the desired goals have not yet been achieved (Delgado et al., 2015; Lawrence & Tar, 2018). Considering one of the key elements of the 2030 Sustainable Development Agenda of the United Nations is quality education, integration of technology and adaptation to new technologies in education has become crucial. Quality education's goal is to guarantee that everyone has access to high-quality, inclusive education. In order to accomplish this, digital technology have become a vital tool (Haleem et al., 2022). In educational system, Computers were first used in mathematics, physics, and engineering to solve mathematical issues, eliminating the slide rule calculation tool and allowing students to focus on real-world problems (Levien, 1972). The first major computer-based education project, PLATO, was started by Donald Bitier at the University of Illinois in 1959. The several thousand terminal system supported a community college in Urbana, many campuses in Chicago, elementary school reading, and undergraduate education. The first major computer-based education project, PLATO, was started by Donald Bitier at the University of Illinois in 1959. The several thousand terminal system supported a community

college in Urbana, many campuses in Chicago, elementary school reading, and undergraduate education (Informational Technology and Its Impact on American Education, 1982). Patrick Suppes and Richard Atkinson launched a research program on computer-assisted math and reading instruction at Stanford in 1963. They created personalized learning strategies that allowed pupils to adjust their responses quickly from group-paced instruction and self-paced programs let students actively learn. In the late 1960s, the National Science Foundation (NSF) financed the establishment of 30 regional computing networks, which included 300 institutions of higher education and some secondary schools. As stated by Flury and Geiss (2023), in the late 1960s, the Organization for Economic Co-operation and Development (OECD) focused on education with computer technology. This aligned with the OECD's enduring commitment to advancing educational technology as an essential component of future-oriented education. By 1974, over two million pupils were using computers in schools (Molnar, 1997). In the 1970s, computers entered the consumer market. By 1981, personal computers were available for under $1000, and amateur enthusiasts, including young people, were programming to fulfill their interests and curiosities; yet, consumer computers remained marginalized and predominantly a hobby (Ackerman, 2024). According to Coley et al., (1997) In 1982, Time named “The Computer” as the “Man of the Year” in 1982, and it set the groundwork for learning. Time claimed, PC is the culmination of a four-decade technology revolution that is now hitting homes (Richardson, 2024). In 1984, the United States had a ratio of 0.008 computers per student, equivalent of 1 computer for every 125 students (Bulman & Fairlie, 2016). In the 1990s, the evolution of multimedia computers, broadband networks, and other notable advancements in the design and delivery of educational content through electronic mediums revolutionized teaching and learning (Dunning et al., 2007). By the early 1990s, the World Wide Web (WWW) emerged, facilitating the swift development of browsers, advanced communication tools, and simple access to globally connected information (Mioduser & Nachmias, 2002). To determine the point of emergence of educational technology, Weller (2020) stated that 1994 serves as an important date for recording the evolution of what is often regarded as the definition of educational technology the integration of Internet-related technologies in education. Until this point, teaching has relied on an interventionist approach in which educators designed the curriculum and students engaged passively in the learning process (Ortega & Bravo, 2002). Therefore, Flury and Geiss (2023) pointed out that with the rapid growth of new information technology throughout all sectors of society and industry, individuals faced the need for new qualifications not only in their personal lives but also in professional settings. The capabilities of the Internet facilitated the integration of constructivist teaching methods, where students

actively participate in the learning process. They can independently develop their knowledge by exploring and learning on their own, sharing experiences with peers, among other activities (Ortega & Bravo, 2002). To define this process, Flury and Geiss (2023) stated that options of integrating computers into classrooms can be classified into two primary types as either computer-aided instruction (CAI) or computer-assisted learning (CAL) refers to initiatives that integrate computer technology into educational institutions to enhance the efficacy of education and revolutionize teaching and learning. CAI is a method that involves analyzing information with students in a dialogue format, organizing instructional processes, and facilitating educational activities. In CAI, the PC plays a crucial role in assisting the instructor in accomplishing educational duties. (Suson & Ermac, 2020). It is also important to note that some resources - refer to these phrases as computer-assisted (Mann, 2009) or computer-aided (Flury & Geiss, 2023); though they can be used interchangeably, nonetheless, the former is significantly more frequent. The body of research examining the efficacy of CAI is vast, covering a period of at least three decades.

2.2 Computer-Assisted Education and Educational Technology

In his work for self-improving teaching systems, O'Shea (1979) claims to have made some changes and contributions to CAI, saying that the primary contribution to CAI has been to illustrate the viability of developing adaptive, self-enhancing educational programs and to outline the methods for their implementation. to artificial intelligence systems up until that date saying Waterman's (1968) methodology for the machine learning of heuristics has been expanded and used in a system that conducts trials on a teaching program to evaluate basic hypotheses regarding potential modifications in tutorial strategy which I believe marks one of the first mentions of AI regarding education in the literature.

The term "educational technology" which is also an umbrella term for CAI, describes the use of tools, technologies, processes, procedures, resources, and strategies to enhance learning in a range of contexts, including learning on demand, workplace learning, non-formal learning, lifelong learning, and just-in-time learning (Huang et al., 2019). The term "technology" originates from the Greek word "techno," expressing willingness, skills, knowledge, methods, rules, and instruments, combined with "logos," which represents science, discourse, learning, and cognitive state (Lazar, 2015). The introduction and use of new techniques, content, theories, methods, and materials, alongside leadership abilities and objectives in education, have led to a gradual transformation in the meaning, definition, concept, nature, and scope of the term educational technology (Mangal & Mangal, 2009).

Regarding its definition, multiple definitions have been put forward in the literature, starting with Leith's (1966): Educational technology is the methodical utilization of scientific insights regarding pedagogy and learning environments to enhance the efficacy of instruction and training. Even though this definition is six decades old, it still holds its value. However, considering the growth and improvement of technology greatly in the past two decades, the need for update for the educational technology concept is needed. In their study, Ouyang and Stanley (2014) defined the concept of educational technology and stated that it refers to tools, technologies, and resources utilized to enhance learning experiences. It consists of both software and hardware, such as cameras, tablets, and PCs, as well as new educational technologies like AR and VR environments and simulations and learning management systems. The initial notion of educational technology was associated with the utilization of audio-visual aids such as charts, models, maps, examples, and actual objects. The “educational technology” phrase was utilized as a synonym for audio-visual aids intended for direct education and instruction (Mangal & Mangal, 2009). Having said that, it is clear that for today’s standards, educational technology has become much more than just audio-visual aids. Presently, society has become separated and imbalanced regarding media and digital literacy, communication competencies, and critical thinking necessary for information evaluation, resulting in a knowledge and information gap (Radovanovic, 2011). ICT plays an increasingly significant role in nearly every area of daily life. Technology is significantly reshaping individuals' job and professional lives, as well as modifying their interactions, communication, information retrieval, sharing practices, and the manner in which governments deliver public services to citizens (OECD, 2023). In educational settings, to address and solve the information gaps present in educational institutions, educators must possess knowledge and comprehension of the importance of developing 21st-century skills, particularly ICT literacy (Warschauer & Ware, 2008). ICT enables educators and learners with tools to gather and analyze data, produce multimedia presentations, and achieve a deeper understanding of subjects.

2.3 A New Dimension of Literacy: Digital Literacy

In the recent years, digital literacy has been interpreted in a variety of ways by numerous scholars. The diverse definitions of digital literacy can be divided into two groups. Some individuals have defined this phrase only by emphasizing technical skills, on the other hand, several have suggested a definition of this phrase, emphasizing the comprehension of wider ideas. In 1997, Gilster (1997) pioneered the term digital literacy, which expresses the ability to acquire valuable information from different internet sources according to him.

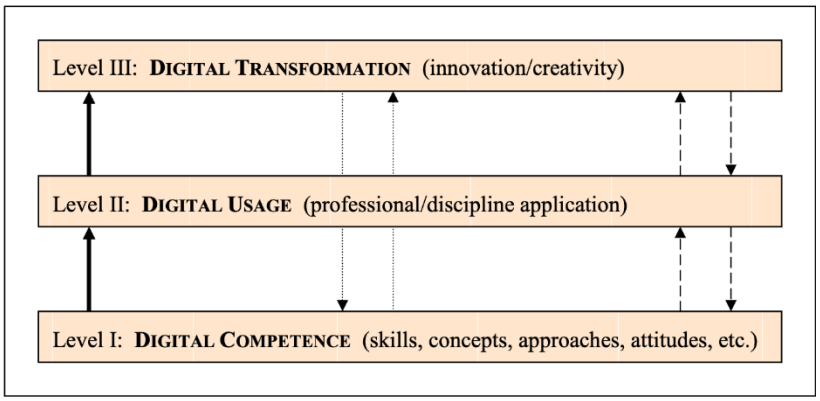
Afterwards, another scholar, Pool described this phrase in the discussion she had with Gilster, as the ability to get used to new media. She also highlighted that users' experiences mainly relied on their competence (Pool, 1997). Even though he is known as the pioneer of the concept, Gilster was not the first individual who utilized the term digital literacy.

During the 1990s, some authors used the term to refer to the capacity to read and comprehend material in the hypertext and multimedia formats that were accessible at the time (Bawden, 2001). It is difficult to establish a single definition of digital literacy, as noted by Helsper, (2008) because the technological, cultural, and societal landscapes are constantly changing, thus redefining the use of digital technologies in personal and professional activities.

As a result of this, multiple definitions regarding the concept have been put forwards by scholars and researchers. Despite the existing body of research available in the literature and the progress the concept has made over the years, comprehension of ICT literacy in the past two decades has been strongly influenced by the definition established by the International ICT Literacy Panel in 2002 (Australian Council for Educational Research, 2016). In line with the definition proposed in the ICT Literacy Panel, in their study, scholars Martin and Grudziecki (2006) established and proposed three levels of digital literacy, mentioning that level 1 covers digital competence, level 2 relates to digital usage, and level 3 involves digital transformation.

Figure 4

Levels of Digital Literacy (Martin & Grudziecki, 2006)



In the recent decades, the concept of digital competence has emerged. Even though digital literacy and digital competence concepts are used interchangeably, they do not refer to the same phenomenon. Studies on digital competence are commonly conducted in European nations excluding the UK, whilst research on digital literacy is common in English-speaking countries (Spante et al., 2018). In 1997, Gilster introduced the term digital literacy, suggesting that it is the ability to get valuable information from various online sources. Digital competence

refers to the capacity to comprehend and read digital, hypertext, and multimedia texts, as well as to utilize information technologies as suggested the concept's name. Gilster, alongside other authors, argues that this new concept of literacy must be regarded as a fundamental life skill, "becoming as essential as a driver's license" or, perhaps figuratively, as a "survival skill." (Bawden, 2001). Even though it is probably not directly correlated, yet, The European Parliament's 2006 policy (The European Parliament, 2006) on essential competences for lifelong learning identifies digital competence as one of eight fundamental life skills as well, alongside communication in the native language, communication in foreign languages, mathematical competence, basic competencies in science and technology, learning to learn, social and civic competences, and a sense of initiative and entrepreneurship. A 2010 OECD (OECD, 2010) report recommended the identification and development of 21st-century skills and competencies, stating that "most of these competencies, if not all, are either supported or enhanced by ICT" (p. 169). According to Søby (2015), researchers, policymakers, and practitioners now all view digital competency as a common objective. In addition, it is worth noting that government educational policies and current technological developments around the globe has elevated digital competence to the status of a target by supporting teachers' professional development (TPD) across different educational settings. Ferrari (2012) states that in order for a person to become digitally competent, what is required is not just a comprehension of digital media but also the ability to critically analyze information that is received from online sources or applications. After initially been defined in 2006, the definition of digital competence was modified following the Council Recommendation update in 2018, which will be the main definition used in this study in the following paragraph. Recent laws and policies implemented in multiple nations illustrate the significance attributed to technology and digital competencies (Zhao, Pinto Llorente, & Sánchez Gómez, 2021). The evolution of social structure and technological trends has transformed both our lifestyle and our methods of information acquisition.

2.3.1 Digital Literacy Framework(s): DigComp and DigCompEdu

With the COVID-19 storm affecting the educational contexts around the globe, numerous institutions have changed their pedagogical approaches to offer a convenient, secure, and adaptable educational environment for their pupils (Schleicher, 2020). Following the European Commission's identification of digital competence as one of the eight essential life skills, they established DigComp (the European Digital Competence Framework) (The European Parliament, 2006) as a reference framework to shed light on the concept of "digital

competence". This EU-wide framework aims to assist policy-makers in developing appropriate policies and planning educational and training programs to enhance the proficiency of certain target groups while advancing citizens' digital competence. In fact, according to literature, Europe adopted DigComp as the main framework for digital competencies. In Flanders area which consists of Belgium and the Netherlands, for instance, Digisprong, which is the government's information center on digitalization in education, utilized DigComp 2.1 to create their teacher guides, an open-source learning platform that trains teachers on how to self-assess their digital competencies (Van Audenhove et al., 2024). In addition, Bartolomé et al. (2022) suggest that DigComp is the most suitable framework for comprehending digital competence across many domains.

In DigComp, digital competence includes "proficient, analytical, responsible usage of, and interaction with, digital technology for educational purposes, professional environments, and societal participation". The eight (8) levels of competence in DigComp 2.1 correlate with Bloom's taxonomy. According to the literature, these competences involve a wide variety of abilities, such as the ability to remember which is in direct relation with Bloom's taxonomy and the ability to solve complex problems and assist others in high-level problem-solving (Zimmerman, 2018). One of the latest attempts to incorporate data literacy into an overall competence framework is the latest version of the DigComp Framework that was developed by the European Union (Van Audenhove et al., 2024). DigComp 2.2, which is the most recent and updated version published in 2022 (European Commission Joint Research Centre, 2022), features an updated compilation of knowledge, abilities, and attitudes compared to its predecessor. It addresses the increased demands for digital literacy resulting from developing technology. DigComp is characterized as a synthesis of information, skills, and attitudes towards digital concepts and their implementation (European Commission Directorate General for Education, Youth, Sport and Culture, 2019). Despite the integration of different policies of ICT in education, existing body of research suggests that teachers lack necessary digital competence (Fernández Batanero & Rodríguez-Martín, 2018; Fernández-Cruz et al., 2018; Fuentes et al., 2019). For instance, (Crue, 2022) conducted an investigation into the digital competence of academic staff in Spanish higher education. The results indicated that the majority of instructors rated themselves as mid level (B2) or highly (C1 and C2) competent, based on and classified by the DigCompEdu framework, a variant based on the DigComp.

Figure 5
DigComp "Flower"



The DigComp framework has 21 digital subskills, categorized into distinct sections. 2010 marked the beginning of the effort associated with operationalizing digital competence in response to the Council Recommendation from 2006. The first DigComp reference framework was published in 2013, and it defined digital competence as a mix of 21 competencies that were organized into five primary domains (European Commission Joint Research Centre, 2022). The framework establishes five primary competence area sections as a "flower", represented in Figure 7 above and which can be read as: "information and data literacy", "communication and collaboration", "digital content production", "safety" and "problem-solving". When examined thoroughly, it can be understood that the framework is established in the way that each and every one of the key competencies is mutually supportive and interdependent on the others and they build upon each other. In other words, competencies that are crucial to one domain will help the development of competencies in another area. The Digital Skills Indicator (DSI), a tool for meausuring digital skills and a basis for policy-target setting, was also built using DigComp at the EU level. As an additional example, the Europass CV includes a section where users can assess their own digital competency; this assessment can then be included in their CV's.

With the aim of improving digital competence, the European Union has created two important frameworks: DigComp for citizens and DigCompEdu for educators. While they share the goal of developing digital skills, their frameworks and targeted participants are quite different. While both frameworks have the same ultimate goal of improving people' digital competence, DigComp is more of a general guide for every individual, with an emphasis on useful, general-purpose digital abilities. On the other hand, DigCompEdu focuses specifically to teachers and places an emphasis on the educational use of technology to enhance the learning

and teaching procedures. In each of these frameworks, the structured proficiency levels offer individuals multiple methods in which they can evaluate and improve their digital proficiency. It is possible that instructors will be able to enhance their teaching practices and the outcomes for their students as they explore DigCompEdu's sections. DigComp provides a road map that the general public can follow in order to explore the digital world with confidence and complete safety. With the rise of Covid-19 pandemic around the globe and additional critical circumstances, it has become more apparent that educators need to acquire digital capabilities. At the time, teachers were confronted with huge obstacles during the pandemic crisis as they adjusted to online teaching, communicating with students and support their learning and development remotely. This need led to different implications and applications for teachers and digital competency levels around the globe. In Germany, for instance, the competencies of teachers in dealing with "digital educational media" are already specified in the strategy document titled "Bildung in der digitalen Welt," which was presented at the meeting of Ministers of Education and Cultural Affairs in the year 2016. A year later, the European Commission introduced DigCompEdu (König et al., 2020). An increasing number of European Member States have come to recognize the importance of equipping teachers with industry-specific digital competences so that they can fully use digital technologies to revolutionize and improve education in the classroom. This acceptance led to the creation of DigCompEdu, the European Framework for the Digital Competence of Educators (Joint Research Centre European Commission et al., 2017). This framework is the result of important consultations with professionals and experts and is aimed to organize existing insights and evidence into a single, comprehensive model that is suitable to all educational contexts (Ghomi & Redecker, 2019). Now that we're a little bit more acquainted with utilization of technology in classrooms, maybe we can figure out how to be successful in this digital world. To achieve a good proficiency level in digital skills, we first need to understand both of the frameworks and what they include, as well as what are the skills' sub-competences. Below, in Table 1, summaries of the both frameworks as prepared and published by Reisoğlu and Çebi (2020) are presented.

Table 1

General description of competence areas for DigComp and DigCompEdu

Competence areas for DigComp	**General description**	**Sub-competences**

Information and data literacy	Identify and locate information, data and digital content. Filter, analyze, evaluate, interpret, organize and store information, data and digital content	Navigation, search, and filtering of information, data, and digital content Evaluation of information, data and digital content Storage and retrieval of information, data and digital content
Communication and collaboration	Connect with others and collaborate through digital tools, share information, data and content. Interact and participate in communities by using public and private digital services, know behavioral norms while using digital technologies, create and manage different digital identities.	Interaction through digital technologies Share information and content Citizen participation online Collaboration through digital channels Netiquette Digital identity management
Digital content creation	Create and edit new digital content in different formats, integrate and re-elaborate previous knowledge and content, know how to apply intellectual property rights and licenses for use, programme instructions of a computer system in order to solve a problem.	Development of digital content Integration and reworking of digital content Copyrights and licenses Programming

Safety	Identify risks and threats in digital environments, protection of digital tools and content, protection of personal data and privacy, avoid physical and psychological threats while using digital technologies, awareness of environmental effects of the use of digital technologies.	Protection of devices and digital content Protection of personal data and digital identity Protection of health and well-being Protection of the environment
Problem-solving	Identify and solve problems while using digital tools. Innovative process. Use of digital tools and technologies for creating products and information. Identify and improve needs of digital competence.	Solving technical problems Identification of needs and technological answers Innovation and use of digital technology in a creative way Identification of gaps in digital competence

Note. From "How can the digital competences of pre-service teachers be developed? Examining a case study through the lens of DigComp and DigCompEdu. By Reisoğlu and Çebi, 2020, *Computers & Education, 156,* p. 2 103940. (https://doi.org/10.1016/j.compedu.2020.103940)

2.4 Frameworks on AI-related Digital Competency

AI has become an innovative technology that has the potential to revolutionize specific educational endeavours, such as writing essays or enabling hybrid intelligence techniques to be used (Järvelä et al., 2023; Molenaar, 2022) These hybrid systems, which combine human and artificial intelligence, have the ability to improve education by supporting learning and teaching activities (Urmeneta & Romero, 2024). Accordingly, In May 16–18, 2019, UNESCO and China hosted the International Conference on Artificial Intelligence and Education, which advocated for the equitable and all-encompassing application of AI in education (AlKanaan, 2022). AI is a disruptive technology that has the potential to completely transform the process of knowledge

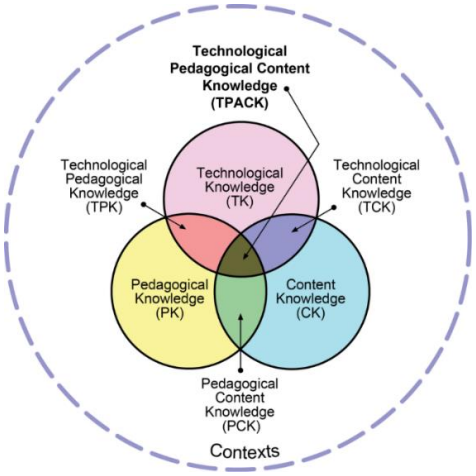
creation for a range of educational stakeholders, including students, teachers, and the general public. Therefore, there has been a noticeable surge in interest in AI in education in recent years, with more educational institutions and organizations investigating the possible benefits of AI-driven technologies (Dwivedi et al., 2021; Su & Yang, 2022). In line with these developments, it is an unavoidable that education is going through a revolutionary process and AI processes will put educators around the world to the test in terms of digital competency.

Teachers must develop the particular digital skills needed to employ AI tools in educationally appropriate and moral ways (Oran, 2023). This is where AI literacy comes in and as far as one is concerned, technological pedagogical content knowledge (TPACK) framework developed by Mishra & Koehler (2006) may be beneficial and serve as a basis and a guide to integrate AI technology into learning and teaching. TPACK is a well-known framework for teacher digital competency that is commonly taught in pre-service programs and teacher development programs. In addition to TPACK, the European Commission's Digital Education Action Plan, the Australian National Professional Standards for Teachers, and the European Framework for the Digital competency of Educators (DigCompEdu) all address teacher digital competency (Chiu et al., 2024; Joint Research Centre (European Commission) et al., 2017). However, according to Chiu et al. (2024), However, AI is a rapidly developing technology that encompasses a wide range of data types and goes beyond non-AI technologies.

The complex nature of teacher competences in utilizing AI in education may be beyond the scope of only TPACK. In the recent past, there have been attempts to redesign or add additional elements to TPACK to make it up to date with the constantly developing AI technologies (Falloon, 2020; Mishra et al., 2023) but whether or not they fulfilled their duty as the basis for AI literacy frameworks remains to be seen.

Figure 6

TPACK Model (Mishra & Koehler, 2006)



The TPACK structure is represented in the Figure 3 above by an overlapping Venn diagram, where the balance of pedogeological, content, and technological knowledge results in the ideal scenario for the implementation of TPACK. The model essentially makes the assumption that it is possible to provide this kind of ideal educational experience; yet, there are a number of hurdles and impediments that prevent effective technology integration in the classroom (Adams, 2019). One of these barriers is AI literacy of teachers in the classroom and it is a key component of effective K–12 universal education systems is teacher AI literacy (Miao & Cukurova, 2024). By improving their understanding of this literacy, teachers can effectively integrate AI into lessons, empower students in AI-driven learning environments, and develop student competency in AI.

2.5 Self-Efficacy Phenomenon

At the school, teachers' objectives and actions are guided by their personal principles. A person's subjective well-being and sense of self-efficacy can also be supported by values. Based on the social cognitive theory, self-efficacy emphasizes the growth and use of human agency as well as the belief that people can have some degree of control over their actions. According to studies, teachers and students of English as a foreign language who have confidence in their ability to complete a task are more likely to succeed than those who have doubts (Wyatt & Faez, 2024). In other terms, people's behavior is influenced by how effective they believe their acts are going to be. A person's personal experiences of performing those actions (enactive mastery experiences), their observations of others' performances and self-evaluations through comparison (vicarious experiences), the support they receive from others (verbal persuasion), and their physical and emotional states at the time of self-evaluation (physiological and affective states) are major sources of self-efficacy beliefs (Bandura, 1986, 1997).

As expected, the most valid source of self-efficacy beliefs for educators is an individual's own successes or failures; however, this isn't always the case for inexperienced educators who may lack the necessary prior teaching experience to form efficacious beliefs (Tschannen-Moran & Hoy, 2007). Due to the value of experience, TSE beliefs usually come mostly from teachers' prior successes, failures, or performances in similar situations. Moreover, TSE views based on self-evaluation using these sources can be strengthened or weakened by witnessing and learning from others' experiences, receiving feedback from others regarding different facets of teaching, and observing and learning about physiological and emotional states in relation to teaching. Additionally, self-efficacy is not the same as self-esteem because

the latter is a reflection of other people's opinions on an individual's confidence in themselves. Even if they are gifted, teachers may not feel very confident about their abilities (Oran, 2023). Furthermore, Even though LTSE views are similar to TSE beliefs in many ways, they also have distinct characteristics (Ölmez-Çağlar, 2024). One such trait is the influence that L2 teachers' perceptions of their own competence in teaching the target language have on their students. This attribute may vary for native and non-native speakers, especially if the latter group experiences stigma (Wyatt, 2018). On the other hand, educators who believe they are competent in their field may hold strong self-efficacy beliefs, which may have a positive impact on their level of job satisfaction levels (Kasalak & Dagyar, 2020), which is an important factor for effective instruction. TSE beliefs have been extensively explored in traditional schooling. Though LTSE belief research is relatively new, it is evident from a recent global review (Wyatt, 2018) that LTSE beliefs are being explored more frequently in a wide range of country contexts.

People also often consider their own physical and emotional states when determining what they can accomplish in a given situation. These states include worry, fatigue, stress, and psychological state. The intensity of these feelings may also have an impact on how one interprets their level of self-efficacy. High self-efficacy teachers have been found to be more capable of viewing challenges as something that can be defeated, to feel less fatalistic about early failure, and to be more confident in their ability to take on new challenges (Gibson & Dembo, 1984). At this point, we can merge the concepts which lay the basis of this thesis: AI literacy (competence) and teacher self-efficacy (TSE). Even though TSE beliefs have been extensively explored in traditional schooling, with the emerging AI systems the notions impact is underexplored. LTSE belief research is relatively new compared to TSE, and it is evident from a recent global review (Wyatt, 2018) that LTSE beliefs are being explored more frequently in a wide range of country contexts. Nevertheless, AI’s impact on TSE, especially LTSE remains a gap in the literature and this thesis aims to address that gap.

2.6 Empiricial Studies Assessing Digital Literacy Levels of Populations

Although numerous studies assess digital competence levels empirically, a few of them use the DigComp and DigCompEdu frameworks and show a limited emphasis on the factors that can impact each competence category. Khan and Vuopala (2019) utilized the DigComp framework to examine the digital competence levels across various age groups and found out that younger individuals, referred to as the "Net generation," demonstrated the highest performance. Additionally, in their study, Guillén-Gámez et al. (2020) analyzed the teachers’ pedagogical digital literacy. Their paper’s results indicated statistically significant differences

between the knowledge and utilization of 2.0 tools. Furthermore, the results have shown that instructor's level of pedagogical digital competency can be predicted based on age and gender, but not on the educational setting at which they are working in, suggesting the educational context has little to no effect on one's digital literacy.

In another study by Napal Fraile et al. (2018) forty-three secondary school teachers in their initial training (pre-service phase) evaluated their competence across 21 subcompetences in five domains outlined by the DIGCOMP project. In general, pre-service teachers' perceptions of their digital proficiency were at a low level. They achieved the highest scores in information, which is primarily the knowledge they have gained during their courses. Secondly, they performed highest in terms of safety and communication, excluding the safeguarding of digital data and the maintenance of digital identity domains. The lowest values were recorded in creating content and problem-solving, which are the dimensions closely related to changing and making an impact around the classrooms.

Hatlevik (2017), in his study, investigated the link between teachers' self-efficacy in ICT, information evaluation strategies, digital competence, and ICT use at school. The author conducted a survey with a sample of 332 teachers. In the study, teachers were asked to fill out a digital competence survey and take an exam with multiple choices. He put forward a hypothesised model of the link between self-efficacy in fundamental ICT, self-efficacy in online collaboration, as well as techniques to assess information, digital competence, and the utilization of ICT and all of these correlations were put to the test through the use of structural equation modeling. According to the analysis done by the author, the empirical data of the study confirmed the hypothesized model. A number of positive correlations and statistically significant factor loadings were found. As of the time when the thesis is being written, the study has been available for close to eight years. Taking into account the advancements in technology as well as the rapid development of artificial intelligence tools and the contribution that these tools have made to the definition of digital literacy and the individuals who are considered to be "digitally literate" has been through a significant change that needs to be researched thoroughly with updated methods, once again.

In a similar case study, Benali et al. (2018) conducted an investigation on the DigCompEdu based check-in tool and found that within the group of 160 Moroccan English teachers, there was a good distribution of competence levels. Higher scores were obtained on the digital competency components by educators who had more years of experience and a better confidence in their ability to teach digitally. Lower levels of proficiency were found in the areas of self-regulated learning, digital assessment, accessibility, inclusivity, and personalization.

Gudmundsdottir and Hatlevik (2018) conducted research on what is the relationship between the teachers' perceptions of the training they received and its quality, as well as the impact it had on their digital competency growth, and their teachers' ICT self-efficacy. The purpose of their research was to examine the ways in which initial teacher education (ITE) programs train "newly qualified" educators to made use of ICT. The results of a survey of 356 newly licensed educators conducted across Norway are presented. The results in the study displayed that the majority of newly qualified teachers feel that their teacher education in information and communication technology was of low quality and did not contribute to them considerably, leading to implied lower digital competency levels which possesses significant outcomes for teacher education across globe.

Lucas et al. (2021) tested, evaluated and developed an instrument based on DigCompEdu using a sample of 1071 Portuguese elementary and secondary school teachers. Their research backed up previously made suggestions to improve the translations of the DigCompEdu. In addition, their results showed that there were substantial gender and age variations across the digital competency components, with male teachers scoring higher levels of competence than female teachers and younger teachers demonstrating more proficiency with digital technology. Lastly, they have concluded that there is a significant correlation between teachers' digital competence and personal elements.

Although with research conducted in an entirely different setting and a different methodology, Zhao et al. (2021) found results that are consistent with those of Lucas et al. (2021). Their research sought to achieve and measure two objectives: first, to characterize how college instructors currently view their own digital competence; and second, to examine how gender and years of experience play a role in their competency. They surveyed 536 active teachers at China's Gansu Agricultural University on their level of digital competency. The results demonstrate that the sample had a positive self-perception in terms of data and information literacy, collaboration & communication and problem-solving, but a poor and negative self-perception in terms of digital content creation. There were statistically significant differences between male and female college instructors on the perception of digital competence, among the analyzed factors. When asked about their level of proficiency in the classroom, educators with less years of experience rated themselves higher in the following areas: problem solving, digital content creation, security, and collaboration.

Pérez-Calderón et al. (2021) tested 109 Spanish educators to assess and validate the DigCompEdu framework. The results showed that most components were performed by the teachers quite well. Since augmented reality phenomenon is a relatively new and

costly material, there was a noticeable lack of digital tools for integrating it in the classroom. Just like the previous findings in the literature, women scored much lower on the perceived digital competency scale than men did, according to the gender-specific analysis.

In the Turkish educational context, Bayrak Karsli et al. (2023) aimed to examine the existing digital competency levels of teacher educators based on DigCompEdu framework. Their study was designed as a mixed-method study and the research approach they have utilized was explanatory design. They have worked with 113 teacher educators from a prestigious Turkish state university as their population and the results of the study showed that digital presentations, videos, and assessment tools are most commonly used by teacher educators, along with Learning Management Systems (LMS). They are quite proficient with digital tools and consider the technological infrastructure at their workplace to be adequate. Educators of future teachers have "Integrative - B1" level digital competences and proficiency in the most important areas of expertise. At these levels, teacher educators are open to new ideas and motivated to learn about the developments in the field.

In their paper Santos and Pedro (2024) implemented a qualitative methodology in the Porteguese higher education context, using semi-structured interviews method with 22 Portuguese professors of higher education who teach online courses. They utilized content analysis to analyze their data, which were then presented using descriptive statistics. Their results demonstrated that DigCompEdu was perceived "applicable" to online higher education in both its overall and specific areas. Despite this, competences 6.4 ("Responsible Use") and 6.5 ("Problem Solving") have been reported with lower scores in comparison to other competences. Findings of "Promoting Digital Competence of Learners" were also unfavorable implying that professors felt there was no need to improve their pupils' digital literacy because they should already be proficient in this area, which should be investigated further in other educational contexts and should be taken into consideration accordingly by policy makers around the world.

In a similar context, Palacios-Rodríguez et al. (2024) worked with an impressive sample size of 170,603 educators from Portugal and Spain (to which they refer to as Andalusia), their research aim was to look at digital competence in the setting of the Iberian Peninsula. Their primary goal was to compare and contrast the levels of digital competence among teachers in these two nations and to identify the factors that may have an impact on these levels. Educators who participated filled out the DigCompEdu Check-In and formed the basis of the research method. Methods for data analysis included descriptive statistics, contrast statistics, and inferential statistics. Overall, across all domains of digital competence, Portuguese

educators demonstrated a little greater degree of proficiency than their Spanish colleagues. Lower scored found in the competency category "Facilitating Learner's Digital Competence" in both nations highlight the need to enhance educators' competence to develop students' digital safety, critical literacy, and problem-solving skills which is consistent with the previous findings in the literature.

In a recent study, using an online questionnaire, Horváth et al. (2025) conducted a quantitative study that was based on DigCompEdu. The purpose of their research was to collect data from a small sample of 183 Hungarian teacher-educators in order to investigate the likely validity evidence for the DigCompEdu. Teacher educators' capacity to scaffold student teachers in developing digital competence was found to be significantly impacted by professional engagement according to their findings which suggests DigCompEdu principles should be supported with professional engagement and development activities for educators.

Research examined in the literature yielded similar and comparable results so far in assessing teachers' or rather educators' digital competency found their level to be at medium-level, implying that there is still room for growth for professionals. Now, with the addition of artificial intelligence into the mix and the assets it brings to the table for educational contexts, there is a need to discuss what to expect as an educator during the age of artificial intelligence. Existing framework should be integrated with artificial intelligence related phenomenon and competency levels in order to keep up with today's standard as technology is growing rapidly with each passing day. In the following section, I will be examining AI and its implications on education, especially language teaching field.

2.7 Implications of Artificial Intelligence in Education

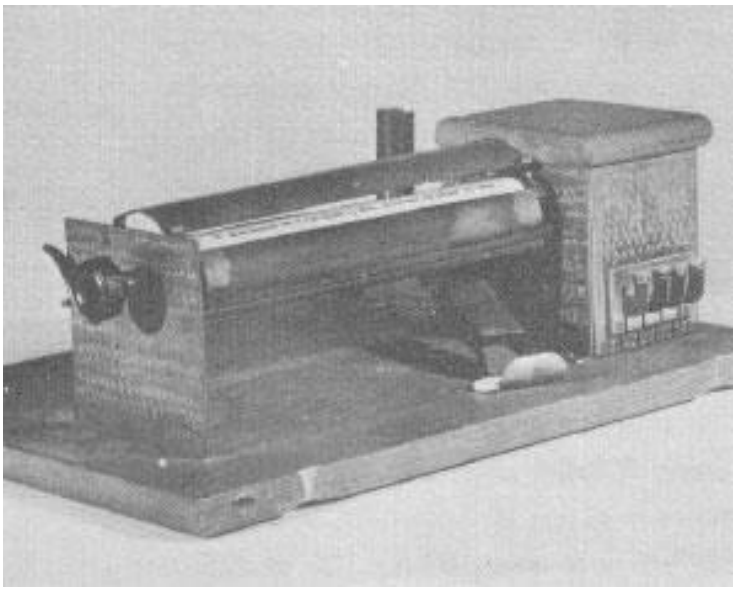
Modern education is undergoing a transformation as a result of the growth of information technology, particularly AI. With the help of AI algorithms and educational tools, LMSs and training systems today constitute a broad range of pedagogical activities (Costa et al., 2017; García et al., 2007). The field of artificial intelligence (AI) is multidisciplinary in nature, and it brings together the fields of education, psychology, neuroscience, linguistics, sociology, and anthropology, among others, to advance the creation of AIEd tools that are effective, engaging, personalized, inclusive, and flexible (Luckin et al., 2016). Education and advances in technology are interlinked. The development of effective relations between AI and education professionals is crucial, as educational technologies cannot function alone (Tapalova & Zhiyenbayeva, 2022).

COVID-19 Pandemic has contributed to the rise in popularity of AIED technology. The past five years have seen fast growth for AIEd, particularly since the public release of ChatGPT in November 2022 (Chu et al., 2022; Zhao, 2024). Therefore, the AIEd community is devoting a lot of resources to studying how AI may change classroom instruction (Seo et al., 2021). For instance, a substantial portion of the traditional education system is comprised of pen-and-paper classical examinations, however, integration of virtual environments to school contexts which led to the administration of online tests, is gradually replacing these examinations (Öğretir Özçelik & Tuğluk, 2018). Since then, research has gained speed to explore how AI changes the current state of education with the goal of making educators' jobs simpler and more efficient by automating non-teaching related duties.

Since the introduction of films and radios into classrooms in the 1920s, educators have employed technology to enhance their teaching (Cuban, 1993). In his study, Mann (2009) suggested that CAI originated from a device created in 1925 by Sidney Pressey, a researcher at Ohio State University, which laid the foundation for contemporary computer-based educational products. Additionally, it has been stated that in Pressey's multiple-choice system, users received instructions, underwent testing, received instant feedback, and their attempts were logged as data. When compared to today's computers, Pressey's system appears to have performed comparable functions. It can also be inferred that this attempt can be regarded as one of the earliest examples of artificial intelligence in education.

Figure 7

Teaching Machine Developed by Sidney Pressey in 1920s (Mcdonald, 2003)



Other examples of the earliest and groundbreaking artificial intelligence systems that provided personalized and adaptive learning can be traced back to the 1970s. As an example, BUGGY system, an innovative approach for teaching basic arithmetic activities, simulated the potential misconceptions that students could have when performing procedural arithmetic. Each student's mistakes were examined by this simulation called "bug library," which served as the system's domain model, in order to provide them with personalized teaching.

A number of studies have shown that teachers might not be technologically prepared to make effective use of educational apps powered by artificial intelligence (Ally, 2019; Seo et al., 2021) According to Seo et al. (2021), teachers might not have the necessary technical knowledge to analyze data or create criteria for AI-driven applications that automatically create student assignments and feedback. Furthermore, educators are under increasing pressure to acquire sufficient digital skills to integrate AI into their lessons. A number of studies have pointed out that, despite AIED's suggested benefits, learners' and teachers' identities, as well as the social, affective, collaborative, and meta-cognitive elements that make up learning, can pose challenges to the design of AIED settings and environments, potentially leading to biased and inaccurate results after featuring human involvement (Bhimdiwala et al., 2022; Luckin et al., 2016; Mustafa et al., 2024; Wang et al., 2024). An investigation that was conducted on college students revealed that about one-third of them have utilized AI technologies, such as software that generates essays, in order to finish their assignments (Intelligent, 2023). Furthermore, researchers at an independent organization worked with a sample of high school English teachers to see whether they can recognize the differences between student and AI-written essays. Almost half of the responses that were examined over by the group were incorrectly identified (High Speed Training, 2023). While AI could improve classroom instruction, it also has the ability to hurt schools when used in context of dishonest methods. Additionally, there is a concern that significant reliance on artificial intelligence may result in a reduction in the capacity for critical thinking (Chanda et al., 2024).

2.8. Actions Taken Regarding AI integration Into Education by Turkish Ministry of National Education

2.8.1. Artificial Intelligence in Education Policy Document

The Turkey Ministry of National Education published the Artificial Intelligence in Education Policy Document (Eğitimde Yapay Zekâ Politika Belgesi) (R. of T. M. of N. Education. MoNE, 2025) in June, 2025 to lay out the country's goals, plans, and priorities for

incorporating AI into the educational system. Consisting of seven parts, it provides a solid basis for coordinating AI-related educational programs with national goals and international standards.

The first section describes the document's goal and scope, emphasizing its relationship to the broader National Artificial Intelligence Strategy. It establishes the foundation by examining the policy's compatibility with Turkey's educational and technological goals.

The second part looks at global advancements in AI in education, referencing international plans and regulations. It also assesses Turkey's current position in this field, as well as the Ministry's attitude, providing a comparative viewpoint that emphasizes the importance of aligning national policies with global standards.

Thirdly, the paper lays out the major use cases for AI in the classroom, including AI literacy, lesson plans, evaluation tools, career guidance, and making choices based on data. These sections are given with specific principles and evaluation criteria, exhibiting a purposeful and structured approach.

The fourth component articulates the Ministry's vision and goals, which are based on a human-centered educational philosophy. The emphasis is on preparing teachers for the digital age and achieving educational equity through ethical and inclusive practices.

The fifth section outlines a strategy vision and action plan for 2025–2029. It offers four strategic goals, 15 policy components, and 40 activities that together form a systematic and comprehensive framework for deploying AI solutions in education. These activities aim to ensure that AI technologies be used effectively, ethically, and sustainably. Section six details the procedures for monitoring and evaluating the policy's execution, which will guarantee the policy's continued usefulness and influence.

To conclude, the report is supported by an extensive reference list of national and international policy documents, initiatives, and research studies in the seventh section, which lays the intellectual and institutional groundwork.

This policy document presents a strategic, integrated, and sustainable framework for AI in education. It promotes a digital transformation that is human-centered, ethical, and inclusive, ensuring that technological innovation in education supports the broader goal of equal access and better learning.

Furthermore, in their announcement for the report, MoNE also reported the following implications of their report: AI workshops will be held in Science and Art Centers (BİLSEM) throughout Turkey to encourage the development of AI-powered learning models and teaching methodologies. Competitions for digital instructional games will also be conducted, and the

results and insights from these endeavors will be recorded and published in a methodical way. An AI-powered language software will be created for Turkish language learners with the goal of improving their listening, speaking, reading, and writing skills as well as identifying their specific areas of weakness and teaching needs. A personalized AI-based language learning tool for foreign language instruction will be developed and scaled. This program will assess one's proficiency in reading, writing, speaking, listening, and grammar. In order to promote more inclusive and efficient language learning experiences, it will provide personalized learning programs and be enhanced with information in many languages.

2.8.2. Professional Development Trainings Conducted by MoNE regarding AI

In April 2024, 120 teacher trainers chosen through the Teacher Informatics Network attended a five-day AI Applications Trainer Training Course in Ankara, Turkey, hosted by The General Directorate of Innovation and Educational Technologies (YEGİTEK). The course, held from April 16 to 20, included theoretical foundations of machine learning and deep learning, as well as hands-on practice with AI tools, block-based programming, and pedagogical applications of generative systems. The workshop aimed to train teachers nationwide in AI literacy and technical skills, while also implementing cutting-edge AI methodologies within the Fatih Project infrastructure to align with Turkey's National AI Strategy. YEĞİTEK professionals led sessions focused on project-based learning, providing participants with conceptual clarity (YEGİTEK, 2025).

YEGİTEK also conducted two additional digital skills training sessions in two provinces of Turkey, Mersin and Eskişehir, from May 12th to 16th, 2025 (YEGİTEK, 2025) as a way of improving teachers' digital competences in accordance with national policy priorities. The goal of these programs was to improve educators' abilities to incorporate AI into the classroom as well as to use technology in a subject-specific learning environment.The training at Mersin centered on the Dynamic Lesson Language Project, which targets Turkish language, social studies, and classroom teachers. Participants were exposed to web-based resources specific to their subject areas and assisted through the creation of technology-supported lesson plans. The training also included lessons on adult learning concepts and communicative competency, with a focus on collaborative lesson design using group work. The Eskişehir workshop, titled Artificial Intelligence Applications, was attended by 54 people. The workshop featured an introduction into comparative insights into worldwide AI education approaches, and hands-on lessons on employing AI tools in the classroom. Participants experimented with language model tools, content creation applications, and audiovisual editing platforms. The

training finished with group project presentations, which included online teaching tools and peer feedback. (YEGİTEK, 2025)

It can be concluded that YEGİTEK's training programs demonstrate its strategic and practical approach to digital transformation in education. They provide concrete instances of how national policy objectives, particularly those concerning AI integration and digital pedagogy, are being transformed into teacher training practices. Key themes emerging from these programs include the contextualization of digital tools for certain disciplines, the development of AI literacy among educators, and the creation of a collaborative and reflective learning environment. Furthermore, this work demonstrates the Ministry's commitment to a unified and future oriented professional development.

2.8.3. The Department for Artificial Intelligence and Big Data Applications of MoNE

The Department for Artificial Intelligence and Big Data Applications within YEGİTEK was established on March 6, 2025 by MoNE, officially declaring its dedication to innovation powered by data. This new unit is responsible for implementing national and international AI policies into educational practices. It does this by analyzing current practices, determining which areas can benefit most from machine learning and advanced analytics, creating frameworks to ensure these technologies are in line with Turkey's education goals, and managing projects from start to finish, including design, implementation, and evaluation. Simultaneously, the department is tasked with developing AI literacy programs and educational resources for teachers, students, and families, as well as establishing meticulous ethical guidelines concerning equity, transparency, accountability, and protection of private data. The department aligns Turkey's AI and big data agenda with global best practices through cooperation with international organizations like the OECD and UNESCO.

2.8.4. Applied Prompt Engineering for Teachers and Innovative Learning Strategies Using Generative Tools Guide

Applied Prompt Engineering for Teachers and Innovative Learning Strategies Using Generative Tools: A Practical Guide to Artificial Intelligence and Education was published in July 2025 by MoNE. This guide aims to help educators incorporate AI tools into their lessons by providing them with practical examples of how to utilize AI in the classroom and make it easier to understand prompt engineering. In this manual, teachers receive detailed, organized explanations of prompt design that will lead them in the creation of engaging, original content

using generative AI systems. There are eight different model prompt templates included, so they can be used for different kinds of lessons. These templates are designed to help teachers improve their content design and make it more relevant to students' learning goals. In order to facilitate their incorporation into the classroom, the book classifies AI technologies according to four primary educational purposes: developing lessons and material, creating instructional activities, gathering and analyzing data, and improving feedback and assessment. It also demonstrates how generative AI may be used to create a wide range of multimedia content, including text, photos, audio, music, video, gamified tasks, and coding projects, therefore aiming to enhance student engagement and content variety. Importantly, the manual also discusses the moral implications of AI in the classroom. It establishes seven fundamental ethical principles: fairness and equity; privacy and data protection; transparency; accountability and responsibility; autonomy; social effect awareness. In order to encourage thoughtful and accountable use of AI in the classroom, these principles can be used as a guide. Lastly, the paper highlights the importance of equipping educators and learners to make educated decisions while utilizing AI. Educators are motivated to incorporate AI into their own practices and help students build their AI literacy, which then empowers learners to make educated decisions when choosing and using digital technologies for education (Y. V. E. T. G. M. MoNE, 2025)

This guide released by MoNE serves as a major step forward in incorporating AI into classroom instruction. This guide aims to close the gap between innovation in technology and classroom usage by providing educators with a systematic and accessible introduction to prompt engineering and generative AI tools.

CHAPTER III
METHODOLOGY

This chapter provides an explanation of the methodology of the research, which includes the research design, participants, data collection tools and the process, as well as the analysis of the statistics. Furthermore, this chapter contains information regarding the participants that contributed to this study and their demographic information. In addition, it details the instruments and methods that were utilized in the process of data collection and analysis.

3.1. Research Design

Main purpose of the study is to examine the existing AI literacy levels of English Language Teachers teaching in both state and private Turkish schools and to see whether or not AI literacy levels have an impact on self-efficacy levels to teach of the teachers. In order to conduct this investigation, survey design based on quantitative methods were adopted. This study uses a quantitative research approach, which involves collecting and analyzing numerical data using standardized measurement tools. The study uses a descriptive research methodology to examine the perceived levels of artificial intelligence (AI) competency and TSE. Descriptive statistics, such as means, standard deviations, and frequency distributions, were used to summarize participants' answers and find general patterns and trends in perceptions.

In addition to its descriptive nature, the study includes a correlational component, which seeks to investigate the potential relationship between teachers' AI literacy levels and their self-efficacy beliefs. This approach seeks out correlations that arise naturally rather than manipulating factors. As a result, the total design can be called a descriptive-correlational survey, which is appropriate for educational research that seek to investigate the status and connections of existent processes in real-world classroom settings.

Quantitative or numerical representation of the habits, attitudes, or opinions of a population can be obtained through the use of a survey design, which involves the examination of a representative sample of that group. Based on the findings of the sample, the researcher makes conclusions or generates hypotheses about the entire population (Creswell, 2009). Therefore, Quantitative research is fundamental to evidence-based decision-making. Quantitative methods offer empirical reliability, which is crucial since it allows the 3Ps (preachers, practitioners, and politicians) to draw useful conclusions from data (Lim, 2024).

The current study started with the administration of a scale to assess the degree of AI literacy and self-efficacy scale among Turkish K-12 EFL teachers of English working at MoNE

affiliated schools in Türkiye, which include both the privately-run and state-run schools. Under the number MEB.TT.2025.023503, the researcher submitted an application to the Ministry of National Education's "Research Application Permits Application and Evaluation System" in order to collect data from three provinces in Turkey, namely Bartın, Bursa, and Kastamonu provinces, including their city centers and district centers. The implementation of an online questionnaire enabled data collection from a sample working in different contexts in terms of provinces they live in which in turn increases the research's scope and effectiveness. There will be a discussion of the selection criteria in the following sections. The results of this present will be reported back to MoNE as soon as the thesis is complete.

3.2. Research Instrument

An established survey developed previously in the literature was used and shared via Google Forms to collect data. The questionnaire was divided into three sections: (1) an informed consent section, (2) demographic information, and (3) the main scale measuring AI literacy and self-efficacy.

The inclusion of demographic information was critical for assessing the sample's characteristics and conducting subgroup analyses to assess the scale's consistency and generalizability across various teacher profiles. The demographic form was located on the first page of the survey instrument and consisted of both categorized and open-ended questions aimed to collect detailed background information about the respondents.

Participants were first asked to state their gender, which allowed researcher to determine whether male and female teachers varied in their self-perceived AI-related competencies. Gender-based analysis is especially essential in technology integration studies since previous research frequently shows differences in access, confidence, and usage patterns between genders.

The second demographic variable collected was age, expressed in years. Age was considered as a continuous variable, allowing correlations to be found between a participant's age and their competency in various aspects of AI use in education. This was especially useful for investigating generational variations in digital fluency, acceptance to technological innovation, and adaptability to emerging technological tools like AI.

The third item addressed participants' educational background, in particular the highest academic degree achieved. The study collected data on educational qualifications to see whether formal academic training level had any impact on teachers' understanding of AI

concepts, pedagogical integration of AI tools, and confidence in AI-based classroom assessment and ethics.

Participants were also asked to mention whether they were now employed in a public or private school. This distinction was critical in determining the impact of institutional resources, administrative assistance, and policy frameworks for AI integration. Public and private schools may have different infrastructure, funding, and professional development opportunities, which may influence teachers' exposure to and use of AI tools in the classroom.

In addition, data on participants' teaching experience, assessed in total years, were gathered. This variable helped to determine whether rookie and veteran teachers differed in terms of AI ability. Teaching experience is frequently associated with pedagogical maturity, classroom management ability, and comfort with implementing new educational technologies, making it an important variable in our study.

At the end of the demographic information section, participants were asked to choose the province where they were now teaching from 3 cities that this study was conducted at: Bartın, Bursa and Kastamonu. Aim of this data was to offer an insight into geographical differences in educational contexts, such as availability of digital infrastructure in classes and availability of AI-related training. Given the potential differences between urban (Bursa province) and rural (Kastamonu and Bartın provinces) settings, the researched aimed that this variable would help develop a more complete understanding of the socioeconomic variables that influence AI competence among teachers in different environments.

The scale that was utilized in this research is the Teacher Artificial Intelligence Competency Self-Efficacy (TAICS) Scale. This scale was developed by Chiu et al. (2024), who cited one of the studies that the researcher of this thesis had previously carried out as the conceptual foundation of their study. The researcher of this thesis asked via e-mail for permission to use the scale to the authors with special thanks for their citation to his work while developing their scale and the article of it. The mentioned e-mail process can be found in the appendix section of this thesis.

TAICS instrument in this study was applied as a way of assessing the level of competence that teachers possess in AI and educational tasks that are associated with AI, referred to as teacher AI competence. The phenomenon is a critical idea that emphasizes teachers' ability to design and maintain a secure, healthy, and productive AI-powered learning environment. (Chiu 2024; Falloon 2020; UNESCO 2024). It is related to teachers' AI proficiency, their capacity to use AI for educational objectives and to foster students' AI literacy

or competency, and their participation in relevant professional development (Falloon, 2020; UNESCO, 2024).

This 24-item instrument assesses teachers' competencies in six subdimensions: AI Knowledge (AIK), AI Pedagogy (AIP), AI Assessment (AIA), AI Ethics (AIE), Human-Centered Education (HCE), and Professional Engagement (PEN). They all emphasize the relevance of AI knowledge and its application in the classroom (AIK and AIP), AI impact and ethics (AIKE and HCE), and continuous professional development (PEN). However, the models do not properly address assessment side of educational contexts which can be regarded as a study that needs to be conducted following up this study.

The study by the developers (Chiu et al., 2024) revealed that the TAICS, created with the Delphi technique, was both reliable and valid. Furthermore, they discovered that the scale remained consistent across different teacher groups, including both male and female participants and those teaching science and non-science subjects. Their findings verified the scale's proposed six-dimensional structure, demonstrating that the components AI knowledge, AI pedagogy, AI evaluation, AI ethics, human-centered education, and professional engagement are relevant, valid and reliable in measuring teachers' artificial intelligence competency. Considering these aspects, which align with the study's objectives, the researcher chose to use the TAICS in his study and see its replicability in the Turkish national educational context.

In the present study, Participants used a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) to answer the scale. This type of scale was used in this research because it is a reliable and efficient approach for capturing the attitudes, views, and self-assessed competencies of the participants in relation to artificial intelligence in education. This format lets participants express varied degrees of agreement or disagreement with specific statements, making it ideal for measuring characteristics like self-efficacy and technical competence. The 5-point Likert scale provides a balance between enough response variation and simplicity, which minimizes respondent fatigue and enhances completion rates (Revilla et al., 2014) in comparison to scales that include a greater number of points such as 7-point and 11-points scales.

3.3. Population

The participants in this study were EFL teachers who were employed in Türkiye and taught students in high schools. In order to narrow down the accessible population and make the research applicable, the researcher focused on EFL teachers who were based in three provinces: Bartın, Bursa, and Kastamonu. To select participants from the available population

of EFL teachers in Türkiye, this study utilized a non-probability selection method, namely convenience sampling method. Creswell (2012) and Rahi (2017) state that researchers use convenience sampling when they gather data from a population that is easily accessible. This type of sampling method is frequently employed in educational and social scientific research when random selection becomes impracticable due to factors such as time, geographical access, or limited resources due to lack of funding (Etikan et al., 2015).

Initially, the scale used in the study was filled out by 139 English language teachers, who voluntarily took part in the study. However, as is case with before carrying out quantitative research, it is essential to ensure the survey data is accurate and valid. A thorough screening process was performed on the dataset before statistical analyses were performed in order to detect and remove responses that could invalidate the results. 13 Participants were excluded from the study as their survey responses were found ineligible as some filled out the questionnaire as a straight line, a response behaviour where they choose the same response option for several or all items on the scale, regardless of the content or context of the items. Furthermore, other respondents' replies contained missing data. Aside from those excluded, 126 high school English language teachers in Turkey represented a range of educational backgrounds, years of experience in the profession, and other variables such as gender and age. Although convenience sampling is believed to restrict the generalizability of findings to the wider group of Turkish EFL teachers, it did allow the researcher to collect important and contextual information. The sample size was deemed enough for both descriptive and inferential statistical analyses as it also ensured a 5 responses per item in the scale ratio, which improved the reliability and interpretability of the findings on AI competency and its relationship to teacher self-efficacy beliefs. Regardless of the number of variables, there are scholars in the literature who state that a sample size of at least 100 is required (Arrindell & Van der Ende, 1985; Gorsuch, 2003). A detailed table regarding demographic variables of the participants will be shared below, in the next chapter.

3.4. Data Collection Procedure

The current study began with an application that was submitted by the researcher to the MoNE's "Research Application Permits Application and Evaluation System" with the number MEB.TT.2025.023503 in order to administrate the TAICS scale to evaluate the current level AI literacy and self-efficacy among Turkish K-12 EFL instructors working at schools affiliated with MoNE in three different provinces, Bartın, Bursa and Kastamonu. The scope of the study includes both privately-run and state-run institutions in order to reach more participants

from a bigger population and have a diverse variance in responses. The application process included writing a 20-page research proposal written along with the thesis proposal in order to be assess its applicability and the reasoning behind it. Furthermore, the researcher filled out additional documents required such as “Detailed Information and Voluntary Participation Form”, “If the Data Collection Tool Previously Used in the Literature Permission for Use”, “Notarized Turkish Translation for Documents Prepared in a Foreign Language” for the data collection instrument as it is originally in English and used as English in the study and “Research Implementation Permit Application Commitment Letter” which acts as a negotiation between the researcher and MoNE. 16 days after the application, it was deemed positive and approved by Bursa, Bartın and Kastamonu provinces’ MoNE directorates.

After this process, the researcher started distrubuting Google Forms document Invitations to participate in the study were distributed through online social groups such as Facebook and WhatsApp groups and social media platforms such as LinkedIn, aimed at English teachers. The invitation notified participants of the study's goal, the voluntary nature of participation, the anonymity of their responses, and their freedom to withdraw at any time. The survey took about 5–8 minutes to complete. However, due to the specific nature of population, researcher had trouble reaching participants at first and contacted some people who stated that they work at the provinces that are in line with the study’s scope. The researcher privately messaged people on LinkedIn to ask teachers for their voluntary participation. Still though, not enough participant sample was reached in order to withdraw conclusions.

The researcher made visits to 59 high schools in the province of Bursa, which are situated in the districts of Nilüfer, Osmangazi, and Yıldırım. Additionally, 19 schools in Kastamonu, which are located in the central and Araç districts, and 11 schools in Bartın, which include the districts of Ulus and Amasra, were visited. The formal document that allowed these visits was available on the research application system of the Ministry of National Education. The researcher had created copies of this formal document, which was written individually for each of the schools in the form of a petition, in order to provide the administrators of the schools with information regarding the research project. Considering the fact that the research application system was updated by MoNE in June 2024, the visit process wasn’t smooth. Some school administrators requested that their provincial directorates send documents directly to the school's document system because they were unaware of this process. To verify the study's legitimacy, the researcher requested them to phone the provincial directorates after showing them the revised declaration from MoNE in the instances where this situation occurred. Also,

one of the state schools and 4 private schools in Bursa didn’t allow the researcher to gather data even with a formal document from the ministry.

The findings of the present study will be reported to MoNE to be used to further develop policies regarding AI such as professional engagement trainings and other opportunities. Furthermore, the researcher believes that the current "Öğretmenlik Mesleği Genel Yeterlilikleri," framework, which was put into effect by law in 2017, does not sufficiently reflect the significant and quick advancements in AI technology, especially with the emergence of generative AI after 2022, and findings of this study may assist to prepare an updated framework.

3.4. Data Analysis

In this study, conducted as part of a master's thesis in the field of educational sciences, the aim was to examine the demographic characteristics of high school teachers participating in the research. Descriptive statistics were employed to summarize participants' gender, age, educational background, teaching experience, type of school they work in, and the province in which they are currently teaching. The following findings outline the distribution of these variables.

The data were analyzed using SPSS 26.0, and all statistical procedures were conducted at a 95% confidence level. In the study, scale scores were calculated, and skewness and kurtosis coefficients were examined to assess the normality of score distributions. Values of skewness and kurtosis falling between +3 and -3 were considered sufficient for the assumption of normal distribution (DeCarlo, 1997; Groeneveld & Meeden, 1984; Hopkins & Weeks, 1990; Moors, 1986).

Since the skewness and kurtosis values for all scale scores were within the acceptable range of +3 to -3, the data were considered to meet the assumption of normality, and parametric test techniques were employed in subsequent analyses. Independent samples t-tests were used to examine differences based on binary variables, while one-way ANOVA tests were used for comparisons across three or more groups.

In confirmatory factor analysis (CFA), a variety of fit indices were used to evaluate the adequacy of the tested model. Given that each index has its own strengths and weaknesses in assessing the fit between the theoretical model and the actual data, it is recommended to report multiple indices to comprehensively evaluate model fit. The most commonly used fit indices include the Chi-Square Goodness-of-Fit Test, Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), Root

Mean Square Residual (RMR), and Root Mean Square Error of Approximation (RMSEA) (Cole, 1987; Sümer, 2000)

In terms of reliability analysis, the reliability of the scale was evaluated using Cronbach's alpha coefficient, which ranges from 0 to 1. The interpretation of the alpha coefficient (α) is as follows (Nunnally, 1978), p. 248):

$.00 \leq \alpha < .40$: the scale is not reliable
$.40 \leq \alpha < .60$: the scale has low reliability
$.60 \leq \alpha < .80$: the scale is moderately reliable
$.80 \leq \alpha < 1.00$: the scale is highly reliable

According to the procedures and analyses described above, it is apparent that the data fulfilled the essential criteria for parametric statistical analyses. Thorough procedures were utilized to assure the validity and the reliability of the study's findings. These procedures included independent samples t-tests, one-way ANOVA, confirmatory factor analysis, and reliability assessments using Cronbach's alpha. After setting up these methodological bases, the next chapter goes into detail about the study's results, giving a full picture of the demographics of the subjects as well as the statistical results that came from the analyses. These results are intended to illuminate the research questions that were posed and to serve as a foundation for the discussion in the following chapters.

CHAPTER IV
RESULTS

4.1. Statistical Findings From the Scale

This chapter presents the findings of a quantitative study that aimed to determine how proficient Turkish high school EFL teachers were in AI and how self-efficacious they were to use AI-based technologies in their classrooms. The data was collected through the use of the TAICS, which assesses six components: AI Knowledge, AI Ethics, Human-Centered Education, AI Pedagogical Application, AI Assessment, and Professional Engagement. Each of the study's three research questions about teachers' perceptions of their own abilities to use AI in the classroom, their current level of AI literacy, and the nature of the connection between the AI literacy and self-efficacy concepts was addressed by the results.

A number of statistical analyses were used to accomplish these objectives. In order to investigate the general patterns in the self-efficacy and AI literacy levels of participants, descriptive statistics (means and standard deviations) were calculated. To find possible differences based on demographic variables, inferential statistics were used: for gender-based differences, we used independent samples t-tests, and for variations across age groups, educational background, teaching experience, and geographical location, one-way ANOVA was used. In the end, we used Pearson correlation analysis to find out how strongly and in what direction teachers' self-efficacy views were correlated with their AI literacy levels. Structured to provide a thorough knowledge of Turkish EFL teachers' perceptions, the results are presented below, starting with demographic variables.

Table 2
Demographic Variables

		n	%
Gender	Female	92	73,0
	Male	34	27,0
Age	18-29	25	19,8
	30-39	38	30,2
	40-49	41	32,5
	50-59	19	15,1
	60 and above	3	2,4

Educational Background	Bachelor's degree	109	86,5
	Master's degree	16	12,7
	Doctorate/PhD	1	0,8
Teaching Experience	0-5 years	16	12,7
	6-10 years	21	16,7
	11-15 years	23	18,3
	16-20 years	30	23,8
	21 years and above	36	28,6
School Type	Private high school	28	22,2
	Public high school	98	77,8
In which province are you currently teaching?	Bartın	33	26,2
	Bursa	64	50,8
	Kastamonu	29	23,0

In this study, conducted as part of a master's thesis in the field of educational sciences, the aim was to examine the demographic characteristics of high school teachers participating in the research. Descriptive statistics were employed to summarize participants' gender, age, educational background, teaching experience, type of school they work in, and the province in which they are currently teaching. The following findings outline the distribution of these variables.

In terms of gender, the majority of participants identified as female (n = 92, 73.0%), while the remaining participants were male (n = 34, 27.0%). Age distribution showed that most respondents were between the ages of 40–49 years (n = 41, 32.5%), followed by those aged 30–39 years (n = 38, 30.2%). Younger participants aged 18–29 constituted 19.8% (n = 25) of the sample, while those aged 50–59 made up 15.1% (n = 19). Only a small proportion of participants were aged 60 and above (n = 3, 2.4%).

Regarding educational background, the vast majority held a bachelor's degree (n = 109, 86.5%). A smaller portion of the sample reported holding a master’s degree (n = 16, 12.7%), and only one participant (0.8%) had completed a doctorate (PhD).

When teaching experience was examined, most participants had over 21 years of experience in the profession (n = 36, 28.6%), followed by those with 16–20 years of experience (n = 30, 23.8%). Participants with 11–15 years (n = 23, 18.3%), 6–10 years (n = 21, 16.7%), and 0–5 years (n = 16, 12.7%) of experience were also represented in the sample.

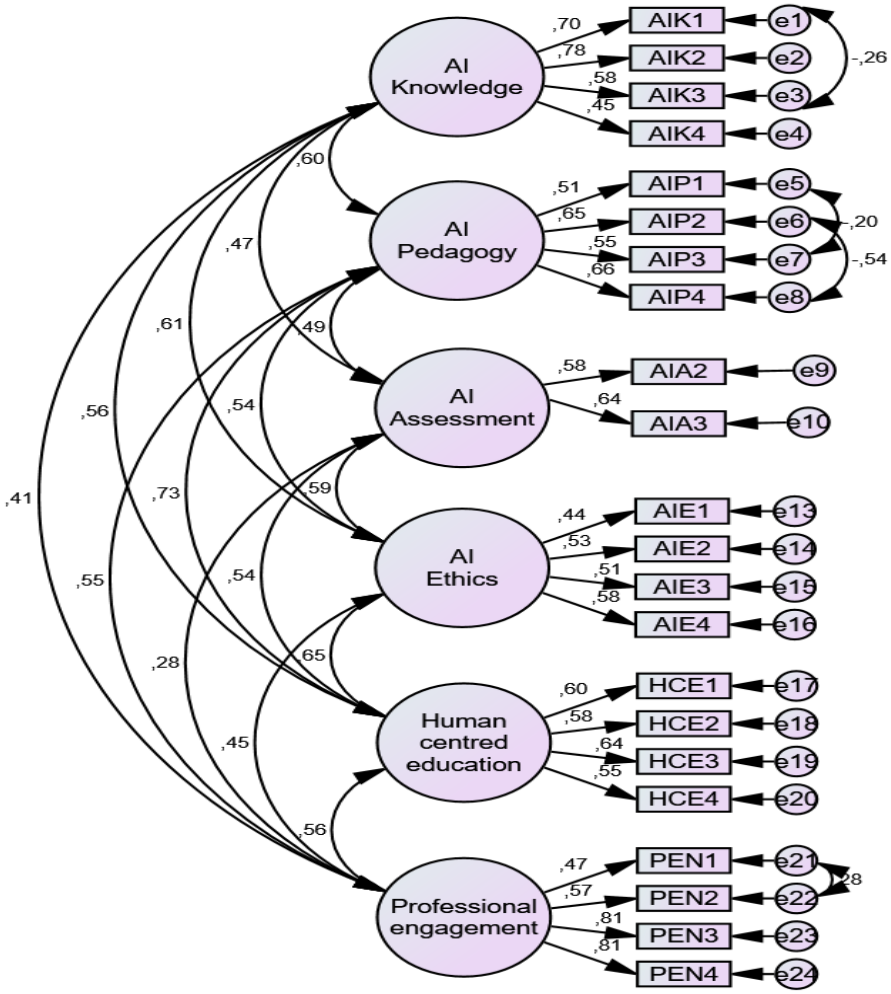
In terms of the type of school, the majority of teachers were employed at public high schools (n = 98, 77.8%), while the remaining participants worked in private high schools (n = 28, 22.2%).

In this study, the distribution of participants based on the province in which they were currently teaching was examined. The majority of the participants reported teaching in Bursa (n = 64, 50.8%), followed by Bartın (n = 33, 26.2%). The smallest proportion of participants were teaching in Kastamonu (n = 29, 23.0%).

Table 3
CFA Results and Path Diagram

Acceptable Indexes	**Calculated Indexes**
$\chi 2/sd \leq 5$	1,26
GFI ≥ 0,90	0,86
AGFI ≥ 0 90	0,81
CFI ≥ 0.97	0,92
RMSEA ≤ 0.08	0,05
RMR ≤ 0.08	0,06

The path diagram constructed in the confirmatory factor analysis (CFA) is presented below. Accordingly, the calculated fit indices χ^2/df, CFI, RMSEA, and RMR indicate acceptable model fit. However, the GFI and AGFI values appear to be relatively low. Anderson and Gerbing (1984), Cole (1987), and Marsh, Balla, and McDonald (1988) suggest that GFI values above 0.85 and AGFI values above 0.80 can also be considered acceptable indicators of model fit.



			Estimate	S.E.	C.R.	P
AIK1	<---	AI_Knowledge	,701			
AIK2	<---	AI_Knowledge	,783	,158	6,354	***
AIK3	<---	AI_Knowledge	,582	,143	4,892	***
AIK4	<---	AI_Knowledge	,445	,122	4,327	***
AIP1	<---	AI_Pedagogy	,514			
AIP2	<---	AI_Pedagogy	,645	,263	4,478	***
AIP3	<---	AI_Pedagogy	,549	,265	4,098	***
AIP4	<---	AI_Pedagogy	,660	,339	4,535	***
AIA2	<---	AI_Assessment	,578			
AIA3	<---	AI_Assessment	,643	,337	3,516	***
AIE1	<---	AI_Ethics	,438			
AIE2	<---	AI_Ethics	,531	,349	3,452	***
AIE3	<---	AI_Ethics	,505	,327	3,372	***

			Estimate	S.E.	C.R.	P
AIE4	<---	AI_Ethics	,580	,335	3,580	***
HCE1	<---	Human_centred_education	,597			
HCE2	<---	Human_centred_education	,578	,201	4,833	***
HCE3	<---	Human_centred_education	,636	,233	5,147	***
HCE4	<---	Human_centred_education	,552	,232	4,720	***
PEN1	<---	Professional_engagement	,466			
PEN2	<---	Professional_engagement	,572	,271	5,011	***
PEN3	<---	Professional_engagement	,812	,418	4,861	***
PEN4	<---	Professional_engagement	,809	,444	4,859	***

As a result of the CFA, items 1 and 4 under the AI Assessment dimension were excluded from the analysis due to their low factor loadings. The remaining items were found to be statistically significant and were retained in the analysis ($p < 0.05$).

Table 4

Descriptive Statistics for the Sub-Domains of the Scale

	n	Minimum	Maximum	Mean	sd	Cronbach's Alpha	Skewness	Kurtosis
AI Knowledge	126	2,00	5,00	3,81	0,67	0,70	-0,57	-0,13
AI Pedagogy	126	2,00	5,00	3,65	0,60	0,60	-0,41	0,39
AI Assessment	126	2,00	5,00	3,57	0,74	0,54	-0,19	-0,38
AI Ethics	126	1,75	5,00	3,62	0,65	0,59	-0,61	0,52
Human-centred education	126	1,75	5,00	3,58	0,70	0,68	-0,29	-0,37
Professional Engagement	126	1,00	5,00	3,40	0,78	0,77	-0,69	0,61
TAICS	126	2,36	5,00	3,61	0,48	0,86	-0,30	0,13

For the AI Knowledge sub-dimension, the mean score was 3.81 (sd = 0.67), with a minimum of 2.00 and a maximum of 5.00. The Cronbach's Alpha was 0.70, the skewness was -0.57, and the kurtosis was -0.13.

For the AI Pedagogy sub-dimension, the mean was 3.65 (sd = 0.60), with scores ranging from 2.00 to 5.00. The Cronbach's Alpha was 0.60, the skewness was -0.41, and the kurtosis was 0.39.

The AI Assessment sub-dimension had a mean of 3.57 (sd = 0.74), a minimum of 2.00 and a maximum of 5.00. The Cronbach's Alpha was 0.54, the skewness was -0.19, and the kurtosis was -0.38.

For the AI Ethics sub-dimension, the mean score was 3.62 (sd = 0.65), with values ranging from 1.75 to 5.00. The Cronbach's Alpha was 0.59, the skewness was -0.61, and the kurtosis was 0.52.

In the Human-centred Education sub-dimension, the mean was 3.58 (sd = 0.70), the minimum was 1.75, and the maximum was 5.00. The Cronbach's Alpha was 0.68, the skewness was -0.29, and the kurtosis was -0.37.

The Professional Engagement sub-dimension had a mean of 3.40 (sd = 0.78), with a minimum of 1.00 and a maximum of 5.00. The Cronbach's Alpha was 0.77, the skewness was -0.69, and the kurtosis was 0.61.

The overall TAICS scale showed a mean of 3.61 (sd = 0.48), with values ranging from 2.36 to 5.00. The Cronbach's Alpha was 0.86, the skewness was -0.30, and the kurtosis was 0.13.

Table 5
Examination of Scores by Gender

Gender		n	Mean	sd	t	p
AI Knowledge	Female	92	3,89	0,65	2,268	0,025
	Male	34	3,60	0,67		
AI Pedagogy	Female	92	3,67	0,63	0,484	0,629
	Male	34	3,61	0,51		
AI Assessment	Female	92	3,60	0,78	0,888	0,376
	Male	34	3,47	0,65		
AI Ethics	Female	92	3,62	0,66	0,071	0,943
	Male	34	3,61	0,63		
Human-centred education	Female	92	3,65	0,69	1,803	0,074
	Male	34	3,40	0,69		
Professional Engagement	Female	92	3,39	0,81	-0,160	0,873
	Male	34	3,42	0,70		
TAICS	Female	92	3,64	0,49	1,234	0,220
	Male	34	3,52	0,46		

T test

For the AI Knowledge sub-dimension, the mean score of female participants (Mean = 3.89, sd = 0.65) was significantly higher than that of male participants (Mean = 3.60, sd = 0.67), t = 2.268, p = 0.025.

In the AI Pedagogy sub-dimension, female participants had a mean score of 3.67 (sd = 0.63), while male participants had a mean of 3.61 (sd = 0.51). This difference was not statistically significant, t = 0.484, p = 0.629.

For the AI Assessment sub-dimension, the mean score for female participants was 3.60 (sd = 0.78), compared to 3.47 (sd = 0.65) for male participants. No significant difference was found between groups, t = 0.888, p = 0.376.

In the AI Ethics sub-dimension, female participants scored a mean of 3.62 (sd = 0.66), and male participants scored 3.61 (sd = 0.63). The difference was not statistically significant, t = 0.071, p = 0.943.

For the Human-centred Education sub-dimension, female participants had a mean score of 3.65 (sd = 0.69), while male participants had a mean of 3.40 (sd = 0.69). The difference approached significance but did not reach the conventional threshold, t = 1.803, p = 0.074.

In the Professional Engagement sub-dimension, female participants had a mean score of 3.39 (sd = 0.81), and male participants scored 3.42 (sd = 0.70). No significant difference was observed, t = -0.160, p = 0.873.

Regarding the overall TAICS scale, the mean score for female participants was 3.64 (sd = 0.49), while male participants had a mean score of 3.52 (sd = 0.46). This difference was not statistically significant, t = 1.234, p = 0.220.

Table 6
Examination of Scores by Age

Age		n	Mean	sd	F	p
AI Knowledge	18-29	25	3,65	0,63	2,193	0,092
	30-39	38	3,85	0,64		
	40-49	41	3,99	0,65		
	50 and above	22	3,61	0,72		
AI Pedagogy	18-29	25	3,68	0,53	0,740	0,530
	30-39	38	3,66	0,62		
	40-49	41	3,72	0,61		
	50 and above	22	3,49	0,62		
AI Assessment	18-29	25	3,30	0,54	1,957	0,124
	30-39	38	3,53	0,91		

	40-49	41	3,74	0,69		
	50 and above	22	3,61	0,65		
AI Ethics	18-29	25	3,56	0,72	0,727	0,538
	30-39	38	3,53	0,71		
	40-49	41	3,65	0,57		
	50 and above	22	3,77	0,59		
Human-centred education	18-29	25	3,54	0,62	0,247	0,863
	30-39	38	3,57	0,81		
	40-49	41	3,65	0,69		
	50 and above	22	3,51	0,60		
Professional Engagement	18-29	25	3,28	0,83	0,929	0,429
	30-39	38	3,29	0,77		
	40-49	41	3,53	0,73		
	50 and above	22	3,49	0,82		
TAICS	18-29	25	3,52	0,43	0,982	0,404
	30-39	38	3,57	0,54		
	40-49	41	3,71	0,45		
	50 and above	22	3,58	0,49		

ANOVA test

For the AI Knowledge sub-dimension, the mean scores across age groups were as follows: 3.65 (sd = 0.63) for participants aged 18–29, 3.85 (sd = 0.64) for those aged 30–39, 3.99 (sd = 0.65) for those aged 40–49, and 3.61 (sd = 0.72) for those aged 50 and above. The difference among age groups was not statistically significant, F = 2.193, p = 0.092.

In the AI Pedagogy sub-dimension, the mean scores were 3.68 (sd = 0.53) for the 18–29 age group, 3.66 (sd = 0.62) for the 30–39 age group, 3.72 (sd = 0.61) for the 40–49 age group, and 3.49 (sd = 0.62) for the 50 and above group. No significant difference was found between the age groups, F = 0.740, p = 0.530.

For the AI Assessment sub-dimension, the mean scores were 3.30 (sd = 0.54) for ages 18–29, 3.53 (sd = 0.91) for 30–39, 3.74 (sd = 0.69) for 40–49, and 3.61 (sd = 0.65) for 50 and above. The difference between groups was not statistically significant, F = 1.957, p = 0.124.

In the AI Ethics sub-dimension, the mean scores were 3.56 (sd = 0.72) for ages 18–29, 3.53 (sd = 0.71) for 30–39, 3.65 (sd = 0.57) for 40–49, and 3.77 (sd = 0.59) for 50 and above. The differences were not statistically significant, F = 0.727, p = 0.538.

For the Human-centred Education sub-dimension, the means were 3.54 (sd = 0.62) for the 18–29 group, 3.57 (sd = 0.81) for 30–39, 3.65 (sd = 0.69) for 40–49, and 3.51 (sd = 0.60) for those 50 and above. There was no statistically significant difference, F = 0.247, p = 0.863.

In the Professional Engagement sub-dimension, the mean scores were 3.28 (sd = 0.83) for ages 18–29, 3.29 (sd = 0.77) for 30–39, 3.53 (sd = 0.73) for 40–49, and 3.49 (sd = 0.82) for 50 and above. The difference among groups was not significant, F = 0.929, p = 0.429.

Regarding the overall TAICS scale, the mean score for the 18–29 age group was 3.52 (sd = 0.43), 3.57 (sd = 0.54) for 30–39, 3.71 (sd = 0.45) for 40–49, and 3.58 (sd = 0.49) for 50 and above. The ANOVA result indicated no statistically significant difference, F = 0.982, p = 0.404.

Table 7

Examination of Scores by Educational Background

Educational Background		n	Mean	sd	t	p
AI Knowledge	Bachelor's degree	109	3,82	0,69	0,128	0,898
	Master's degree/PhD	17	3,79	0,46		
AI Pedagogy	Bachelor's degree	109	3,66	0,59	0,260	0,795
	Master's degree/PhD	17	3,62	0,65		
AI Assessment	Bachelor's degree	109	3,58	0,72	0,576	0,566
	Master's degree/PhD	17	3,47	0,89		
AI Ethics	Bachelor's degree	109	3,58	0,66	-1,627	0,106
	Master's degree/PhD	17	3,85	0,51		
Human-centred education	Bachelor's degree	109	3,60	0,66	0,879	0,381
	Master's degree/PhD	17	3,44	0,89		
Professional Engagement	Bachelor's degree	109	3,39	0,78	-0,396	0,693
	Master's degree/PhD	17	3,47	0,80		
TAICS	Bachelor's degree	109	3,61	0,48	-0,107	0,915
	Master's degree/PhD	17	3,62	0,51		

T test

For the AI Knowledge sub-dimension, the mean score was 3.82 (sd = 0.69) for participants with a bachelor's degree and 3.79 (sd = 0.46) for those with a master's or doctorate degree. The difference between groups was not statistically significant, t = 0.128, p = 0.898.

In the AI Pedagogy sub-dimension, the mean was 3.66 (sd = 0.59) for bachelor's degree holders and 3.62 (sd = 0.65) for those with a higher degree. This difference was not statistically significant, t = 0.260, p = 0.795.

For the AI Assessment sub-dimension, bachelor's degree holders had a mean of 3.58 (sd = 0.72), while the other group had a mean of 3.47 (sd = 0.89). No significant difference was found, t = 0.576, p = 0.566.

In the AI Ethics sub-dimension, participants with a bachelor's degree scored a mean of 3.58 (sd = 0.66), while those with a master's or doctorate degree had a higher mean of 3.85 (sd = 0.51). However, the difference was not statistically significant, t = -1.627, p = 0.106.

For the Human-centred Education sub-dimension, the mean score was 3.60 (sd = 0.66) for bachelor's degree holders and 3.44 (sd = 0.89) for the higher-degree group. This difference was not statistically significant, t = 0.879, p = 0.381.

In the Professional Engagement sub-dimension, the mean was 3.39 (sd = 0.78) for the bachelor's degree group and 3.47 (sd = 0.80) for the master's/doctorate group. There was no statistically significant difference, t = -0.396, p = 0.693.

Regarding the overall TAICS scale, the mean score was 3.61 (sd = 0.48) for bachelor's degree holders and 3.62 (sd = 0.51) for those with a master's or doctorate degree. The difference was not statistically significant, t = -0.107, p = 0.915.

Table 8

Examination of Scores by Teaching Experience

Teaching Experience		n	Mean	sd	F	p
AI Knowledge	0-5 years	16	3,70	0,50	1,514	0,202
	6-10 years	21	3,75	0,75		
	11-15 years	23	3,89	0,59		
	16-20 years	30	4,03	0,57		
	21 years and above	36	3,67	0,77		
AI Pedagogy	0-5 years	16	3,73	0,49	0,524	0,718
	6-10 years	21	3,52	0,56		
	11-15 years	23	3,74	0,62		
	16-20 years	30	3,69	0,68		
	21 years and above	36	3,60	0,58		
AI Assessment	0-5 years	16	3,34	0,51	1,034	0,393
	6-10 years	21	3,50	0,91		
	11-15 years	23	3,48	0,80		
	16-20 years	30	3,58	0,74		
	21 years and above	36	3,75	0,68		
AI Ethics	0-5 years	16	3,44	0,78	1,270	0,286
	6-10 years	21	3,42	0,79		
	11-15 years	23	3,72	0,45		

	16-20 years	30	3,63	0,64		
	21 years and above	36	3,74	0,59		
Human-centred education	0-5 years	16	3,66	0,73	1,026	0,397
	6-10 years	21	3,40	0,59		
	11-15 years	23	3,47	0,82		
	16-20 years	30	3,76	0,71		
	21 years and above	36	3,57	0,65		
Professional Engagement	0-5 years	16	3,30	0,96	1,699	0,155
	6-10 years	21	3,13	0,53		
	11-15 years	23	3,49	0,75		
	16-20 years	30	3,66	0,66		
	21 years and above	36	3,33	0,88		
TAICS	0-5 years	16	3,55	0,43	1,227	0,303
	6-10 years	21	3,45	0,52		
	11-15 years	23	3,64	0,50		
	16-20 years	30	3,74	0,50		
	21 years and above	36	3,60	0,45		

ANOVA test

For the AI Knowledge sub-dimension, the mean scores were 3.70 (sd = 0.50) for participants with 0–5 years of experience, 3.75 (sd = 0.75) for 6–10 years, 3.89 (sd = 0.59) for 11–15 years, 4.03 (sd = 0.57) for 16–20 years, and 3.67 (sd = 0.77) for those with 21 years and above. The differences were not statistically significant, F = 1.514, p = 0.202.

In the AI Pedagogy sub-dimension, the mean was 3.73 (sd = 0.49) for 0–5 years, 3.52 (sd = 0.56) for 6–10 years, 3.74 (sd = 0.62) for 11–15 years, 3.69 (sd = 0.68) for 16–20 years, and 3.60 (sd = 0.58) for 21 years and above. No significant difference was found, F = 0.524, p = 0.718.

For the AI Assessment sub-dimension, the mean scores were 3.34 (sd = 0.51) for 0–5 years, 3.50 (sd = 0.91) for 6–10 years, 3.48 (sd = 0.80) for 11–15 years, 3.58 (sd = 0.74) for 16–20 years, and 3.75 (sd = 0.68) for 21 years and above. The differences were not statistically significant, F = 1.034, p = 0.393.

In the AI Ethics sub-dimension, participants scored 3.44 (sd = 0.78) for 0–5 years, 3.42 (sd = 0.79) for 6–10 years, 3.72 (sd = 0.45) for 11–15 years, 3.63 (sd = 0.64) for 16–20 years, and 3.74 (sd = 0.59) for 21 years and above. There was no significant difference, F = 1.270, p = 0.286.

For the Human-centred Education sub-dimension, the mean scores were 3.66 (sd = 0.73) for 0–5 years, 3.40 (sd = 0.59) for 6–10 years, 3.47 (sd = 0.82) for 11–15 years, 3.76 (sd = 0.71) for 16–20 years, and 3.57 (sd = 0.65) for 21 years and above. The ANOVA result was not statistically significant, F = 1.026, p = 0.397.

In the Professional Engagement sub-dimension, the mean was 3.30 (sd = 0.96) for 0–5 years, 3.13 (sd = 0.53) for 6–10 years, 3.49 (sd = 0.75) for 11–15 years, 3.66 (sd = 0.66) for 16–20 years, and 3.33 (sd = 0.88) for 21 years and above. The difference was not statistically significant, F = 1.699, p = 0.155.

Regarding the overall TAICS scale, the mean score was 3.55 (sd = 0.43) for 0–5 years, 3.45 (sd = 0.52) for 6–10 years, 3.64 (sd = 0.50) for 11–15 years, 3.74 (sd = 0.50) for 16–20 years, and 3.60 (sd = 0.45) for 21 years and above. The ANOVA result indicated no statistically significant difference, F = 1.227, p = 0.303.

Table 9
Examination of Scores by School Type

School Type		n	Mean	sd	t	p
AI Knowledge	Private high school	28	3,95	0,57	1,199	0,233
	Public high school	98	3,78	0,69		
AI Pedagogy	Private high school	28	3,82	0,49	1,709	0,090
	Public high school	98	3,60	0,62		
AI Assessment	Private high school	28	3,63	0,57	0,463	0,644
	Public high school	98	3,55	0,79		
AI Ethics	Private high school	28	3,73	0,64	1,068	0,288
	Public high school	98	3,58	0,65		
Human-centred education	Private high school	28	3,61	0,52	0,288	0,775
	Public high school	98	3,57	0,74		
Professional Engagement	Private high school	28	3,47	0,72	0,556	0,579
	Public high school	98	3,38	0,80		
TAICS	Private high school	28	3,71	0,36	1,505	0,137
	Public high school	98	3,58	0,51		

T test

For the AI Knowledge sub-dimension, the mean score was 3.95 (sd = 0.57) for teachers in private high schools and 3.78 (sd = 0.69) for those in public high schools. The difference was not statistically significant, t = 1.199, p = 0.233.

In the AI Pedagogy sub-dimension, the mean was 3.82 (sd = 0.49) for private high school teachers and 3.60 (sd = 0.62) for public high school teachers. This difference was not statistically significant, t = 1.709, p = 0.090.

For the AI Assessment sub-dimension, the mean score was 3.63 (sd = 0.57) for private school teachers and 3.55 (sd = 0.79) for public school teachers. The difference was not significant, t = 0.463, p = 0.644.

In the AI Ethics sub-dimension, private high school teachers had a mean score of 3.73 (sd = 0.64), while public high school teachers had a mean of 3.58 (sd = 0.65). The difference was not statistically significant, t = 1.068, p = 0.288.

For the Human-centred Education sub-dimension, the mean was 3.61 (sd = 0.52) for teachers in private high schools and 3.57 (sd = 0.74) for those in public high schools. The difference was not statistically significant, t = 0.288, p = 0.775.

In the Professional Engagement sub-dimension, teachers in private high schools had a mean score of 3.47 (sd = 0.72), while those in public high schools had a mean of 3.38 (sd = 0.80). No statistically significant difference was found, t = 0.556, p = 0.579.

Regarding the overall TAICS scale, the mean score was 3.71 (sd = 0.36) for private high school teachers and 3.58 (sd = 0.51) for public high school teachers. This difference was not statistically significant, t = 1.505, p = 0.137.

Table 10

Examination of Scores by the Province Taught

In which province are you currently teaching?		n	Mean	sd	F	p	Posthoc
AI Knowledge	Bartın	33	3,72	0,74	1,572	0,212	
	Bursa	64	3,78	0,60			
	Kastamonu	29	4,00	0,70			
AI Pedagogy	Bartın	33	3,48	0,58	5,424	0,006	1<3
	Bursa	64	3,61	0,60			2<3
	Kastamonu	29	3,95	0,52			
AI Assessment	Bartın	33	3,58	0,88	0,009	0,991	
	Bursa	64	3,57	0,73			
	Kastamonu	29	3,55	0,60			
AI Ethics	Bartın	33	3,58	0,64	1,559	0,214	
	Bursa	64	3,55	0,68			
	Kastamonu	29	3,80	0,56			
Human-centred education	Bartın	33	3,33	0,74	4,888	0,009	1<3
	Bursa	64	3,57	0,68			

	Kastamonu	29	3,87	0,57			
	Bartın	33	3,36	0,74			1<3
Professional Engagement	Bursa	64	3,27	0,85	4,127	0,018	2<3
	Kastamonu	29	3,75	0,56			
	Bartın	33	3,50	0,49			1<3
TAICS	Bursa	64	3,56	0,47	4,937	0,009	2<3
	Kastamonu	29	3,84	0,43			

ANOVA test

For the AI Knowledge sub-dimension, the mean scores were 3.72 (sd = 0.74) for Bartın, 3.78 (sd = 0.60) for Bursa, and 4.00 (sd = 0.70) for Kastamonu. The difference was not statistically significant, F = 1.572, p = 0.212.

In the AI Pedagogy sub-dimension, the mean scores were 3.48 (sd = 0.58) for Bartın, 3.61 (sd = 0.60) for Bursa, and 3.95 (sd = 0.52) for Kastamonu. A statistically significant difference was found, F = 5.424, p = 0.006. Post-hoc analysis indicated that the mean scores of Bartın and Bursa were significantly lower than that of Kastamonu (1 < 3; 2 < 3).

For the AI Assessment sub-dimension, the mean scores were 3.58 (sd = 0.88) for Bartın, 3.57 (sd = 0.73) for Bursa, and 3.55 (sd = 0.60) for Kastamonu. No significant difference was found, F = 0.009, p = 0.991.

In the AI Ethics sub-dimension, the mean scores were 3.58 (sd = 0.64) for Bartın, 3.55 (sd = 0.68) for Bursa, and 3.80 (sd = 0.56) for Kastamonu. The difference was not statistically significant, F = 1.559, p = 0.214.

For the Human-centred Education sub-dimension, the mean scores were 3.33 (sd = 0.74) for Bartın, 3.57 (sd = 0.68) for Bursa, and 3.87 (sd = 0.57) for Kastamonu. A statistically significant difference was found, F = 4.888, p = 0.009. Post-hoc results showed that Bartın had significantly lower mean scores than Kastamonu (1 < 3).

In the Professional Engagement sub-dimension, the mean scores were 3.36 (sd = 0.74) for Bartın, 3.27 (sd = 0.85) for Bursa, and 3.75 (sd = 0.56) for Kastamonu. The difference was statistically significant, F = 4.127, p = 0.018. Post-hoc comparisons indicated that both Bartın and Bursa had significantly lower mean scores than Kastamonu (1 < 3; 2 < 3).

Regarding the overall TAICS scale, the mean scores were 3.50 (sd = 0.49) for Bartın, 3.56 (sd = 0.47) for Bursa, and 3.84 (sd = 0.43) for Kastamonu. A statistically significant difference was found, F = 4.937, p = 0.009. Post-hoc results revealed that both Bartın and Bursa had significantly lower scores than Kastamonu (1 < 3; 2 < 3).

CHAPTER V
DISCUSSION

This chapter seeks to explain and critically analyze the results of the current study, which looked at the degrees of AI literacy among Türkiye's English language teachers in specific regions and how those levels were related to their beliefs regarding their self-efficacy. This chapter aims to position the research findings within the bigger academic literature by expanding upon the theoretical framework discussed in earlier sections, also including concepts like technological pedagogical content knowledge (TPACK), digital competence, AI literacy, and teacher self-efficacy.

5.1. What is the current level of artificial intelligence literacy levels of English language teachers working in Türkiye? (RQ1)

In previous studies, it is been reported that about half of all educators are uncomfortable about using AI in the classroom, either because they have never dealt with it before or because they are worried about what the future holds (Langreo, 2023). An important contributor to this discomfort is the fact that many educators still do not fully understand AI and its practical applications in the classroom. As Ng et al. (2023) and Du et al. (2024) have underlined, it is essential to have an understanding of the knowledge and attitudes that teachers have on AI in order to ensure that the integration of AI is successful. Based on this, one of the main aims of the present study is to examine whether this applies to the Turkish educational context and to exemplify the AI competencies of Turkish teachers of English.

The study found that English language instructors' AI literacy was moderate with an overall mean score of the scale with 3.61, with significant differences in different domains assessed. The results overall indicate that participants self-state familiarity with AI tools and concepts, but their knowledge and skill in this area are only moderate. Teachers' understanding of these technologies' deeper side, ethical considerations, and ways to incorporate them into their teaching was generally lacking. Findings support the belief that, while teachers are familiar with surface-level AI tools, they frequently lack deep competency in critically engaging with AI technology in educational settings. This finding is in line with previous studies suggesting that teachers are generally informed about technological innovations, but they have a hard time effectively incorporating these tools into educational plans (Mishra & Koehler, 2006). In this study, the variation is highlighted by the fact that teachers' scores on the AI Knowledge subdimension were higher (M = 3.81), but their scores on the AI Pedagogy (M = 3.65) and AI

Assessment subdimensions were reportedly lower (M = 3.57). This supports the idea that teachers might have a general idea of what artificial intelligence is and why it's important conceptually, but they might not have the knowledge or self-efficacy to accurately incorporate AI into their lessons or assessment.

Among the domains assessed, AI Knowledge subscale had the highest overall results (M = 3.81, SD = 0.67), followed by AI Pedagogy (M = 3.65), AI Ethics (M = 3.62) and AI Assessment (M = 3.57). This implies that, despite the fact that educators possess a basic comprehension of AI concepts and an openness to pedagogical integration, there is still space for improvement in the practical and evaluative aspects. Furthermore, this finding matches the results of recent studies that show teachers learn about new technology in theory through courses or self study, yet putting that information into practice may be a challenge (Meylani, 2024). Teachers frequently have lower scores in the more applied parts of digital literacy, even if frameworks like DigCompEdu place equal emphasis on knowledge, personalization, application, and problem-solving (Redecker, 2017). In a study conducted by Napal Fraile et al. (2018), it was discovered that pre-service teachers in Spain had reasonably good assessments for their knowledge of digital information handling. However, they had much lower ratings for content creation and problem-solving, which are dimensions that are similar to the AI Assessment and AI Pedagogy subdimensions in this research. In a similar manner, Zhao et al. (2021) found that people rated their own digital content creation skills poorly, even though they rated themselves highly in other areas of digital domains. All of these findings support the findings in this study.

Regarding the overall TAICS scale, the mean score for female participants was 3.64 (sd = 0.49), while male participants had a mean score of 3.52 (sd = 0.46). This difference was not statistically significant, t = 1.234, p = 0.220. Similarly, trends in the literature can be seen when looking at gender, age, and location. Studies like Lucas et al. (2021) and Pérez-Calderón et al. (2021) discovered that male teachers reported higher scores for digital competence. In this study, however, female teachers scored significantly higher than male teachers in AI Knowledge (p =.025). This finding partially contrasts the findings in the studies mentioned. This can be due to the fact that the present study features a limited sample compared to other studies. Yet, a more recent study based on AI literacy levels of Turkish as a foreign language learners found that there was no statistically significant difference in the awareness, assessment, or ethical sub-dimensions of students' AI literacy levels according to gender. However, there was a difference in the usage sub-dimension (Sofu et al., 2025).

On the other hand, the lowest mean score was recorded on the Professional Engagement domain (M = 3.40), indicating that teachers may understand AI on theory or as a concept but they are not likely to engage in professional networks focused on AI or seek constant professional development opportunities. This finding may be the result of lacking relevant official training opportunities available for teachers in Türkiye. The argument put forth by Ertmer and Ottenbreit-Leftwich (2010) stating that educators' adoption of new technology is greatly influenced by institutional culture and their access to organized communities of practice may be reflected in this study's pattern as Turkish national educational context heavily emphasizes national exam based educational system, therefore focusing on fixed pieces of information that will be on the exam. As a summary, while educators may show general understanding of AI, this study presents a pattern that they aren't putting their knowledge into practice through AI-focused professional development, communities of practice, or collaborative projects. This trend is in line with studies conducted all around the world that show how education does not guarantee that teachers would put their newly acquired information into practice (Du et al., 2024; Duan & Zhao, 2024).

Although no statistically significant differences were found, teachers in public high schools scored lower on all sub-dimensions of AI literacy than their private school counterparts. This finding implies that private institutions may offer superior support, resources, or professional development opportunities in relation to AI integration. Celik et al. (2022) concluded that private schools tend to have more technological resources and liberty to develop their curricula, which can lead to a higher level of AI literacy among teachers. However, it is also apperent from the data that p ublic school teachers in Türkiye are also building AI abilities at comparable levels, as there are no statistically significant differences. This suggests that AI literacy growth is not solely dependent on school type. This might be an indication of government programs or policies on a national level that are trying to get every type of schools to use technology increasingly.

Regarding educational background, teachers with a bachelor's degree and those with graduate degrees showed nearly identical levels of AI literacy across all dimensions. In terms of AI Knowledge, for example, the mean scores for individuals with a bachelor's degree were 3.82 and for those with a master's degree, 3.79, whereas the total TAICS scores were very close to being identical, at 3.61 and 3.62, respectively. None of these differences were statistically significant.

Based on these results, it seems that English language teachers in Türkiye do not automatically have a better level of AI literacy only because they hold higher degrees. This

finding would suggest that factors other than formal education level, such as personal determination, institutional support, and ongoing professional development, have a greater impact on AI literacy scores. Holmes et al. (2019) concluded that improving technology-related competences is best accomplished through ongoing, practice-oriented learning rather than formal qualifications. Their finding is in line with our findings, which reinforces and supports their view.

Further results based in the context of province-based analysis, the TAICS instrument provided mean scores of 3.50 (sd = 0.49) for Bartın, 3.56 (sd = 0.47) for Bursa, and 3.84 (sd = 0.43) for Kastamonu. The results showed a statistically significant difference ($F = 4.937$, $p = 0.009$). Bartın and Bursa both had considerably lower scores than Kastamonu, as indicated by post-hoc results ($1 < 3$; $2 < 3$). Limited sampling size of the study would not be enough to make inferences based on the provincial analysis.

The AI Assessment component also reported a relatively lower mean score (3.57), suggesting that teachers might feel like there are obstacles to using AI tools and concepts for assessment in the classroom. Because assessment is so important in education and AI has the ability to revolutionize the way teachers evaluate student learning, this discovery is very concerning. The lower scores in assessment dimension could be due to a lack of knowledge about AI assessment tools, doubts about the validity and reliability of AI-generated tests, or a lack of clarity on the ethical consequences of AI-assisted evaluation. Another possible key factor is mentioned by the literature, as teachers frequently argue that automated assessment systems are unable to grasp "the big picture" or "read between the lines" as well as people (Sperling et al., 2024).

As a further note, although the DigCompEdu framework was not utilized directly in this study, it is important to mention that the components examined in the study, specifically AI Knowledge, Pedagogy, and Ethics have similarities with DigCompEdu's "Digital Resources," "Teaching and Learning," and "Empowering Learners" domains. This study's finding of moderate literacy levels are in line with the larger body of research that describes teachers' digital competence as "intermediate" with a lot of opportunity for improvement (Horváth et al., 2025; Pérez-Calderón et al., 2021). It can be said that digital competence is not an independent characteristic, rather, it is significantly affected by factors such as teachers' self-efficacy levels, the quality of their training, and the availability of contextualized learning opportunities (Hatlevik, 2017; Gudmundsdottir and Hatlevik, 2018). As a result, there has to be a fresh effort to modernize existing frameworks and incorporate AI-specific aspects like ethical awareness,

adaptive learning, and algorithmic transparency into the present digital competency discussion as AI is integrated.

These findings build upon and are consistent with earlier studies on AI literacy in the classroom. Similarly, Uygun et al. (2024) discovered that Turkish teachers' awareness of AI was moderate. Teachers with higher levels of education and younger backgrounds reported greater expertise with AI in Uygun's study, which raises the possibility that these demographic trends are present in this study's sample as well. Furthermore, Al-Abdullatif (2024) stated that teachers with higher AI literacy are more likely to adopt and effectively employ AI tools. Moreover, it can be stated that literacy in AI requires not just technical knowledge but also the ability to critically evaluate and make ethical judgments. It can be inferred from the findings that participants' modest literacy levels may cause them to be hesitant or uncertain about the use of AI in class.

Additionally, several international organizations have emphasized the need to focus on AI ethics since the novel features and complexity of AI have elevated the question of AI "problem" to a critical level. Previous findings suggest that K-12 educators' competence with AI has a direct impact on their knowledge of AI ethics, therefore

Several factors are likely to be responsible for these patterns. Due to the relative novelty of AI in ordinary education, Turkey's teachers have received minimal formal training. It should be stated that this pattern is not only unique to Turkey as well, as UNESCO states that "many educators lack proper guidance" because only a few countries have defined [AI] competencies or developed national programs to train teachers in AI. This results in instructors acquiring AI knowledge more through informal means than formal education, which in turn might lead to inequalities in performance. The results obtained in the study are in line with existing competency frameworks; for example, the AI Competency Framework put out by UNESCO (2024) ,which emphasizes the following dimensions: AI ethics, AI pedagogy, AI for professional learning, AI foundations, and AI with a human-centered mindset. In light of the results, it appears that the ethical and human-centered features, which were suggested by UNESCO, require further attention and more work. Teachers may be skeptical about advanced usage and long-term consequences because generative AI based technologies like ChatGPT are still in their early stages of classroom adoption and many educators are currently investigating their potential benefits and drawbacks. In order to mitigate their disadvantages, targeted professional development and curriculum intervention are required for nations.

5.2. What are English teachers' self-efficacy beliefs about artificial intelligence and the use of artificial intelligence tools in their classrooms? (RQ2)

The results show that English teachers in Türkiye have moderate perceptions about their self-efficacy to utilize AI in the classroom. Although the study did not explicitly report on a distinct self-efficacy scale, the sub-dimensions of the AI literacy scale particularly those related to applicational areas of the education, serve as benchmarks for the competence and perceived proficiency of teachers in their usage of AI tools. The sub-dimension measuring instructors' active engagement and confidence in using AI professionally had the lowest mean score (3.40), indicating that there is a relative lack of high self-efficacy in this domain. This is a noteworthy finding since instructors' confidence in their own abilities is a major factor in whether they would implement and maintain innovative methods like integrating AI, in this example (Bandura, 1997).

Additionally, our findings match some recent findings in the literature. For instance Kasinidou et al. (2025) in their study concluded that Cypriot educators generally possessed intermediate digital skills and neutral attitudes toward AI and demonstrate intermediate levels of AI literacy. Teachers' digital literacy, attitudes, and intentions to utilize and teach AI were positively correlated with their digital skills, according to their research.

An important aspect of this study is the AI Assessment sub-dimension, which asks educators about their familiarity and self-perceived competence with using AI tools to assess their students' progress in class. Compared to AI Knowledge and AI Pedagogy, the mean score for AI Assessment in this study was 3.57, indicating an average level of proficiency. Based on this, it can be suggested that English teachers in Turkey are gaining familiarity with AI and are somewhat aware of its potential use in daily tasks such as lesson planning, but they are less confident with its use in assessing student progress in the classroom. Concerns about the use of AI tools in language schools have been expressed by EFL teachers. The absence of sufficient training for instructors and students in the efficient utilization of AI is one of these issues, and another is the possibility that AI technologies would encourage cheating and plagiarism. A further common worry is that students may become too reliant on AI, which could limit their ability to think critically and creatively. There are also privacy and ethical concerns about how AI technologies handle data (Özkan et al., 2024). Factors such as these contribute to the fact English teachers in Turkey may have some surface level knowledge about AI but are lacking in terms of their usage in the classrooms. Importantly, AI has the potential to automate grading, provide formative feedback, and support personalized education, all of which are essential

components of effective instruction (Holmes et al., 2019; Wang et al., 2024). Consequently, this finding is worth mentioning. This study did not investigate the frequency or quality of actual AI use in classroom assessment; rather, it only examined the opinions and confidence of teachers based on their own self-reported data. In addition, the study did not assess the effectiveness of AI in classroom assessment. In order to gather a more complete picture of how teachers are using AI in their assessment processes and the challenges they encounter, future research should include qualitative or observational data.

Regarding the correlation between AI and self-efficacy, they line up with the findings of theory and research, especially Bandura's (1997) model, which states that higher levels of self-efficacy are directly linked to gains in both knowledge and experience with mastery.

From a practical standpoint, the statistics imply that being knowledgeable with AI is associated with increased self-efficacy beliefs. Similarly, teachers who evaluated themselves higher on AI knowledge also rated their teaching-efficacy with AI tools higher. All things considered, the results demonstrate that English teachers hold a cautiously optimistic view of AI. They see its potential benefits and have a modest level of confidence in their abilities.

This link has been confirmed by research. According to Du et al. (2024), AI literacy is a strong predictor of teachers' confidence in implementing AI tools, particularly for K-12 educators. Zhang et al. (2025) found similar results when studying college students; they found that AI literacy had a direct and indirect effect on self-efficacy through lowering anxiety. In a Turkish EFL setting, this study's results reflect these connections: teachers with a deeper understanding of AI are more likely to believe they are able to utilize it in their lessons. In addition, there appears to be a developmental progression in the variation in self-efficacy levels, which are higher for routine applications and lower for creative or evaluative usage. Once educators gain further confidence with AI, they may progress to more complex applications. It is clear from this that focused professional development for educators is crucial. AI literacy and self-efficacy do not evolve independently; they reinforce one another. It is most effective for educational opportunities that combine technical instruction, ethical reflection, and pedagogical modeling simultaneously. In order for educators to acquire the necessary skills and self-efficacy

Furthermore, a qualitative research on South African educators' AI usage conducted by van den Berg (2025) highlights this connection. Consistent with our finding of strong self-efficacy in fundamental AI uses, he noted that teachers readily utilized AI, particularly ChatGPT, for class preparation and saw that they can save time in routine classroom tasks.

Importantly, van den Berg pointed out that teachers' lack of confidence in their own ability to use AI was a major reason why they didn't use these technologies.

We can infer that some educators are aware of the advantages of AI in the classroom from the moderate scores seen in our sample. This might be because people have been exposed to AI more often recently, through more mainstream tools like ChatGPT. In addition, there was a wide variety of self-efficacy responses; certain assignments received varying opinions. While the most positive viewpoint was on apparent, knowledge based practical applications of AI, the most negative one was on creative or ethical uses of AI integration. This finding indicates that educators are still unsure about the educational impact of AI, even though they are using it for simple tasks. Bandura's theory is in alignment with this nuance: teachers feel self-efficacious in circumstances that are familiar to them, but scepticism emerges as tasks become more complex.

When putting AI into practice, schools can supplement it with resources that target its weaker points; for instance, providing teachers with ethical AI usage guidelines or showcasing AI-driven pedagogy through case studies that could boost teachers' confidence where it is low. Lastly, the results have policy implications: they support the idea that already available curricula should be updated to include more AI literacy in the classroom, which could lead to new standards for teacher training. As a whole, Turkish English teachers' receptivity to AI is encouraging, but they may benefit from more specific interventions, particularly those that help them become more AI literate to make education processes in the classrooms more effective.

In line with this study’s findings, the study by van den Berg (2025) reached similar conclusions, stating that teachers' self-efficacy beliefs to use AI tools in the classroom grows as they see the positive effects these tools have on their students. Such educators can inspire people to use AI by setting a good example themselves, which speeds up the process of innovation spread. According to her results, the sample members who used AI tools were likely pioneers in embracing the technology, with ChatGPT standing out as the most popular tool. Relating it to self-efficacy, she said that teachers' confidence in AI was reinforced by personal mastery experiences when they saw the benefits of AI in the classroom, such as improved instruction and time savings. In this thesis, the author makes the inference that in addition to mastery vicarious experiences, AI literacy and its relation to teacher self-efficacy can be linked to other domains that make up the self-efficacy concept: performance outcomes, verbal persuasion and physiological feedback.

CHAPTER VI
CONCLUSION

The last chapter provides a summary of the study and discusses the significance of the findings for EFL classrooms, language teachers, students and other stakeholders in Turkish national education system. The author addresses the conclusions and their implications, proposing areas for further study. A discussion of the limitations of the study is also included, along with suggestions for further research.

6.1. Summary of Key Findings

Drawing on data acquired using the TAICS instrument and analyzed quantitatively, the present research has provided valuable insights into the existing levels AI self-efficacy in the Turkish high school EFL environment. The results of this research carry significant consequences for a proposed revision of Turkey's national teacher competency standards. The existing "Öğretmenlik Mesleği Genel Yeterlilikleri," was put in practice in 2017 by law and considering its date, it can be said that it fails to capture the swift and significant advancements in AI technologies, especially with the rise of generative AI post 2022. The current framework incorporates digital competencies which can serve as an umbrella term; however, it is overly broad and out of date with today's standards. The term fails to address the complicated technical, pedagogical, and ethical challenges related to the application of AI in educational settings. This is espcially important for English language teacher training and education programs as they should prioritize AI literacy since English language learning is expected to be the field that uses AI for learning the most frequently in the field of education (Crompton & Burke, 2023). Below, in Table 11, general competencies for teaching profession as put forward by MoNE is presented.

Table 11

General Competencies for Teachers by MoNE (MoNE, 2017)

A Professional Knowledge	B Professional Skills	C Attitudes and Values
A1. Content Knowledge	**B1. Planning of Education and Teaching**	**C1. National, Moral and Universal Values**
She/he has an advanced and critical perspective on theoretical, methodological and factual knowledge in his/her subject field.	She/he plans education and teaching processes effectively.	She/he observes national, moral and universal values.

<table>
<tr><td>A2. Pedagogical Content Knowledge</td><td>B2. Creating Learning Environments</td><td>C2. Approach to Students</td></tr>
<tr><td>She/he has a good knowledge of the curriculum and pedagogical content knowledge of her/his subject area.</td><td>She/he prepares appropriate teaching materials and builds an healthy and safe learning environments, where effective learning can be achieved for all students.</td><td>She/he has an attitude that supports the development of students.</td></tr>
<tr><td>A3. Knowledge on Legislation</td><td>B3. Managing the Teaching and Learning Process</td><td>C3. Communication and Cooperation</td></tr>
<tr><td rowspan="3">As an individual and teacher, she/he conducts her/himself according to the legislation related to her/his duties, rights and responsibilities.</td><td>She/he manages the teaching and learning process effectively.</td><td>She/he establishes an effective communication and cooperation with students, colleagues, families, and other educational stakeholders.</td></tr>
<tr><td>B4. Assessment and Evaluation</td><td>C4. Personal and Professional Development</td></tr>
<tr><td>She/he uses the methods, techniques and tools of assessment and evaluation that fit for purpose.</td><td>By carrying out self appraisal she/he participates in personal and professional development activities.</td></tr>
</table>

Note. Taken from MoNE (2017). *Öğretmenlik Mesleği Genel Yeterlikleri*. https://oygm.meb.gov.tr/www/ogretmenlik-meslegi-genel-yeterlikleri/icerik/486 (MoNE, 2017)

The revised national framework must also be consistent with globally acknowledged frameworks, such as the European Commission's "DigCompEdu" and UNESCO's AI Competency Framework for Teachers (AI CFT). By providing a thorough and organized approach, UNESCO's Artificial Intelligence Competency Framework for Teachers helps educators systematically build their knowledge, abilities, and attitudes towards artificial intelligence. The framework is based on five interconnected dimensions: a human-centered attitude, AI ethics, basic knowledge and uses of AI, AI pedagogy, and the use of AI for professional learning. These qualities are supported by a progression model that consists of

three developmental stages that assist teachers through an ongoing development of competence, from early comprehension to effective application in educational settings. Importantly, the framework intends not just to improve teachers' technical skills, but also to raise awareness about the ethical and responsible use of AI in education. It underlines the significance of understanding potential risks and preventing the exploitation of AI technologies, while also encouraging educators to think critically and ethically. As a result, it promotes the development of teachers who are both digitally competent and led by ideals relevant to the demands of the digital age. Finally, the framework prepares instructors to take active and informed roles in increasingly AI-integrated educational contexts. It assures that, as educational settings evolve technologically, teachers remain committed to a human-centered and values-based approach to pedagogy, sustaining education's ethical and social foundations in the age of AI. Furthermore, The AI CFT aligns with and extends the 2018 UNESCO ICT Competence Framework for Teachers, which is still relevant in assisting teachers to develop their capacities for teaching and professional learning using ICT and digital Technologies (Miao & Cukurova, 2024).

Basing the updated general competency for teachers national framework on such global developments and frameworks will ensure that the national framework keeps up international standards and is marked as a important piece of pre-service teacher education. Furthermore, it is crucial to recognize that understanding AI goes beyond just technical skills; it is a fundamental educational and ethical requirement during the era we are living in. This understanding enables educators to thoughtfully interact with AI technologies, advancing student achievement making sure that they receive the best possible education available. Artificial Intelligence in Education Policy Document published by MoNE (2025) also refers to studies mentioned in this thesis study, such as UNESCO’s framework which shows that the ministry took these global advancements into account although a developmental work for updating general teacher competencies has not been initiated yet.

Further research on a national level is also necessary to back up the revision process; studies like the present one provide vital empirical evidence on the weakness’, strengths, as well as potential of today's teachers. Creation of this database is critical for developing customized, research-based strategies that meet the unique needs of teachers in different branches, topics and school types in different regions in the Turkish educational context.

The findings indicate that educators demonstrating moderate levels of AI self-efficacy capability in the integration of AI tools within their teaching methodologies, suggesting that technical knowledge and pedagogical confidence reinforce each other. This insight is especially significant for teacher education programs in Türkiye and across the world, because

they play a critical role in creating future educators' mindsets, competences, and perspectives toward technology and pedagogical potential of it in the classroom. Based on the results, it seems that teachers have a moderate understanding of AI, but their competence varies across the six areas that were tested: AI Knowledge, AI Ethics, AI Pedagogical Application, AI Assessment, and Professional Engagement. Despite the fact that teachers do report familiarity with basic AI concepts and tools, s pecifically, when it comes to AI-based assessment and professional engagement, teachers' confidence begin to decrease as they transition from theoretical understanding to practical application.

Considering these findings, the inclusion of AI literacy courses into pre-service curricula has shifted from being just a suggestion to an essential requirement, with the goal of equipping future educators to meet the demands created by modern educational environments. Pre-service programs need to extend beyond the offering of general ICT training, focusing instead on delivering specialized instruction regarding AI principles, ethical considerations, pedagogical applications, and critical evaluation of AI-generated content. Embedding these competences early in teacher professional development ensures that they enter the workforce not only with the ability to use AI tools, but also with the confidence to experiment, innovate, and manage the challenges of AI integration. Moreover, providing pre-service teachers with a solid basis in AI literacy contributes to reducing potential equity disparities across various regions in Türkiye, as newly graduated educators will carry this knowledge into schools, regardless of the available resources at hand or professional training opportunities.

The body of this study possibly highlight and infer the significant importance of professional engagement opportunities, such as workshops, conferences, and collaborative training, in improving teachers' AI literacy and bolstering their self-efficacy beliefs. Findings of the study points out the need for ongoing, practice-focused professional development that extends beyond initial pre-service training. Although initial training establishes a fundamental base, it is through ongoing professional development that educators enhance, modify, and broaden their skills to address the changing technological landscape and ever evolving AI technologies.

6.2. Significance of the Study

This study seeks to respond to its research questions and make a contribution to the knowledge of AI competency in ELT. The study's limitations and scope should be considered when interpreting the results, but overall, the research seems to have accomplished its goals and provided useful insights.

According to a probabilistic analysis conducted by the World Economic Forum, which analyzed the economic impact of automation and AI, twenty percent of the professions that are currently the United Kingdom may be impacted by the AI developments (Dwivedi et al., 2021). As a result, worries around the globe have developed over the capability of artificial intelligence to totally replace teachers as its application in education continues to increase each day. For instance, Chan and Tsi (2023) point out that there are many who believe that AI can outperform human teachers in terms of both instruction and evaluations, and that it can keep going without showing any signs of prejudice towards students or show signs of burnout. Considering the teachers' widely acknowledged role as the key component of the educational systems, their self-efficacy levels and AI developments around the globe which are transformational in terms of education plays a key role, as these are believed to greatly affect students' performance and the ability of future generations to obtain knowledge. Therefore, the significance of equipping teachers with AI literacy should be one of the primary priorities of educational systems around the world. Even though literacy, at its core, is a set of practices and strategies for reading and writing that allow individuals to understand and articulate themselves in written form within a certain social and cultural setting (Keefe & Copeland, 2011), its usage in the present study and the literature is evolved into to refer to the knowledge ability and skills sets related to AI on how to utilize it appropriately. AI literacy requires users to have a fundamental understanding of how to utilize computers in order to comprehend AI.

The present study will mark the first example of research on high school teachers' AI competency self-efficacy levels in Türkiye and serves as one of the early examples of AI literacy research of language teachers in the Türkiye context. This study makes an important contribution to the quickly growing area of AI in educational sciences. There should be an organized effort to improve both the technical and pedagogical competencies of educators in light of the positive connection between AI literacy and self-efficacy in the classroom. Although there have been a great number of studies that have been published in the academic literature that focus on the development of the traits and characteristics of teachers, studies that specifically focus on the relationship between teacher self-efficacy and their AI literacy remains undiscovered. Being the first research in the literature to do so, it is essential to point out that the findings of the present study have significant implications for both the practice and educational policies.

First of all, it is evident that teachers require additional training in AI literacy and organized professional development programs should be implemented in place to provide for this need of the teachers (Falloon, 2020). Secondly, the results imply that future educators could

benefit from enhancing their self-efficacy and skillsets by including AI literacy modules into pre-service teacher education programs. In addition, policymakers need to think about updating national frameworks like "Öğretmenlik Mesleği Genel Yeterlilikleri", which is published by MoNE, to specifically highlight AI competencies as essential parts of teacher professionalism, in line with worldwide developments like UNESCO's AI Competency Framework (Miao & Cukurova, 2024). Other AI related initiatives by MoNE mention UNESCO's framework, therefore its application fort his domain is also likely. Due to the close link between AI literacy and self-efficacy, there will likely be a domino effect when it comes to AI training. As teachers gain deeper knowledge, their confidence increases, and they are then more likely to apply AI technology in a meaningful way in the classroom, possibly increasing the success of their students.

AI tools become outdated so rapidly in terms of their capability, accessibility, and range considering factors like their costs. Considering the vast amount of AI tools available on the market even shortly after ChatGPT's release, it is difficult to quantify the number of these that are helpful or developed for the purpose of language education and teaching, in order to tackle this issue, educational stakeholders need to plan out programs, competency guides, professional development opportunities to boost AI literacy of language educators. There have been several attempts in the literature to create guidelines for AI literacy, however, existing frameworks that guide educators of necessary AI competencies are limited (Ng et al., 2023).

Considering the lack of an established framework in the national level, this study serves as potential research data that can be benefitted from while preparing a framework for AI literacy levels of language teachers and their related self-efficacy levels. Educational institutions can better allocate resources, identify training gaps, and modify curricula to prepare students for the future if they understand teachers' perspectives on AI awareness (literacy) (Ferikoğlu & Akgün, 2022).

6.3. Recommendations for Future Research

The current research has provided substantial insights into the existing levels of artificial intelligence literacy among Turkish English as a Foreign Language teachers, as well as their opinions on AI and its relationship with their thoughts regarding their teacher self-efficacy. In addition, the study offers a number of recommendations and implications for additional research that could contribute to the advancement of the field.

First of all, even though a substantial number of participants filled out the scale, not every Turkish EFL teacher were included in this study. In order to ensure that the findings are

consistent and replicable, it may be necessary to conduct a similar study with a bigger and more representative sample size. Furthermore, the current study centred on only the population of high school foreign language teachers in the Turkish; however, in future studies, it could potentially be feasible to conduct further research by taking other main grade levels and higher education institutions as a context into account.

The present research might also be broadened to include preservice EFL teachers in order to investigate the differences between in-service and pre-service teachers. In addition, it is essential to carry out research in order to gain an understanding of the perspectives held by every other stakeholder involved in the Turkish national educational system, teachers, administrators and parents. In addition, it can be concluded that further study needs to be conducted to investigate the elements that either encourage or discourage the introduction of AI into the classrooms of EFL teachers. It is possible that it will reveal the underlying problems and could provide solutions to eliminate the obstacles. Moreover, the results would be more accurate and dependable if they were based on direct observation of the in-class methods that teachers use in relation to the utilization of AI.

Considering the fact that AI integration into ELT is a relatively young field of research, longitudinal studies on the effects of AI on ELT can be carried out. These studies have the potential to track changes over time and evaluate the development of AI integration in ELT as well as its sustainability. Furthermore, in doing so, it could be possible to monitor changes in the levels of awareness of AI that are linked to the flow of time and the advancement of technology.

As the research on AI in ELT is still in its early stages, it is vital to conduct an in-depth investigation into potential future issues and practical solutions. Researchers and educators can obtain a better understanding of the obstacles that could prevent the efficient application of AI in ELT by carefully investigating these concerns. The creation of a guideline for teachers to effectively leverage AI in their classroom instruction is something that can be suggested on the basis of the concerns of participants, ethical issues, notably involving data privacy, bias in algorithms, and the possibility for growing educational inequality.

Competence in artificial intelligence is closely linked to other modern literacies, which include data, mathematical, scientific, and computational competencies. In the present study, the level of AI competency is the main and sole subject that is the focus. A more holistic view, taking into account all relevant dimensions of literacy, should be the goal of future research to complement the findings of this study.

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APPENDICES

Appendix 1: The Approval of the Institute of Educational Sciences for the Thesis Topic

Appendix 2: Approval of Research Ethics Committee

Appendix 3: Informed Consent Form

Appendix 4: The Approval of the Institute of Educational Sciences for the Thesis Topic

Appendix 5: Online Data Collection Instrument (Google Forms)

Appendix 6: Research Permitted School List

Appendix 7: Ministry of National Education Research Letter of Commitment

Appendix 8: Permission to Use the Instrument of the Study

APPENDICES

Appendix 1: The Approval of the Institute of Educational Sciences for the Thesis Topic

T.C.
BURSA ULUDAĞ ÜNİVERSİTESİ
Eğitim Bilimleri Enstitüsü Müdürlüğü

Sayı: E-20585590-000-18102 04.11.2024
Konu: Tez Konusu Değişikliği Önerisi (Bedirhan Berk ORAN)

YABANCI DİLLER EĞİTİMİ ANABİLİM DALI BAŞKANLIĞINA

İlgi : 24.10.2024 tarihli ve 56643073-300-18059 sayılı yazınız.

Anabilim Dalınız Yüksek Lisans öğrencisi Bedirhan Berk ORAN'a ait bildirilen tez konusu değişikliği önerisine ilişkin alınan karar örneği ekte gönderilmiştir.

Bilgilerinizi ve kararın öğrenci ile danışmanı Prof.Dr. Ayşegül Amanda YEŞİLBURSA'ya bildirilmesi konusunda gereğini rica ederim.

Prof. Dr. Gökhan ARI
Müdür

Ek:
Karar Örneği

Bu belge, güvenli elektronik imza ile imzalanmıştır.
Belge Doğrulama Kodu:g1CTnUC8BU6f-xxcWAzTXw Belge Doğrulama Adresi: https://udos.uludag.edu.tr/Teyit/

BUÜ Eğitim Bilimleri Enstitüsü Görükle Kampüsü 16059 Nilüfer/BURSA
Telefon No: 0(224)294 00 00 Faks No: 0(224)294 00 37
e-Posta: zubeyde@uludag.edu.tr İnternet Adresi: zubeyde@.uludag.edu.tr
Kep Adresi: uludag.rektorluk@hs03.kep.tr

Bilgi için: Zübeyde ÖZDEMİR
Bilgisayar İşletmeni
Telefon No: 02242942883

Bu belge UDOS ile hazırlanmıştır.

1/1

BURSA ULUDAĞ ÜNİVERSİTESİ
EĞİTİM BİLİMLERİ ENSTİTÜSÜ
ENSTİTÜ YÖNETİM KURULU
TOPLANTISI

FR 3.8.2_01

ENSTİTÜ YÖNETİM KURULU KARARI

OTURUM TARİHİ	**OTURUM SAYISI**
31.10.2024	2024/44

KARAR NO: 2/a

Yabancı Diller Eğitimi Ana Bilim Dalı 24.10.2024 tarih ve 18059 sayılı 802293022 numaralı Yüksek Lisans Programı öğrencisi Bedirhan Berk ORAN'ın tez konusu değişikliği önerisi konulu yazısı görüşmeye açıldı.

Yapılan görüşmeler sonunda; Yabancı Diller Eğitimi Ana Bilim Dalı İngiliz Dili Eğitimi Bilim Dalı Öğretim Üyesi Prof.Dr. Ayşegül Amanda YEŞİLBURSA'nın danışmanlığını yürüttüğü 802293022 numaralı Yüksek Lisans Programı öğrencisi Bedirhan Berk ORAN'ın "Ortaöğretim Düzeyinde İngilizce Öğretmenlerinin Yapay Zeka Yetkinlik Düzeylerinin ve Yapay Zeka Yetkinliğinin Öğretmen Öz Yeterlilik İnançları Üzerindeki Etkisinin İncelenmesi " tez konusu değişikliği önerisinin BUÜ Lisansüstü Eğitim-Öğretim Yönetmeliğinin 28/2 maddesi uyarınca uygun olduğuna oy birliği ile karar verildi.

Appendix 2: Approval of Research Ethics Committee

BURSA ULUDAĞ ÜNİVERSİTESİ
ARAŞTIRMA VE YAYIN ETİK KURULLARI
(Sosyal ve Beşeri Bilimler Araştırma ve Yayın Etik Kurulu)
TOPLANTI TUTANAĞI

OTURUM TARİHİ	OTURUM SAYISI
29 KASIM 2024	2024-11

KARAR NO 50: Eğitim Bilimleri Enstitüsü Müdürlüğü'nden alınan Yabancı Diller Eğitimi Ana Bilim Dalı öğretim üyelerinden Prof. Dr. Ayşegül Amanda YEŞİLBURSA'ın danışmanlığında İngiliz Dili Eğitimi Bilim Dalı yüksek lisans programı öğrencisi Bedirhan Berk ORAN'ın "Ortaöğretim Düzeyinde İngilizce Öğretmenlerinin Yapay Zeka Yetkinlik Düzeylerinin ve Yapay Zeka Yetkinliğinin Öğretmen Öz Yeterlilik İnançları Üzerindeki Etkisinin İncelenmesi" konulu tez çalışması kapsamında uygulanacak ölçek sorularının değerlendirilmesine geçildi.

Yapılan görüşmeler sonunda; Eğitim Bilimleri Enstitüsü, Yabancı Diller Eğitimi Ana Bilim Dalı öğretim üyelerinden Prof. Dr. Ayşegül Amanda YEŞİLBURSA'ın danışmanlığında İngiliz Dili Eğitimi Bilim Dalı yüksek lisans programı öğrencisi Bedirhan Berk ORAN'ın "Ortaöğretim Düzeyinde İngilizce Öğretmenlerinin Yapay Zeka Yetkinlik Düzeylerinin ve Yapay Zeka Yetkinliğinin Öğretmen Öz Yeterlilik İnançları Üzerindeki Etkisinin İncelenmesi" konulu tez çalışması kapsamında uygulanacak ölçek sorularının fikri, hukuki cezai ve idari bakımından metot ve ölçeğine ilişkin sorumluluğu başvurucuya ait olmak üzere uygun olduğuna oybirliği ile karar verildi. Sorulara verilecek cevaplar ceza kanunları bakımından suç teşkil etmesi durumunda ilgili makamlara bildirme yükümlülüğü ilgili araştırmacılara (sorumlu, yardımcı, danışman ve diğerleri) aittir.

Appendix 3: Informed Consent Form

AYRINTILI BİLGİLENDİRME VE GÖNÜLLÜ KATILIM FORMU

Sayın Katılımcı,

Aşağıda ayrıntılı bilgileri yer alan araştırma T.C. Millî Eğitim Bakanlığının izni ile gerçekleşmektedir. Araştırma uygulamasına katılım tamamıyla gönüllülük esasına dayalı olmaktadır. Araştırmaya katılıp katılmamakta özgürsünüz. Araştırma herhangi bir istenmeyen etki ya da risk taşımamaktadır. Katılımınız tamamen sizin isteğinize bağlıdır, reddedebilir ya da herhangi bir aşamasında ayrılabilirsiniz. Araştırmaya katılım sağlanamaması veya araştırmadan ayrılma durumunda okul ile ilgili ilişkileriniz etkilenmeyecektir. Araştırmada sizden kimlik belirleyici hiçbir bilgi istenmemektedir. Cevaplar gizli tutulacak ve sadece araştırmacılar tarafından değerlendirilecektir. Araştırma uygulamaları, kişisel rahatsızlık verecek sorular ve durumlar içermemektedir. Ancak, katılım sırasında sorulardan ya da herhangi başka bir nedenden kendinizi rahatsız hissederseniz cevaplama işini yarıda bırakıp çıkmakta özgürsünüz. Araştırmaya katıldıktan sonra istediğiniz an vazgeçebilirsiniz. Böyle bir durumda veri toplama aracını uygulayan kişiye, araştırmayı tamamlamayacağınızı söylemeniz yeterli olacaktır. Araştırmaya katılmamak ya da katıldıktan sonra vazgeçmek size hiçbir sorumluluk getirmeyecektir. Onay vermeden önce konu ile ilgili herhangi bir sorunuz varsa aşağıda iletişim bilgileri verilen araştırmacıya sorabilirsiniz.

Araştırmacının Adı Soyadı	Bedirhan Berk ORAN
Araştırmacının İletişim Bilgileri	
Araştırmanın Adı	Ortaöğretim Düzeyinde İngilizce Öğretmenlerinin Yapay Zeka Yetkinlik Düzeylerinin Ve Yapay Zeka Yetkinliğinin Öğretmen Öz Yeterlilik İnançları Üzerindeki Etkisinin İncelenmesi
Araştırmanın Amacı	Her geçen gün gelişen ve çeşitli şekillerde karşımıza çıkan yapay zeka (YZ) ve YZ araçları, öğretmenlerin verimliliğini ve iş yükünü hafifletebilecek, eğitimi komple değiştirme potansiyeli sahip önemli araçlar haline gelmiştir. Bu gelişmeler neticesinde okullarda görevli bulunan öğretmenlerin YZ okuryazarlığının ölçülmesi ve gerektiği takdirde iyileştirmelerin yapılabilmesi için neler yapılabileceği araştırılmalıdır ve bu tez çalışması bu hedef ile beraber YZ okuryazarlığının öğretmenlerin öz-yeterlik inançları ile ilişkisini incelemek amacıyla gerçekleştirilecektir.

Yukarıda bilgileri bulunan araştırmaya katılmayı kabul ediyorum. …/…/.....

İmza:

Katılımcının Adı-Soyadı:

Appendix 4: Online Data Collection Instrument (Google Forms)

Investigating Artificial Intelligence Competency Levels of K-12 EFL Teachers and the Impact of Artificial Intelligence Competency on Their Teacher Self-Efficacy Beliefs

Dear Colleague,

I kindly invite you to participate in master's thesis study titled "Investigating Artificial Intelligence Competency Levels of K-12 EFL Teachers and the Impact of Artificial Intelligence Competency on Their Teacher Self-Efficacy Beliefs," conducted as part of the Master's program at Bursa Uludağ University's English Language Teaching department.

You will be asked to respond to statements on a scale from 1 to 5: "Strongly Disagree," "Disagree," "Neutral," "Agree," and "Strongly Agree." Completing the questionnaire will take approximately 5–8 minutes. Participation in this study is entirely voluntary, and all responses will remain confidential. The data will be used solely for scientific purposes.

Thank you in advance for taking the time to complete this questionnaire. Your contribution to educational sciences is greatly appreciated.

Bedirhan Berk Oran
Researcher

I voluntarily agree to participate in this study. *

- [ ] Yes
- [ ] No

Educational Background *

Please indicate your last **obtained** degree.

- ○ Bachelor's degree
- ○ Master's degree
- ○ Doctorate/PhD

Teaching Experience *

- ○ 0–5 years
- ○ 6–10 years
- ○ 11–15 years
- ○ 16–20 years
- ○ 21 years and above

School Type *

- ○ Public High School
- ○ Private High School

School Type *

- ○ Public High School
- ○ Private High School

In which province are you currently teaching? *

- ☐ Bartın
- ☐ Bursa
- ☐ Kastamonu

1- I can distinguish whether a tool is AI-based or not. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

2- I can create content with AI. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

3- I can explain what AI is. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

4- I know how to choose the right AI tools to effectively complete a task. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

5- I can choose an AI tool to use in my classroom that enhances what I teach, how I teach, and what students learn. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

6- I can choose an AI tool that enhances my teaching subject content for a lesson. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

7- I can teach lessons that appropriately combine my teaching subject, AI tools, and teaching approaches. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

8- I can help others coordinate the use of subject content, AI tools, and teaching approaches. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

9- I can use AI tool to foster assessment for learning. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

10- I can design an assessment approach to improve student learning in an AI-based environment. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

11- I can assess student learning in an AI-based environment. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

12- I can choose an AI tool to foster student self-assessment. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

13- I can teach students AI ethics. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

14- I can protect sensitive content from AI tools (e.g., exams, students' grades and personal data). *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

15- I can ensure my health and well-being while using AI tools. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

16- I teach students how to behave safely and responsibly when learning with AI tools. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

17- I can assess the benefits of an AI tool. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

18- I can assess the risks of an AI tool.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

19- I recognise human is responsible for AI bias. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

20- I can explain how AI impact our society. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

21- I can use different websites and search strategies to find and select a range of different AI tools. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

22- I actively look for continuous professional development activities outside my educational organization. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

23- I actively share my AI teaching experience with other colleagues within and outside my educational organization. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

24- I love to help my colleagues design learning activities with AI. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Appendix 5: Print Version of the Data Collection Instrument

Dear Participant,

I kindly invite you to participate in master's thesis study titled "Investigating Artificial Intelligence Competency Levels of K-12 EFL Teachers and the Impact of Artificial Intelligence Competency on Their Teacher Self-Efficacy Beliefs," conducted as part of the Master's program at Bursa Uludağ University's English Language Teaching department.

You will be asked to respond to statements on a scale from 1 to 5: "Strongly Disagree," "Disagree," "Neutral," "Agree," and "Strongly Agree." Completing the questionnaire will take approximately **5–8 minutes**. **Participation in this study is entirely voluntary, and all responses will remain confidential. The data will be used solely for scientific purposes.**

Thank you in advance for taking the time to complete this questionnaire. Your contribution to educational sciences is greatly appreciated.

Research Assistant B.Berk Oran — **Researcher**

Prof. Dr. Ayşegül Amanda Yeşilbursa — **Advisor**

Gender

- ○ Female
- ○ Male
- ○ Prefer not to say

Age

- ○ 18–29
- ○ 30–39
- ○ 40–49
- ○ 50–59
- ○ 60 and above

Educational Background

Please indicate your last **obtained** degree.

- ○ I haven't obtained a degree yet.
- ○ Bachelor's degree (Lisans)
- ○ Master's degree (Yüksek Lisans)
- ○ Doctorate/PhD (Doktora)

Teaching Experience

- ○ 0–5 years
- ○ 6–10 years
- ○ 11–15 years
- ○ 16–20 years
- ○ 21 years and above

School Type

- ○ Public High School
- ○ Private High School

In which province are you currently teaching?

- ☐ Bartın
- ☐ Bursa
- ☐ Kastamonu

Statements / Items	**Strongly Disagree (1)**	**Disagree (2)**	**Neither Agree, Nor Disagree (3)**	**Agree (4)**	**Strongly Agree (5)**
1- I can distinguish whether a tool is AI-based or not.	(1)	(2)	(3)	(4)	(5)
2- I can create content with AI.	(1)	(2)	(3)	(4)	(5)
3- I can explain what AI is.	(1)	(2)	(3)	(4)	(5)
4- I know how to choose the right AI tools to effectively complete a task.	(1)	(2)	(3)	(4)	(5)
5- I can choose an AI tool to use in my classroom that enhances what I teach, how I teach, and what students learn.	(1)	(2)	(3)	(4)	(5)
6- I can choose an AI tool that enhances my teaching subject content for a lesson.	(1)	(2)	(3)	(4)	(5)
7- I can teach lessons that appropriately combine my teaching subject, AI tools, and teaching approaches.	(1)	(2)	(3)	(4)	(5)
8- I can help others coordinate the use of subject content, AI tools, and teaching approaches.	(1)	(2)	(3)	(4)	(5)
9- I can use AI tool to foster assessment for learning.	(1)	(2)	(3)	(4)	(5)
10- I can design an assessment approach to improve student learning in an AI-based environment.	(1)	(2)	(3)	(4)	(5)
11- I can assess student learning in an AI-based environment.	(1)	(2)	(3)	(4)	(5)
12- I can choose an AI tool to foster student self-assessment.	(1)	(2)	(3)	(4)	(5)

Statements / Items	**Strongly Disagree (1)**	**Disagree (2)**	**Neither Agree, Nor Disagree (3)**	**Agree (4)**	**Strongly Agree (5)**
13- I can teach students AI ethics.	(1)	(2)	(3)	(4)	(5)
14- I can protect sensitive content from AI tools (e.g., exams, students' grades and personal data).	(1)	(2)	(3)	(4)	(5)
15- I can ensure my health and well-being while using AI tools.	(1)	(2)	(3)	(4)	(5)
16- I teach students how to behave safely and responsibly when learning with AI tools.	(1)	(2)	(3)	(4)	(5)
17- I can assess the benefits of an AI tool.	(1)	(2)	(3)	(4)	(5)
18- I can assess the risks of an AI tool.	(1)	(2)	(3)	(4)	(5)
19- I recognise human is responsible for AI bias.	(1)	(2)	(3)	(4)	(5)
20- I can explain how AI impact our society.	(1)	(2)	(3)	(4)	(5)
21- I can use different websites and search strategies to find and select a range of different AI tools.	(1)	(2)	(3)	(4)	(5)
22- I actively look for continuous professional development activities outside my educational organization.	(1)	(2)	(3)	(4)	(5)
23- I actively share my AI teaching experience with other colleagues within and outside my educational organization.	(1)	(2)	(3)	(4)	(5)
24- I love to help my colleagues design learning activities with AI.	(1)	(2)	(3)	(4)	(5)

Appendix 6: Research Permitted School List

T.C.
MİLLÎ EĞİTİM BAKANLIĞI
ARAŞTIRMA UYGULAMA İZNİ BELGESİ

EĞİTİMİN YÜZYILI

Başvuru No: MEB.TT.2025.023503.01

T.C. Kimlik No: 31*******84

Adı Soyadı: BEDİRHAN BERK ORAN

Araştırmanın Adı: Ortaöğretim Düzeyinde İngilizce Öğretmenlerinin Yapay Zeka Yetkinlik Düzeylerinin ve Yapay Zeka Yetkinliğinin Öğretmen Öz Yeterlilik İnançları Üzerindeki Etkisinin İncelenmesi

Araştırmanın Niteliği: Yüksek Lisans Tezi

Araştırmanın Örneklem / Çalışma Grubu: Öğretmen

Veri Toplama Aracının Başlığı: Öğretmen yapay zeka yetkinlik öz-yeterlik ölçeği (Teacher artificial intelligence competence self-efficacy (TAICS) scale)

Araştırma Uygulama İzninin Kabul Tarihi: 30.04.2025

Araştırma Uygulama İzninin Bitiş Tarihi: 30.04.2026

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

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
BURSA	Anadolu Lisesi	Ahmet Erdem Anadolu Lisesi	269429
BURSA	Anadolu Lisesi	Ali Karasu Anadolu Lisesi	750776
BURSA	Anadolu Lisesi	Nilüfer Belediyesi Barış Anadolu Lisesi	751178
BURSA	Anadolu Lisesi	Osman Şevki Uludağ Anadolu Lisesi	765103
BURSA	Anadolu Lisesi	Ahmet Yesevi Anadolu Lisesi	765104
BURSA	Anadolu Lisesi	Ertuğrul Seyhan Anadolu Lisesi	765105
BURSA	Anadolu Lisesi	Hüseyin Özdilek Anadolu Lisesi	767472
BURSA	Anadolu Lisesi	İslam Uyar Anadolu Lisesi	767474

Doğrulama Kodu: b81e54552113401ce4bc21b880d89aed827ff37db796688d8cf4bb3c6c511c94
Doğrulama Adresi: arastirmaizinleri.meb.gov.tr/belge-dogrula
Serhat Mah. 1290. Sokak No.8/B 06374 Yenimahalle/Ankara TÜRKİYE
Telefon No: (0312) 413 43 00, Belgegeçer No: (0312) 413 45 12
e-posta: ttkb_arastirmaizinleri@meb.gov.tr, internet adresi: ttkb.meb.gov.tr

Sayfa 1/11

T.C.
MİLLÎ EĞİTİM BAKANLIĞI
ARAŞTIRMA UYGULAMA İZNİ BELGESİ

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
BURSA	Anadolu Lisesi	Şahinler Anadolu Lisesi	964264
BURSA	Anadolu Lisesi	Çamlıca Anadolu Lisesi	974068
BURSA	Anadolu Lisesi	Özlüce Şehit Aykut Yurtsever Anadolu Lisesi	974069
BURSA	Fen Lisesi	Tofaş Fen Lisesi	759587
BURSA	Fen Lisesi	Nilüfer Borsa İstanbul Fen Lisesi	974049
BURSA	İmam Hatip Lisesi	Özlüce Nurettin Topçu Kız Anadolu İmam Hatip Lisesi	748806
BURSA	İmam Hatip Lisesi	Fatih Anadolu İmam Hatip Lisesi	751707
BURSA	İmam Hatip Lisesi	Nilüfer Anadolu İmam Hatip Lisesi	964462
BURSA	Anadolu İmam Hatip Lisesi	Ahmed Cevdet Paşa Anadolu İmam Hatip Lisesi	760888
BURSA	Anadolu İmam Hatip Lisesi	Ali Kuşçu Anadolu İmam Hatip Lisesi	761223
BURSA	Anadolu İmam Hatip Lisesi	Özlüce Rasim Özdenören Anadolu İmam Hatip Lisesi	761232
BURSA	Özel Fen Lisesi	ÖZEL TAN FEN LİSESİ	99912286
BURSA	Özel Fen Lisesi	ÖZEL FİNAL FEN LİSESİ	99913073
BURSA	Özel Fen Lisesi	ÖZEL BURSA ARENA DURSUN ŞAHİN ARSLAN FEN LİSESİ	99936577
BURSA	Özel Fen Lisesi	ÖZEL BURSA SINAV KOLEJİ FEN LİSESİ	99949022
BURSA	Özel Fen Lisesi	ÖZEL ŞAHİNKAYA FEN LİSESİ	99950206
BURSA	Özel Fen Lisesi	ÖZEL ÇAĞDAŞ ÖNCÜ FEN LİSESİ	99960376
BURSA	Özel Fen Lisesi	ÖZEL ÖZLÜCE SINAV KOLEJİ FEN LİSESİ	99971437

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
BURSA	Özel Fen Lisesi	ÖZEL ÜÇ MART HALİL GÜLEÇ FEN LİSESİ	99977238
BURSA	Özel Fen Lisesi	ÖZEL NİLÜFER YÖNDER FEN LİSESİ	99977395
BURSA	Özel Fen Lisesi	ÖZEL BURSA AYDIN FEN LİSESİ	99981054
BURSA	Özel Fen Lisesi	ÖZEL ULUDAĞ KOLEJİ FEN LİSESİ	99983120
BURSA	Özel Fen Lisesi	ÖZEL BURSA ÇÖZÜM KOLEJİ FEN LİSESİ	99983291
BURSA	Özel Fen Lisesi	ÖZEL ALTIN ŞEHİR FEN LİSESİ	99986986
BURSA	Özel Fen Lisesi	ÖZEL ÖZLÜCE TAN FEN LİSESİ	99987540
BURSA	Özel Fen Lisesi	ÖZEL BURSA ARENA FEN LİSESİ	99988094
BURSA	Özel Fen Lisesi	ÖZEL BURSA FEN GURUP FEN LİSESİ	99991480
BURSA	Özel Fen ve Teknoloji Lisesi	ÖZEL BURSA ÖZLÜCE DOĞA FEN VE TEKNOLOJİ LİSESİ	99985671
BURSA	Özel Fen ve Teknoloji Lisesi	ÖZEL ÇAKIR FEN VE TEKNOLOJİ LİSESİ	99997074
BURSA	Özel Mesleki ve Teknik Anadolu Lisesi	ÖZEL ŞEHRİ EFSANE MESLEKİ VE TEKNİK ANADOLU LİSESİ	99954740
BURSA	Özel Mesleki ve Teknik Anadolu Lisesi	ÖZEL MURAT YILDIRIM MESLEKİ VE TEKNİK ANADOLU LİSESİ	99954776
BURSA	Özel Mesleki ve Teknik Anadolu Lisesi	ÖZEL NİLÜFER MAVİ ATLAS TEKNOKENT KOLEJİ MESLEKİ VE TEKNİK ANADOLU LİSESİ	99955328
BURSA	Özel Mesleki ve Teknik Anadolu Lisesi	ÖZEL MAVİ ATLAS TEKNOKENT KOLEJİ MESLEKİ VE TEKNİK	99983049

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
		ANADOLU LİSESİ	
BURSA	İmam Hatip Lisesi	Osmangazi Ali Osman Sönmez Anadolu İmam Hatip Lisesi	748807
BURSA	İmam Hatip Lisesi	Mihraplı Abdulkadir Can Anadolu İmam Hatip Lisesi	749195
BURSA	İmam Hatip Lisesi	Nizam Karasu Anadolu İmam Hatip Lisesi	751327
BURSA	İmam Hatip Lisesi	Cem Sultan Anadolu İmam Hatip Lisesi	751708
BURSA	Fen Lisesi	Ahmet Hamdi Gökbayrak Fen Lisesi	757879
BURSA	Anadolu İmam Hatip Lisesi	Şehit Jandarma Er Selim Koçdemir Anadolu İmam Hatip Lisesi	758371
BURSA	Anadolu İmam Hatip Lisesi	Demirtaş İsmail Hakkı Bursevi Kız Anadolu İmam Hatip Lisesi	758585
BURSA	Anadolu İmam Hatip Lisesi	Mehmet Zahid Kotku Anadolu İmam Hatip Lisesi	761376
BURSA	Anadolu İmam Hatip Lisesi	Niyazi Mısri Anadolu İmam Hatip Lisesi	761383
BURSA	Anadolu İmam Hatip Lisesi	Şeyh Edebali Kız Anadolu İmam Hatip Lisesi	761384
BURSA	Anadolu İmam Hatip Lisesi	Bursa Türkiye Odalar ve Borsalar Birliği Anadolu İmam Hatip Lisesi	764911
BURSA	Anadolu İmam Hatip Lisesi	Hasan Gülişan Arseven Kız Anadolu İmam Hatip Lisesi	766852
BURSA	Sosyal Bilimler Lisesi	BTSO Ali Osman Sönmez Sosyal Bilimler Lisesi	966308
BURSA	Özel Anadolu Lisesi	ÖZEL SERHAN EYLEMER ANADOLU LİSESİ	99960887
BURSA	Özel Anadolu Lisesi	ÖZEL İDEA ANADOLU LİSESİ	99971156

T.C.
MİLLÎ EĞİTİM BAKANLIĞI
ARAŞTIRMA UYGULAMA İZNİ BELGESİ

EĞİTİMİN YÜZYILI

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
BURSA	Özel Anadolu Lisesi	ÖZEL OSMANGAZİ SINAV KOLEJİ ANADOLU LİSESİ	99982386
BURSA	Özel Anadolu Lisesi	ÖZEL İSPAT BADEMLİ ANADOLU LİSESİ	99982707
BURSA	Özel Anadolu Lisesi	ÖZEL ÇEKİRGE BİLİMSEL FARKLILIK ANADOLU LİSESİ	99987567
BURSA	Özel Anadolu Lisesi	ÖZEL OSMANGAZİ BİLNET ANADOLU LİSESİ	99990829
BURSA	Özel Fen Lisesi	ÖZEL İDEA FEN LİSESİ	99971166
BURSA	Özel Fen Lisesi	ÖZEL OSMANGAZİ SINAV KOLEJİ FEN LİSESİ	99982385
BURSA	Özel Fen Lisesi	ÖZEL ÇEKİRGE BİLİMSEL FARKLILIK FEN LİSESİ	99987570
BURSA	Özel Fen Lisesi	ÖZEL OSMANGAZİ BİLNET FEN LİSESİ	99990830
BURSA	Özel Fen Lisesi	ÖZEL İSPAT BADEMLİ FEN LİSESİ	99991312
BURSA	Özel Anadolu Lisesi	ÖZEL SELÇUK ANADOLU LİSESİ	99987599
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA BİLİM KOLEJİ ANADOLU LİSESİ	99987709
BURSA	Özel Anadolu Lisesi	ÖZEL NET KOLEJİ ANADOLU LİSESİ	99990855
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA BÜYÜK KOLEJ ANADOLU LİSESİ	99991331
BURSA	Özel Mesleki ve Teknik Anadolu Lisesi	ÖZEL DATA KOLEJİ BURSA MESLEKİ VE TEKNİK ANADOLU LİSESİ	99994578
BURSA	Özel Anadolu Lisesi	ÖZEL KESTEL SINAV KOLEJİ ANADOLU LİSESİ	99960570
BURSA	Özel Anadolu Lisesi	ÖZEL KESTEL KÜLTÜR ANADOLU LİSESİ	99994752
BURSA	Özel Fen Lisesi	ÖZEL KESTEL SINAV	99960569

Doğrulama Kodu: b81e54552113401ce4bc21b880d89aed827ff37db796688d8cf4bb3c6c511c94
Doğrulama Adresi: arastirmaizinleri.meb.gov.tr/belge-dogrula
Serhat Mah. 1290. Sokak No.8/B 06374 Yenimahalle/Ankara TÜRKİYE
Telefon No: (0312) 413 43 00, Belgegeçer No: (0312) 413 45 12
e-posta: ttkb_arastirmaizinleri@meb.gov.tr, internet adresi: ttkb.meb.gov.tr

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
		KOLEJİ FEN LİSESİ	
BURSA	Özel Mesleki ve Teknik Anadolu Lisesi	ÖZEL MESAFE MESLEKİ VE TEKNİK ANADOLU LİSESİ	99975682
BURSA	Anadolu Lisesi	Mudanya Sami Evkuran Anadolu Lisesi	317763
BURSA	Anadolu Lisesi	Ahmet Rüştü Anadolu Lisesi	750775
BURSA	Anadolu Lisesi	Mudanya Güzelyalı Anadolu Lisesi	767315
BURSA	Anadolu Lisesi	Turhan Tayan Anadolu Lisesi	970494
BURSA	İmam Hatip Lisesi	Mudanya Anadolu İmam Hatip Lisesi	135648
BURSA	Anadolu İmam Hatip Lisesi	Şehit Cüneyt Bursa Kız Anadolu İmam Hatip Lisesi	762163
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA KÜLTÜR ANADOLU LİSESİ	99947446
BURSA	Özel Anadolu Lisesi	ÖZEL BADEMLİ SINAV KOLEJİ ANADOLU LİSESİ	99957582
BURSA	Özel Anadolu Lisesi	ÖZEL BALAT ÖZGÜN KOLEJİ ANADOLU LİSESİ	99959844
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA BİLFEN ANADOLU LİSESİ	99959888
BURSA	Özel Anadolu Lisesi	ÖZEL MAVİ DÜNYA ANADOLU LİSESİ	99960817
BURSA	Özel Anadolu Lisesi	ÖZEL YEDİ RENKLİ ÇINAR ANADOLU LİSESİ	99971414
BURSA	Özel Anadolu Lisesi	ÖZEL MUDANYA YOLU FARKLI KALİTE MODERN ANADOLU LİSESİ	99986623
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA VENÜS KAMPÜS ANADOLU LİSESİ	99987097
BURSA	Özel Fen Lisesi	ÖZEL BURSA KÜLTÜR FEN LİSESİ	99955321

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
BURSA	Özel Fen Lisesi	ÖZEL EMİNE ÖRNEK FEN LİSESİ	99957033
BURSA	Özel Fen Lisesi	ÖZEL BURSA BİLFEN FEN LİSESİ	99959891
BURSA	Özel Fen Lisesi	ÖZEL YEDİ RENKLİ ÇINAR FEN LİSESİ	99977235
BURSA	Özel Fen Lisesi	ÖZEL MUDANYA YOLU FARKLI KALİTE MODERN FEN LİSESİ	99986622
BURSA	Özel Fen Lisesi	ÖZEL BURSA VENÜS KAMPÜS FEN LİSESİ	99987098
BURSA	Özel Hazırlık Sınıfı Bulunan Anadolu Lisesi	TED BURSA ÖZEL KOLEJİ	99912284
BURSA	Özel Hazırlık Sınıfı Bulunan Anadolu Lisesi	ÖZEL BURSA BAHÇEŞEHİR KOLEJİ ANADOLU LİSESİ	99912843
BURSA	Özel Hazırlık Sınıfı Bulunan Anadolu Lisesi	ÖZEL EMİNE ÖRNEK KOLEJİ	99953131
BURSA	Özel Anadolu Lisesi	ÖZEL FİNAL ANADOLU LİSESİ	99910360
BURSA	Özel Anadolu Lisesi	ÖZEL ŞAHİNKAYA ANADOLU LİSESİ	99913130
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA ARENA YUSUF ZİYA KARAKUŞ ANADOLU LİSESİ	99916955
BURSA	Özel Anadolu Lisesi	ÖZEL GÜMÜŞTEPE ANADOLU LİSESİ	99938521
BURSA	Özel Anadolu Lisesi	ÖZEL İLKGÜNEŞ ANADOLU LİSESİ	99948788
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA SINAV KOLEJİ ANADOLU LİSESİ	99949020
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA MELTEM ANADOLU LİSESİ	99953516
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA BÜYÜK KOLEJİ ANADOLU LİSESİ	99957440

Doğrulama Kodu: b81e54552113401ce4bc21b880d89aed827ff37db796688d8cf4bb3c6c511c94
Doğrulama Adresi: arastirmaizinleri.meb.gov.tr/belge-dogrula
Serhat Mah. 1290. Sokak No.8/B 06374 Yenimahalle/Ankara TÜRKİYE
Telefon No: (0312) 413 43 00, Belgegeçer No: (0312) 413 45 12
e-posta: ttkb_arastirmaizinleri@meb.gov.tr, internet adresi: ttkb.meb.gov.tr

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA ÖZLÜCE DOĞA ANADOLU LİSESİ	99957739
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA FEN GURUP ANADOLU LİSESİ	99959555
BURSA	Özel Anadolu Lisesi	ÖZEL ÇAĞDAŞ ÖNCÜ ANADOLU LİSESİ	99960375
BURSA	Özel Anadolu Lisesi	ÖZEL ALTINŞEHİR ANADOLU LİSESİ	99960686
BURSA	Özel Anadolu Lisesi	ÖZEL NİLÜFER OKYANUS ANADOLU LİSESİ	99971430
BURSA	Özel Anadolu Lisesi	ÖZEL ÖZLÜCE SINAV KOLEJİ ANADOLU LİSESİ	99971436
BURSA	Özel Anadolu Lisesi	ÖZEL ERA EĞİTİMDE RASYONEL AÇILIM ANADOLU LİSESİ	99971586
BURSA	Özel Anadolu Lisesi	ÖZEL YÜZÜNCÜ YIL BATI ANADOLU LİSESİ	99971617
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA EĞİTİM KALESİ ANADOLU LİSESİ	99977015
BURSA	Özel Anadolu Lisesi	ÖZEL İHSANİYE SINAV KOLEJİ ANADOLU LİSESİ	99977148
BURSA	Özel Anadolu Lisesi	ÖZEL ÜÇ MART ULVİYE-ZİYA GÖKALP ÖZER ANADOLU LİSESİ	99977275
BURSA	Özel Anadolu Lisesi	ÖZEL NİLÜFER YÖNDER ANADOLU LİSESİ	99977394
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA UĞUR ANADOLU LİSESİ	99977504
BURSA	Özel Anadolu Lisesi	ÖZEL AKADEMİK KOLEJİ ANADOLU LİSESİ	99977618
BURSA	Özel Anadolu Lisesi	ÖZEL KÜPKÖK KOLEJİ ANADOLU LİSESİ	99977987
BURSA	Özel Anadolu Lisesi	ÖZEL YAVUZ ERŞAT KABUKCU ANADOLU LİSESİ	99978048

T.C.
MİLLÎ EĞİTİM BAKANLIĞI
ARAŞTIRMA UYGULAMA İZNİ BELGESİ

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA AYDIN ANADOLU LİSESİ	99981056
BURSA	Özel Anadolu Lisesi	ÖZEL MURAT YILDIRIM ANADOLU LİSESİ	99982706
BURSA	Özel Anadolu Lisesi	ÖZEL ÜÇGEN ANADOLU LİSESİ	99982782
BURSA	Özel Anadolu Lisesi	ÖZEL KAPLAN ÜÇEVLER ANADOLU LİSESİ	99982991
BURSA	Özel Anadolu Lisesi	ÖZEL ULUDAĞ KOLEJİ ANADOLU LİSESİ	99983137
BURSA	Özel Anadolu Lisesi	ÖZEL SERCAN ŞAHİN ANADOLU LİSESİ	99983191
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA ÇÖZÜM KOLEJİ ANADOLU LİSESİ	99983293
BURSA	Özel Anadolu Lisesi	ÖZEL MAT TEMATİK KOLEJİ ANADOLU LİSESİ	99983450
BURSA	Özel Anadolu Lisesi	ÖZEL SİMYA KOLEJİ ANADOLU LİSESİ	99986224
BURSA	Özel Anadolu Lisesi	ÖZEL MODERN BURSA ANADOLU LİSESİ	99986312
BURSA	Özel Anadolu Lisesi	ÖZEL ÖZLÜCE TAN ANADOLU LİSESİ	99987537
BURSA	Özel Anadolu Lisesi	ÖZEL OPTİMUM ANADOLU LİSESİ	99988053
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA ARENA ANADOLU LİSESİ	99988101
BURSA	Özel Anadolu Lisesi	ÖZEL KOLEJ ON ALTI ANADOLU LİSESİ	99988196
BURSA	Özel Anadolu Lisesi	ÖZEL NİLÜFER KÜLTÜR ANADOLU LİSESİ	99991712
BURSA	Özel Anadolu Lisesi	ÖZEL GÖKKUŞAĞI KOLEJİ ANADOLU LİSESİ	99999728
KASTAMONU	Anadolu Lisesi	Mustafa Kaya Anadolu Lisesi	168112

T.C.
MİLLÎ EĞİTİM BAKANLIĞI
ARAŞTIRMA UYGULAMA İZNİ BELGESİ

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
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BURSA	Özel Anadolu Lisesi	ÖZEL MURAT YILDIRIM ANADOLU LİSESİ	99982706
BURSA	Özel Anadolu Lisesi	ÖZEL ÜÇGEN ANADOLU LİSESİ	99982782
BURSA	Özel Anadolu Lisesi	ÖZEL KAPLAN ÜÇEVLER ANADOLU LİSESİ	99982991
BURSA	Özel Anadolu Lisesi	ÖZEL ULUDAĞ KOLEJİ ANADOLU LİSESİ	99983137
BURSA	Özel Anadolu Lisesi	ÖZEL SERCAN ŞAHİN ANADOLU LİSESİ	99983191
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA ÇÖZÜM KOLEJİ ANADOLU LİSESİ	99983293
BURSA	Özel Anadolu Lisesi	ÖZEL MAT TEMATİK KOLEJİ ANADOLU LİSESİ	99983450
BURSA	Özel Anadolu Lisesi	ÖZEL SİMYA KOLEJİ ANADOLU LİSESİ	99986224
BURSA	Özel Anadolu Lisesi	ÖZEL MODERN BURSA ANADOLU LİSESİ	99986312
BURSA	Özel Anadolu Lisesi	ÖZEL ÖZLÜCE TAN ANADOLU LİSESİ	99987537
BURSA	Özel Anadolu Lisesi	ÖZEL OPTİMUM ANADOLU LİSESİ	99988053
BURSA	Özel Anadolu Lisesi	ÖZEL BURSA ARENA ANADOLU LİSESİ	99988101
BURSA	Özel Anadolu Lisesi	ÖZEL KOLEJ ON ALTI ANADOLU LİSESİ	99988196
BURSA	Özel Anadolu Lisesi	ÖZEL NİLÜFER KÜLTÜR ANADOLU LİSESİ	99991712
BURSA	Özel Anadolu Lisesi	ÖZEL GÖKKUŞAĞI KOLEJİ ANADOLU LİSESİ	99999728
KASTAMONU	Anadolu Lisesi	Mustafa Kaya Anadolu Lisesi	168112

T.C.
MİLLÎ EĞİTİM BAKANLIĞI
ARAŞTIRMA UYGULAMA İZNİ BELGESİ

EĞİTİMİN YÜZYILI

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
KASTAMONU	Anadolu Lisesi	Aytaç Eruz Anadolu Lisesi	750946
KASTAMONU	Anadolu Lisesi	Kastamonu Göl Anadolu Lisesi	758063
KASTAMONU	Anadolu Lisesi	Abdurrahmanpaşa Lisesi	964145
KASTAMONU	Anadolu Lisesi	15 Temmuz Şehitler Anadolu Lisesi	967675
KASTAMONU	Fen Lisesi	Kastamonu Fen Lisesi	953939
KASTAMONU	İmam Hatip Lisesi	Kastamonu Anadolu İmam Hatip Lisesi	168161
KASTAMONU	Anadolu İmam Hatip Lisesi	Kastamonu Kız Anadolu İmam Hatip Lisesi	758287
KASTAMONU	Anadolu İmam Hatip Lisesi	Şeyh Şabanı Veli Anadolu İmam Hatip Lisesi	763545
KASTAMONU	Anadolu İmam Hatip Lisesi	Hüma Hatun Kız Anadolu İmam Hatip Lisesi	763548
KASTAMONU	Spor Lisesi	Kastamonu Spor Lisesi	774285
KASTAMONU	Sosyal Bilimler Lisesi	Prof. Dr. Saime İnal Savi Sosyal Bilimler Lisesi	760010
KASTAMONU	Özel Anadolu Lisesi	ÖZEL KASTAMONU SINAV KOLEJİ ANADOLU LİSESİ	99982716
KASTAMONU	Özel Anadolu Lisesi	ÖZEL KASTAMONU BAHÇEŞEHİR KOLEJİ ANADOLU LİSESİ	99983148
KASTAMONU	Özel Anadolu Lisesi	ÖZEL HAZERBEY KOLEJİ ANADOLU LİSESİ	99994709
KASTAMONU	Özel Fen Lisesi	ÖZEL HAZERBEY KOLEJİ FEN LİSESİ	99994710
KASTAMONU	İmam Hatip Lisesi	Araç Anadolu İmam Hatip Lisesi	168327
KASTAMONU	Çok Programlı Anadolu Lisesi	Araç Çok Programlı Anadolu Lisesi	324188
KASTAMONU	Çok Programlı Anadolu Lisesi	İğdir Çok Programlı Anadolu Lisesi	746205

T.C.
MİLLÎ EĞİTİM BAKANLIĞI
ARAŞTIRMA UYGULAMA İZNİ BELGESİ

Uygulama Yapılacak İller	Uygulama Yapılacak Birimler	Uygulama Yapılacak MEB Teşkilatları	Uygulama Yapılacak MEB Teşkilatının Kurum Kodu
BARTIN	Anadolu Lisesi	Davut Fırıncıoğlu Anadolu Lisesi	265635
BARTIN	Anadolu Lisesi	Fatih Sultan Mehmet Anadolu Lisesi	758085
BARTIN	Anadolu Lisesi	Bartın Lisesi	964341
BARTIN	Anadolu Lisesi	TOBB Cumhuriyet Anadolu Lisesi	972800
BARTIN	Anadolu Lisesi	Köksal Toptan Anadolu Lisesi	972801
BARTIN	Fen Lisesi	Hasan Sabri Çavuşoğlu Fen Lisesi	965591
BARTIN	Anadolu İmam Hatip Lisesi	Şehit Mustafa Yaman Anadolu İmam Hatip Lisesi	762240
BARTIN	Anadolu İmam Hatip Lisesi	Bartın Nene Hatun Kız Anadolu İmam Hatip Lisesi	757700
BARTIN	Anadolu Lisesi	Ulus Şehit Erkan Yalçın Anadolu Lisesi	765068
BARTIN	Çok Programlı Anadolu Lisesi	Amasra Çok Programlı Anadolu Lisesi	748407
BARTIN	İmam Hatip Lisesi	Bartın Anadolu İmam Hatip Lisesi	265672

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

Appendix 7: Ministry of National Education Research Letter of Commitment

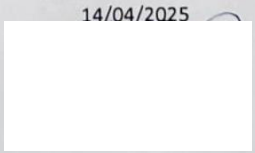
MİLLÎ EĞİTİM BAKANLIĞINA BAĞLI HER TÜRLÜ TEŞKİLATTA GERÇEKLEŞTİRİLECEK ARAŞTIRMA UYGULAMALARINA İLİŞKİN ARAŞTIRMA UYGULAMA İZNİ BAŞVURU TAAHHÜTNAMESİ

1. Araştırmam boyunca Anayasa/kanun/yönetmelikler ve yürürlükte olan diğer mevzuata uygun davranacağımı,
2. Araştırmayı yürüteceğim Millî Eğitim Bakanlığı teşkilatının kurallarına uyacağımı,
3. Araştırmam boyunca hiç kimseyi araştırmama/çalışmama katılmaya zorlamayacağımı,
4. Araştırmayı bana tahsis edilen mekân/sınıf ve zamanda gerçekleştireceğimi,
5. Araştırmanın olası fiziksel/ruhsal etkileri konusunda katılımcıları bilgilendireceğimi,
6. Araştırmam sırasında topladığım kişisel bilgileri 6698 sayılı Kişisel Verilerin Korunması Hakkındaki Kanun kapsamında koruyacağımı,
7. Katılımcılara ait her türlü kişisel bilgiyi, katılımcıların (katılımcılar reşit değil ise velilerin) yazılı izni veya mahkeme kararı olmadan hiçbir şahıs veya kurumla paylaşmayacağımı,
8. Katılımcıların (katılımcılar reşit değil ise velilerin) kişisel verilerinin onların izni olmadan kamuoyuna duyurmayacağımı,
9. Araştırmam için gerektiği kadar veri toplayacağımı,
10. Araştırmam sırasında öğrencilerin eğitim ve öğretiminin aksatılmamasına dikkat edeceğimi,
11. Araştırmam sırasında herhangi bir ticari faaliyette bulunmayacağımı,
12. Katılımcıları herhangi bir ürün/eser/tedaviye yönlendirmeyeceğimi,
13. Araştırma izin evraklarını okul yönetimine teslim edeceğimi,
14. Araştırma sırasında izni olan evrakları kullanacağımı,
15. Araştırma/Tıbbi araştırmalarda araştırmanın uygulama sırasında tıbbi etik kurul izni kurallarına uyacağımı,
16. Araştırma sırasında topladığım ses ve görüntü kayıtlarını güvenilir ortamlarda saklayacağımı ve araştırma sonrasında ifşa etmeyeceğimi,
17. Genelge hükümlerine aykırı davranmam ve herhangi bir yanlış ifade, beyan ve maddi gerçeği gizleme gibi durumlarda hukuki sorumlulukları yükleneceğimi,
18. İzin alınmış araştırmalarda insanlarla ilgili yapılacak anket, görüşme, gözlem, alan araştırması, uygulama ve incelemelerde sağlık, güvenlik, insan hakları, mevcut mevzuat hükümleri, hukukun genel ilkelerini ihlal etmeyeceğimi ve etik ilkelere uyacağımı,
19. Topladığım veriyi başka bir araştırmada ya da başka bir amaçla kullanmayacağımı,
20. Araştırmalarım sonucunda hazırladığım ürünleri (tez, makale, rapor, proje raporu vb.) araştırma uygulama izni bitiş tarihinden itibaren iki yıl içinde modüle yükleyeceğimi,

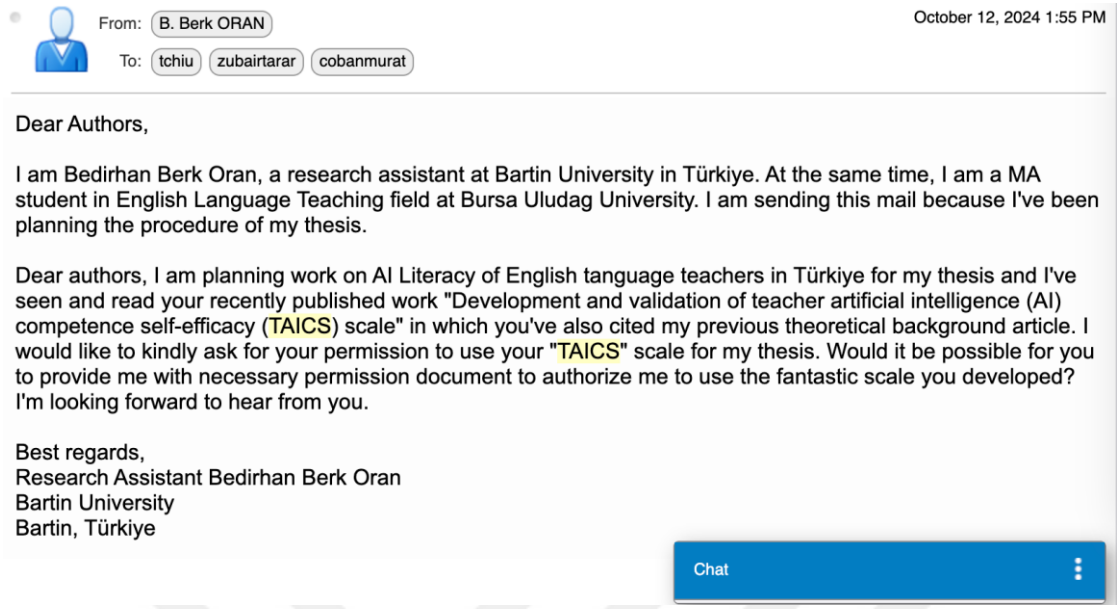
Kabul ve beyan ederim.

Araştırmanın Adı: Ortaöğretim Düzeyinde İngilizce Öğretmenlerinin Yapay Zeka Yetkinlik Düzeylerinin Ve Yapay Zeka Yetkinliğinin Öğretmen Öz Yeterlilik İnançları Üzerindeki Etkisinin İncelenmesi

14/04/2025



Appendix 8: Permission to Use the Instrument of the Study



From: B. Berk ORAN
To: tchiu zubairtarar cobanmurat
October 12, 2024 1:55 PM

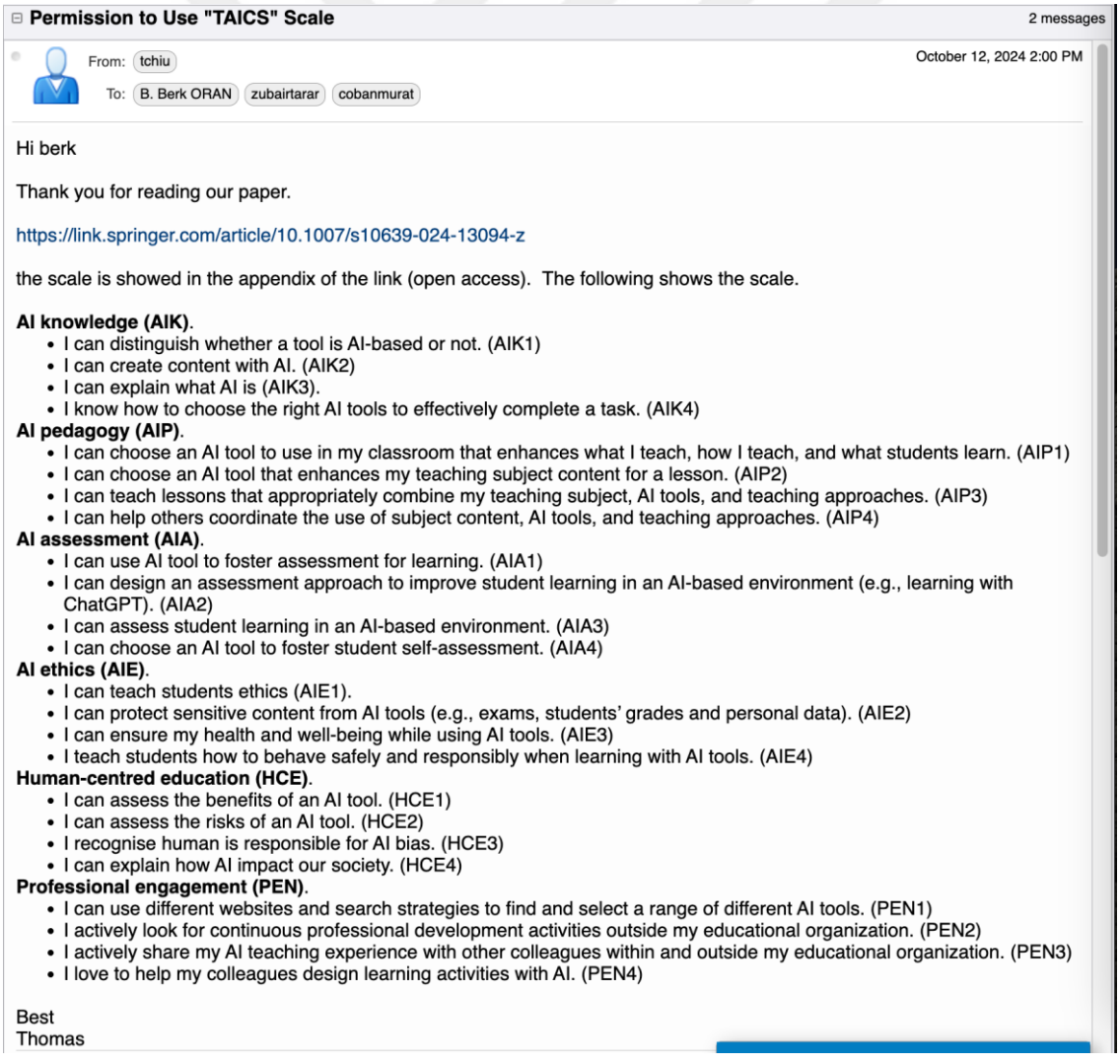
Dear Authors,

I am Bedirhan Berk Oran, a research assistant at Bartin University in Türkiye. At the same time, I am a MA student in English Language Teaching field at Bursa Uludag University. I am sending this mail because I've been planning the procedure of my thesis.

Dear authors, I am planning work on AI Literacy of English tanguage teachers in Türkiye for my thesis and I've seen and read your recently published work "Development and validation of teacher artificial intelligence (AI) competence self-efficacy (TAICS) scale" in which you've also cited my previous theoretical background article. I would like to kindly ask for your permission to use your "TAICS" scale for my thesis. Would it be possible for you to provide me with necessary permission document to authorize me to use the fantastic scale you developed? I'm looking forward to hear from you.

Best regards,
Research Assistant Bedirhan Berk Oran
Bartin University
Bartin, Türkiye

Chat



Permission to Use "TAICS" Scale 2 messages

From: tchiu
To: B. Berk ORAN zubairtarar cobanmurat
October 12, 2024 2:00 PM

Hi berk

Thank you for reading our paper.

https://link.springer.com/article/10.1007/s10639-024-13094-z

the scale is showed in the appendix of the link (open access). The following shows the scale.

AI knowledge (AIK).
- I can distinguish whether a tool is AI-based or not. (AIK1)
- I can create content with AI. (AIK2)
- I can explain what AI is (AIK3).
- I know how to choose the right AI tools to effectively complete a task. (AIK4)

AI pedagogy (AIP).
- I can choose an AI tool to use in my classroom that enhances what I teach, how I teach, and what students learn. (AIP1)
- I can choose an AI tool that enhances my teaching subject content for a lesson. (AIP2)
- I can teach lessons that appropriately combine my teaching subject, AI tools, and teaching approaches. (AIP3)
- I can help others coordinate the use of subject content, AI tools, and teaching approaches. (AIP4)

AI assessment (AIA).
- I can use AI tool to foster assessment for learning. (AIA1)
- I can design an assessment approach to improve student learning in an AI-based environment (e.g., learning with ChatGPT). (AIA2)
- I can assess student learning in an AI-based environment. (AIA3)
- I can choose an AI tool to foster student self-assessment. (AIA4)

AI ethics (AIE).
- I can teach students ethics (AIE1).
- I can protect sensitive content from AI tools (e.g., exams, students' grades and personal data). (AIE2)
- I can ensure my health and well-being while using AI tools. (AIE3)
- I teach students how to behave safely and responsibly when learning with AI tools. (AIE4)

Human-centred education (HCE).
- I can assess the benefits of an AI tool. (HCE1)
- I can assess the risks of an AI tool. (HCE2)
- I recognise human is responsible for AI bias. (HCE3)
- I can explain how AI impact our society. (HCE4)

Professional engagement (PEN).
- I can use different websites and search strategies to find and select a range of different AI tools. (PEN1)
- I actively look for continuous professional development activities outside my educational organization. (PEN2)
- I actively share my AI teaching experience with other colleagues within and outside my educational organization. (PEN3)
- I love to help my colleagues design learning activities with AI. (PEN4)

Best
Thomas

CV

Bedirhan Berk ORAN

Education	
Bachelor's Degree **2018-2022**	Bursa Uludağ University, English Language Teaching, Faculty of Education, Bursa, Türkiye
Associate Degree **2020-2023**	Anadolu University, Open Education Faculty, International Trade
Master's Degree **2022-**	Bursa Uludağ University, English Language Education, Institute of Educational Sciences, Bursa, Türkiye
Intercultural Experience	
2019 August – 2020 January **Erasmus+ Exchange**	Københavns Professionshøjskole, Teacher Education Department, København V, Denmark
2024 June – 2024 July **Fully Funded Exchange Program Attendance**	Halla University, HIP Program, Wonju-si, South Korea
Work Experience	
2023-	**Research Assistant /** Bartın University, Faculty of Letters, Department of Translation Studies / English Translation and Interpretation Department
Grants ▪ Recipient of Fulbright Foreign Language Teaching Assistantship Grant at University of Mississippi for 2025-2026 Academic Year ▪ Recipient of Ignaz Kögler Summer Camp scholarship (had to decline to due to a time clash in calendars)	

Publications

Scientific Article: Oran, B. B. (2023). Correlation between artificial intelligence in education and teacher self-efficacy beliefs: a review. RumeliDE Dil Ve Edebiyat Araştırmaları Dergisi(34), 1354-1365. https://doi.org/10.29000/rumelide.1316378

Book chapter: Oran, B. B. (2023). Localizing Pixels: Factors That Constitute Identities of Video Game Translators and Video Game Localization Process. In Agenda of Translation Studies (pp. 190-214). Kriter Yayinevi ISBN: 9786256606210

Conference Proceedings

- *Correlation between Artificial Intelligence in Education and Teacher Self-efficacy Beliefs: A Review through AI Literacy.* 15th International METU ELT Convention, 2024, Ankara, Türkiye
- *Text-to-Image ARTificial Intelligence Tools in Vocabulary Teaching: Exploring the Potential of Optical Illusions and Stable Diffusion.* GlobELT 2024: 10th International Conference on Teaching and Learning English as an Additional Language. 2024, Konya, Türkiye