The Impact of AI on Teacher Identity

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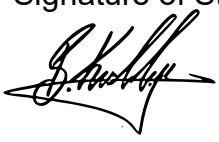

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ABSTRACT

This thesis investigates the multidimensional impact of artificial intelligence (AI) on teacher identity within higher education. The research is grounded in the Technology Acceptance Model (TAM), providing a framework to analyze the impact of adoption of AI technologies by teachers. Conducting a mixed-methods analysis and focusing on 52 educators at TOBB University of Economics and Technology in Ankara, Turkey, the study explores the impact of AI integration on teacher identity, relationship between AI familiarity and teachers' perception of their professional identity, AI technologies and their ease of use or usefulness dynamics, and relationship between teachers' demographic characteristics and their attitudes towards AI. The results suggest a positive relationship between the integration of AI and its impact on teachers' professional identity. A strong positive correlation was observed between AI familiarity and teachers' perception of the positive impact of AI on their professional identity, indicating that increased familiarity with AI enhances teachers' sense of its beneficial effects. Perceived usefulness of AI technologies significantly predicts teachers' attitudes towards AI adoption, whereas perceived ease of use does not show a significant impact. This underscores the importance of perceived usefulness in shaping positive attitudes towards AI. Among the demographic factors examined, younger age is associated with more positive attitudes towards AI, while digital competence, gender, education level, and teaching experience do not show significant predictive power. This study highlights AI's potential to challenge traditional teaching practices and its influence on teachers' motivation and dedication.

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List of Acronyms

AI	Artificial Intelligence
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology
ET	Ecological Theory,
SLT	Social Learning Theory
AVOVA	Analysis of Variance
CVA	Classroom Video Analysis
TPACK	Technological Pedagogical and Content Knowledge

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CHAPTER 1: INTRODUCTION

1.1. Background

Artificial Intelligence (AI) is a term which is used to describe machines that can simulate human thinking to perform tasks (Jamal, 2023). The term was initially introduced by John McCarthy in 1956 at a workshop held at Dartmouth College. However, there is evidence to suggest that discussions about AI had taken place prior to this (Lu, 2019). It is revolutionizing multiple facets of human existence and has achieved notable progress in diverse domains. The domain of education has been largely transformed by its introduction (Seldon et al., 2020). This transformation has presented both difficulties and possibilities. The incorporation of AI in education, namely among teachers, has had a substantial impact on both educational research and practice (Pham & Sampson, 2022). Teachers' obligations towards learners may be influenced to a greater extent, enhancing their skill sets and providing them with new possibilities to adapt to their positions as facilitators and mentors. Additionally, it grants workers entry to a diverse range of tools as well as resources that can aid in enhancing their efficiency (Chen et al., 2020). One of the sectors that has been affected by AI is Teacher Identity (Arantes, 2022).

Teacher identity, often regarded as the cornerstone of the educational profession, encapsulates the unique blend of beliefs, values, experiences, and practices that shape an educator's professional persona (Miller, 2009). From the earliest interactions with education to ongoing professional development, teachers are continually influenced by a myriad of factors that are the impetus behind formation and evolution of their identity. As educators navigate the complexities of teaching, they continuously refine their identity, adapting their beliefs and practices to fulfil the needs of students and the demands of their profession. Teacher identity is not only significant on a personal level but also in its implications for teaching and learning (Reeves, 2018). A strong

sense of teacher identity fosters confidence, passion, and resilience in educators, enabling them to create meaningful connections with students and facilitate their growth and development. Moreover, teacher identity shapes instructional practices, classroom management strategies, and decision-making processes, ultimately impacting the educational experiences of students. Recently, there has been a growing focus on studying teacher identity, which has emerged as a prominent and popular field in educational research. Identity plays a significant role in the professional growth of teachers (Leeferink et al., 2019), and it has a profound impact on their thinking and professional behaviors (Beauchamp & Thomas, 2011). As technology continues to advance rapidly, there's a burgeoning interest in examining its impact, particularly artificial intelligence, on teacher identity. This exploration reflects a recognition of the evolving role technology plays in shaping educational landscapes and the identity constructs of those within them.

Technology can influence teacher identity in several ways. Technology facilitates the ability of instructors to establish connections with other educators, professionals, and communities in many locations, disciplines, and cultures. These exchanges have the potential to enhance teacher learning, promote cooperation, and introduce instructors to a wide range of ideas and practices (Badia & Iglesias, 2019). Increasing the size of teacher networks can help strengthen teacher identity by fostering a feeling of inclusion, acknowledgment, and validation (Rostock, 2014). Technology can also enable teacher reflection, which is an essential aspect of teacher growth, by offering data, evidence, as well as feedback that can assist instructors in recognizing their areas of proficiency, areas for improvement, potential avenues for growth, and barriers to overcome (Lawless & Pellegrino, 2007). Technology has the ability to question and test the assumptions that instructors hold about themselves, their pupils, their curriculum, and their environment. Teacher

assumptions have the potential to impact teacher identity and growth by influencing the choices, behaviors, and responses of teachers (Bahari, 2022). Technology has the potential to challenge instructors' assumptions by presenting them with novel knowledge, experiences, and viewpoints that may contradict or challenge their current beliefs (Abbott, 2016). Technology has the capacity to enhance teacher agency, which refers to the capability and inclination of teachers to take action and exert control over their own teaching and learning. Teacher agency can strengthen teacher identity and foster professional growth by empowering teachers to articulate their perspectives, principles, and aspirations within their field and specific circumstances (Abbott, 2016).

AI can have a particular effect on teacher identity by providing support in three crucial areas: planning, execution, and assessment (Celik et al., 2022). The benefits of AI in relation to planning include the acquisition of data regarding students' backgrounds and aiding teachers in making informed decisions about the educational material to be used during lesson planning (Celik et al., 2022). The main benefit of AI is its capability to monitor learning processes in a timely manner. Additional research indicated that AI has the potential to empower teachers in modifying or even choosing the most efficient learning activity by utilizing AI input (Park & Kwon, 2024). AI assists teachers by automating exams, grading essays, and aiding in the evaluation of student performance. Research has demonstrated that an automated essay scoring system can enhance the efficiency of essay scoring and promote objectivity in the scoring process.

It could be argued here that with AI handling certain aspects of planning, implementation, and assessment, teachers may find their roles shifting. They might become more facilitators of learning than the sole source of information impacting their identity. On the flip side, AI could augment teachers' capabilities by providing them with valuable insights, data, and tools to enhance their teaching practices (Celik et al., 2022). This might lead to a sense of empowerment and

professional growth, reinforcing their identity as effective educators. Further, embracing AI in education compels teachers to streamline with new technologies and methodologies. This adaptation process could challenge their existing identities but also provide opportunities for growth and innovation (Kim, 2023).

Based on the above, there could be several possible ways in which AI could impact the teacher identity both positively and negatively (Ye, 2021). Therefore, it is cardinal to comprehensively study cumulative impact of increasing integration of AI in the education domain on the teacher identity and comprehend its practical implications. This is also important because it seems like the role of AI in the education sector is expected to increase manifold in the coming days. This imperative stems from several compelling factors: Firstly, the integration of AI may lead to a redefinition of teachers' roles and responsibilities, prompting an understanding of the ensuing changes. Moreover, AI-driven personalized learning experiences raise questions about pedagogical autonomy and adaptation, necessitating an exploration of how teachers deal with their identities within AI-mediated teaching environments (Markauskaite et al., 2022).

Nevertheless, despite the growing popularity of AI, there has been a limited investigation into the patterns, research issues, and practical applications of AI in the domain of teacher identity. Choi, Jang, and Kim (2023) state that teachers rarely incorporate AI educational technologies and there is less understanding of their attitudes towards AI tools (Choi et al., 2023). There is a dearth of comprehensive understanding of utilization of AI systems by students and teachers, as well as the integration of it into educational institutions such as schools and colleges (Williamson & Eynon, 2020). To fully comprehend the attitudes of future instructors regarding AI and the elements that impact their willingness to use this technology, it is crucial to recognize their role in

adopting AI tools in their instruction and how they will serve as an inspiration and influence for future generations of students.

AI technologies reshape traditional teaching roles (Ye, 2021), and it is critical to understand how this transformation affects teachers' sense of professional identity. By focusing on this, we can identify the specific professional development needs arising from AI integration, ensuring that educators are equipped with the knowledge as well as skills necessary to employ these technologies effectively while preserving their autonomy and expertise. The present study will investigate the multidimensional impact of AI on teacher identity within the realm of higher education. Consequently, this study aims to investigate the linkage between AI and teacher identity through a mixed-methods approach and seeks to explore how the integration of AI tools and technologies influences the professional roles, perceptions, and interactions of educators. By examining various dimensions of AI usage, including familiarity, perceptions, and usage patterns, this study aims to find out the ways in which AI shapes teachers' identities, their pedagogical practices, and their sense of belonging within academic community.

1.2. Thesis Summary

This study explores the impact of AI on teacher identity drawing upon a mixed-method approach. The first part of the thesis, the literature review, provides a comprehensive analysis of existing research on AI and teacher identity, discussing key theoretical frameworks such as constructivism, ecological theory, social learning theory, activity theory, and TAM. It identifies research gaps and outlines the objectives of the current study. It also describes in detail research hypothesis and research questions based on the literature review. The next section, the research methodology, details the mixed-methods approach used in this study, including the design, data collection instruments, and sampling procedure. It describes the primary data analysis and the

study population in detail. Following this, the results and discussion chapter presents the quantitative and qualitative findings of the study, discussing impact of AI integration on teacher identity, relationship between AI familiarity and teachers' perception of impact of AI on their professional identity, AI technologies and their ease of use or usefulness dynamics, and relationship between teachers' demographic characteristics and their attitudes towards AI, and the effects of AI on motivation, dedication, and student engagement. Finally, the conclusion and recommendations chapter summarizes the key findings and their implications for teachers and educational institutions, provides recommendations for future research, and addresses the limitations of the current study.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

This literature review chapter aims to provide a comprehensive analysis of existing research on this topic of intersection of artificial intelligence and teacher identity, drawing upon a range of theoretical frameworks and empirical studies. Section 2.2 examines the empirical findings on the impact of AI on teacher identity, highlighting studies that explore educators' perceptions, experiences, and challenges associated with AI integration in the classroom. Section 2.3 offers a theoretical review, discussing key theoretical perspectives such as constructivism, ecological theory, social learning theory (SLT), activity theory, and technology acceptance model (TAM). These frameworks provide a lens through which to know the impetus of AI adoption and its implications for teacher identity. Finally, Section 2.4 identifies research gaps and outlines the objectives of the current study.

2.2. Empirical Literature

2.2.1. Teacher's Professional Identity

Professional identity encompasses the self-perceived or externally assigned meanings of "who one is" as a professional (Marcelo, 2009). Teacher professional identity means how teachers perceive and understand their role in the profession of teaching. It is a kind of a lens which teachers can use to view their job, assign significance to it, and behave accordingly (Brenner et al., 2018). Professional identity encompasses several sub-identities, and instructors incorporate different perceived statuses as well as roles into a unified self-image (Sachs, 2001). Chere-Masopha (2018) proposed a framework for understanding teacher professional identity, which consists of three key dimensions: the personal landscape (referring to teachers' individual skills and beliefs about

knowledge), situational landscape (referring to teachers' role within the school community) and contextual landscape (referring to teachers' membership in broader socio-cultural communities) (Chere-Masopha, 2018).

Previous research has highlighted three dimensions of identity in connection to teachers' disciplinary tasks. One factor to consider is how teachers perceive their jobs in relation to academic objectives (Van Veen et al., 2001). There are two different ways of thinking about teaching: one focuses mainly on helping students gain knowledge and skills for specific qualifications, while the other has a broader focus on students' overall well-being and personal development. The second factor pertains to the teachers' perception of their tasks in terms of instruction, namely their orientations towards instructional approaches (Van Veen et al., 2005). Teachers can adopt either a student-centered approach, which focuses on students actively constructing knowledge and participating in the learning process, or a content/teacher-centered approach, which prioritizes the transmission of a predetermined set of knowledge and skills. Teachers' perception of their tasks in relation to the academic skill base is the third factor. Teachers can present themselves as experts in their subject matter, emphasizing their deep understanding and skills in the subject. Alternatively, they can position themselves as experts in teaching and learning, prioritizing the students' learning experience and using their expertise to create meaningful and effective learning opportunities in the subject. The orientations of teacher professional identity that are distinctive to different disciplines have been found to be associated with teachers' capacity and desire to adapt to changes and introduce innovative teaching practices. For example, Veen & Sleegers (2006) discovered that teachers who identified strongly with a teacher-centered identity were of the opinion that student-centered school innovations were not in line with professional beliefs and reacted unfavorably to these innovative things. Teachers who prioritize student-centered learning

noticed a greater alignment between their professional inclinations and these developments (Van Veen & Sleegers, 2009).

Although the initial investigations did not always describe identity clearly or consistently, the professional identity of teachers became a major subject of research in the 1990s (Beijaard et al., 2004). Subsequent to these initial studies, there has been a transition from perceiving identity as a singular and unchanging entity to perceiving it as a dynamic process in which identities are shaped and reshaped (Henry, 2016). Moreover, the stability of identities can vary depending on the professional or personal circumstances of the teacher (Day et al., 2006). According to Beijaard et al., (2004), identity could be understood as the response to ongoing inquiry: "Who am I right now?". An important element of teacher's identity is influence of their emotions and interplay of cognitive as well as emotional dimensions of teacher identity (Uitto et al., 2015). Beijaard et al. (2004) further delineated 4 characteristics of teachers' identity: it is a continuous and evolving process rather than a static one; it is interconnected with both the individual and their surrounding environment; it comprises of various sub-identities that should not contradict each other; and teachers possess the ability to actively shape and manifest their identity (Beijaard et al., 2004).

As stated, individual's identity is in a permanent state of change and is determined by their ideas, attitudes, motives, and experiences (Morris & Tsakissiris, 2015). These factors are further shaped by the social and cultural milieu in which the individual exists. Within the realm of education, professional identity is closely linked to the perception and reputation of a teacher. The illustration pertains to the process of teaching and the growth and progression of a teacher. This picture is also linked to a teacher's willingness or disposition to embrace change in education. In another study by Darrow-Kleinhaus (2012), professional identity was found to be associated with the process of reflection or internal assessment by teachers to enhance their personal

professionalism. Put simply, a teacher's professional identity is associated with their personal characteristics and behaviour within the teaching profession (Darrow-Kleinhaus, 2012). Similarly, Kreber (2010) explains that academics in higher education develop many identities as a result of belonging to several groups. These identities together relate to their complete academic identity (Kreber, 2010). Nixon (1996) proposes that teachers could own distinct identities as a teacher, researcher, or administrator (Nixon, 1996).

Teacher identity has shown to be shaped by educational background and personal ideas about themselves and pupils (Hockings et al., 2009). Lankveld et al., (2017) outline 4 contextual elements that influence formation of teacher identity: education at the higher sector, the ultimate work environment, interactions with pupils, and professional development opportunities for staff. Skelton argues that teachers exhibit "strategic compromise" by accepting external limitations on their teaching methods while maintaining internal qualms about the influence of these restraints on their pedagogy. They argue that teacher identity is formed and sustained through processes involving perception of value, interpersonal relationships, skills, dedication, and aspirations for their professional future. The fourth aspect, commitment, pertains to instructors' profound dedication to educating the future generation and their concern for the well-being of children (Van Lankveld et al., 2017).

2.2.2. Teachers and Adoption of Technology

In this digital age, technology occupies a pivotal role, permeating various spheres of human life. Its significance in modern education cannot be overstated, as it serves as a transformative force, redefining pedagogical practices and educational paradigms. Within this context, educators emerge as crucial mediators, employing technology in several ways possible.

Teachers have the ability to utilize technology for instruction in several methods that differ in quality. For example, Hall (2010) discovered that certain teachers utilized interactive whiteboards to provide information, while others employed them to facilitate student investigation (Hall, 2010). Teachers have varying interpretations of e-learning, such as viewing it as a tool for self-study, a means to facilitate interaction between students and teachers, or a platform for learning in collaboration (Stein et al., 2011). Trentin (2008) observed various ways in which university teachers utilized the Web. Some employed it as a means to give away information about and as materials for learning. Others employed it to encourage collaboration as well as among students regarding course, or to enhance the learning ability by combining online and in-person instruction (blended solutions). Additionally, some teachers utilized the Web to develop personalized learning materials or to integrate independent study via collaborating through educational processes (networked learning) (Trentin, 2008). These many technologies differ in the degree of technological integration, which aligns with the technology integration continuum described by Zemsky & Massy (2004). They assert that there are 4 distinct phases of integration of technology: 1) Improvements to traditional course setups, such as offering digital learning materials. 2) Systems for managing courses, including organizing and distributing teaching materials and enabling interaction between teachers and students. 3) Incorporating external course materials to provide more engaging and stimulating learning experiences. 4) Implementing new course setups that significantly alter the teaching approach to enhance students' learning process (Zemsky & Massy, 2004). While Zemsky and Massy (2004) classified the process into four stages, the initial two stages mostly include utilizing technology to enhance the presentation and accessibility of pre-existing content and can be considered as a single category. Ertmer et al. (2012) conducted a study to analyze the technology integration methods of twelve K-12 instructors. They

identified and categorized three kinds of technological methods that could effectively summarize and combine findings from prior studies. The objectives are: 1) utilizing technology for delivering information and reinforcing skills; 2) employing technology to enhance and enrich the learning experience; and 3) employing technology to revolutionize teaching and learning, empowering learners to take on more active roles in the learning process. The study employed these three forms of technology use as a framework to classify the extent to which teachers integrated technology (Ertmer et al., 2012).

Ertmer et al. (2012) discovered a strong correlation between instructors' understanding of teaching and their use of technology in the classroom. Instructors who had learner-centered beliefs were more likely to utilize technology to enhance student learning (Ertmer et al., 2012). Other studies have also confirmed this connection, showing that teachers who prioritize learner-centered instruction are more inclined to utilize technology in creative ways that go beyond simply delivering information. These teachers are more likely to facilitate learning, encourage student-centered technology use, and explore new teaching and learning methods through technology (Li et al., 2019; Liu & Geertshuis, 2021). The utilization of technology in a more dispersed manner is found to be linked with an instructional approach that prioritizes the learner's needs and preferences (Ravitz et al., 2000). On the other hand, teachers that have a teacher-centered attitude tend to use technology in a controlled and limited way, mainly to help students acquire skills (Martin, 2008)

2.2.3. Artificial Intelligence in Education

As stated previously, the influence of technology on several aspects of today is undeniable, and academics is certainly not exempt from this impact. Currently, there is a global shift towards adopting the 5th generation of Internet, also known as Internet of Things, in the field of academics.

This resulted in burgeoning interest in incorporating AI applications into teaching along with learning. The significance of AI has greatly increased, especially following the shutdown of educational institutions due to the COVID-19 pandemic. Hence, AI could potentially influence educational practices, leading to the need for the creation of learning-based management systems, assessment tools, and other mechanisms to assist learning (Al Darayseh, 2023; Graesser & D'Mello, 2012). Recent studies in the discipline of AI-based learning suggest that increasing the availability of space for learning through current applications might lead to greater chances for making the education system better and keeping pace. AI has the potential to play a substantial role in a student's education due to its various critical contributions to both the learning process and the components of learning (Mahmoud, 2020).

As educational institutions endeavor to adjust to the digital landscape of the 21st century, the incorporation of AI technology into teaching and learning processes has become a crucial field of investigation. This transition encompasses both technological and pedagogical aspects, since it fundamentally changes the roles of educators and learners, the instructional approaches, and the structure of educational content delivery. The increasing fascination in this field is shown in an expanding collection of literature that aims to comprehend, scrutinize, and forecast the influence of AI on education. Fahimirad and Kotamjani (2018) were among the first to explore the rise and integration of AI in educational contexts. Their groundbreaking research highlights the growing use of AI technologies to enhance educational methods (Fahimirad & Kotamjani, 2018). By conducting a thorough examination, they discovered the diverse and extensive possibilities of AI to completely transform teaching and learning methods, establishing a basis for further investigations into this dynamic intersection. The core of their discoveries indicates a forthcoming era in which AI assumes a central role in the educational ecosystem, rather than being a mere

supplement. This holds the potential to improve learning outcomes, customize educational experiences, and optimize administrative operations (Rios-Campos et al., 2023).

Agreeing with this viewpoint, Tapalova and Zhiyenbayeva (2022) conducted a more thorough investigation into the function of AI in enabling customized learning paths. Their research highlights the flexibility of AI systems to meet the varied requirements of individual learners, demonstrating the technology's ability to democratize and personalize education (Tapalova & Zhiyenbayeva, 2022). By emphasizing personalization, they underscore a fundamental benefit of AI: its capacity to shape pedagogical content and delivery based on the distinct preferences, aptitudes, and limitations of individual students. According to it, this individualized method not only promotes an all-encompassing learning atmosphere but also guarantees that education is more pertinent, captivating, and efficient. Yu's (2021) research enhances discussion from an administrative standpoint by investigating the progress and use of AI in the management of university education. Their analysis highlighted the dual character of AI in school administration, emphasizing the advantages of efficiency and data-driven decision-making, as well as the limitations posed by ethical considerations and the necessity of complete training. This comprehensive analysis highlights that the influence of AI goes beyond the confines of the classroom, impacting the wider operational structures of educational institutions (Yu & Guo, 2023). Expanding upon these viewpoints, Rios-Campos et al. (2023) specifically situates ChatGPT within the wider framework of AI in the field of education. Their inquiry into the utilization of AI-driven technologies such as ChatGPT in the context of students, teachers, and educational systems provides important insights into the diverse usefulness of AI. The study explores the various ways in which AI might be a catalyst for educational innovation and progress, including automating regular chores, facilitating personalized learning, and boosting administrative

efficiency (Rios-Campos et al., 2023). Based on these influential studies, it is clear that the incorporation of AI in education marks the beginning of a new period of teaching and learning.

2.2.4. Artificial Intelligence and Teachers

Several empirical studies have been conducted on the usage of AI by teachers. The advantages of AI in relation to planning include the acquisition of information regarding students' backgrounds and aiding teachers in making decisions about the educational material to be used during lesson planning. A recent study demonstrated the utilisation of an AI system to furnish teachers with comprehensive information regarding children's predisposition to engage in delinquent behaviour, including factors such as violence (Pelham et al., 2020). Dalvean and Enkhbayar (2018) employed machine learning techniques to categorise readability of fiction works in English, specifically focusing on teacher support in fabricating learning materials. The study indicated that the classification can help language educators in designing the curriculum by taking into account the readability characteristics (Dalvean & Enkhbayar, 2018).

However, there is limited conceptual guidance on structuring and implementing effective teacher-AI collaboration (TAC) while maintaining teachers' instructional roles. In a recent study by Kim et al., (2024) constituting in-depth interviews with 20 leading Chinese educators in AI in Education, the study showed that teachers want to enhance students' subject-matter knowledge and build their capacity through data-driven problem-based learning and case-based reasoning, supplemented by growth-focused and reflective assessment. The study findings indicated that developing teachers' data literacy and making a collaborative relationship with AI is very important. Teachers expect AI to possess Technological Pedagogical and Content Knowledge (TPACK) and conflict resolution skills as well.

Ayanwale et al., (2022) provided an analysis of the elements that impact the behavioral intention and preparedness of in-service educators to teach AI. The survey involved a total of 368 educators, ranging from primary to secondary school levels (Ayanwale et al., 2022). They employed a quantitative approach, specifically variance-based structural equation modelling, to examine the correlation between eight variables (AI for social good, AI anxiety, Attitude towards using AI, relevance of AI, AI readiness, perceived confidence in teaching AI, perceived usefulness, and behavioural intention) that were investigated in this study. The findings suggested that having confidence in the teaching of AI is a major predictor of the intention to teach AI, whereas the relevance of AI highly predicts the willingness to teach AI. Anxiety and social awareness were found to have no predictive power in determining teachers' intention and willingness to adopt AI in classrooms, despite the presence of other influencing factors (Ayanwale et al., 2022).

In a recent systematic analysis by Celik et al., (2022), the authors presented a comprehensive analysis of the research conducted on the utilization of AI applications and machine learning techniques by teachers to examine their data (Celik et al., 2022). The analysis revealed that AI provides teachers with various prospects for enhancing their planning (such as identifying students' requirements and acquainting teachers with these needs), implementation (such as offering immediate feedback and enabling teacher intervention), and assessment (such as automatic essay scoring) of their teaching. Furthermore, the research revealed that professors play diverse roles in the advancement of AI technologies. These jobs encompass serving as exemplars for training Algorithms using artificial intelligence and engaging in AI development by verifying the precision of AI automated evaluation systems (Celik et al., 2022). In another systematic review, Salas-Pilco et al., (2022) described in detail various studies related to intersection of AI and instructors. The results suggested that researchers are primarily interested in examining the

behaviors, perceptions, and digital skills of both pre-service and in-service teachers when it comes to incorporating AI in their teaching methods. The main sources of data used in these studies include discourse data, behavioral data, as well as statistical data. Machine learning algorithms were commonly utilized in the majority of these studies. However, only a few studies mention obtaining ethical clearance for their research (Salas-Pilco et al., 2022).

Ye et al. (2024) investigated the transformative impact of AI on the roles of teachers. The study explored how AI is reshaping the educational landscape, emphasizing the dual logic that characterizes this transformation: innovation and humanistic perspectives. The study discussed the connotation and characteristics of AI, highlighting its significance in the context of information technology education. AI's role in individualizing teaching objectives, creating systematic teaching models, and diversifying teaching methods was shown. The study claimed that traditionally teachers have been seen as leaders of passive learning, executors of curriculum teaching, and administrators of education and teaching. However, with AI, their roles are evolving. The innovation logic of AI in education redefines teachers from being the sole source of knowledge to facilitators of deep learning, shifting from standardized teaching to more personalized approaches, and from executing traditional education methods to embracing intelligent education strategies. Additionally, humanistic logic emphasizes maintaining the essential educational values amidst technological advancements. It insists on transitioning from merely imparting knowledge to fostering comprehensive education that promotes lifelong learning and development. This balance ensures that while AI optimizes educational processes, the crucial human element in teaching is preserved.

As stated, AI has been shown to have the ability to reduce the working load of a teacher with the help of feedback, helping in planning, and helping student supervision. The significance

of these services to teachers was highlighted in multiple research (Ma et al., 2020). Thus, it could be argued that the AI systems for learning may offer the additional benefit of a decreased workload of teaching. Investigations found that teachers gained benefits from utilizing AI-based peer instructor recommender system, which resulted in saving of time for other tasks (Ma et al., 2020).

Further, AI has shown to empower teachers to choose or modify the most effective learning practice based on input from the AI system. In the study conducted by Bonneton-Botté et al. (2020), educators chose to incorporate activities, including letter and number writing, for pupils with limited graphomotor skills, depending on the input they received from AI (Bonneton-Botté et al., 2020). AI has also been shown to speed up the educational process by more fulfilling for teachers. According to teachers, AI-tutors enhanced their teaching experiences by alleviating boredom in the educational setting (McCarthy et al., 2016). Additionally, it has been discovered that algorithms based on AI are able to increase teacher-student engagement by collecting and examining reports from moments of productivity and monitoring student growth (Farhan et al., 2018).

Further, AI has shown to assist teachers by automating exams, scoring essays, and aiding in the evaluation of student performance. Research conducted by Yuan et al. (2020) demonstrated that a machine-learning essay evaluation program can enhance accuracy of essay scoring. Consequently, academics are surprised by utilization of AI abilities to understand automated systems (Yuan et al., 2020). AI-based systems are valuable for identifying similarity index in student essays, as highlighted by Dawson et al. (2020). Various current AI-driven tools, such as Turnitin, make the instructors able to verify the originality of essays handed in by students in advanced academic programmes (Alharbi & Al-Hoorie, 2020). This might be seen as a significant application of AI in evaluating students. Existing classroom video analysis (CVA) scoring

techniques can be used by natural language processing algorithms to identify teachers' verbal communication patterns when delivering instructional information to students. Moreover, the utilization of machine vision techniques can be employed to analyze teachers' video recordings and discern the recurring patterns in their body posture (Ozdemir & Tekin, 2016). These strategies have the potential to offer significant feedback to inexperienced teachers in order to enhance their teaching abilities.

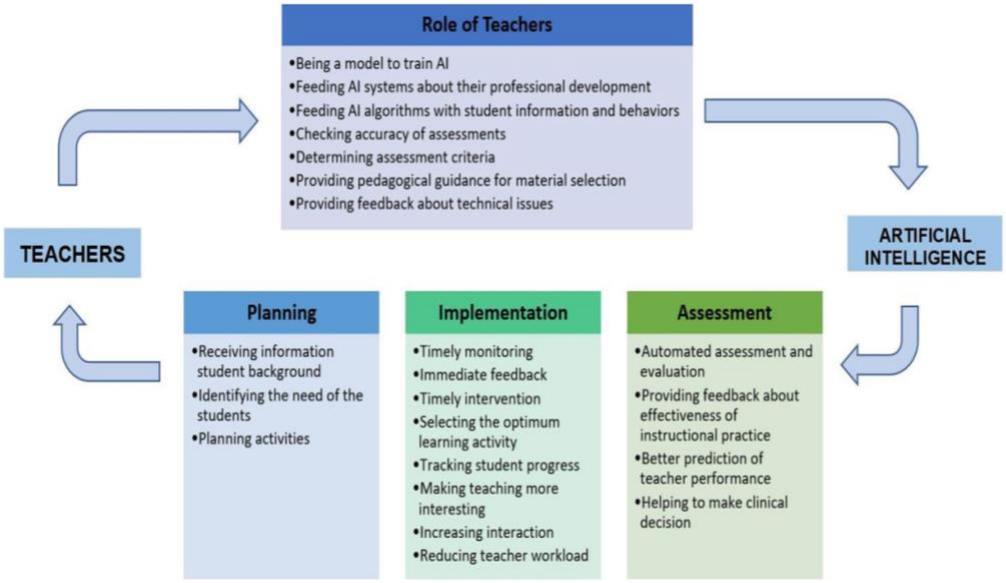
AI has also shown the potential to assist in evaluating the success of teachers' educational methods, as demonstrated by studies conducted by Farhan et al. (2018). Multiple data sources and AI can automatically model the pedagogically significant teaching elements of teachers (Dillenbourg, 2016). These approaches enable teachers to enhance their instructional practices. In addition, the pedagogically efficient models have the ability to instruct AI algorithms in order to enhance their complexity. In addition, AI technologies were employed to enhance the accuracy of predicting or evaluating instructor performance or outcomes. Researchers utilized machine learning methods to forecast the professional growth outcomes of the preservice or existing teachers, including course achievement. These techniques are advantageous in uncovering complicated and non-linear connections. Furthermore, Cohen et al. (2017) did an investigation comparing sample of students with autism disorder to a sample of individuals without the illness. The findings demonstrated that a machine learning technique can offer precise and insightful information for the diagnosis of autism spectrum disorder. During Cohen et al.'s study, teachers provided feedback regarding the precision of the instrument (Cohen et al., 2017).

In **Figure 1**, Celik et al., (2022) have shown the involvement of educators in AI research and highlighted benefits of AI for educators (Celik et al., 2022). This gives details on the

anticipated part of AI in education for both instructors and the potential prospects it presents for them.

Figure 1

80Intersection of AI and teacher roles



Note. Adopted from Celik, I. (2023). Towards Intelligent-TPACK: An empirical study on teachers' professional knowledge to ethically integrate artificial intelligence (AI)-based tools into education. Computers in Human Behavior, 138, 107468.

2.2.5. Challenges to Teacher Identity in the Age of Technology

Professional identities based on roles may play a crucial role in determining how teachers integrate technology into their teaching practices, as the adoption of technology represents significant shifts (Liu & Geertshuis, 2021). Individuals participate in acts that align with their sense of identity. When teachers accept technology, they engage in a process of making sense of it, seeking to find harmony and consistency between their current professional beliefs and the practices associated with technology (Avidov-Ungar & Forkosh-Baruch, 2018). Studies have

shown that a focus on the needs and preferences of learners has a positive and significant impact on teachers' intention to use technology for instruction. This is influenced by their perception of the usefulness and value of technology. On the other hand, a focus on the needs and preferences of teachers is associated with negative beliefs about the educational value of technology. According to Kimmerl (2020), instructors' views towards adopting a learning management system are influenced by their subject matter expertise and didactic expertise (Kimmerl, 2020). Additional research has shown that instructors who have broad perspectives on their role as educators are more inclined to embrace technology due to the increased sense of engagement it can provide (Simon, 2012). Role-based professional identities significantly influence teachers' teaching methods and their adoption of technology (Richter et al., 2021). These identities not only affect teachers' perceptions and rate of technology adoption but also impact how technology is integrated into their teaching practices.

The research on technology often fails to recognise the importance of the values component in shaping teacher identity. It has been observed that when teachers are required to embrace new technology, it might create a clash between their views on teaching and learning and their actual teaching methods (Westberry et al., 2015). This can result in teachers experiencing a sense of detachment, both in terms of their teaching methods and emotional connection. This can also apply to teachers who possess a strong sense of self-assurance. These examples demonstrate the overlapping of Henkel's three dimensions: disagreements about the interpretation of their beliefs and practices are frequently imbued with values and might impact one's self-esteem. Values also influence decisions regarding technology.

2.2.6. Impact of AI on Teacher Identity

The discussion surrounding AI in education is lacking in comprehensiveness if it fails to consider the viewpoint of the instructors, who are important to the educational process. Ferikoğlu & Akgün (2022) make a substantial contribution in this area by creating a scale designed to assess instructors' knowledge and views on AI technology. Their research provides insights into how educators, who are the main agents of learning, perceive and engage with AI in their professional environments. The research highlights the significance of providing educators with the essential information and abilities to effectively traverse the AI-enhanced educational landscape. This is achieved by increasing teachers' awareness (Ferikoğlu & Akgün, 2022).

A recent study examined the effects of AI on teacher identity and found that integrating AI into instructional practices had a substantial empowering influence on teachers' identity (Satvati et al.). This integration also shaped their identity across various ecological layers, including micro-pedagogical, meso-institutional, and macro-societal levels. Based on the data collected at the classroom level, the utilization of AI had a beneficial impact on the professional identity of teachers. It made them feel capable, valuable, and effective in their classes. The results demonstrated that the incorporation of AI prompted teachers to enhance their knowledge, so potentially boosting their self-assurance. This emotional experience, in turn, had a role in creating their professional identity. This is consistent with prior research that has demonstrated the influence of emotional experiences on altering long-term memory formation (Jeongyeon & Hye Young, 2020; Kamali & Nazari, 2023).

Furthermore, AI was discovered to be highly efficient in aiding teachers in their pre-class preparations. It might aid them in delivering feedback, providing additional resources and materials, which aligned with the findings of Ji et al. (2023) and resulted in participating teachers feeling more structured during class (Ji et al., 2023). The study suggests that AI apps have the

potential to assist instructors in problem-solving as well as decision-making processes. This finding supports the earlier research conducted which suggested that technological advancements can enhance problem-solving and decision-making abilities in the field of education (Mintz & Brodie, 2019). This work further contributed to the discussion by highlighting the potential of AI as a tool to support teachers and enhance their professional identity. At the micro-pedagogical level, there is a widely held idea that integrating AI into learning can have a significant impact on students' academic success. However, the study participants argued that AI should serve more as an assistant to teachers rather than learners. Language teachers reported a sense of accomplishment when they observed the learners' progress in the process of learning after incorporating AI into the classroom. These findings align with the study conducted by Srinivasa (2022), which suggests that artificial intelligence can be beneficial in enhancing educational outcomes for learners.

Additionally, the study found that AI has the potential to significantly enhance learners' autonomy, which has created worries among teachers regarding their job security and the possibility of being replaced by AI (Srinivasa et al., 2022). The results also uncovered certain concerns surrounding the utilization of AI by learners. Although AI might be beneficial for students, its use in education can also provide obstacles. This study identifies plagiarism and cheating as significant issues associated with the use of AI in the field of education. This could potentially lead to a change since it demonstrates a hesitancy to support the incorporation of AI as an aid in the self-directed learning process. AI integration at the meso-institutional level was successful when it was founded on parents' views and has support from the school. If parents and schools adopt a favorable stance towards the use of AI in education and provide comprehensive support to teachers in terms of pedagogy, technology, and finances, language instructors will effectively incorporate it into their lectures, resulting in increased efficiency and effectiveness.

The results corroborated the assertions made by another study, highlighting the beneficial influence of a technologically supportive school climate on teachers' concern towards technology (Bradley & Russell, 1997).

According to Luo and Xie (2018), AI has significantly enhanced teachers' relationships and interactions with their colleagues in schools. This is achieved by enabling the exchange of educational resources and enhancing teaching efficiency (Luo & Xie, 2018). As a result, teachers are able to develop their professional status and become more organized in their job performances. Nevertheless, it is widely acknowledged that in order to enhance the utilization of AI in instructional practices, it is imperative for instructors to stay informed and acquire confidence in technology usage. Professional development programmes can play a crucial role in achieving this. A study highlights the significant importance of 24 critical factors in reaching this outcome (Nazaretsky et al., 2022). Schools can potentially offer support in this specific area. The participants argued that teachers must expand their expertise in technology issues in order to attain a more advanced professional position. Nevertheless, offering these courses may result in expenses. The significant costs associated with setting up technical infrastructure such as the Internet, smart screens, software, and other necessary tools may hinder teachers from incorporating AI into their classrooms, thereby impacting their professional identity. These are the areas in which schools should offer support. At the sociocultural level, the results indicated that the integration of AI in education is necessary due to society's transition towards the technological era. Teachers must fulfil the demands of society, alternatively, they will be substituted by technology-focused individuals. Although it may appear unjust, this has a beneficial impact by motivating instructors to enhance their knowledge and understanding of AI, ensuring their longevity as language educators (Siu-Cheung et al., 2023).

AI can hasten the process of teacher transformation. However, the belief in the positive transformative impact may be more prevalent among teachers who have a strong enthusiasm for technology. Thus, despite the limitations and problems, teachers focused on AI are actively incorporating AI into their classes. They believe that AI brings more advantages than disadvantages (Steckman, 2020), and are persuading others in their professional network to adopt AI as well (Steckman, 2020).

2.3. Theoretical Review

The utilization of technology for educational purposes is not a recent concept. A century ago, Pressey and subsequently Skinner pioneered the development of teaching machines. Skinner (1958) provided a description of Pressey's machine, which involved posing questions and offering multiple potential replies for each inquiry. Participants were required to hit the button that corresponded to their chosen response (Skinner, 1958). If the individual selected the accurate response, a further question was presented, and this process continued consecutively. In the event of an incorrect answer, learners were required to select an alternative response until they identified the proper one. The machine designed by Skinner featured a tiny variation: instead of identifying the correct response from a set of options, learners were required to write it down. These exercises, designed within the framework of behaviorist learning, offer the advantage of providing rapid feedback after the user's response and presenting questions that are adjusted to the appropriate level of difficulty. The ultimate goal was to personalize education by accommodating the pace and requirements of each student.

Currently, learning technologies can manifest in several formats, including multimedia documents, films, and virtual reality. The goal is consistently to enhance educational circumstances. Technologies can assist teachers in facilitating the learning process by offering

content that adheres to specific design principles, such as the modality impact and the signaling or contiguity principles (Fiorella & Mayer, 2014). Furthermore, the technological constraints of the previous century are now obsolete. AI, specifically machine learning, is being increasingly utilized in the field of education. It has the capability to generate content such as summaries and subtitles for videos based on oral content (Cojean & Martin, 2021). Additionally, it can analyze various variables through a process known as learning analytics (Nguyen et al., 2020). At present, educational software programs can be seen as the logical progression of teaching machines, but they may not always adhere strictly to behaviorist teaching methods. These software programs are typically created to improve the development of a particular ability, such as drafting document summaries, numeracy, vocabulary learning, or implicit comprehension. They enable the consideration of individual characteristics and the customization of learning experiences. Therefore, they serve as a crucial educational tool that teachers can utilize. Nevertheless, a significant aspect to consider when examining the application of AI in education is the interaction between the instructor and the computer. Consequently, it is vital to conduct an investigation on the aim to utilize instructional technology that incorporates artificial intelligence.

Various acceptability theoretical frameworks, such as the Technology Acceptance Model (TAM) developed by Davis et al. in 1989, and the Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Venkatesh et al. in 2003, can be utilized to assess the acceptability of new technologies. Acceptability refers to the evaluation or judgement of a product or system before its actual use, as defined by Schuitema et al. in 2010. Several studies have utilized these models to evaluate the acceptability of AI in professional (Brundage et al., 2020) or educational settings (Cruz-Benito et al., 2019). These studies have utilized models originally designed for analyzing the adoption of specific products or systems, such as mobile apps, to assess

the acceptance of the broader idea of AI. Recent research, such as the study by Martin et al. (2020), has demonstrated that the traditional acceptability/acceptance models are still applicable to AI. These models consider various factors, such as performance and effort expectancy, social influence, and facilitating conditions, which are believed to influence the future use of technology. The study by Cruz-Benito et al. (2019) also discusses the significance of resistance to change, which is likely linked to the commonly expressed apprehension of machines overtaking humans (Cruz-Benito et al., 2019).

In exploring the intricate ways in which AI influences teacher identity, this study describes several relevant theoretical perspectives. At its core, the research is guided by an integrated theoretical framework that combines principles of Constructivism, Ecological Theory, TAM, SLT and Activity Theory. These theories collectively provide a comprehensive lens through which the impact of AI on teacher identity can be understood and analyzed.

2.3.1. Constructivism

In the theoretical expanse of this study, Constructivism serves as a foundational pillar, especially when examining the metamorphosis of teacher identity in the wake of AI's integration into educational practices. This educational philosophy, anchored in the works of Piaget and Vygotsky, posits that knowledge and identity are constructed through interactions with the environment and collaborative social engagement (Dennick, 2016; Vygotsky & Cole, 1978). In the context of AI's burgeoning role in education, Constructivism implicates a reconfiguration of the educators' role from knowledge disseminator to facilitator of learning experiences that are mediated by intelligent systems. Teachers within this constructivist framework are prompted to adapt their self-concept to accommodate the transformative agency of AI as they foster environments where technology augments the cognitive development of learners (Jonassen &

Rohrer-Murphy, 1999). The identity of the teacher thus becomes a dynamic construct, continually reshaped by the evolving pedagogical paradigms that AI technologies introduce. Promoting a shift from traditional didactic instruction to a more guided discovery and inquiry-based learning that constructivist theory advocates.

Moreover, as AI facilitates individualized learning trajectories, it inherently upholds the constructive standard of knowledge construction, being unique to each learner, thereby impacting the teacher's approach to instruction and their professional identity. Teachers' engagement with AI not only necessitates either definition of their professional roles, but also engenders a reflective practice pivotal in constructivist thought, leading to an ongoing refinement of identity as educators reconcile their established pedagogical beliefs with the novel, data-driven insights afforded by AI (Van Lankveld et al., 2017). This continuous interplay between technology, pedagogy, and identity emphasizes the need to explore how AI reshapes the teacher's sense of self, roles, and the associated pedagogical commitments, ultimately crafting an identity that aligns with the ideals of a constructivist, technologically augmented educational landscape.

2.3.2. Ecological Theory

Satvati (2023) applied ecological theoretical framework while studying the impact of AI on teacher identity of language teachers, drawing on Bronfenbrenner's ecological systems theory (Satvati et al.). This theory posits that human development is influenced by the interactions between individuals and their environments across multiple interconnected levels. In the context of this study, the ecological perspective serves as a lens through which to understand how the integration of AI in language education impacts teachers' identity formation. This framework operates across five main levels, each offering unique insights into the dynamics of AI adoption and its impact on teachers' professional identity formation.

At the micro-pedagogical level, the focus is on the immediate classroom environment and how AI integration influences teachers' professional identity. This level examines teachers' confidence, efficiency, and sense of worth in relation to their use of AI tools, emphasizing the emotional experiences of teachers as they navigate the integration of AI and its implications for their teaching practices. Moving to the meso-institutional level, attention shifts to institutional factors that shape AI integration in language education. This level explores school policies, support mechanisms, and organizational culture surrounding AI usage, investigating how these factors facilitate or hinder teachers' adoption of AI tools in their classrooms. Additionally, it examines how interactions with colleagues and supervisors influence teachers' perceptions of AI integration and their professional identity within the institution. At the macro-sociocultural level, the focus expands to broader societal trends and cultural attitudes towards technology adoption in language education. This level considers how societal perspectives on AI influence teachers' beliefs and behaviors, examining factors such as societal expectations regarding technological proficiency and their implications for teachers' motivations to integrate AI in their classrooms. Furthermore, it explores the role of societal norms and values in shaping teachers' professional identity in relation to AI integration (Satvati et al.).

2.3.3. Social Learning Theory

Originally conceptualized by Bandura, SLT posits that learning occurs within a social context and can happen purely through observation and instruction, even in the absence of motor reproduction or direct reinforcement (Bandura, 1977). This theory’s pertinence to the integration of AI in education lies in its emphasis on the observational learning and modeling that teachers engage in as they adapt to new technologies. As AI tools are increasingly deployed in classrooms, educators not only have to acquire new skills, but also have to reshape their professional identities

to include these competencies. The reciprocal determinism aspect of SLT, which suggests an interplay between a person's behavior, personal factors, and the environment illuminates how teachers' interactions with AI tools and their personal beliefs about teaching and technology influence their professional identity (Bandura, 1977).

Moreover, SLT underscores the concept of self-efficacy, which is crucial when considering the confidence with which teachers approach AI integration in their pedagogy. As educators observe their peers successfully implementing AI, their belief in their ability to do the same can increase thus fostering a more positive professional identity in relation to technology integration. The application of SLT to AI's impact on teacher identity also considers the role of vicarious experiences in shaping self-efficacy, where witnessing successful examples within a community of practice can enhance teachers' willingness to integrate AI into their pedagogy, thus shifting their identity. In this evolving educational landscape, teachers are, therefore, learners who refine their identity through the prism of SLT - by observing, imitating, and modeling, they align their sense of professional self with the competencies required for effective AI integration. This identity evolution is integral to the effective use of AI in education, as it is not only about the technology itself, but also about the educators' perceptions of their role and their adaptability to incorporate these advancements within their teaching practices. The social learning theory thereby offers a vital framework for understanding the complex dynamics of identity formation among teachers as they navigate through the transformative effects of artificial intelligence on educational methodologies and their own professional development.

2.3.4. Activity Theory

Originally developed by Lev Vygotsky and subsequently expanded by Aleksei Leont'ev and Yrjö Engeström, Activity Theory provides a robust theoretical framework for analyzing

human activities. It posits that human behavior and consciousness emerge from interactions within a cultural-historical context, mediated by tools and signs. Evolved through three generations, each adding layers of complexity and interaction between components of activity systems (Burner & Svendsen, 2020). Activity Theory offers a comprehensive lens through which to analyze the integration of artificial intelligence (AI) technologies in educational settings and their impact on teacher identities. Engeström's Third Generation of Activity Theory provides a particularly relevant framework for this study. It expands the analytical focus from individual to collective forms of work activities, introducing the concept of multiple interacting activity systems. This approach is essential for examining the systemic contradictions that arise from the integration of AI within the educational sphere. Engeström highlights that these contradictions are pivotal as they drive change and development within activity systems (Engestrom, 2000). For example, the introduction of AI can disrupt traditional teaching methods, which may lead to resistance or adaptation among educators.

In applying Activity Theory to the context of AI in education, it is important to consider the role of AI as a mediating tool. According to Engeström, tools in an activity system not only facilitate specific forms of activity but also influence the structure of the activity itself, potentially leading to new patterns of interaction and professional identities among teachers (Engestrom, 2000). This aspect of Activity Theory will guide the analysis of how AI tools are reshaping educational activities and teacher interactions within your research setting. Roger Barnard's application of Activity Theory to intercultural academic activities provides further insights into how this framework can be adapted to study the integration of AI in diverse educational contexts. Barnard's work focuses on how different academic communities negotiate and collaborate through

mediated activities, offering a valuable perspective on the potential of AI to foster collaborative educational environments across cultural and institutional boundaries (Barnard, 2010).

Therefore, this thesis will use Activity Theory to explore the dynamic and complex interactions between teachers, AI technologies, and the educational institution. It will particularly focus on the contradictions and tensions that emerge from these interactions, examining how they may catalyze changes in teachers' professional identities and teaching practices. The analysis will draw on empirical data to identify key instances of change and examine the underlying mechanisms through the lens of Activity Theory.

2.3.5. Technology Acceptance Model (TAM)

In this study, the TAM, as developed by Fred D. Davis in 1989, is instrumental in examining the factors influencing the adoption of artificial intelligence (AI) technologies in educational settings. TAM suggests that perceived usefulness and perceived ease of use are fundamental determinants in an individual's decision to embrace a technology (Davis, 1989). Perceived usefulness, as defined in the literature, is the degree to which an individual believes that using a specific technology will enhance their job performance. This notion is grounded in the expectancy theory of motivation, which asserts that individuals are likely to engage in behaviors that they perceive will result in outcomes that are valuable to them. In the context of my research, this involves determining whether teachers believe that AI tools will improve their teaching efficacy and subsequently enhance student learning outcomes.

Similarly, perceived ease of use refers to the degree to which a person believes that using a technology will be free of effort. This includes considerations of how simple the technology is to learn and to use on an ongoing basis. It is critical for my study to assess how seamlessly AI technologies can be integrated into teachers' existing workflows and whether the

straightforwardness of the technology influences their adoption decisions. Davis's seminal research underscores that perceived usefulness is a more significant predictor of technology acceptance than perceived ease of use, though both factors markedly influence user attitudes towards technology. He reported strong correlations suggesting that perceived usefulness is more closely associated with actual technology use (r=.85), while perceived ease of use shows a moderate correlation (r=.59) (Davis, 1989).

Utilizing TAM, my research aims to dissect how these perceived attributes—usefulness and ease of use - inform teachers' attitudes toward AI tools and their likelihood of integrating such technologies into their instructional practices. Understanding these dynamics is crucial for identifying the obstacles and opportunities that shape AI technology adoption in educational settings. The findings could provide valuable insights into where strategic interventions may facilitate more effective incorporation of AI tools in education.

2.4. Research Gap and Demarcation of Current Study

Research on the integration of AI by teachers is in its infancy. As stated before, studies suggest that two categories of elements play a crucial role: extrinsic factors, also referred to as first-order factors, and intrinsic factors, known as second-order factors (Ertmer, 1999). Extrinsic determinants encompass elements often associated with the subject and school culture, along with the accessibility of resources such as equipment, time, training, and support. Intrinsic factors pertain to teachers' attitudes and beliefs regarding change and the educational benefits of AI, their overall beliefs about teaching and learning, their confidence in their own technological literacy and relevant skills, and their knowledge and abilities in using AI for pedagogical purposes (Kim et al., 2013). These internal variables, including core beliefs about teaching and learning, can impede the adoption of AI and its incorporation into teaching practices, even after overcoming external

obstacles (Kim et al., 2013). While there's a growing focus on internal elements impacting teachers' acceptance of AI, previous studies have predominantly concentrated on teachers' perception of technical features, efficacy, attitudes, and beliefs towards AI (Celik, 2023). Understanding the impact of teachers' professional demands and beliefs on their profession remains underexplored. Recognizing teachers' participation in professional and social communities and examining teachers through the lens of their professional identity could offer a more comprehensive approach to understanding how teachers adopt AI.

Not only this, but a comprehensive review of literature also shows that there is a dearth of research on the impact of AI on teacher identity. As AI technologies infiltrate classrooms, they don't merely augment teaching practices; they redefine them (Celik et al., 2022). AI technologies reshape traditional teaching roles, and it is critical to understand how this transformation affects teachers' sense of professional identity (Onesi-Ozigagun et al., 2024). By focusing on this, we can identify the specific professional development needs arising from AI integration, ensuring that educators are equipped with the skills and knowledge necessary to employ these technologies effectively while preserving their autonomy and expertise. Without a deep understanding of how AI alters teacher identity, we risk undermining the integrity of the profession, diminishing the vital human element in education.

Moreover, exploring the ethical implications of AI in education and its influence on student-teacher dynamics can inform the development of policies and guidelines that promote responsible AI use and safeguard the integrity of the teaching profession. Therefore, this study will extensively examine the impacts of AI on teacher identity. Further, the study will investigate the multidimensional impact of AI on teacher identity within the realm of higher education. Specifically, this research seeks to explore how the integration of AI tools and technologies

influences the professional roles, perceptions, and interactions of educators. This would be implemented with the incorporation of technology acceptance model related in the research instrument to base our study on the perceived usefulness and other TAM parameters for better theoretical underpinnings of this study. Further the research would incorporate the ecological perspective to study the confounding parameters on the impact on teacher identity. By examining various dimensions of AI usage, including familiarity, perceptions, and usage patterns, this study aims to understand the ways in which AI shapes teachers' identities, their pedagogical practices, and their sense of belonging within the academic community. Moreover, this research endeavors to identify potential challenges and opportunities associated with AI integration in education and assess its alignment with institutional values and priorities. Through a comprehensive examination of teachers' experiences, perceptions, and reflections, this study ultimately tries to understand link between AI and teacher identity, thereby informing strategies for effective AI adoption and supporting the professional development and well-being of educators in digital age.

2.5. Research Questions

The proposed research is designed to address the relationship between the integration of AI technologies into educational settings and its impact on teachers' professional identity. Therefore, the research intends to determine the following:

1) How and what aspects of teacher identity are influenced by AI integration?
2) How does the level of AI familiarity among teachers influence teachers' perception of their professional identity within teaching practices?

3) How do perceptions of ease of use and usefulness, as outlined in the Technology Acceptance Model (TAM), influence teachers' attitudes towards adopting AI technologies in their teaching practices?

4) Is there a significant relation between teachers' demographic characteristics (age, teaching experience, education level, digital competency) and their attitudes towards AI? How do these factors influence their professional identity?

2.6. Research Hypothesis

Simultaneous with the research questions, the alternative hypotheses are as follows:

1) There is a positive impact of AI integration on teacher identity.

2) There is a positive relationship between AI familiarity and teachers' perception of impact of AI on their professional identity

3) Teachers who perceive AI technologies as easy to use and useful are more likely to have a positive attitude towards adoption and integration of AI in their teaching practices.

4) There is a significant correlation between teachers' demographic characteristics and their attitudes towards AI, such that younger age and greater digital competency are associated with more positive attitudes towards AI and a stronger influence on their professional identity.

The corresponding null hypotheses are as follows:

1) AI integration does not influence teachers' identity in a positive way.

2) The level of AI familiarity among teachers does not influence their perception of professional identity within teaching practices.

3) Perceptions of ease of use and usefulness of AI technologies, as outlined in the TAM, do not influence teachers' attitudes towards adopting AI technologies in their teaching practices.

4) Teachers' demographic characteristics (age, teaching experience, education level, digital competency) do not relate to their attitudes towards AI and do not influence their professional identity.

CHAPTER 3: METHODOLOGY

3.1. Introduction

The study methodology section provides a comprehensive description of the approach and procedures employed to accomplish the research objectives stated in the preceding chapter. This chapter offers an overview of the research paradigm, including research design, research strategy, and research methods. In addition, the chapter provides a thorough examination of the data collection process, which encompasses information on procedures for selecting samples, determining sample size, formulating questionnaires, achieving response rates, and utilizing data processing tools and statistical methodologies for data analysis. Furthermore, the chapter addresses concerns regarding the validity and reliability of the study.

3.2. Research Design

This section outlines the research design, offering a clear understanding of the technique and procedures employed to accomplish the research goals. Comprehensive descriptions of data collecting methods clarify the specific ways and sources from which the information will be obtained. Creating a comprehensive strategy for collecting relevant data to answer the research inquiries is an essential stage in the research procedure. A research strategy should clearly outline the approach that the researcher intends to use for data collection, including the recommended methods and tools (Salkind, 2010).

3.2.1. Sample

This study targets language instructors at TOBB University of Economics and Technology. A sample of 52 instructors, aged between 24 to 56 years, were selected, representing various

language departments. Thirty-seven participants were native Turkish speakers with at least C1 level English proficiency according to the Common European Framework of Reference for Languages, two were British, and the remaining eleven were American. The participants' diverse linguistic, cultural, and educational backgrounds provide a rich tapestry of experiences and insights. Their varied experiences encompass a broad spectrum of teaching practices, curriculum designs, and technological proficiencies. This ensures the study captures multiple viewpoints and experiences, offering a comprehensive perspective on how AI is perceived and integrated into the professional identities of instructors.

Table 1 shows the age distribution of survey respondents. The majority of respondents fall within the range of 30-39 age, representing 62.5 % of the sample. Among the total sample, 18.8% of the sample are young teachers within the range of 20-29 years, indicating a demographic which is more accustomed with modern technological advancements due to their digital built-in characteristics. Similarly, the groups having ages from 40-49 and above 50 represent less number signifying high levels of teaching experience.

Table 1

Age distribution of respondents

Age Range	Frequency	Percentage
20-29	6	18.8
30-39	20	62.5
40-49	5	15.6
50 & Above	1	3.1
Total	32	100.0

A significant representation of mid-career educators having 10-14 years of teaching experience represents 50% of the sample. Teachers with 5-9 years of experience contain 18.8% of studied sample are in the stages of their early to mid-career. Early-career educators having 0-4

years of experience represent 12.5%, routing initial years in the profession along technology integration. Expert teachers having experience of 15-19 and 20+ years establish 9.4% and 9.4%, respectively

Table 2

Teaching experience of respondents

Years Range	Frequency	Percentage	Cumulative Percentage
0-4	4	12.5	12.5
05-09	6	18.8	31.3
10-14	16	50	81.3
15-19	3	9.4	90.6
20+	3	9.4	100
Total	32	100	

Table 3 shows the educational level of respondents. The majority of respondents held a master's degree having proportion of 75% of total studied sample. A smaller ratio of respondents holds either a Bachelor's degree (12.5%) or a Ph.D. (12.5%).

Table 3

Education level of respondents

Education Level	Frequency	Percentage	Cumulative Percentage
Bachelor	4	12.5	12.5
Master	24	75	87.5
PhD	4	12.5	100
Total	32	100	

Table 4 shows the gender distribution among the participant teachers. A significant representation *i.e.* 71.9% was from female teachers. Male respondents were 28.1% of total respondents. **Figure 2** shows the summary of the demographic characteristics of the respondents in this study.

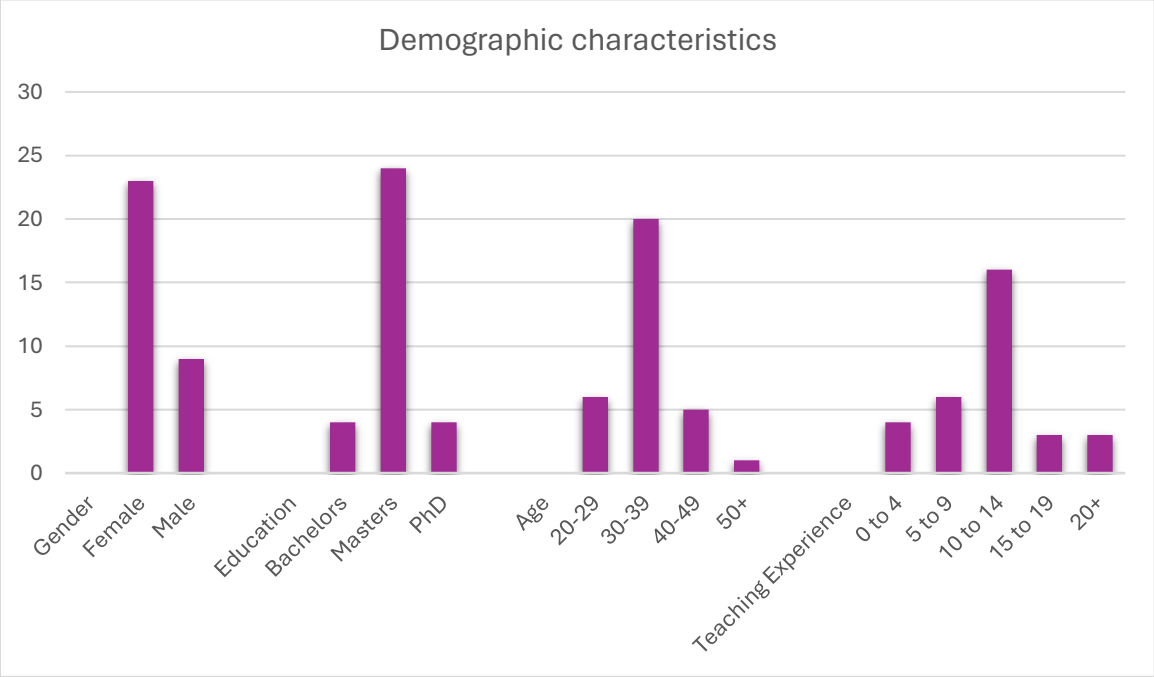
Table 4

Gender distribution of respondents

Gender	Frequency	Percentage	Cumulative Percentage
Female	23	71.9	71.9
Male	9	28.1	100
Total	32	100	

Figure 2

Demographic characteristics of respondents.



3.3. Materials

3.3.1. Data Instrument and Variables

To assess language instructors' familiarity and proficiency with AI, a tailored questionnaire was developed due to the absence of existing validated scales directly addressing this focus. The instrument comprehensively evaluates instructors' comfort levels, proficiency in using AI tools, and how these factors impact their identities, ensuring that the evaluation aligns with the study's

objectives. The questionnaire used as the data collection instrument in this study is composed of 5 parts (Please see **Appendix A**).

1. Consent Form and Demographic Information: The first section included a detailed consent form and questions regarding demographic characteristics such as age, gender, years of teaching experience, and education level. This contextual data helps identify patterns within subgroups and provides a basis for further analysis.
2. Digital Competency: In this section, the e-DigCompEdu Reference Framework (Reference Framework for Teaching Digital Competences in Online Higher Education) was employed to assess the digital literacy of educators. This framework provides a holistic assessment of digital competency across different domains. Digital competence was evaluated using 14 items designed to gauge teachers' proficiency and comfort with digital tools and technologies. Each item was rated on a 5-point Likert scale, with responses ranging from 1 (strongly disagree) to 5 (strongly agree).
3. Attitudes and Familiarity with AI in Education: The Technology Acceptance Framework was used to analyze instructors' attitudes toward AI adoption or resistance. It examined frequency, perceived usefulness, ease of use, and general attitudes toward integrating AI into teaching practices, providing insight into the motivational factors influencing their acceptance or resistance. AI familiarity was measured through 5 items that assessed the respondents' knowledge and awareness of AI technologies. Each item was rated on a 5-point Likert scale, similar to the digital competence items.
4. Impact of AI on Teacher Perceptions: A Likert-scale questionnaire assessed the perceived effects of AI on professional identity and teaching practices. This part examined shifts in

pedagogical strategies, assessment methods, and perceived challenges or advantages stemming from AI adoption.

5. Open-Ended Questions: The final section included five open-ended questions to capture more subtle responses about teachers' perceptions of AI. These questions aimed to explore thoughts, ideas, and attitudes that may not be covered in the structured questions, offering richer insights into how AI is perceived within the teaching profession.

After developing the questionnaire in Microsoft Forms, it was piloted electronically with 11 instructors who would not participate in the main data collection phase. These pilot participants completed the questionnaire and provided detailed feedback on the questionnaire's structure, clarity, relevance, and comprehensiveness. Based on this feedback, the questionnaire was refined and validated through consultation with four university researchers. They completed a survey evaluating the instrument's clarity, relevance, and accuracy in capturing the intended constructs. After incorporating the researchers' feedback, further refinement was applied to improve the questionnaire's validity and reliability. Issues related to ambiguity, redundancies, and technical terminology were addressed to ensure that questions were clear and accessible to all participants. A random sampling methodology was employed to distribute questionnaire and 32 valid responses were included in the final assessment in this research.

3.4. Procedure

The questionnaire for this study was delivered electronically to respondents using Microsoft Forms. The data collection for this study was conducted using convenience sampling due to the ease of access to potential respondents. The process began by distributing a link to the

electronic questionnaire via email chain to the instructors of the Foreign Language Department instructors at TOBB University.

The survey was sent out on April 24, 2024, and was open for responses for a period of above two weeks, concluding on May 12, 2024. Out of the 52 recipients, 32 instructors responded, resulting in a response rate of approximately 61.54%. On average, respondents took 21 minutes to complete the questionnaire.

3.5. Data Analysis

After gathering the data, the analysis was conducted according to the study questions and objectives. The subsection 3.5.1. will focus on Primary Data Analysis, highlighting the importance of collecting firsthand information through surveys and in-person observations to address research objectives. This subsection will be followed by a detailed examination of Mixed Methods Analysis, which combines quantitative and qualitative tools to provide comprehensive understanding of the data.

3.5.1. Primary Data Analysis

The information gathered especially for a research topic, usually through surveys or in-person observations, is known as primary data. Secondary data is defined as pre-existing data that has been gathered by previous researchers. It can manifest as published synopses, academic literature, official reports, or population statistics. In order to achieve the objectives and address the research inquiries of the study, it is vital to get primary data. Nevertheless, secondary evidence, such as literature reviews, holds similar importance in laying the groundwork and constructing the conceptual framework (Rabianski, 2003).

3.5.2. Mixed Methods Analysis

The utilization of both quantitative and qualitative tools and methodologies for gathering, analyzing, and presenting data is referred to as the adoption of the mixed method (Byrne & Humble, 2007). This technique can leverage the unique and situational understanding offered by qualitative data, while also making broad generalizations based on that understanding. Combining quantitative and qualitative methods can yield study findings with solid, trustworthy evidence while also mitigating the drawbacks of each methodology (Tashakkori & Creswell, 2007). Thus, this study employs a mixed-method approach, commencing with a sequential design that begins with quantitative inquiry. The study employs a cross-sectional survey design to capture the data at a single point in time, offering insights into the current state of affairs. This approach is particularly suitable for establishing relationships between variables, allowing researchers to determine the nuanced ways in which AI influences instructors' professional identities. The study uses the quantitative component to assess digital competency, AI familiarity, and perceived impact through structured questions, while the qualitative component explores open-ended responses to gain deeper insights into instructors' thoughts and feelings.

The mixed-methods approach ensures that the analysis is comprehensive and multidimensional. Quantitative data provides a broad overview, while qualitative responses allow the research to explore complexities and contradictions. This combination enhances the validity of the findings and creates a well-rounded understanding of the intersection between AI technology and professional identity. By capturing the educational landscape shaped by AI integration, the study offers vital information for educational policy-makers, curriculum designers, and educators themselves.

3.5.2.1. Qualitative Data Analysis

The statistical package for the social sciences (IBM-SPSS®) (version 25.0) was used for statistical analysis. Descriptive (frequency, percentage, mean, and standard deviation) and inferential analysis i.e. ANOVA were used in this study. The data analysis began with descriptive statistics to provide an overview of the demographic characteristics of the sample, including age, gender, educational level, and teaching experience. This initial step was crucial for understanding the composition of the participant pool and contextualizing the subsequent analysis. Descriptive statistics were also employed to get a primary understanding of the data patterns of the main questionnaire administered. To assess the normality of the data distributions, the Kolmogorov-Smirnov and Shapiro-Wilk tests were employed. These tests are standard procedures in statistical analysis to determine whether the data follow a normal distribution, which is a prerequisite for many parametric tests. Following the tests of normality, Spearman's correlation was utilized to explore the relationships between the key variables: digital competence, AI familiarity, technology acceptance, AI usage, and teacher perceptions. This analysis provided insights into how familiarity with AI correlated with teachers' professional identities and their perceptions of AI in the educational field. To further elucidate the impact of AI familiarity on teachers' professional identity, a multiple regression analysis was conducted. This technique allowed for the examination of the predictive power of AI familiarity on professional identity, while controlling for other variables such as digital competence and technology acceptance. The regression model included AI familiarity as the independent variable and professional identity as the dependent variable. Additional variables such as age, gender, educational level, and teaching experience were included as control variables to account for their potential confounding effects.

3.5.2.2. Qualitative Data Analysis

For qualitative data analysis, NVivo 14 software package was employed. The thematic analysis involved coding the open-ended responses and grouping them into coherent themes, helping identify patterns related to the impact of AI on teaching practices, attitudes, and identity. For coded networking Atlas.ti was employed. The research design integrates both data streams to derive a holistic understanding of the phenomenon, ensuring that the quantitative results are contextualized by qualitative insights and vice versa.

CHAPTER 4: RESULTS

4.1. Introduction

This chapter presents the results of the quantitative as well as qualitative analysis conducted to investigate the impact of AI familiarity on teachers' professional identity. The chapter is organized into several sections. First, it details the demographic characteristics of the respondents, providing insights into their age, gender, educational levels, and teaching experience. This demographic information is crucial for understanding the context and generalizability of the findings. Next, the chapter describes the analysis of the key variables, including digital competence, AI familiarity, technology acceptance, AI usage, and teacher perceptions. Statistical methods, such as descriptive statistics, tests of normality, linear regression and multiple regression analysis are employed to study the associations between these variables and tests hypothesis.

4.2. Quantitative Analysis

4.2.1. Descriptive Statistics

The descriptive statistics analysis provides a basic understanding of the digital competence, AI familiarity, technology acceptance, AI usage, and teacher perceptions among the studied teachers. These comprehensions are vital for contextualizing the following analyses and interpreting the data accordingly.

4.2.1.1. Digital Competence

The digital competence of respondents was measured through 14 well-construct questionnaire items, illustrating a mean score of 2.888 with a standard deviation of 0.695 (**Table 5**). This indicates moderate digital competence levels among teachers. Individual item scores varied, with some items indicating higher competence having mean score of 3.69 and others with lowest mean score of 1.94. Skewness and kurtosis diverse across items, telling divergent allocations from symmetrical to slight skew.

Table 5

Descriptive Statistics of Digital Competence

Digital Competence (N=32)	Mean	Std. Deviation	Skewness	Kurtosis
I use different digital channels to communicate with learners and colleagues	3.47	1.047	-0.182	-0.378
I use digital technologies inside and outside my educational organization	3.37	1.008	0.567	-0.755
I actively develop my digital competence for teaching	3.69	1.148	-0.561	-0.592
I am aware of and participate in online training opportunities	3.03	0.897	-0.064	-0.355
I use different internet sites and search strategies to find and select a range of different digital resources	3.28	0.813	0.194	-0.288
I carefully consider how, when, and why to use digital technologies in classroom with my learners	2.94	0.914	0.941	0.43
I use digital technologies to allow learners to plan, document and monitor their learning themselves	2.69	1.203	0.179	-0.909
I use digital assessment tools to monitor student progress	2.13	1.157	0.541	-1.175
I use digital technologies for learners to actively participate in class or online learning	3.31	1.03	0.069	-0.331
I teach students how to assess the reliability of information	3.19	1.256	0.457	-1.488
I set up course tasks which require learners to create digital content	2.84	0.92	-0.203	0.423
I encourage learners to use digital technologies creatively to solve concrete problems	2.37	1.04	0.999	0.983
I find and use open licenses in digital resources	2.19	1.148	1.245	0.836
I adopt open educational practices in my teaching in order to make it more inclusive	1.94	0.948	0.857	0.011

4.2.1.2. AI Familiarity

The AI familiarity of teachers was assessed through 5 items, with an overall mean score of 4.0375 and a standard deviation of 0.60841, demonstrating a high level of AI familiarity (**Table 6**). Scores ranged from 2.40 to 5.00 across items, with varying degrees of Skewness and kurtosis.

This endorses that teachers generally have a notable level of familiarity with AI technologies, although there is some inconsistency among specific facets of AI.

Table 6

AI Familiarity among respondents

AI Familiarity (N=32)	Mean	STD	Skewness	Kurtosis
I understand the basic principles of AI	4.56	0.564	-0.834	-0.282
I am aware of various AI tools and applications available for educational purposes	4.38	0.554	-0.076	-0.848
I regularly keep myself updated on new AI technologies relevant to education	3.56	1.045	-0.448	-0.234
I enjoy exploring and experimenting with AI tools	4.16	0.767	-0.738	0.58
I believe my current level of AI knowledge is sufficient to effectively integrate AI into my teaching	3.53	1.016	-0.287	-0.998

4.2.1.3. Technology Acceptance Model

The data represents scores for items related to TAM among surveyed teachers. On average, teachers mean scored is 4.1531 with a standard deviation of 0.72423, representing an encouraging attitude towards technology acceptance (**Table 7**). Scores ranged from 2.10 to 5.00 across items, showing changeability in opinions of ease of use and usefulness. Skewness and kurtosis values advocate a normally stable range with minor deviations from normality. This data imitates a satisfactory temperament among teachers towards accepting technology in their teaching job.

Table 7

Technology Acceptance Model Factor

TAM Framework (N=32)	Mean	Std. Deviation	Skewness	Kurtosis
Using AI in my work helps me accomplish tasks more quickly	4.31	0.78	-1.063	1.014
Using AI improves my work performance	4.09	0.995	-1.244	1.74
Using AI improves my work productivity	4.19	0.78	-0.784	0.499

Using AI enhances my effectiveness at work	4.16	0.808	-0.692	0.059
Using AI makes it easier to do my work	4.31	0.859	-1	0.089
I find AI useful in my wok	4.28	0.851	-0.93	0.032
Learning to use AI has been easy for me	4.16	0.847	-0.994	0.854
I find it easy to get AI to do what I want it to do	3.97	1.062	-1.141	0.927
It is easy for me to become skillful at using AI	4	0.916	-0.538	-0.531
I find AI easy to use	4.06	0.982	-0.786	-0.333

4.2.1.4. AI Usage

The data provides opinions into AI usage amongst surveyed teachers through personal and professional settings. On average, teachers recorded 2.615 with a standard deviation of 0.884, specifying a moderate level of AI usage (**Table 8**). Scores diverse across items, with higher means scores 3.41 for personal AI usage compared to professional AI usage ranging from 1.53 to 3.56. Skewness and kurtosis values propose a commonly composed sharing with slight deviations from normality. This data shows that teachers involve more with AI in personal settings than in their professional roles, underlining prospective regions for further examination and support in incorporating AI into teaching field.

Table 8

AI Usage

AI Usage (N=32)	Mean	Std. Deviation	Skewness	Kurtosis
How often do you use AI tools for personal purposes	3.41	1.365	-0.481	-0.98
How often do you use AI tools for Automated Grading	1.53	0.915	2.191	5.655
How often do you use AI tools for Automated Feedback	1.78	0.975	1.362	2.17
How often do you use AI tools for Develop Material	3.56	1.216	-0.556	-0.61
How often do you use AI tools for Create Assessment	2.59	1.478	0.252	-1.381
How often do you use AI tools for Prepare Presentations	2.25	1.107	0.532	-0.379
How often do you use AI tools for Professional Development	2.97	1.555	-0.055	-1.534
How often do you use AI tools for Prepare Lesson Plan	2.22	1.497	0.832	-0.85
How often do you use AI tools for Other professional purposes	3.22	1.996	-0.244	-2.053

4.2.1.5. Teacher Perceptions

The data mirrors teachers' opinions through several aspects, with scores ranging from 1 to 5. On average, teachers scored 3.272 with a standard deviation of 0.548, showing a usually positive insight among the surveyed teachers. The Skewness and kurtosis values advocate a slightly negatively skewed distribution with a moderate peak. Individual item mean scores varied, with some items scoring higher 3.81, demonstrating stronger positive views, while others scored lower (e.g., 2.56) indicating comparatively weaker perceptions (**Table 9**). Especially, item 5 had the lowest score of 2, specifying that all teachers ranked this characteristic positively. Generally, the data proposes that teachers usually have positive opinions across the surveyed facets, though there are dissimilarities in the strength of these opinions across items.

Table 9

Teacher Perceptions of Impact of AI on their identity.

Teacher Perceptions (N=32)	Mean	Std. Deviation	Skewness	Kurtosis
Do you believe AI tools have improved the quality of your interactions with students	3.03	1.092	-0.382	-0.269
Do you believe AI tools have hindered the quality of your interactions with students	2.56	1.105	0.52	-0.192
Do you feel that AI technologies has contributed to your professional growth as a teacher	3.81	1.061	-1.158	1.465
Does the use of AI align with your department's values and priorities regarding teaching	3.56	0.982	-0.95	1.359
Do you feel that AI tools support or undermine the recognition of teaching excellence in your department	3.44	0.759	-0.011	-0.188
Has the use of AI in your teaching affected how valued or recognized you feel as an educator	3.03	0.999	0.348	-0.271
Do AI tools help you feel more connected to your colleagues and students	2.63	1.008	0.038	-0.186

Has integrating AI into your teaching affected your confidence in your teaching abilities	3.47	0.95	-0.868	1.358
Do you think AI tools aid in recognizing and showcasing teaching excellence	3.37	1.008	-0.239	-0.3
Do you believe advancements in AI technology have influenced your vision of your future career path in education	3.81	0.965	-0.748	0.893

4.2.2. Hypothesis Testing

The hypothesis testing aims to explore the relationship between the Impact of AI on Teacher Identity within teaching practices. The above table shows that teachers' perception of impact of AI on their professional identity is somewhat positive. It shows that overall teachers consider that integration of AI in their educational practice has a positive impact on their identity as a teacher based on van Lankveld's explanation of the main components of teacher identity. However, items 2 and 7 have shown a moderate impact. Item 2 pertains to the question of whether AI tools have hindered the quality of interactions with students, indicating that teachers have mixed feelings about AI's effect on their interactions with students. Item 7 relates to whether AI tools help teachers feel more connected to their colleagues and students, suggesting that AI tools moderately enhance the sense of connection among teachers and students. The following sections will describe in detail the data analysis to test the hypotheses of this research.

4.2.2.1. Hypothesis H_2

Initially, the hypothesis testing aims to explore the association between teachers AI familiarity and their professional identity within teaching practices.

Tests of Normality

The normality of the data was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The results are presented below:

Table 10

Test of normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Teacher Perception	0.158	32	0.041	0.935	32	0.054
AI Familiarity	0.129	32	0.193	0.956	32	0.219

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

The tests indicate that the data for Teacher Perception is marginally significant (p =.041) in the Kolmogorov-Smirnov test but not significant (p =.054) in the Shapiro-Wilk test. For AI Familiarity, the data does not violate normality assumptions (p > .05). The Q-Q plot indicates that the residual is normally distributed as shown in **Figure 3** for Teacher Perception and in **Figure 4** for the AI Familiarity and meeting homoscedasticity and multivariate normality.

Figure 3

Q-Q Plot for normality test of Teacher Perception

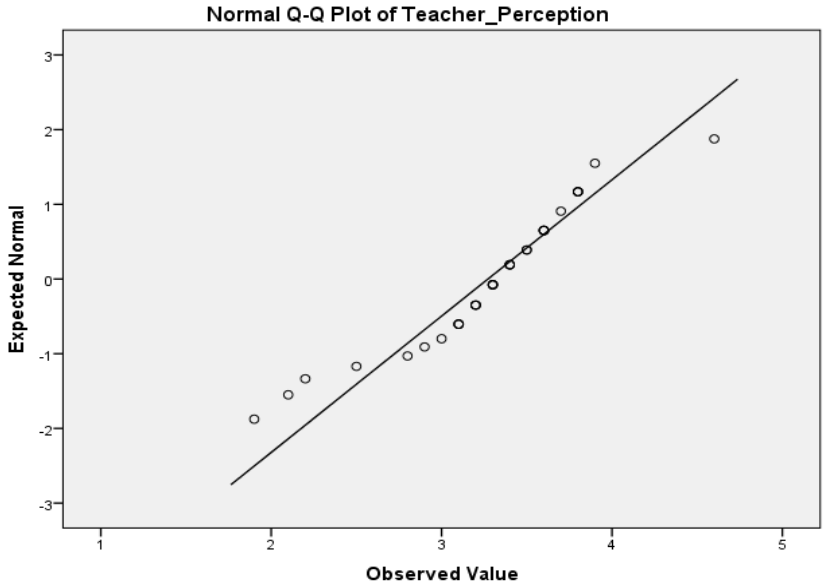
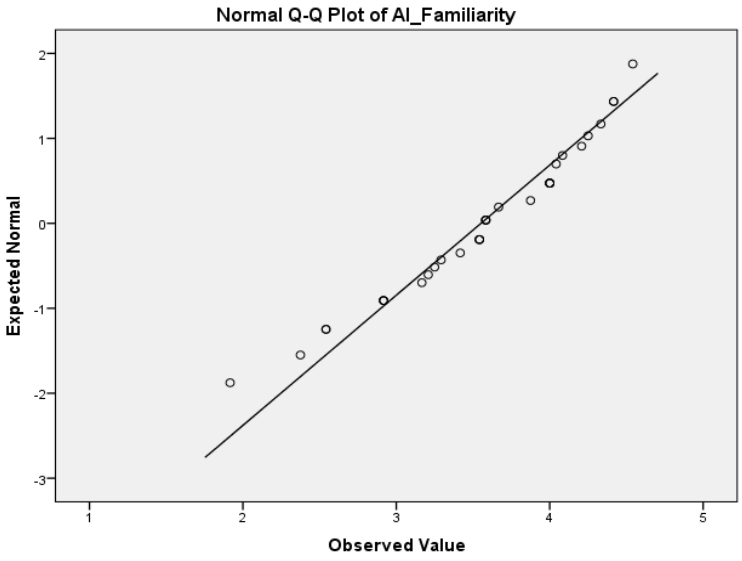


Figure 4

Q-Q Plot for normality test of AI Familiarity



Regression Analysis

The hypothesis tests provide that there is a positive relationship between AI familiarity and teachers' perception of the impact of AI on their professional identity. The dependent variable Teacher Perception was regressed on the predictor variable AI Familiarity to test hypothesis H_2. AI Familiarity significantly predicted Teacher Perception, $F(1, 30) = 10.920$, $p = 0.002$, indicating that AI Familiarity plays a significant role in shaping Teacher Perception ($\beta = 0.517$, $p = 0.002$). These results evidently exhibit the positive effect of AI Familiarity. Moreover, $R^2 = 0.267$ indicates that the model explains 26.7% of the variance in Teacher Perception. Table 11 shows the summary of findings (**Table 11**).

Table 11

Summary of Regression Analysis of H_2

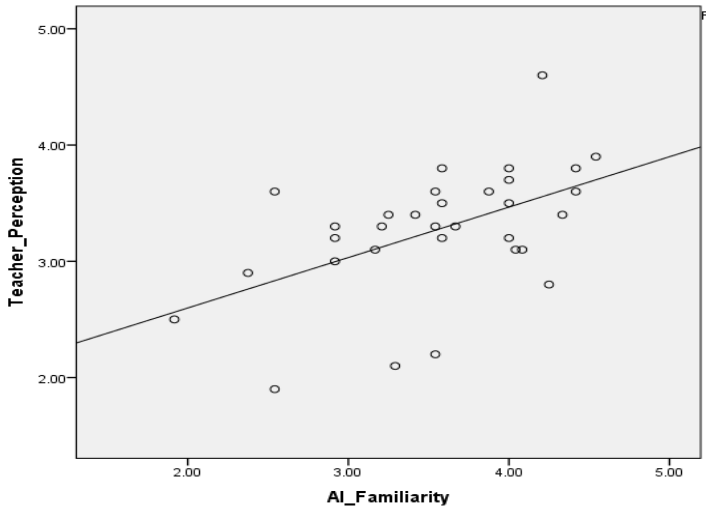
Hypothesis	Regression Weights	β	R^2	F	p-value	Hypotheses Supported

H_1	*AI Familiarity-Teacher Perception*	.517	.267	10.920	.002	Supported

The scatter plot demonstrates the relationship between AI Familiarity and Teacher Perception, and this indicates moderate correlation between AI Familiarity and teacher perceptions as shown in **Figure 5.**

Figure 5

AI Familiarity Vs. Teacher Perception



Overall, the analysis results show that as teachers advance with AI technologies, they are more likely to progress a positive professional identity within their teaching practices. Hence, the study findings support the hypothesis H_2 and focus the possible advantages of AI familiarity for professional development of teachers and their teaching practices.

4.2.2.2. Hypothesis H_3

In next step, H_3 i.e. Teachers who perceive AI technologies as easy to use and useful are more likely to have a positive attitude towards adoption and integration of AI in their teaching practices were assessed through multiple linear regression. Detailed analysis is described below:

Tests of Normality

The normality of the data was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The tests indicate that the data for Teacher Perception is marginally significant (p = .041) in the Kolmogorov-Smirnov test but not significant (p = .054) in the Shapiro-Wilk test. For Ease of Use and Usefulness, the data does not violate normality assumptions (p > .05). The observed Q-Q plot displays that the data is almost normally distributed and satisfied normality assumption for the variables Ease of Use and Usefulness, as indicating in **Figure 6** and **Figure 7.**

Figure 6

Q-Q plot of EaseofUse Normality

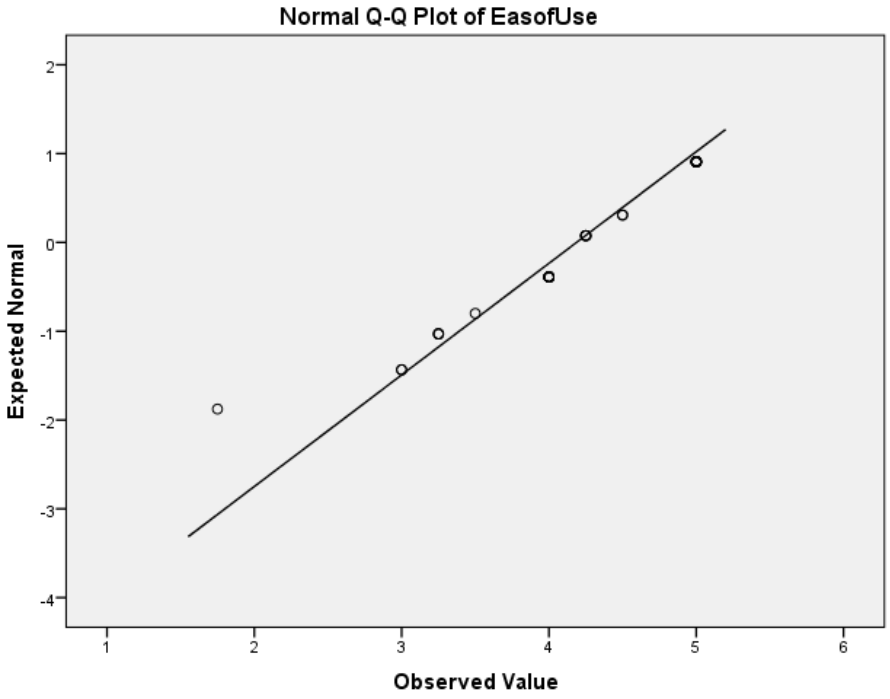
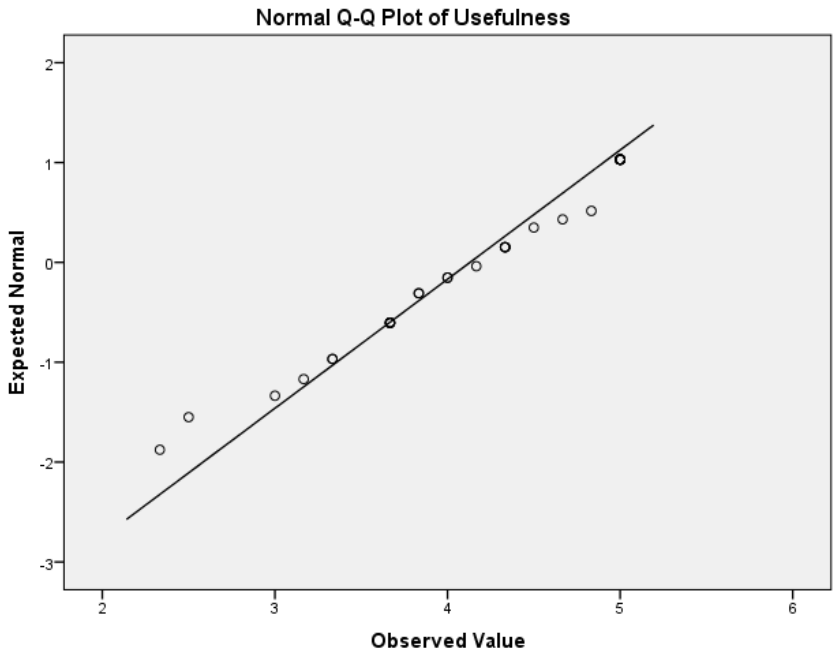


Figure 7

Q-Q plot of Usefulness normality



Multiple Regression Analysis

A multiple regression analysis was conducted to examine the association between teachers' perceptions of the ease of use and usefulness of AI technologies (independent variables) and their attitudes towards the adoption and integration of AI in teaching practices (dependent variable). The analysis results indicate that perceived usefulness of AI technologies significantly predicts teachers' positive attitude towards adoption and integration of AI in their teaching practices, while perceived ease of use does not. The dependent variable Teacher Perception was regressed on the predictor variables Usefulness and Ease of Use to test hypothesis H_3. The overall model was significant, $F(2, 29)=8.749$, $p=0.001$, with $R^2=0.376$, showing that 37.6% of the variance in Teacher Perception is explained by the model. Usefulness significantly predicted Teacher Perception ($\beta = 0.468$, $p = 0.031$), whereas Ease of Use did not ($\beta = 0.186$, $p = 0.374$). **Table 12** shows the summary of multiple regression analysis findings.

Table 12

Summary of Multiple Regression Analysis of H_3

Variable	Beta	SE	95.0% CI		β	R^2	F	t-Value	p-Value
			LL	UL					
(Constant)	1.366	.468	.408	2.323		.376	8.749	2.916	.007
Ease of Use	.128	.142	-.162	.419	.186			.903	.374
Usefulness	.331	.146	.032	.630	.468			2.265	.031

The scatter plot as shown in **Figure 8** and **Figure 9** indicates a moderate correlation between Ease of Use and Teacher perception and Usefulness and Teacher perception.

Figure 8

Usefulness Vs Teacher Perception

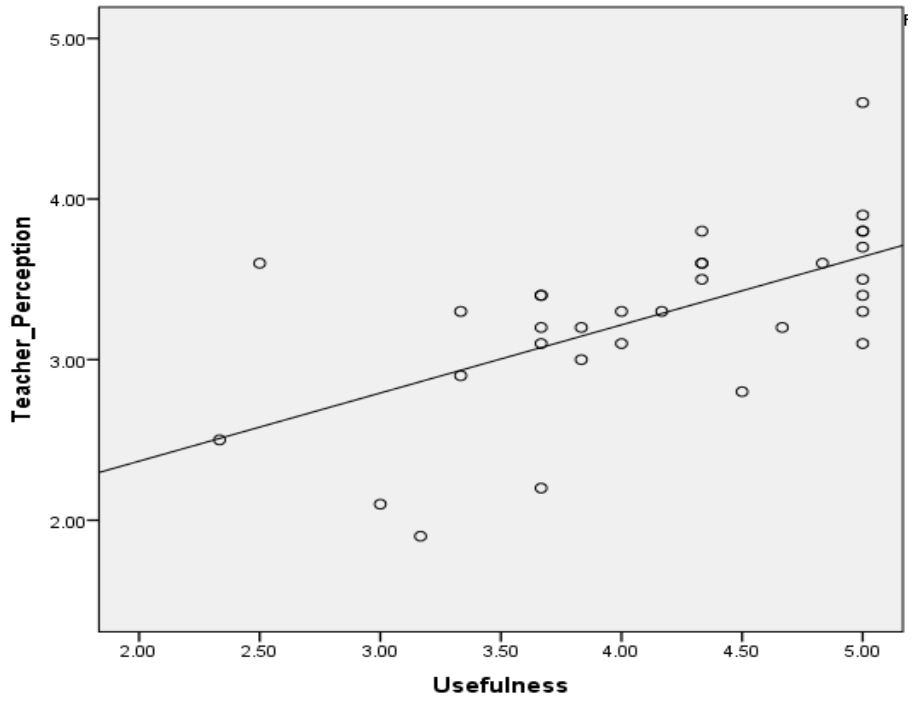
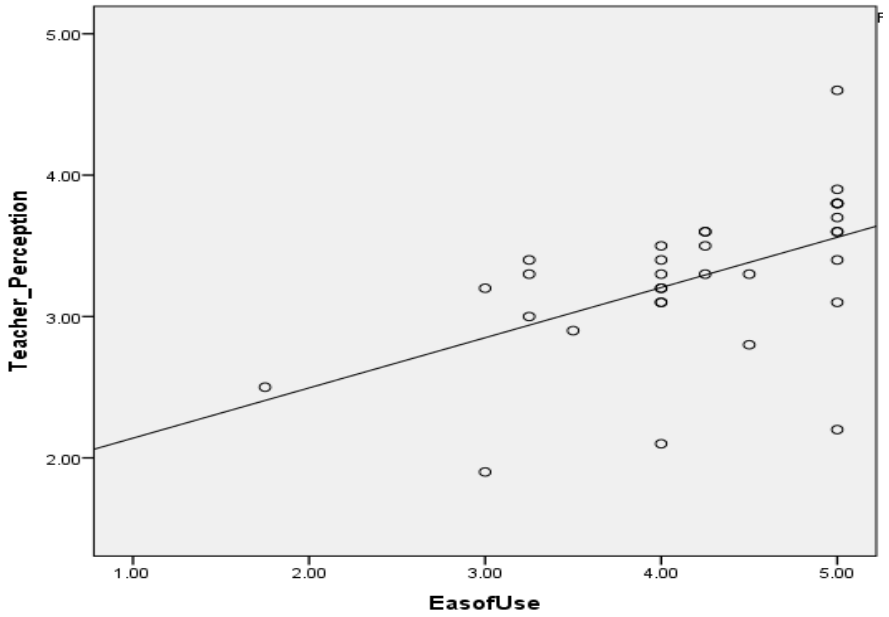


Figure 9

Ease of Use Vs Teacher Perception



4.2.2.3. Hypothesis H_4

Then, we conducted a multiple regressions analysis to analyze whether there is a significant correlation between teachers' demographic characteristics and their attitudes towards AI, such that younger age and greater digital competency are associated with more positive attitudes towards AI and a stronger influence on their professional identity.

The hypothesis tests suggest that younger age and greater digital competence are associated with more positive attitudes towards AI and a stronger influence on their professional identity. The dependent variable Teacher Perception was regressed on the predictor variables Age, Digital Competence, Gender, Education Level, and Teaching Experience to test hypothesis H3. The overall model approached significance, $F(5, 26) = 2.195$, $p = 0.086$, with $R^2 = 0.297$, indicating that 29.7% of the variance in Teacher Perception is explained by the model. Age significantly predicted Teacher Perception ($\beta = -0.585$, $p = 0.033$), suggesting that younger teachers have a more positive perception of AI. However, Digital Competence ($\beta = 0.002$, $p = 0.990$), Gender ($\beta = 0.328$, $p = 0.081$), Education Level ($\beta = 0.259$, $p = 0.140$), and Teaching Experience ($\beta = 0.236$,

p = 0.362) did not significantly predict Teacher Perception. **Table 13** shows the summary of multiple regression analysis findings**.**

Table 13

Summary of Multiple Regression Analysis Findings of H_4

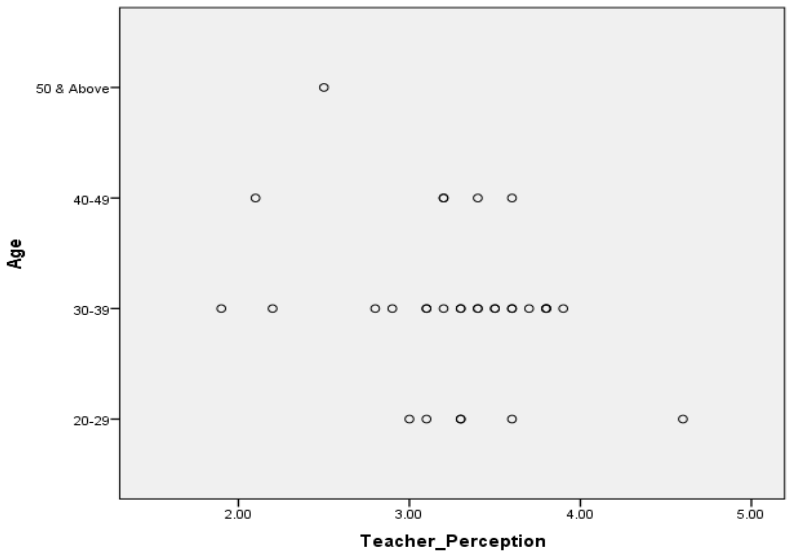
Variable	Beta	SE	95.0% CI		β	R^2	F	t-Value	p-Value
			LL	UL					
(Constant)	2.801	.613	1.540	4.062		.297	2.195	4.566	.000
Digital Competence	.002	.141	-.288	.292	.002			.012	.990
Age	-.462	.205	-.882	-.041	-.585			-2.256	.033
Teaching Experience	.120	.129	-.146	.385	.236			.928	.362
Education Level	.279	.183	-.097	.656	.259			1.524	.140
Gender	.393	.217	-.052	.839	.328			1.814	.081

Age and Attitudes towards AI

The scatter plot depicted in **Figure 10** shows a weak correlation between Age of Teachers and Teacher Perception.

Figure 10

Teachers Age VS Attitude towards AI.

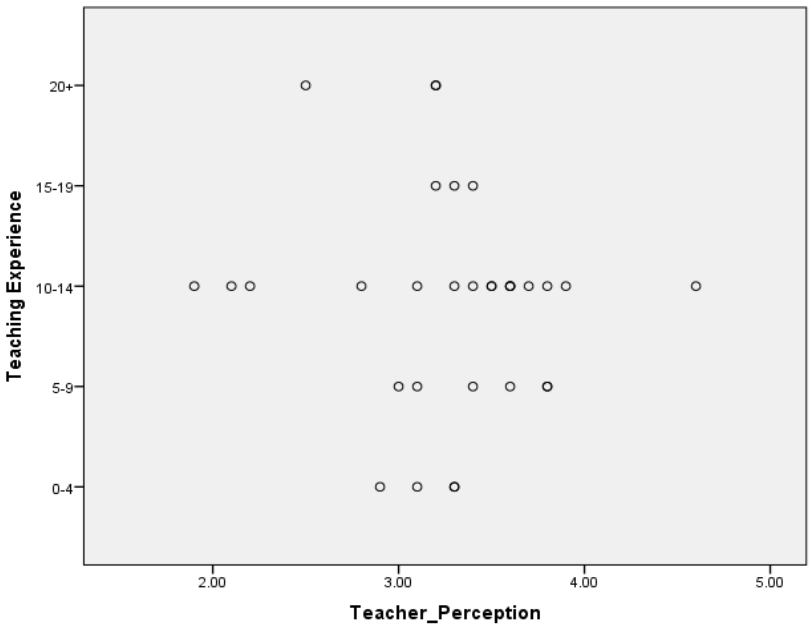


Teaching Experience and Attitudes towards AI

The scatter plot illustrates a very weak correlation between Teaching Experience and Teacher Perception as shown in **Figure 11**.

Figure 11

Teaching Experience VS Attitudes towards AI



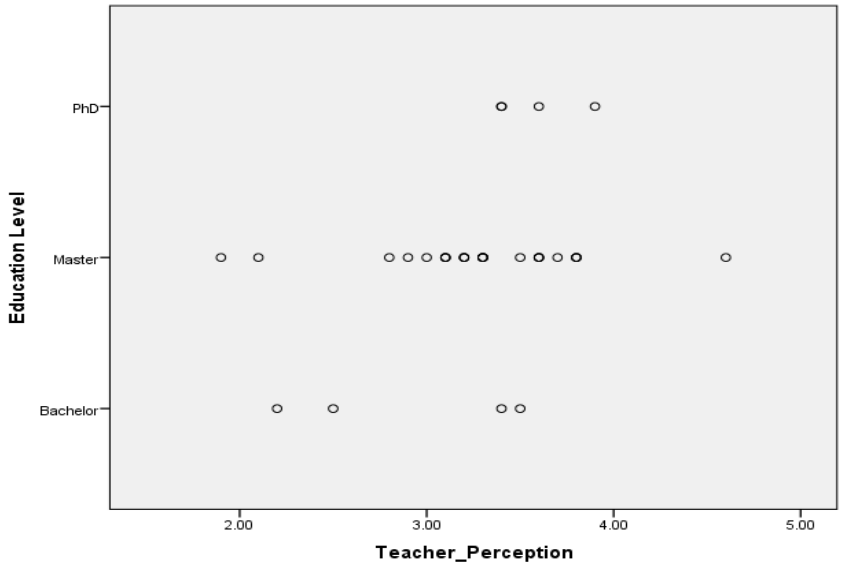
This infers that while expert teachers may be older, their level of experience does not strongly impact their attitudes towards AI adoption.

Education Level and Attitudes towards AI

The scatter plot shows a weak correlation between Teachers' Education Level and Teacher Perception as shown in **Figure 12**

Figure 12

Teachers Education VS Attitudes towards AI

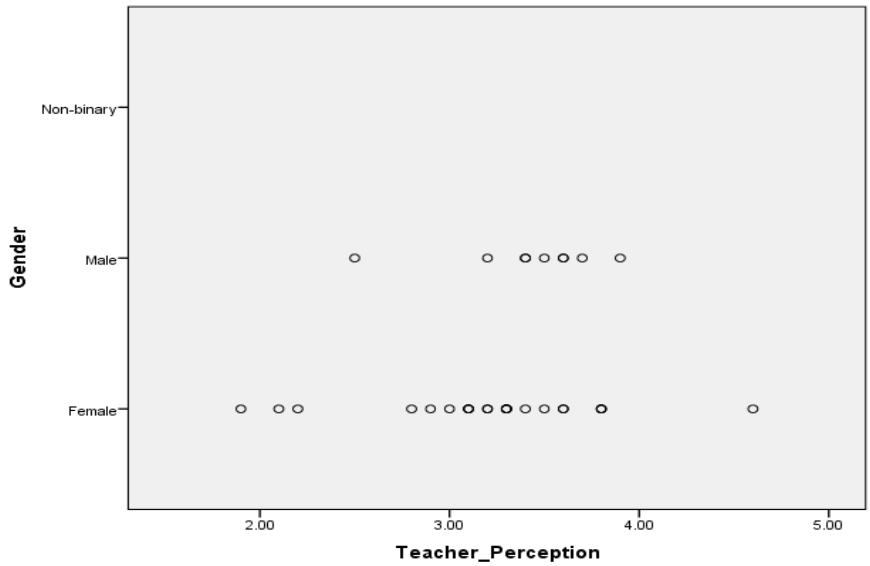


Gender and Attitudes towards AI

Figure 13 shows week correlation between Gender and Teacher Perception.

Figure 13

Teachers Gender VS Attitudes towards AI

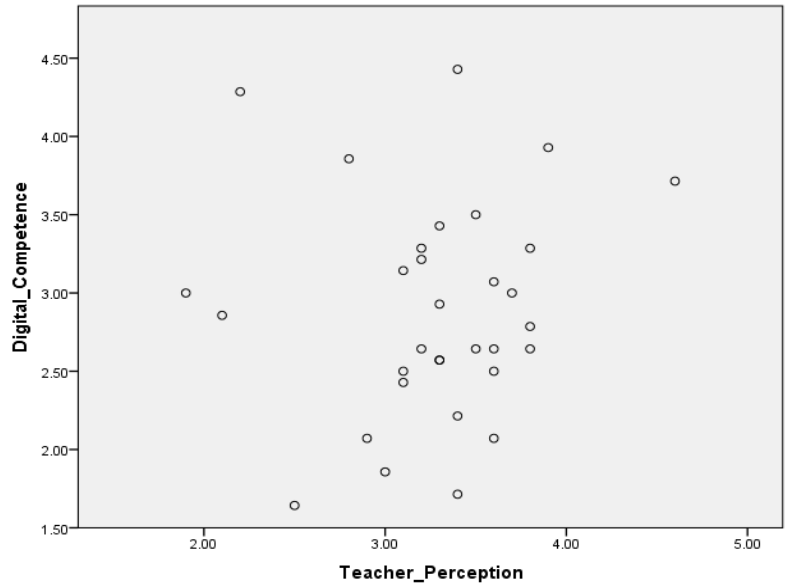


Digital Competence and Attitudes towards AI

The **Figure 14** shows the relationship between Digital Competence of Teachers and Teacher Perception towards AI Adoption and the scatter plot demonstrate a very weak correlation among Teacher Digital Competence and Teacher Perception towards AI.

Figure 14

Teachers Digital Competence VS Attitudes towards AI



Overall, the analysis suggests that age is a significant factor in shaping teachers' perceptions of AI, with younger teachers being more positive. However, other demographic characteristics do not significantly predict or influence these perceptions. These findings support with the null hypothesis H_0, providing insights into the demographic factors that may need to be considered in future AI adoption strategies in educational settings.

4.2.3. Summary of Quantitative Analysis

The data analysis reveals that AI familiarity significantly enhances teachers' perceptions of AI's impact on their professional identity, explaining 26.7% of the variance in these perceptions. Also, while the perceived usefulness of AI positively influences teachers' attitudes towards AI

adoption, ease of use does not have a significant impact. Furthermore, among the demographic factors examined, younger age is associated with more positive attitudes towards AI, but digital competence, gender, education level, and teaching experience do not show significant predictive power. These findings underscore the importance of AI familiarity and perceived usefulness in shaping teachers' positive attitudes towards AI, with age also playing a notable role.

Overall, the analyses provided diverse results. While AI familiarity was found to positively associate with teachers' professional identity, perceptions of ease of use and usefulness of AI technologies and demographic characteristics did not significantly predict attitudes towards AI adoption among teachers. This shows the density of factors influence teachers' attitudes towards AI and suggests the need for further research to classify other conceivable influences.

4.3. Qualitative Analysis

This section describes the qualitative data analysis of the survey questionnaire and will be based on detailed thematic analysis of the respondents' answers.

4.3.1. Professional Uses of AI Tools

It was shown that participants utilize AI tools for various professional purposes beyond teaching-related tasks. These include creating texts for item writing, engaging in professional development by preparing for teaching sessions, checking language usage, generating ideas on specific topics, seeking work-related information, demonstrating assessment methods to students, creating reading passages and exam materials, translation tasks, material development, simplifying complex topics for young learners, providing engaging activity ideas, brainstorming, and co-creating outlines and content.

4.3.2. Impact of AI on Teacher Identity

The impact of AI on teacher identity in higher education is multifaceted, as revealed through qualitative analysis of participant responses. There was found to be a mix of positive and negative sentiments regarding AI's impact on teacher identity. While some find AI tools beneficial in enhancing their identity and productivity positively, others express concerns about feeling obsolete or questioning their existence in the face of rapid AI development. **Figure 15** shows the coding network for the responses to the question of impact of AI on teacher identity.

Positively impacting Teacher Identity

A few considered it positively impacting the teacher identity as

"As a teacher, I've witnessed AI's transformative impact on teaching in higher education. AI tools have enhanced my ability to personalize learning, provide timely feedback, and optimize instructional strategies. This has redefined my role and helped me become more adaptive, innovative, and student-centered in my approach"

"Ai may impact my role as a teacher in higher education by providing tools for more personalized learning experiences, administrative tasks, research capabilities."

"It actually made my life easier as educator. I have become more productive and confident, I have more free time for self-development and don't waste my time on finding examples, exercises, etc. that I need"

"They also appreciate it when i show them how to use it to their benefit instead of banning it. This kind of appreciation makes me feel competent."

Feeling Obsolescence and Worthless

While acknowledging the potential benefits of AI, participants expressed apprehension about the evolving role of teachers. There was a consensus that AI might gradually replace traditional

teaching functions, leading to a shift towards guiding and shaping learning experiences rather than direct instruction.

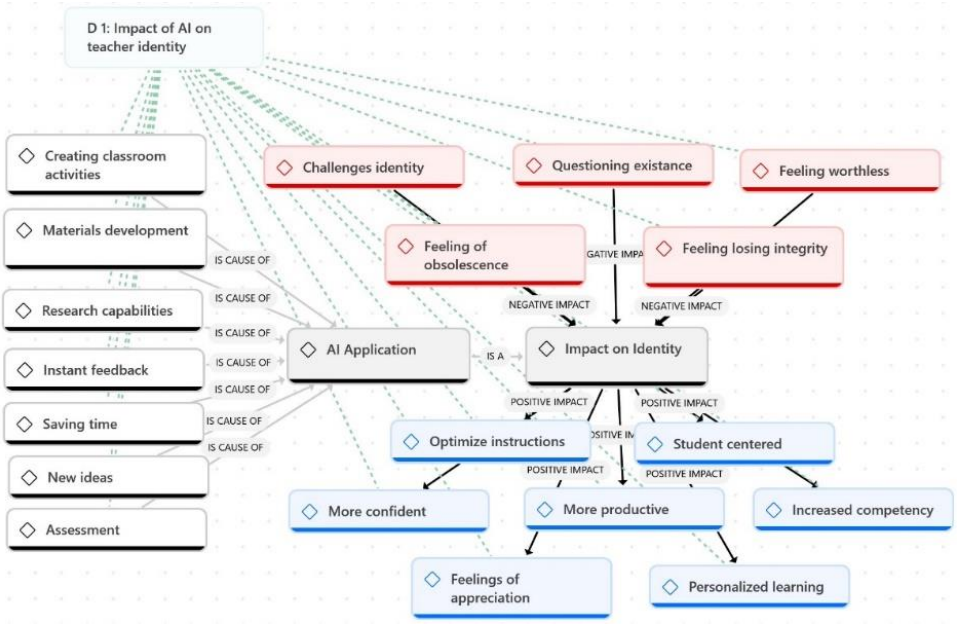
"However, while the students are producing their homework, they do not get help from AI but they just copy and paste what AI provides them with. This makes us feel obsolete."

"I sometimes question the reason of my existence due to this rapid development in AI sector."

"In our university during the term, we asked students not to use AI for writing their report spot unfortunately nearly all of them benefited from AI Tool. This made our profession worthless"

Figure 15

Coding network in Atlas.ti for the question of impact of AI on teacher identity



Challenging Teacher Identity

While some discussed about being challenged by AI integration

"I heard ChatGPT, I thought that it challenged my role and identity as a teacher in higher education owing to what it can do."

Unaffected by identity's sway

One respondent opined that AI is just in its nascent phase and it is far from having any noticeable impact on my identity as a teacher.

"AI is very useful in the preparation phase of my teaching practices but it doesn't have a considerable impact on my identity as a teacher."

While others also regarded AI being only helpful without any significant impact.

"It definitely eases the process of preparing extra materials for class."

"I use it to create assessment. Different AI tools can be really handy in certain tasks."

Professional Development and Adaptation

Participants acknowledged AI's role in enhancing their professional development and teaching practices. AI was perceived as a catalyst for innovation, allowing educators to focus more on self-development and instructional strategies.

4.3.3. AI Impact on Motivation and Dedication

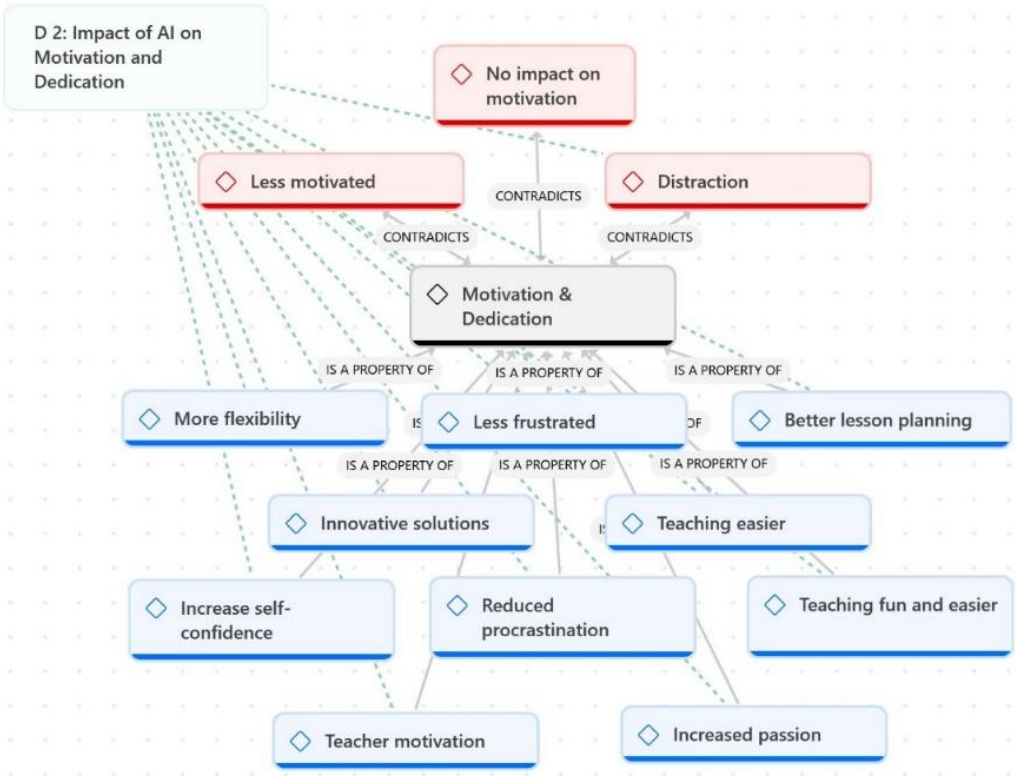
Some participants expressed ambivalence towards the influence of AI on their motivation and dedication to teaching. While some felt motivated by the convenience and time-saving aspects of AI, there were conflicting views as well which expressed being less motivated though such instances were lesser as compared to positive group. **Figure 16** shows the coding network for the responses on question of impact of AI on teacher motivation and dedication.

Increased Efficiency and Timesaving

Participants highlighted that AI tools make teaching tasks easier and more efficient, thereby increasing teachers' motivation. These tools streamline administrative tasks, save time in lesson preparation, and provide opportunities for more engaging activities.

Figure 16

Coding network in Atlas.ti for the question of impact of AI on teacher motivation and dedication.



"I feel like I don't worry much about it because I know that with AI I get ready in short time. I think this also motivates me."

"It reduced my prep time and expanded the variety of activities that I use in lessons. This gives me more time and energy to teach and to connect with my students. It reduced my procrastination."

"Makes everything easier which increases teachers' motivation."

"Using AI for these tasks and editing afterwards has made things easier for me. This has contributed to my motivation as an assessor and a teacher."

While some also opined that it just allows them to save time and have no significant impact on their motivation.

Positive Impact on Teaching Practices and Student Engagement

Participants noted that AI influences their teaching practices by expanding the variety of activities and enhancing student engagement.

"The use of AI has increased my motivation and dedication to teaching by offering innovative solutions to enhance learning outcomes"

No Profound Impact on Motivation & Dedication

While several of the respondents commented that AI though has helped them save time and could have significant impact in future but not significant impact on motivation or dedication at the moment.

"Not much, it just helped me save time"

"It opened new areas to consider about my teaching and career as a whole. I wouldn't say I am more motivated to teach."

"it doesnt have a considerable effect on this yet. but, when AI is improved and it will make teaching much more easier in the sense of material preparation."

Negative Impact of AI on Motivation

A lesser number of participants also claimed that AI reduced their motivation to teaching when they feel students mostly takes help from AI for their assignments and preparation.

"I feel less motivated since it's easy for them to learn things thanks to AI tools

when a student submits an assignment which has been AI generated, it demotivates me."

However, the proportion of respondents reporting demotivation is notably lower compared to those expressing higher motivation or unaffected dedication in response to AI's influence.

4.3.4. The Integration of AI and Departmental Culture

The integration of AI within the broader academic and departmental culture is perceived as a significant step towards modernizing education, as revealed through qualitative analysis of participant responses.

Positive Attitudes towards AI Integration

Participants express positive attitudes towards the integration of AI within academic settings, recognizing its potential to simplify tasks, improve research, and promote innovative teaching methods.

A few of the respondents called for it to be used as material preparation as well as feedback and assessment tool.

"It can be used more especially in assessment and giving feedback within the department

I think it should be integrated to the departmental culture to avoid unnecessary workload (material prep and assessment to a certain extent)"

"Curriculum units can work add AI suggestions on different topics into the schedules."

However, respondents also stressed the ethical side of AI integration. Thus, some participants exhibited cautious optimism towards AI integration, emphasizing the importance of considering ethical implications and ensuring responsible AI use within educational contexts.

"however, the ethical considerations should be discussed at length."

To help this, participants stressed the importance of proper training and integration of AI within academic and departmental cultures. They advocate for AI to be seen as an integral part of education, requiring education on its correct use and adaptation to changes it brings.

"However, in the long run AI is going to change the academic scene dramatically."

"However, it also requires careful consideration of ethical implications and ongoing professional development to ensure effective implementation."

Challenges in AI integration

Several participants mention challenges related to resources and potential negative implications for integrating AI into educational settings.

"however, we cannot unfortunately adapt those technologies into our educational system in a way to protect students' academic dignity. Students do not aim to learn from AI, but all they want to do is just copying and pasting."

4.3.5. Effects of AI Tools on Student Engagement and Connection

Participants note a positive impact on student motivation, attributing it to the incorporation of AI tools in teaching practices. They highlight how increased student motivation positively affects the teacher-student relationship.

"they enable students to be engaged even more in the educational process"

"I sometimes get really good ideas and apply them in class. After the implementation, we discuss these ideas in class. I'd like to hear how it went and how my students respond to ideas created by AI."

"AI, for example ChatGPT, can provide us with topics that can trigger students' attention and interest."

Time-saving and Increased Focus on Students

Several participants highlight how the incorporation of AI tools has saved time for educators, allowing them to allocate more time and attention to student engagement and connection. They note a positive impact on their ability to engage with students on a deeper level.

"I can now spare more time for my students"

"It has somewhat helped me. Particularly, when I see a full mail inbox after hours of teaching, I do not get frustrated. I reply them with the help of ai in a faster manner."

Personalized Learning Stuff

A few respondents argued that incorporation of AI has helped them to prepare personalized learning materials and tailored content creating more engaging classroom environment with better connection.

"The incorporation of AI tools has significantly enhanced my ability to engage and connect with students on a deeper level. These tools allow for personalized materials, interactive learning experiences, and tailored content delivery, creating a more dynamic and interactive classroom environment. This has strengthened student-teacher relationships…"

"Using AI tools has helped me to prepare materials spontaneously and quickly, it's provided me prepare personalized learning stuff quickly."

Mixed Experiences and Frustrations

Some participants also shared mixed experiences and frustrations with the incorporation of AI tools. They mention challenges such as technical issues, student misuse of AI, and unmet expectations, which impact their ability to engage and connect with students.

"Mostly I've found myself disgruntled with AI use. Either AI hasn't helped in the ways I've tried to use it, or students have used it without check to pass of work as their own. Both situations end in frustration."

A few of the respondents claimed that integration of AI has no discernible impact on our relationship with students.

"My ability to connect my students hasn't been affected by AI."

"It didnt have much effect now but will be more soon"

4.4. Summary

Chapter 4 presents the results of the quantitative and qualitative analyses conducted to examine the impact of AI familiarity on teachers' professional identity. The results are organized into several key sections. The analysis provides a basic understanding of digital competence, AI familiarity, technology acceptance, AI usage, and teacher perceptions among the respondents. The overall digital competence level among teachers is moderate, with variations across different items. While TAM analysis reflects a positive attitude towards technology and AI, actual AI usage is moderate. A positive correlation was found between AI familiarity and teachers' perception of professional identity integration, suggesting the potential benefits of AI literacy for educators. Usefulness of AI significantly predicts attitudes towards AI adoption, while ease of use does not have a significant impact. Demographic factors also do not significantly predict these attitudes. This highlights the importance of perceived usefulness in shaping positive attitudes towards AI

adoption among teachers. Qualitative analysis highlights AI's role in streamlining administrative tasks and enhancing instructional focus.

CHAPTER 5: DISCUSSION

5. Introduction

The results section has described in detail the quantitative as well as qualitative analysis related to this study and in this section an appraisal of the results based on exiting literature will be discussed. The demographic profile of the respondents, including age, gender, education levels, and teaching experience, provides essential context for the findings. The age distribution shows that majority of teachers (62.5%) are in their thirties, suggesting a cohort that balances substantial teaching experience with a potential openness to new technologies. The high level of academic qualifications among respondents, predominantly holding Master's degrees (75%), suggests well-educated respondents adding to the validity and reliability of the findings. The analysis of digital competence shows moderate levels among teachers, with a mean score of 2.888. Variations in this domain necessitates professional development to enhance digital competencies uniformly, ensuring that all teachers are equipped to use AI effectively in their teaching practices. Teachers' familiarity with AI was found to be relatively high, with an overall mean of 4.0375. This indicates a general awareness and understanding of AI technologies among the respondents. The high familiarity levels are promising for the adoption of AI, as teachers who are more knowledgeable about AI are likely to integrate it better into their teaching.

Similarly, the Technology Acceptance Model (TAM) analysis shows a positive attitude towards technology, with a mean score of 4.1531. This suggests that teachers generally perceive technology as useful and are willing to incorporate it into their teaching practices. The stable skewness and kurtosis values show a uniform acceptance of technology among the respondents. The data on AI usage shows moderate engagement, with a mean score of 2.615. Notably, teachers reported higher AI usage in personal contexts compared to professional settings. This discrepancy

highlights a potential area for intervention, where support and resources could be directed towards integrating AI into professional practices. By bridging this gap, educators can better utilize AI to enhance their teaching effectiveness and student outcomes. Teachers' perceptions of AI and its impact on their professional identity were generally positive, with an average score of 3.272. However, the variation in responses suggests that some teachers view AI very positively, while others are more hesitant.

The hypothesis testing was used to explore the relationship between AI familiarity and teachers' perception of impact of AI on their professional identity. The results of the Spearman correlation analysis indicate a moderately strong positive correlation (rho = 0.498) between AI familiarity and teachers' perception of professional identity integration. The correlation was found to be significant ($p = 0.004$). This shows that as teachers become more familiar with AI, they are more likely to develop an AI integrated and positive sense of professional identity within their teaching practices. This finding supports the alternative hypothesis, emphasizing the potential benefits of AI familiarity for teachers' professional development in the field of AI integration in educational practices. The model explains almost 26.7% of the variance in professional identity, indicating a substantial impact of AI familiarity on how teachers perceive and integrate their professional roles. The statistical significance of this model was also confirmed by the ANOVA results. The study's findings related to the ease of use and usefulness of AI technologies presented somewhat inconsistent results. While the correlation analysis showed moderate positive relationships between these factors and teachers' attitudes towards AI adoption, the multiple regression analysis revealed that only perceived usefulness significantly predicted attitudes towards AI adoption, not ease of use. Ease of use and usefulness collectively accounted for 37.6% of the variance in attitudes towards AI adoption, but only the coefficient for usefulness was

statistically significant. This suggests that perceived usefulness, rather than ease of use, is a key factor related to teachers' attitudes and is sufficient on its own to influence AI adoption.

The study also examined the role of demographic characteristics in influencing teachers' attitudes towards AI. Among the demographic factors examined, younger age was found to be associated with more positive attitudes towards AI, but digital competence, gender, education level, and teaching experience did not show significant predictive power. The multiple regression analysis confirmed these findings, with the model showing that demographic characteristics do not significantly predict teachers' attitudes towards AI. Thus, the study showed that demographic factors, except for age, may not be critical determinants of teachers' attitudes towards AI integration

Overall, the quantitative analysis results showed that AI familiarity is a key factor in increasing teachers' professional identity, while perceived ease of use and usefulness of AI, along with demographic characteristics, do not significantly predict attitudes towards AI adoption. The positive impact of AI familiarity suggests that professional development programs focusing on increasing AI literacy among teachers could be beneficial. The results call for further research to identify additional factors that may influence teachers' attitudes towards AI. These could include contextual elements such as institutional support, peer influence, and the availability of resources.

The qualitative analysis section provides deeper insights into teachers' perspectives on AI and its influence on their professional identity. Through thematic analysis of the interview data, several themes emerged, shedding light on the nuanced ways in which AI impacts teachers' roles, attitudes, and identity. Teachers reported that AI tools streamline administrative tasks, allowing them to focus more on instruction and student engagement. The automation of grading, attendance,

and data analysis was highlighted as a significant benefit, leading to more efficient classroom management. AI's ability to tailor learning experiences to individual student needs was praised.

Teachers noted that AI helps in identifying students' strengths and weaknesses, enabling them to provide more targeted support and resources. A significant portion of participants reported that AI tools have positively transformed their roles as educators, enhancing their teaching practices and overall professional identity. Many educators highlighted that AI tools enable them to personalize learning experiences for their students more effectively. The ability of AI to provide timely and tailored feedback allows teachers to optimize their instructional strategies, making them more adaptive and student-centered. AI tools were also shown to increase teachers' productivity and confidence. By automating routine tasks such as creating examples, exercises, and assessment materials, AI frees up valuable time for teachers to focus on self-development Moreover, the integration of AI was found to be enhancing educators' professional development and instructional strategies. This positive impact on professional identity is further reinforced by the appreciation teachers receive from students when demonstrating the beneficial use of AI, fostering a sense of competence and relevance.

However, while the overall sentiment is positive, some educators expressed concerns about AI's impact on their professional identity. There was found to be apprehension about obsolescence of traditional teaching roles and the fear of becoming less relevant as AI tools become more advanced. A few participants conveyed feelings of obsolescence, stating that the ease with which students can use AI to complete assignments makes them question their role and value as educators. Additionally, the ethical implications of AI integration were highlighted as a significant concern. Participants stressed the importance of responsible AI use and the need for proper training to ensure that AI is used ethically and effectively within educational contexts.

The combined analysis of quantitative and qualitative data offers a comprehensive understanding of how AI familiarity influences teachers' professional identity. The quantitative data revealed a significant positive correlation between AI familiarity and professional identity integration, supported by moderate levels of digital competence and technology acceptance. However, it also highlighted areas where AI usage in professional settings is less prevalent compared to personal contexts.

5.1. Limitations

This section discusses the limitations identified in the current study. These limitations provide context for interpreting the findings and offer directions for future research. Recognizing these limitations is critical for contextualizing the outcomes and understanding the boundaries within which the conclusions can be drawn.

- One notable limitation is the relatively small sample size of 32 valid responses. The small sample size limits the generalizability of the findings to a broader population. While this sample provides important information into the professional identities of language instructors at TOBB University of Economics and Technology, it may not be representative of the broader population of language instructors in different institutions or geographical regions. The specific context of a nonprofit foundation university in Ankara, Turkiye, may also limit the generalizability of the findings to other educational settings.
- The reliance on self-reported data collected through questionnaires introduces the possibility of response bias. Participants may have provided socially desirable answers or may not have accurately recalled or reported their attitudes and experiences with AI. Although steps were taken to ensure anonymity and encourage honest responses, the inherent limitations of self-reporting cannot be entirely eliminated.

- The cross-sectional design of this study, which captures data at a single point in time, limits the ability to make causal inferences about the impact of AI on professional identity. Longitudinal studies that track changes over time would provide a more robust understanding of how AI influences the professional identities of language instructors and could identify trends and long-term effects that a cross-sectional study cannot.
- Although the questionnaire was developed specifically for this study and validated through pilot testing and expert feedback, it remains a new instrument. The absence of existing validated scales directly addressing the focus of this research means that further validation and refinement of the questionnaire are necessary.
- The study assumes a certain level of technological proficiency among the participants, as they are language instructors at a university level. However, there may be variations in technological proficiency that were not fully captured or accounted for in the study.
- The cultural context of the study, conducted in Turkey, may influence the findings and their applicability to other cultural settings. Cultural attitudes toward technology, education, and professional identity can vary significantly across different regions.
- The potential for researcher bias in coding and interpreting the qualitative responses remains. Efforts were made to ensure objectivity and consistency, but complete elimination of subjective interpretation is challenging.
- The study examined the impact of demographic variables such as age, teaching experience, education level, gender, and digital competence on attitudes towards AI adoption. However, these variables did not significantly predict or influence teachers' attitudes. This suggests that other factors not included in the study may play a critical role. Future research

should explore additional variables, such as cultural context, institutional support, and individual attitudes towards technology, to gain a better understanding of the factors influencing AI adoption in education.

- The rapid pace of technological advancements in AI means that the findings of this study may quickly become outdated. As AI technology evolves, the ways in which it impacts the professional identities of language instructors are likely to change. Ongoing research is necessary to keep pace with these developments and provide up-to-date insights.

In conclusion, while this study provides important information regarding the impact of AI on the professional identities of language instructors, it is essential to consider aforementioned limitations when interpreting the findings.

5.2. Recommendations

The findings of this study have several implications for educational policy and practice. The positive correlation between AI familiarity and professional identity suggests that increasing teachers' knowledge and comfort with AI can enhance their professional self-concept and efficacy. Professional development programs should focus on building AI competence and confidence among teachers. Additionally, the moderate levels of digital competence and AI usage indicate areas where further support is needed to ensure that all teachers can fully benefit from AI technologies.

- Implementing training programs that could enhance both digital competence and AI familiarity among teachers could help in positively integrating AI in professional identity with practical applications in educational contexts. Respondents also emphasized the necessity for ongoing professional development to keep pace with AI advancements. They

expressed a desire for training programs that not only teach technical skills but also address pedagogical strategies for integrating AI.

- It was shown by the results that although teachers are quite familiar with AI technologies they are not very consistent with the collaboration based on the technology with their colleagues and peers. By having such collaborations, the strengths of employing AI for practical educational purposes could be improved. Thus, there is a need to create awareness to utilize technology for better integration and collaboration among the teaching community which could prove to mitigate the shortcomings of AI integration as well.
- Teachers discussed how AI is reshaping their roles, transitioning from knowledge dispensers to facilitators of learning. This shift was seen positively by some, who embraced the opportunity to focus on higher order thinking skills and mentorship. However, there was an impression about the lack of reliable infrastructure for the effective integration of AI in day-to-day classroom activities. Teachers expressed concerns about the reliability and accessibility of AI technologies. Technical glitches and lack of adequate infrastructure were cited as barriers to effective AI integration.
- While majority of the teachers have a positive attitude towards AI, few teachers experienced identity conflicts, feeling that their traditional teaching skills were undervalued in an AI-driven environment. This highlights a need for reconciling traditional and modern pedagogical approaches to support teachers' evolving professional identities.
- Regarding this particular study, as stated the qualitative analysis revealed mixed sentiments regarding the impact of AI on teacher identity and motivation. While some teachers reported positive impacts, others expressed concerns about feeling obsolete or questioned

their roles. The qualitative data highlighted the complexity of teachers' experiences with AI. Future research could benefit from more in-depth qualitative methods, such as interviews or focus groups, to explore these themes further and understand the underlying reasons for differing perceptions.

In conclusion, the study reveals the importance of AI familiarity in shaping teachers' professional identity, while also highlighting the limitations of focusing solely on ease of use, usefulness, and demographic factors. The findings suggest that a more comprehensive approach, considering a wider range of influences, is necessary to fully understand and support teachers in integrating AI into their teaching practices and positively shaping their identity. This comprehensive approach will ultimately contribute to more effective and sustainable AI adoption in education.

CHAPTER 6: CONCLUSION

This research was designed to study the multidimensional impact of AI on the professional identities of teachers within higher education, focusing specifically on language instructors at TOBB University of Economics and Technology in Ankara, Turkey. Grounded in the Technology Acceptance Model (TAM), this study employed a mixed-methods approach to analyze how AI integration and familiarity influence teachers' perceptions of their professional identities.

The findings of this research show several insights. Firstly, there was a positive correlation between AI integration and the perceived impact on teachers' professional identities. Teachers who actively incorporate AI tools into their teaching practices tend to view these technologies as beneficial to their roles. Additionally, a strong positive correlation was observed between AI familiarity and teachers' perceptions of AI's impact on their professional identity. This suggests that increased familiarity with AI enhances teachers' confidence in its positive influence on their work.

The perceived usefulness of AI technologies was found to significantly predict teachers' attitudes towards AI adoption, whereas perceived ease of use did not show a significant impact. This highlights the importance of perceived usefulness in shaping positive attitudes towards AI among teachers. Furthermore, among the demographic factors examined, younger age was associated with more positive attitudes towards AI, while digital competence, gender, education level, and teaching experience did not show significant predictive power. This highlights the complexity of AI integration in educational settings, suggesting that attitudes towards AI are influenced by a broader range of factors than initially anticipated.

The qualitative data provided an understanding of teachers' experiences with AI. While some teachers reported positive impacts, including enhanced motivation and a shift towards

facilitating learning rather than merely dispensing knowledge, others expressed concerns about feeling obsolete or questioning their roles. This mixed sentiment underscores the importance of addressing both the benefits and challenges of AI integration. Teachers emphasized the need for ongoing professional development and reliable infrastructure to support effective AI use in classrooms.

The study's limitations, including its focus on a single university and reliance on self-reported data, suggest areas for future research. Exploring other variables that might influence attitudes towards AI, such as organizational support and personal innovation, could offer a better understanding.

In conclusion, this thesis demonstrates that while AI has the potential to positively influence teachers' professional identities, a comprehensive approach that considers a wide range of influences is necessary for effective and sustainable AI adoption in education. Increasing AI familiarity through targeted professional development, addressing infrastructural challenges, and fostering a supportive organizational culture are essential steps towards leveraging AI's full potential.

References

Abbott, R. C. (2016). Embracing Digital Technologies in Classroom Practice: The Impact of Teacher Identity. *Australian Educational Computing*, *31*(2), 1–26.

Al Darayseh, A. S. (2023). Acceptance of artificial intelligence in teaching science: Science teachers' perspective. *Computers and Education: Artificial Intelligence*, *4*(8), 100132. https://doi.org/10.1016/j.caeai.2023.100132

Alharbi, M. A., & Al-Hoorie, A. H. (2020). Turnitin peer feedback: controversial vs. non-controversial essays. *International Journal of Educational Technology in Higher Education*, *17*(1). https://doi.org/10.1186/s41239-020-00195-1

Arantes, J. A. (2021). The "Postdigital Teacher Identities" Praxis: a Discussion Paper. *Postdigital Science and Education*, *№ 2*, 447–466. https://doi.org/10.1007/s42438-021-00271-3

Avidov-Ungar, O., & Forkosh-Baruch, A. (2018). Professional identity of teacher educators in the digital era in light of demands of pedagogical innovation. *Teaching and Teacher Education*, *73*, 183–191. https://doi.org/10.1016/j.tate.2018.03.017

Ayanwale, M. A., Sanusi, I. T., Adelana, O. P., Aruleba, K. D., & Oyelere, S. S. (2022). Teachers' readiness and intention to teach artificial intelligence in schools. *Computers and Education: Artificial Intelligence*, *3*(100099), 100099. https://doi.org/10.1016/j.caeai.2022.100099

Badia, A., & Iglesias, S. (2019). The Science Teacher Identity and the Use of Technology in the Classroom. *Journal of Science Education and Technology*, *28*(5), 532–541. https://doi.org/10.1007/s10956-019-09784-w

Bahari, A. (2022). Teacher identity in technology-assisted language learning: Challenges and affordances. *E-Learning and Digital Media*, *19*(4), 204275302210928. https://doi.org/10.1177/20427530221092855

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Advances in Behaviour Research and Therapy*, *1*(4), 139–161. https://doi.org/10.1016/0146-6402(78)90002-4

Barnard, R. (2010). Activity theory: A framework for analysing intercultural academic activity. *Researchcommons.waikato.ac.nz*. https://hdl.handle.net/10289/4354

Beauchamp, C., & Thomas, L. (2011). New teachers' identity shifts at the boundary of teacher education and initial practice. *International Journal of Educational Research*, *50*(1), 6–13. https://doi.org/10.1016/j.ijer.2011.04.003

Beijaard, D., Meijer, P. C., & Verloop, N. (2004). Reconsidering research on teachers' professional identity. *Teaching and Teacher Education*, *20*(2), 107–128. https://doi.org/10.1016/j.tate.2003.07.001

Bonneton-Botté, N., Fleury, S., Girard, N., Le Magadou, M., Cherbonnier, A., Renault, M., Anquetil, E., & Jamet, E. (2020). Can tablet apps support the learning of handwriting? An investigation of learning outcomes in kindergarten classroom. *Computers & Education*, *151*(151), 103831. https://doi.org/10.1016/j.compedu.2020.103831

Bradley, G., & Russell, G. (1997). Computer Experience, School Support and Computer Anxieties. *Educational Psychology*, *17*(3), 267–284. https://doi.org/10.1080/0144341970170303

Brenner, P. S., Serpe, R. T., & Stryker, S. (2017). Role-specific Self-efficacy as Precedent and Product of the Identity Model. *Sociological Perspectives*, *61*(1), 57–80.

https://doi.org/10.1177/0731121417697306

Brundage, M., Avin, S., Wang, J., Belfield, H., Krueger, G., Hadfield, G., Khlaaf, H., Yang, J., Toner, H., Fong, R., Maharaj, T., Koh, P. W., Hooker, S., Leung, J., Trask, A., Bluemke, E., Lebensold, J., O'Keefe, C., Koren, M., & Ryffel, T. (2020, April 20). *Toward Trustworthy AI Development: Mechanisms for Supporting Verifiable Claims*. ArXiv.org. https://doi.org/10.48550/arXiv.2004.07213

Burner, T., & Svendsen, B. (2020). Activity Theory—Lev Vygotsky, Aleksei Leont'ev, Yrjö Engeström. *Springer Texts in Education*, *1*(1), 311–322. https://doi.org/10.1007/978-3-030-43620-9_21

Byrne, J., & Humble, A. M. (2007). An introduction to mixed method research. *Atlantic Research Centre for Family-Work Issues*, *1*, 1–4.

Celik, I. (2023). Towards Intelligent-TPACK: An empirical study on teachers' professional knowledge to ethically integrate artificial intelligence (AI)-based tools into education. *Computers in Human Behavior*, *138*, 107468. https://doi.org/10.1016/j.chb.2022.107468

Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022). The Promises and Challenges of Artificial Intelligence for Teachers: a Systematic Review of Research. *TechTrends*, *66*(4). Springer. https://doi.org/10.1007/s11528-022-00715-y

Chen, L., Chen, P., & Lin, Z. (2020). Artificial Intelligence in Education: a Review. *IEEE Access*, *8*, 75264–75278. https://doi.org/10.1109/ACCESS.2020.2988510

Chere-Masopha, J. (2018). Personal Landscapes of Teacher Professional Identities versus Digital Technology Adoption and Integration in Lesotho Schools. *International Journal of Learning, Teaching and Educational Research*, *17*(3), 28–42. https://doi.org/10.26803/ijlter.17.3.3

Choi, S., Jang, Y., & Kim, H. (2022). Influence of Pedagogical Beliefs and Perceived Trust on Teachers' Acceptance of Educational Artificial Intelligence Tools. *International Journal of Human–Computer Interaction*, *39*(4), 1–13. https://doi.org/10.1080/10447318.2022.2049145

Cohen, I. L., Liu, X., Hudson, M., Gillis, J., Cavalari, R. N. S., Romanczyk, R. G., Karmel, B. Z., & Gardner, J. M. (2017). Level 2 Screening With the PDD Behavior Inventory: Subgroup Profiles and Implications for Differential Diagnosis. *Canadian Journal of School Psychology*, *32*(3-4), 299–315. https://doi.org/10.1177/0829573517721127

Cojean, S., & Martin, N. (2021). Reducing the split-attention effect of subtitles during video learning: might the use of occasional keywords be an effective solution? *L'Année Psychologique*, *Vol. 121*(4), 417–442. https://doi.org/10.3917/anpsy1.214.0417

Cruz-Benito, J., Sánchez-Prieto, José Carlos, Therón, R., & García-Peñalvo, F. J. (2019). *Measuring students' acceptance to AI-Driven assessment in eLearning: Proposing a first TAM-Based research model* (P. Zaphiris & A. Ioannou, Eds.; pp. 15–25). Springer International Publishing.

Dalvean, M., & Enkhbayar, G. (2018). Assessing the readability of fiction: a corpus analysis and readability ranking of 200 English fiction texts. *Linguistic Research*, *35*(null), 137–170. https://doi.org/10.17250/khisli.35..201809.006

Darrow Kleinhaus, S. (2012). Developing Professional Identity Through Reflective Practice. *Touro Law Review*, *28*(4). https://digitalcommons.tourolaw.edu/lawreview/vol28/iss4/11/?utm_source=digitalcommons.tourolaw.edu%2Flawreview%2Fvol28%2Fiss4%2F11&utm_medium=PDF&utm_campaign=PDFCoverPages

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *Journal of Risk and Uncertainty*, *18*(3), 321–325. https://doi.org/10.1023/a:1011156710779

Day, C., Kington, A., Stobart, G., & Sammons, P. (2006). The personal and professional selves of teachers: stable and unstable identities. *British Educational Research Journal*, *32*(4), 601–616. https://doi.org/10.1080/01411920600775316

Dennick, R. (2016). Constructivism: reflections on twenty five years teaching the constructivist approach in medical education. *International Journal of Medical Education*, *7*(1), 200–205. https://doi.org/10.5116/ijme.5763.de11

Dillenbourg, P. (2016). The Evolution of Research on Digital Education. *International Journal of Artificial Intelligence in Education*, *26*(2), 544–560. https://doi.org/10.1007/s40593-016-0106-z

Engestrom, Y. (2000). Activity theory as a framework for analyzing and redesigning work. *Ergonomics*, *43*(7), 960–974. https://doi.org/10.1080/001401300409143

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education*, *59*(2), 423–435. https://doi.org/10.1016/j.compedu.2012.02.001

Fahimirad, M., & Kotamjan, S. S. (2018). A Review on Application of Artificial Intelligence in Teaching and Learning in Educational Contexts. *International Journal of Learning and Development*, *8*(4), 106. https://doi.org/10.5296/ijld.v8i4.14057

Farhan, M., Jabbar, S., Aslam, M., Ahmad, A., Iqbal, M. M., Khan, M., & Maria, M.-E. A. (2017). A Real-Time Data Mining Approach for Interaction Analytics Assessment: IoT Based Student Interaction Framework. *International Journal of Parallel Programming*,

46(5), 886–903. https://doi.org/10.1007/s10766-017-0553-7

Ferikoğlu, D., & Akgün, E. (2022). An Investigation of Teachers' Artificial Intelligence Awareness: A Scale Development Study. *Malaysian Online Journal of Educational Technology*, *10*(3). https://doi.org/10.52380/mojet.2022.10.3.407

Fiorella, L., & Mayer, R. E. (2014). Role of expectations and explanations in learning by teaching. *Contemporary Educational Psychology*, *39*(2), 75–85. https://doi.org/10.1016/j.cedpsych.2014.01.001

Graesser, A. C., & D'Mello, S. (2012). Moment-To-Moment Emotions During Reading. *The Reading Teacher*, *66*(3), 238–242. https://doi.org/10.1002/trtr.01121

Hall, G. E. (2010). Technology's Achilles Heel. *Journal of Research on Technology in Education*, *42*(3), 231–253. https://doi.org/10.1080/15391523.2010.10782550

Henry, A. (2016). Conceptualizing Teacher Identity as a Complex Dynamic System. *Journal of Teacher Education*, *67*(4), 291–305. https://doi.org/10.1177/0022487116655382

Hockings, C., Cooke, S., Yamashita, H., McGinty, S., & Bowl, M. (2009). "I'm neither entertaining nor charismatic …" negotiating university teacher identity within diverse student groups. *Teaching in Higher Education*, *14*(5), 483–494. https://doi.org/10.1080/13562510903186642

Jamal, A. (2023). The role of Artificial Intelligence (AI) in teacher education: Opportunities & challenges. *International Journal of Research and Analytical Reviews (IJRAR)*, *10*(1), 139–146.

Jeongyeon, K., & Hye Young, S. (2020). Negotiation of emotions in emerging language teacher identity of graduate instructors. *System*, *95*, 102365. https://doi.org/10.1016/j.system.2020.102365

Ji, H., Han, I., & Ko, Y. (2022). A systematic review of conversational AI in language education: focusing on the collaboration with human teachers. *Journal of Research on Technology in Education*, *55*(1), 1–16. https://doi.org/10.1080/15391523.2022.2142873

Jonassen, D. H., & Rohrer-Murphy, L. (1999). Activity theory as a framework for designing constructivist learning environments. *Educational Technology Research and Development*, *47*(1), 61–79. https://doi.org/10.1007/bf02299477

Kamali, J., & Nazari, M. (2023). Transnational language teachers' emotional vulnerability and professional identity construction: an ecological perspective. *Journal of Multilingual and Multicultural Development*, 1–15. https://doi.org/10.1080/01434632.2023.2257659

Kim, C., Kim, M. K., Lee, C., Spector, J. M., & DeMeester, K. (2013). Teacher beliefs and technology integration. *Teaching and Teacher Education*, *29*(29), 76–85. https://doi.org/10.1016/j.tate.2012.08.005

Kim, J. H. (2023). Leading teachers' perspective on teacher-AI collaboration in education. *Education and Information Technologies*, *29*(7). https://doi.org/10.1007/s10639-023-12109-5

Kimmerl, J. (2020). Does Who Am I as a Teacher Matter? Exploring Determinants of Teachers' Learning Management System Adoption in Education Style. *ICIS 2020 Proceedings*. https://aisel.aisnet.org/icis2020/digital_learning_env/digital_learning_env/11

Kong, S.-C., William Man-Yin Cheung, & Zhang, G. (2023). Evaluating an Artificial Intelligence Literacy Programme for Developing University Students' Conceptual Understanding, Literacy, Empowerment and Ethical Awareness. *Educational Technology & Society*, *26*, 16–30. https://doi.org/10.30191/ETS.202301_26(1).0002

Kreber, C. (2009). Academics' teacher identities, authenticity and pedagogy. *Studies in Higher*

Education, *35*(2), 171–194. https://doi.org/10.1080/03075070902953048

Lawless, K. A., & Pellegrino, J. W. (2007). Professional Development in Integrating Technology Into Teaching and Learning: Knowns, Unknowns, and Ways to Pursue Better Questions and Answers. *Review of Educational Research*, *77*(4), 575–614. https://doi.org/10.3102/0034654307309921

Leeferink, H., Koopman, M., Beijaard, D., & Schellings, G., L. M. (2018). Overarching professional identity themes in student teacher workplace learning. *Teachers and Teaching*, *25*(1), 69–89. https://doi.org/10.1080/13540602.2018.1527762

Li, Y., Garza, V., Keicher, A., & Popov, V. (2018). Predicting High School Teacher Use of Technology: Pedagogical Beliefs, Technological Beliefs and Attitudes, and Teacher Training. *Technology, Knowledge and Learning*, *24*(1), 501–518. https://doi.org/10.1007/s10758-018-9355-2

Liu, Q., & Geertshuis, S. (2019). Professional identity and the adoption of learning management systems. *Studies in Higher Education*, 1–14. https://doi.org/10.1080/03075079.2019.1647413

Lu, Y. (2019). Artificial intelligence: a survey on evolution, models, applications and future trends. *Journal of Management Analytics*, *6*(1), 1–29. https://doi.org/10.1080/23270012.2019.1570365

Luo, X., & Xie, L. (2018). *Research on Artificial Intelligence-Based Sharing Education in the Era of Internet+*. https://doi.org/10.1109/icitbs.2018.00092

Ma, Z.-H., Hwang, W.-Y., & Shih, T. K. (2020). Effects of a peer tutor recommender system (PTRS) with machine learning and automated assessment on vocational high school students' computer application operating skills. *Journal of Computers in Education*, *7*(3),

435–462. https://doi.org/10.1007/s40692-020-00162-9

Mahmoud, A. mokhtar. (2020). Artificial intelligence applications An Introduction to Education Development in the light of Corona Virus Pandemic (COVID-19) Challenges. *International Journal of Research in Educational Sciences*, *3*(4), 171–224. https://doi.org/10.29009/ijres.3.4.4

Marcelo, C. (2009). Professional Development of Teachers : past and future. *Sísifo : Educational Sciences Journal*, *8*, 5–20.

Markauskaite, L., Marrone, R., Poquet, O., Knight, S., Martinez-Maldonado, R., Howard, S., Tondeur, J., De Laat, M., Buckingham Shum, S., Gašević, D., & Siemens, G. (2022). Rethinking the entwinement between artificial intelligence and human learning: What capabilities do learners need for a world with AI? *Computers and Education: Artificial Intelligence*, *3*(3), 100056. https://doi.org/10.1016/j.caeai.2022.100056

McCarthy, T., Rosenblum, L. P., Johnson, B. G., Dittel, J., & Kearns, D. M. (2016). An Artificial Intelligence Tutor: A Supplementary Tool for Teaching and Practicing Braille. *Journal of Visual Impairment & Blindness*, *110*(5), 309–322. https://doi.org/10.1177/0145482x1611000503

Miller, J. (2009). Teacher identity. In A. Burns & J. C. Editors. Richards (Eds.), *The Cambrige Guide to Second Language Teacher Education* (pp. 172–181). Cambridge University Press.

Mintz, Y., & Brodie, R. (2019). Introduction to artificial intelligence in medicine. *Minimally Invasive Therapy & Allied Technologies*, *28*(2), 73–81. https://doi.org/10.1080/13645706.2019.1575882

Morris, M., & Tsakissiris, J. (2017). The Importance of Context in Management Education: A

Report. *Journal of Learning Design*, *10*(1), 1. https://doi.org/10.5204/jld.v9i3.291

Nazaretsky, T., Ariely, M., Cukurova, M., & Alexandron, G. (2022). Teachers' Trust in AI-powered Educational Technology and a Professional Development Program to Improve It. *British Journal of Educational Technology*, *53*(4). https://doi.org/10.1111/bjet.13232

Nguyen, A., Gardner, L., & Sheridan, D. (2020). Data Analytics in Higher Education: An Integrated View. *Journal of Information Systems Education*, *31*(1), 61–71.

Nixon, J. (1996). Professional identity and the restructuring of higher education. *Studies in Higher Education*, *21*(1), 5–16. https://doi.org/10.1080/03075079612331381417

Onesi-Ozigagun, O., Ololade, J., Eyo-Udo, L., & Ogundipe, O. (2024). REVOLUTIONIZING EDUCATION THROUGH AI: A COMPREHENSIVE REVIEW OF ENHANCING LEARNING EXPERIENCES. *International Journal of Applied Research in Social Sciences*, *6*(4), 589–607. https://doi.org/10.51594/ijarss.v6i4.1011

Ozdemir, O., & Tekin, A. (2016). Evaluation of the presentation skills of the pre-service teachers via fuzzy logic. *Computers in Human Behavior*, *61*, 288–299. https://doi.org/10.1016/j.chb.2016.03.013

Park, W., & Kwon, H. (2023). Implementing artificial intelligence education for middle school technology education in Republic of Korea. *International Journal of Technology and Design Education*, *34*(1), 1–27. https://doi.org/10.1007/s10798-023-09812-2

Pelham, W. E., Petras, H., & Pardini, D. A. (2019). Can Machine Learning Improve Screening for Targeted Delinquency Prevention Programs? *Prevention Science*, *21*(2), 158–170. https://doi.org/10.1007/s11121-019-01040-2

Pham, S. T. H., & Sampson, P. M. (2022). The development of artificial intelligence in education: A review in context. *Journal of Computer Assisted Learning*, *38*(5), 1408–

1421. https://doi.org/10.1111/jcal.12687

Rabianski, J. S. (2003). Primary and secondary data: Concepts, concerns, errors, and issues. *The Appraisal Journal*, *71*(1), 43–55.

Ravitz, J. L., Becker, H. J., & Wong, Y. (2000). *Constructivist-compatible beliefs and practices among US teachers. Teaching, learning, and computing: 1998 national survey report# 4.* ERIC.

Reeves, J. (2018). Part of the Curriculum and Instruction Commons, and the Teacher Education and Professional Development Commons. *John I. Liontas, Ed., the TESOL Encyclopedia of English Language Teaching*, *8*. https://doi.org/10.1002/9781118784235.eelt0268

Richter, E., Brunner, M., & Richter, D. (2021). Teacher educators' task perception and its relationship to professional identity and teaching practice. *Teaching and Teacher Education*, *101*, 103303. https://doi.org/10.1016/j.tate.2021.103303

Rios-Campos, C., Soledad, E., Rumela, I., Elisa, H., Jesús, D., Peña, W. S., Evitt, C., & Yeckle, M. (2023). Artificial Intelligence and Education. *South Florida Journal of Development*, *4*(2), 641–655. https://doi.org/10.46932/sfjdv4n2-001

Rostock, R., & Yoon, S. (2014). Developing a workable teacher identity: Building and negotiating identity within a professional network. In *ProQuest Dissertations and Theses* (No. 3622668, University of Pennsylvania; p. 252). ProQuest Dissertations & Theses Global.

Sachs, J. (2001). Teacher professional identity: competing discourses, competing outcomes. *Journal of Education Policy*, *16*(2), 149–161. https://doi.org/10.1080/02680930116819

Salas-Pilco, S. Z., Xiao, K., & Hu, X. (2022). Artificial Intelligence and Learning Analytics in Teacher Education: A Systematic Review. *Education Sciences*, *12*(8), 569.

https://doi.org/10.3390/educsci12080569

Salkind, N. J. (2010). *Encyclopedia of research design* (Vol. 1). sage.

Satvati, N., Kamali, J., Boldaji, F. S., Khodadadi, M., & Akhondi, S. (2023). *Exploring the Role of Ai Integration into Language Education in Language Teacher Identity Construction: An Ecological Perspective*. https://doi.org/10.2139/ssrn.4670840

Seldon, A., Abidoye, O., & Metcalf, T. (2020). *The fourth education revolution reconsidered: Will artificial intelligence enrich or diminish humanity?* Legend Press Ltd.

Simon, E. (2012). *The coming of age of the virtual teacher: The impact of online teaching on higher education faculty's professional identity and the role of technology*. https://api.semanticscholar.org/CorpusID:158283187

Skinner, B. F. (1958). Teaching Machines: From the experimental study of learning come devices which arrange optimal conditions for self-instruction. *Science*, *128*(3330), 969–977. https://doi.org/10.1126/science.128.3330.969

Srinivasa, K. G., Kurni, M., & Saritha, K. (2022). Harnessing the Power of AI to Education. In *Learning, Teaching, and Assessment Methods for Contemporary Learners: Pedagogy for the Digital Generation* (pp. 311–342). Springer.

Steckman, L. M. (2020). *Examining internet and technology around the world*. Bloomsbury Publishing.

Stein, S. J., Shephard, K., & Harris, I. (2009). Conceptions of e-learning and professional development for e-learning held by tertiary educators in New Zealand. *British Journal of Educational Technology*, *42*(1), 145–165. https://doi.org/10.1111/j.1467-8535.2009.00997.x

Tapalova, O., & Zhiyenbayeva, N. (2022). Artificial Intelligence in Education: AIEd for

Personalised Learning Pathways. *Electronic Journal of E-Learning*, *20*(5), 639–653. https://doi.org/10.34190/ejel.20.5.2597

Tashakkori, A., & Creswell, J. W. (2007). Exploring the nature of research questions in mixed methods research. *Journal of Mixed Methods Research*, *1*(3), 207–211. https://doi.org/10.1177/1558689807302814

Trentin, G. (2006). Technology Enhanced Learning and university teaching: different approaches and reasons for their choice. *DOAJ (DOAJ: Directory of Open Access Journals)*, *14*(1), 3–3. https://doi.org/10.17471/2499-4324/382

Uitto, M., Jokikokko, K., & Estola, E. (2015). Virtual special issue on teachers and emotions in Teaching and teacher education (TATE) in 1985–2014. *Teaching and Teacher Education*, *50*, 124–135. https://doi.org/10.1016/j.tate.2015.05.008

van Lankveld, T., Schoonenboom, J., Volman, M., Croiset, G., & Beishuizen, J. (2016). Developing a teacher identity in the university context: a systematic review of the literature. *Higher Education Research & Development*, *36*(2), 325–342. https://doi.org/10.1080/07294360.2016.1208154

van Veen, K., & Sleegers, P. (2009). Teachers' Emotions in a Context of Reforms: To a Deeper Understanding of Teachers and Reforms. In P. Schutz & M. Zembylas (Eds.), *Advances in Teacher Emotion Research: The Impact on Teachers' Lives* (pp. 233–251). Springer Nature. https://doi.org/10.1007/978-1-4419-0564-2_12

van Veen, K., Sleegers, P., Bergen, T., & Klaassen, C. (2001). Professional orientations of secondary school teachers towards their work. *Teaching and Teacher Education*, *17*(2), 175–194. https://doi.org/10.1016/s0742-051x(00)00050-0

van Veen, K., Sleegers, P., & van de Ven, P.-H. (2005). One teacher's identity, emotions, and

commitment to change: A case study into the cognitive–affective processes of a secondary school teacher in the context of reforms. *Teaching and Teacher Education*, *21*(8), 917–934. https://doi.org/10.1016/j.tate.2005.06.004

Vygotsky, L. S. (1978). Mind in Society: Development of Higher Psychological Processes. In M. Cole, V. Jolm-Steiner, S. Scribner, & E. Souberman (Eds.), *Mind in Society: Development of Higher Psychological Processes* (Vol. 1, Issue 1). Harvard University Press. https://doi.org/10.2307/j.ctvjf9vz4

Westberry, N., McNaughton, S., Billot, J., & Gaeta, H. (2014). Resituation or resistance? Higher education teachers' adaptations to technological change. *Technology, Pedagogy and Education*, *24*(1), 101–116. https://doi.org/10.1080/1475939x.2013.869509

Williamson, B., & Eynon, R. (2020). Historical threads, missing links, and future directions in AI in education. *Learning, Media and Technology*, *45*(3), 1–13. https://doi.org/10.1080/17439884.2020.1798995

Ye, Z. Q. (2021). *Dual logic of teacher role transformation based on artificial intelligence* (pp. 282–287). IEEE Catalog Number: 2021 2nd International Conference on Big Data and Informat ion Education (ICBDIE 2021). https://doi.org/10.1109/ICBDIE52740.2021.00070

Yu, H., & Guo, Y. (2023). Generative artificial intelligence empowers educational reform: current status, issues, and prospects. *Generative Artificial Intelligence Empowers Educational Reform: Current Status, Issues, and Prospects*, *8*. https://doi.org/10.3389/feduc.2023.1183162

Yuan, S., He, T., Huang, H., Hou, R., & Wang, M. (2020). Automated Chinese Essay Scoring based on Deep Learning. *Computers, Materials & Continua*, *65*(1), 817–833.

https://doi.org/10.32604/cmc.2020.010471

Zemsky, R., & Massy, W. (2004). *Thwarted Innovation What Happened to e-learning and Why*. The Learning Alliance at the University of Pennsyvlania.

Appendix A

The Impact of AI on Teacher Identity
Questionnaire

Part 1
Informed Consent Form

Dear participant,
You are invited to participate in a research study entitled "The impact of AI on teacher identity". This study is conducted by Burcu Kabadayı, under the supervision of Assoc. Prof. Mar Gutiérrez-Colón Plana. It is designed to examine the possible impact of artificial intelligence on teacher's professional identity.
Participation in the study is entirely voluntary. Your responses will remain confidential and anonymous. Data from this research will be kept under lock and key and reported only as a collective combined total. No one other than the researcher will know your answers to this questionnaire.

The questionnaire is divided into three parts. In case of necessity, there will be a second phase to interview some participants. For this reason, your *e-mail address is requested* in the questionnaire only if you wish to take part in the interview stage.

It should take *15 minutes* to complete. It is pivotal for the study that you give your answers carefully to obtain precise results. Thank you in advance for contributing to this study and for your time. If you have any questions about this research, feel free to contact Burcu Kabadayı at bkabadayi@etu.edu.tr.

- ☐ I have read and I understand the provided information. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I voluntarily agree to take part in this study and accept the use of the information I share for scientific publications.

Demographic Information

1. Please enter your birth year.

……..

2. Teaching experience (in years)
   - ☐ 0-4
   - ☐ 5-9
   - ☐ 10-14
   - ☐ 15-19
   - ☐ 20+

3. Education level (completed)
   - ☐ Bachelor
   - ☐ Master

- PhD

4. Gender
   - Female
   - Male
   - Non-binary

Part 2

Digital Competence

1. I use different digital channels to communicate with learners and colleagues whenever appropriate (eg emails, blogs, educational organization's website, LMS, Apps)

- I do not use digital communication channels.
- I use basic digital communication channels, eg e-mail, instant messaging system.
- I combine different communication channels, eg e-mail, instant messaging, or the education organization's website.
- I analyze and assess the communication channels to choose the ones I consider most effective for my communication purpose.
- I confidently plan my digital communication strategy using a variety of digital technologies.

2. I use digital technologies whenever appropriate to work together with colleagues inside and outside my educational organization.

- I do not collaborate with other colleagues.
- I sometimes exchange materials and ideas with colleagues, eg via e-mail or videoconference.
- Among colleagues, we work together in collaborative environments or use shared drives.
- I experiment with new tools for online collaboration with colleagues inside and outside my institution.
- I jointly create, reuse and share materials with other educators in an online network.

3. I actively develop my digital competence for teaching.

- I do not work on my digital competence for teaching.
- I improve my digital competence for teaching through reflection and experimentation.
- I use a range of resources to develop my digital competence for teaching.
- I discuss with colleagues how to use digital technologies to innovate and improve my educational practice.
- I register and attend different digital competence development courses, online or
- face-to-face, for improving my teaching practices.

4. I am aware of and participate in online training opportunities eg online courses, MOOCs, webinars, virtual conferences...

- This is something that I have not yet considered.
- I have participated in online training once or twice.
- I have tried out various online training opportunities.

- I participate in all kinds of online training that could help me improve my teaching skills.
- I am professionally certified in the use of different technologies for teaching and
- learning.

5. I use different internet sites and search strategies to find and select a range of different digital resources.

- I do not know how to use the internet to search for useful resources.
- I am able to use the internet to search for useful resources.
- I use search engines and educational/resource platforms to find relevant resources.
- I compare resources using a range of relevant criteria, eg reliability, quality, fit, design, interactivity, appeal.
- I take the lead on fostering the use of digital resources in my institution.

6. I carefully consider how, when, and why to use digital technologies in classroom with my learners, so that they are used with added value.

- I do not or only rarely use technology in the classroom.
- I make basic use of available equipment, eg digital whiteboards, projectors, or virtual learning environments if teaching online.
- I use a variety of digital resources and tools in my teaching.
- I developed my own tested portfolio of activities, technologies, and teaching methods.
- I use digital tools to implement innovative pedagogical strategies.

7. I use digital technologies to allow learners to plan, document and monitor their learning themselves Eg quizzes for self-assessment, ePortfolios for documentation and showcasing, online diaries/blogs for reflection...

- I encourage learners to reflect on their learning, but not with digital technologies.
- I use basic tools, for example, quizzes for self-assessment or a course blog.
- I integrate different digital tools to allow learners to plan, monitor and reflect on their progress.
- I selectively choose the best digital tools to integrate into my teaching, after testing them with different learning tasks and cohorts of learners.
- I develop apps or digital games to engage learners in their own learning.

8. I use digital assessment tools to monitor student progress.

- I do follow the learners progress regularly, but not with digital means.
- I use a digital tool, eg a quiz/blog/activity delivery records, to review the learners' progress.
- I use a variety of digital tools to review learners' progress.
- I selectively choose the best digital tools and test them to use with learners, for assessment, to monitor progress.
- I develop my own apps and digital tools for progress monitoring and/or assessment purposes.

9. I use digital technologies for learners to actively participate in class or online learning.

- ☐ It is not possible to actively involve learners in class or with online learning.
- ☐ I do involve learners actively in class, but not with digital technologies.
- ☐ When teaching, I use motivating stimuli, eg videos, animations.
- ☐ My learners use digital technologies to investigate, discuss and create knowledge.
- ☐ I help learners not only to create but also present and share the knowledge they create.

10. I teach students how to assess the reliability of information.

- ☐ This is not possible in my subject or work environment.
- ☐ I remind them that not all online information is reliable.
- ☐ I discuss with learners how to verify the accuracy of information.
- ☐ I discuss with learners how information is generated and can be distorted.
- ☐ I discuss with learners how can they adapt and produce information that is free of misinformation, bias and manipulation.

11. I set up course tasks which require learners to create digital content eg videos, audios, photos, digital presentations, blogs, wikis...

- ☐ I do not know how to do it.
- ☐ I do not implement this type of activity with my learners because they do not have enough digital skills.
- ☐ Sometimes, for fun and motivation.
- ☐ My learners create digital content as an integral part of their study.
- ☐ I encourage learners to create digital content at the same time to identify openly licensed content which can be reused.

12. I encourage learners to use digital technologies creatively to solve concrete problems eg to overcome obstacles or challenges emerging in the learning process.

- ☐ This is not possible with my learners, in my work environment.
- ☐ I do it whenever an opportunity arises.
- ☐ I create opportunities to foster learners' digital problem solving.
- ☐ I integrate opportunities for creative digital problem solving.
- ☐ Apart from creating opportunities for learners to use their digital problem-solving skills, I let them spot these opportunities arising themselves.

13. I find and use open licenses in digital resources.

- ☐ I do not know what an open educational resource is.
- ☐ I can identify the license of an educational resource.
- ☐ I openly license the educational materials I produce.
- ☐ I share the OER I create and adapt with others.
- ☐ I support my institution in the implementation of OER as an open education practice.

14. I adopt open educational practices in my teaching in order to make it more inclusive.

- ☐ I do not know how to apply open educational practices in my teaching.
- ☐ I apply the principles of Open Educational Practices (OEP) in my teaching. (for example, by using and sharing open educational resources (OER), using MOOCs and free and open online courses as support material or reference, etc.)

- Besides applying the principles of Open Educational Practices (OEP) in my teaching, I take into account the access and accessibility of the teaching materials that I produce, in order to cater for those learners with special needs.
- I not only apply Open Education Practices (OEP) principles in my teaching but also openly share my teaching practices with other colleagues by using digital technologies. (for example, by recording and publishing podcasts or keeping an updated blog, or by collaborating on open platforms or social networks).
- I create different learning pathways for the OER that I produce with the aim to enable the personalization of the learning process.

Part 3

AI Familiarity

Please indicate your level of agreement with the following statements. (1 Strongly disagree to 5 Strongly agree Likert Scale)

1. I understand the basic principles of Artificial Intelligence (AI).
2. I am aware of various AI tools and applications available for educational purposes.
3. I regularly keep myself updated on new AI technologies relevant to education.
4. I enjoy exploring and experimenting with AI tools.
5. I believe my current level of AI knowledge is sufficient to effectively integrate AI into my teaching.

(TAM Framework) Please indicate your level of agreement with the following statements. (1 Strongly disagree to 5 Strongly agree Likert Scale)

Using AI in my work helps me accomplish tasks more quickly.
Using AI improves my work performance.
Using AI improves my work productivity.
Using AI enhances my effectiveness at work.
Using AI makes it easier to do my work.
I find AI useful in my wok.
Learning to use AI has been easy for me.
I find it easy to get AI to do what I want it to do.
It is easy for me to become skillful at using AI.
I find AI easy to use.

(AI Usage)

1. How often do you use AI tools for personal purposes? (1 Never to 5 Always Likert Scale)
2. How often do you use AI tools for professional purposes stated below:
   - Automated Grading
   - Automated Feedback
   - Develop Material
   - Create Assessment
   - Prepare Presentations
   - Professional Development
   - Prepare Lesson Plan
   - Other* (if any)

*Please specify for what other professional purposes you use AI tools for if there are any.
……..

Part 4
Teacher Perceptions

Please indicate your level of agreement with the following statements. (1 Strongly disagree to 5 Strongly agree Likert Scale)

1. Do you believe AI tools have improved the quality of your interactions with students?
2. Do you believe AI tools have hindered the quality of your interactions with students?
3. Do you feel that AI technologies has contributed to your professional growth as a teacher?
4. Does the use of AI align with your department's values and priorities regarding teaching?
5. Do you feel that AI tools support or undermine the recognition of teaching excellence in your department?
6. Has the use of AI in your teaching affected how valued or recognized you feel as an educator?
7. Do AI tools help you feel more connected to your colleagues and students?
8. Has integrating AI into your teaching affected your confidence in your teaching abilities?
9. Do you think AI tools aid in recognizing and showcasing teaching excellence?
10. Do you believe advancements in AI technology have influenced your vision of your future career path in education?

Open-Ended Questions

11. Please share any personal experiences or insights you have regarding the impact of AI on your role and identity as a teacher in higher education.

    …….
    …….
    …….
12. How has the use of AI influenced your motivation and dedication to teaching?
    ……..……..
    …….
    …….
13. How do you perceive the integration of AI within the broader academic and departmental culture?

…….
…….
…….

14. How has the incorporation of AI tools affected your ability to engage and connect with students?

…….
…….
…….

Thank you for participating!

Please write down your email address if you would like to participate in the interview phase.

……..