

**Mapping of Artificial Intelligence Studies on Teachers and Prospective Teachers in
Türkiye: Thematic Analysis of Postgraduate Theses from the 2020-2025 Period**

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Abstract

While the integration of artificial intelligence (AI) into education systems is rapidly advancing today, the success of this process largely depends on factors such as teachers' and pre-service teachers' attitudes, knowledge, and professional competencies regarding AI. In this context, the aim of this study is to map the thematic landscape of postgraduate theses on AI conducted on teachers and pre-service teachers in Türkiye during the 2020-2025 period and to systematically analyze academic trends in this field. The study was designed based on document analysis, one of the qualitative research approaches. The dataset consists of a total of 88 postgraduate theses obtained as a result of a systematic search conducted in the Council of Higher Education (CoHE) National Thesis Center database between 2020-2025 with keywords covering AI and the teaching profession. The collected theses were subjected to a detailed content analysis based on the variables of distribution by year, thesis type, publication language, university/institute/department, and primarily subject areas (thematic foci). The findings of postgraduate theses reviewed for the 2020-2025 period indicate that AI studies on teachers and pre-service teachers quantitatively peaked in 2024-2025. The dominance of the Master's level suggests that the field is still in an exploratory/initial stage. While the disciplinary focus is concentrated in the Institute of Educational Sciences and Computer and Instructional Technologies Education, Gazi University achieved the highest output. The thematic analysis points to research predominantly focusing on teachers' Opinions and Experiences regarding AI, with applied effectiveness and design studies remaining secondary.

Keywords: Artificial Intelligence, Education, Teachers and Teacher Candidates, Postgraduate Thesis, Thematic Analysis.

INTRODUCTION

Artificial intelligence (AI), considered one of the most striking technological developments of the 21st century, is the creation of computer systems capable of learning, problem-solving, decision-making, and mimicking skills that normally require human intelligence (Devaraju & Sowmya, 2025). In particular, the rapid transformation in AI technologies is fundamentally changing education systems, significantly

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The 14th InTraders International Conference On Multidisciplinary Studies, 27-28 October 2025, Sakarya, Türkiye impacting this field and adding new dimensions. Indeed, AI attracts the attention of both educators and researchers with its potential to personalize learning processes, improve teaching methods, and enrich educational experiences (Temur, 2024).

The ability of educational environments to maintain their contemporary quality is directly related to the training of teachers who follow current technologies, use them efficiently, and can evaluate their effects (Orhan Göksun, 2025). Indeed, AI technologies have the potential to revolutionize teaching and learning processes and offer great opportunities for both educators and students. In this context, developing teachers' AI usage skills will facilitate their integration of these technologies into educational environments, thereby increasing learning efficiency (Wang et al., 2021). Furthermore, it is predicted that teachers who can adapt to change and effectively manage AI tools with a flexible approach will come to the forefront in the future. As in all processes of change and uncertainty, maintaining teacher effectiveness in the face of technological advancements will also indirectly contribute to preserving teachers' professional satisfaction (Fidan, 2025). The importance of this transformation is supported by the findings of international organizations and research. For example, the World Economic Forum (2025) has suggested viewing teachers as "learning architects" and collaborating with AI to provide individualized support to every student. Additionally, a study by Kaufman et al. (2025) found that one in four teachers in the United States uses AI in lesson planning.

The integration of AI technologies into education also brings a series of challenges stemming from the unknown (Dişlioğlu & Medeni, 2025). One of the primary challenges is inadequate teacher preparation for this technology (Ayanwale et al., 2022). The rapid introduction of new applications widens the gap in basic AI literacy, making it difficult for teachers to stay informed about the latest developments, make appropriate choices, and learn practical applications (Sanusi et al., 2022). Therefore, it has become necessary to re-evaluate the training of future teachers in light of new challenges and opportunities (Dubovyk, 2024). Mastering digital tools and the correct use of AI technologies is a significant responsibility for teachers (Nurueva & Muktarbekova, 2025). Teachers play an important role in critical thinking and future readiness so that students can correctly interpret and use information provided by AI (Fidan, 2025). Therefore, teachers need to develop themselves in ethically using the potential of AI and also help students (Chiu et al., 2023). Yue et al. (2024) similarly pointed out the necessity of investing in professional development programs that will provide teachers with the necessary knowledge, skills, and confidence to work with AI technology. All these developments indicate that the integration of AI technologies into education reveals the need to reconceptualize the content and structure of teachers' knowledge competence (Trapitsyn & Tursynbaeva, 2025).

Within this framework, the increasing importance of AI in education and the transformation of the teacher's role have revealed the necessity of examining studies conducted at the national level. In this context, the study aims to map the scientific accumulation in this field by conducting an "Analysis of AI-related Postgraduate Studies (2020-2025) on Teachers and Teacher Candidates in Türkiye ". Indeed, by analyzing postgraduate theses covering the 2020-2025 period, it aims to guide future research by identifying current trends, focused topics, methods used, and identified gaps in the field. To create a comprehensive map of the theses, a systematic evaluation was conducted based on the following dimensions:

- 1) **Publication Year:** Determining the year the study contributed to the scientific field to reveal the temporal distribution of current trends in the field.
- 2) **Thesis Type:** Identifying which academic degree (Master's or Doctorate) the study represents at the postgraduate level.
- 3) **Language:** Determining the language in which the thesis was written (Turkish or foreign languages).
- 4) **University:** Identifying the higher education institution where the thesis was academically conducted and approved.
- 5) **Institute:** Identifying the academic unit within the university to which the thesis belongs (e.g., Institute of Educational Sciences, Institute of Science, Institute of Social Sciences).
- 6) **Department/Major Science Branche:** Determining the disciplinary area where the thesis is scientifically positioned (e.g., Computer and Instructional Technologies Education, Curriculum and Instruction, Turkish Language Education).
- 7) **Subject Areas and Themes:** Identifying and classifying which themes the theses focus on, such as the use of AI in education, teacher competencies, perceptions, ethical dimensions, AI literacy, and teacher roles.

METHOD

Research Model and Scope

This research is designed based on a qualitative research pattern, using the document review method. The qualitative research paradigm aims to achieve an in-depth, realistic, and holistic understanding of the phenomenon or event being examined (Almusaed et al., 2025). Document review, on the other hand, is a method that involves the systematic analysis of written materials related to the research topic (Chand, 2025), and for the purpose of this study, it offers a suitable approach to map the scientific accumulation in Türkiye.

The data source for the study consists of postgraduate theses completed between 2020-2025, obtained from the Council of Higher Education National Thesis Center (CoHENTC) database. These theses were determined using the criterion sampling strategy, one of the purposeful sampling methods (Michelucci, 2025).

The criteria used to determine the theses to be included in the research scope are as follows:

1. The postgraduate study must include "Artificial Intelligence (AI)" or related keywords.
2. The study must directly focus on "teachers" and/or "pre-service teachers" as a sample/subject.
3. The thesis must have been completed between "2020-2025".

As a result of a systematic search conducted in line with these determined criteria, a total of 88 postgraduate theses, which constitute the data set of the research, were reached. The main reason for choosing the 2020-2025 period in the study is the acceleration of AI technologies and their placement at the center of educational transformation during this period, leading to an increase in academic interest and research on the subject.

Data Collection Tool

Within the scope of the research, the "Thesis Analysis Form" was used as a data collection tool, which enabled the systematic examination and analysis of theses. This form was revised based on forms used in similar thesis analysis studies in the literature (Temur, 2025a) and made specific to the objectives of the study.

The Thesis Analysis Form was created from the following main sections to obtain information about the bibliographic and methodological structure of the 88 theses collected:

1. **Thesis Publication Information:** Type of thesis, publication year, publication language, university, institute, and department where it was published.
2. **Thesis Subject Areas and Themes:** Identification of specific topics (AI perception, AI integration, ethics, competencies, role transformation, etc.) on which the thesis focuses.

Analysis of Data

The 88 postgraduate theses examined in the research were evaluated using descriptive content analysis. Descriptive content analysis is a systematic method that aims to provide a comprehensive picture of a field by identifying trends and findings in a specific subject area (Jayarajah et al., 2014). This method allowed for the categorization and interpretation of collected data according to predetermined themes (Bengtsson, 2016).

The findings obtained in line with the criteria determined in the Thesis Analysis Form were first categorized, and then relevant themes were created from these categories. The findings were presented in tables with frequency and percentage values to clearly show the distributions and trends in the field. The obtained data were systematically explained, interpreted, and related to the dimensions within the scope of the research to reach conclusions.

Validity and Reliability

Ensuring validity and reliability in qualitative research is critical for ensuring the transparency and consistency of research processes (Yüksel et al., 2007).

To increase the validity of the study, the research model, data source, data collection, and analysis processes were explained in a detailed and transparent manner. In addition, to enrich the perspective of the study, an external critical evaluation (Silverman, 2016) was provided during the coding process by consulting an expert researcher in AI and descriptive content analysis.

In the reliability phase, inter-coder reliability and intra-coder reliability analyses were performed to ensure the consistency of the codings. For inter-coder reliability, an expert researcher in the main themes and categories of the thesis was asked to perform independent coding. For intra-coder reliability, the coding process performed by the researcher was repeated approximately one month later. The reliability coefficient was calculated using the formula proposed by Miles and Huberman (1994). As a result of the calculations, a rate above 80% is considered reliable, and a high reliability coefficient of 96% obtained in this study indicates that the codings are highly consistent. This finding supports the reliability of the analysis.

FINDINGS

Table 1: Distribution of Postgraduate Theses by Publication Year

Year	(<i>f</i>)	(%)
2020	-	-
2021	1	1,13
2022	4	4,54
2023	6	6,81
2024	29	32,95
2025	48	54,54
Total	88	100

According to the data in Table 1, while no theses were published in 2020, a gradual and steady increase in the number of theses is observed from 2021 to 2025. Academic production in the last two years of the period is particularly noteworthy: 32.95% of the total theses were published in 2024, and this rate reached its highest level at 54.54% in 2025. This finding reveals that the topic of AI in the context of teachers and pre-service teachers has become an increasing focus of interest in the academic community, and scientific production in this field has gained

significant momentum, especially in the later years of the examined period.

Table 2: Distribution of Postgraduate Theses by Thesis Type

Thesis Type	(f)	(%)
Master's Degree	84	95,45
Doctoral Thesis	4	4,54
Total	88	100

When Table 2, which shows the distribution of postgraduate theses by type, is examined, it is determined that AI studies on teachers and pre-service teachers are predominantly concentrated at the master's level. 84 of the total 88 postgraduate theses are master's theses, constituting 95.45% of the total studies. In contrast, the number of studies conducted at the doctoral level was found to be quite limited (f=4).

Table 3: Distribution of Postgraduate Theses by Language

Thesis Language	(f)	(%)
Turkish	71	80,68
English	17	19,31
Total	88	100

When Table 3, which shows the distribution of postgraduate theses by language of publication, is examined, it is seen that the vast majority of AI studies on teachers and pre-service teachers were written in Turkish. 71 of the total 88 theses (80.68%) were published in Turkish. This finding indicates the dominance of the research in the national literature. In contrast, the number of theses published in English is 17, which constitutes 19.31% of the total studies. This distribution shows that approximately four-fifths of the examined postgraduate theses were produced in the national language.

Table 4: Distribution of Postgraduate Theses by University

University	(f)	(%)
Gazi University	11	12,50
Bahçeşehir University	6	6,81
Necmettin Erbakan University	6	6,81
Anadolu University	4	4,54
Ankara University	3	3,40
İnönü University	3	3,40
Fırat University	3	3,40
Van Yüzüncü Yıl University	3	3,40
Kastamonu University	3	3,40
Bolu Abant İzzet Baysal University	3	3,40
Muğla Sıtkı Koçman University	3	3,40
Atatürk University	3	3,40
Mersin University	2	2,27
Bursa Uludağ University	2	2,27
Yıldız Teknik University	2	2,27
Burdur Mehmet Akif Ersoy University	2	2,27
Afyon Kocatepe University	2	2,27
İstanbul Aydın University	2	2,27
Other	25	28,40
Total	88	100

When Table 4, which shows the distribution of postgraduate theses by the universities where they were published, is examined, it is determined that 88 theses were produced within 43 different universities. This indicates that the topic of AI is of interest in a wide geographical area.

When the distribution of postgraduate theses by the universities where they were published is examined, Gazi University was found to be the institution with the most academic production in this field (f=11). This institution is followed by Bahçeşehir University (f=6) and Necmettin Erbakan University (f=6). Anadolu University (f=4) is ranked fourth. On the other hand, Ankara University, İnönü University, Fırat University, Van Yüzüncü Yıl University, Kastamonu University, Bolu Abant İzzet Baysal University, Muğla Sıtkı Koçman University, and Atatürk University (f=3) indicate a relatively high level of production.

The remaining large part of the table consists of 6 universities that published two theses each (f=2) and 25 universities that published one thesis each (f=1). These findings show that a significant portion of universities contribute to the research of AI; however, approximately one-eighth of the academic production is concentrated in a single institution (Gazi University).

Table 5: Distribution of Postgraduate Theses by Institute

Institute	(f)	(%)
Institute of Educational Sciences	48	54,54
Institute of Graduate Education	25	28,40
Institute of Science	7	7,95
Institute of Social Sciences	6	6,81
Institute of Health Sciences	1	1,13
Institute of Winter Sports and Sports Sciences	1	1,13
Total	88	100

The analysis of Table 5, which shows the distribution of postgraduate theses on AI studies concerning teachers and pre-service teachers by the institutes where they were published, reveals the disciplinary focus of academic production.

54.54% (f=48) of the total 88 theses examined were produced within the Institute of Educational Sciences. This finding indicates that research on AI in the context of education is overwhelmingly led by the most dominant discipline. The institute with the second highest number of theses is the Institute of Graduate Education, with a rate of 28.40% (f=25).

These two institutes together constitute the vast majority of total academic production. Looking at the distribution of the remaining studies, the Institute of Science contributed 7.95% (f=7) and the Institute of Social Sciences contributed 6.81% (f=6).

The Institute of Health Sciences and the Institute of Winter Sports and Sports Sciences were identified as

the institutes providing the most limited contribution, with one thesis each (f=1), at a rate of 1.13%. These data, the research fundamentally confirms that it is on the agenda of the field of educational sciences.

Table 6: Distribution of Postgraduate Theses by Department/Major Science Branche

Department/Major Science Branche	(f)	(%)
Computer and Instructional Technologies Education Major Science Branche	19	21,59
Foreign Languages Education Major Science Branche	14	15,90
Mathematics and Science Education Major Science Branche	14	15,90
Educational Sciences Major Science Branche	12	13,63
Turkish and Social Sciences Education Major Science Branche	6	6,81
Basic Education Major Science Branche	6	6,81
Fine Arts Education Major Science Branche	2	2,27
English Language Education Major Science Branche	2	2,27
Educational Technologies Major Science Branche	2	2,27
Physical Education and Sports Major Science Branche	2	2,27
Special Education Major Science Branche	2	2,27
Internet and Information Technologies Management Major Science Branche	2	2,27
English Language and Literature Major Science Branche	1	1,13
Education Programs and Instruction Major Science Branche	1	1,13
Information Systems and Technologies Major Science Branche	1	1,13
Innovation and Entrepreneurship Major Science Branche	1	1,13
Turkish and Social Studies Major Science Branche	1	1,13
Total	88	100

The analysis of Table 6, which shows the distribution of postgraduate theses by major science branche, details the distribution of AI studies within educational sciences. It was determined that a total of 88 theses were produced in 17 different main fields of study.

The area where theses are most concentrated is the Department of Computer Education and Instructional Technology, with a rate of 21.59% (f=19). This finding reveals that AI has strong interest focusing on instructional technologies.

In second and third place, with an equal number of theses, are the Department of Foreign Language Education and the Department of Mathematics and Science Education (f=14). Following this, the Department of Educational Sciences is positioned in fourth place with 13.63% (f=12).

Other main fields of study that produced a relatively high number of theses (f=6) are Turkish and Social Sciences Education and Primary Education.

The remaining 11 main fields of study offer a more limited contribution with two (f=2) or one thesis (f=1) each. This distribution clearly shows that the weight of research on AI is concentrated in the disciplines of instructional technologies, foreign languages, and basic sciences education.

Table 7: Distribution of Postgraduate Theses by Subject Area

Category	Review Focus	Thesis No.	(f)	(%)
Opinions and Experiences	Investigation of qualitative perceptions and opinions on the impact of AI on education, practices, curriculum, and feedback.	7, 10, 11, 16, 21, 24, 27, 30, 32, 36, 41, 46, 47, 50, 54, 65, 67, 68, 69, 72, 73, 76, 78, 81, 86, 87	26	29,54
Awareness Levels and Perceptions	Investigation of knowledge, awareness, perceptions, and metaphorical thinking levels regarding the concept of AI, its use, and its inclusion in language teaching.	3, 8, 9, 25, 28, 39, 51, 52, 53, 57, 64, 79, 84	13	14,77
Relational Studies	Correlational and structural studies that relate AI concepts to concepts such as leadership, innovation, 21st-century skills, and computational thinking.	2, 12, 13, 14, 17, 26, 37, 44, 59, 63, 70, 80, 83	13	14,77
Attitude, Acceptance, Intention, Readiness, and Interest Levels	Measurement of emotional tendencies, willingness to adopt/use, intention, and interest levels towards AI.	19, 22, 33, 45, 55, 60, 61, 77	8	9,09
Literacy and Trends	Identification of skills (literacy) and tendencies in understanding and critically using AI tools.	20, 29, 31, 40, 43, 58, 74, 75, 82	9	10,22
Effectiveness and Comparative Analyses of AI Applications/Tools	Applied studies that examine the effects of AI tools (feedback, scoring, language models) on learning outcomes or compare them with teachers.	1, 4, 15, 34, 38, 49, 56, 66, 85	9	10,22
Self-Efficacy, Anxiety, and Technostress	Investigation of an individual's self-efficacy beliefs regarding AI, anxiety, and stress levels caused by technology use. (Those with a predominant focus on AI anxiety)	23, 35, 48, 62	4	4,54
Lesson Plan and Material Design	Development-oriented studies proposing AI-supported content/material/lesson plan design or professional development models.	5, 6, 18, 71,	4	4,54
Reliability and Validity Study	Studies focusing on developing a scale for AI or on the linguistic adaptation and validity of an existing scale.	42, 88	2	2,27
Total			88	100

The analysis of Table 7, which shows the distribution of postgraduate theses by subject areas, reveals the thematic intensity of AI studies conducted on teachers and prospective teachers. It was determined that a total of 88 theses were grouped under 9 main categories.

The most dominant area of examination is the "Opinions and Experiences" category, with a rate of 29.54% (f=26). This category focuses on examining qualitative perceptions and opinions regarding the impact of AI on education, practices, curriculum, and feedback. This finding indicates that researchers primarily try to understand teachers' subjective evaluations and experiences about AI.

The second place is shared by two categories with equal distribution: "Awareness Levels and Perceptions" and "Relational Studies" (f=13). This shows that the determination of knowledge, consciousness, and perception levels regarding the concept of AI, and correlational studies that associate AI with other pedagogical and professional concepts such as leadership and innovation, hold an important place.

Other important categories were determined as "Literacy and Tendencies" (f=9) and "Effectiveness and Comparative Analyses of AI Applications/Tools" (f=9), respectively. This situation indicates that applied research examining the effects of AI tools on learning outcomes also has significant weight on the academic agenda.

The remaining categories are represented at lower rates: "Attitude, Acceptance, Intention, Readiness, and Interest Levels" (f=8); "Self-Efficacy, Anxiety, and Technostress" (f=4); "Lesson Plan and Material Design" (f=4); and "Reliability and Validity Study" (f=2). This distribution clarifies that research largely focuses on measuring teachers' perceptions and opinions towards AI, but applied effectiveness studies and pedagogical design-oriented theses also constitute an important subset.

CONCLUSION, DISCUSSION AND RECOMMENDATIONS

In this section, the findings obtained from the reviewed postgraduate theses are presented under subheadings in line with the study's research questions. These findings, which reveal the current status of AI studies on teachers and pre-service teachers in Türkiye, have been discussed with a comparative and critical approach in relation to relevant studies in both national and international literature. In this context, the findings regarding the distribution of academic production by year, level, publication language, institutions, disciplines, and subject areas, and their place in the literature, are discussed in detail below.

The distribution of the reviewed postgraduate theses by year in the 2020-2025 period (Table 1) reveals that the topic of AI in the context of teachers and pre-service teachers is exhibiting a rapidly rising trend in the academic community. Indeed, the absence of any theses published in this area in 2020 indicates that the topic is relatively new to Türkiye's educational sciences literature. However, the consistent increase starting from 2021, and especially the publication of the vast majority of total theses (87.49%) in 2024 and 2025, demonstrates that academics perceived the transformative potential of AI in education and the problems requiring urgent solutions more strongly towards the end of the period. This finding confirms that issues such as the integration of AI into the education system and its impact on teacher competencies have gained momentum recently, in parallel with Türkiye's education policies and technological agenda. This result is also consistent with other bibliometric studies conducted in the field of education. For example, Temur (2025a) stated in his study examining education postgraduate theses in Türkiye that there

The 14th InTraders International Conference On Multidisciplinary Studies, 27-28 October 2025, Sakarya, Türkiye was a significant increase in the number of theses after 2022. Yurtsever and Yurtsever (2025), who conducted a systematic literature review specifically examining the impact on teachers, also revealed a significant increase in the number of studies on teachers between 2022-2023. Similarly, Uğur and Usta (2025) concluded that the highest number of theses in the field of AI in education was recorded in 2023-2024. From a broader perspective, Ilham et al. (2024) showed that publications related to AI in education were on a continuous upward trend globally between 2014-2022. Specifically, Hündür et al. (2025), who mapped studies in the field of science education, also determined that 2024 was the year with the highest concentration of AI-related studies in Türkiye. These parallels indicate that the increase in academic production on AI in the context of teachers and pre-service teachers is an integral part of the overall AI-based research boom in Turkish education literature. In light of these data, it can be said that awareness and research needs regarding the role of AI in education are steadily increasing; this strengthens the expectation that academic production in this field will continue to grow in the coming years.

The distribution of postgraduate theses by type (Table 2) shows that a large majority of academic production in the field (95.45%) is concentrated at the Master's level. The extremely limited number of doctoral-level studies (f=4) suggests that in-depth, theoretically strong, and long-term scientific research in the field has not yet reached sufficient maturity. Since Master's theses are generally introductory, local-scale, and descriptive studies, this distribution structure indicates that the current literature on AI in the context of teachers and pre-service teachers is generally exploratory and descriptive. This situation highlights the need to encourage doctoral research, which is critically important for developing comprehensive theoretical models specific to the field, deeply examining causal relationships, and producing original scientific knowledge. Thus, strengthening the scientific infrastructure for the integration of AI into the discipline of educational sciences requires focusing on theoretically based and broadly participatory studies at the doctoral level. This finding is in full alignment with the results of other studies examining the structure of AI-themed postgraduate research in education in Türkiye. Bibliometric reviews conducted by Ateş (2025), Güven and Saygın (2025), Hündür et al. (2025), and Temur (2025a) concluded that the vast majority of AI-related studies in Türkiye are at the Master's thesis level. This consistency suggests that AI research in the field of educational sciences in Türkiye is still in its early stages, and there is a tendency to seek quick and practical initial answers to related questions. In the future, as knowledge in the field deepens and theoretical models develop, an increase in the proportion of doctoral theses will indicate that the literature is entering a maturation process.

The distribution of the examined theses by publication language (Table 3) shows that the studies were predominantly written in Turkish. This finding confirms that the research focuses on the national education system and the Turkish-speaking teacher population, and its dominance in the national

literature. On the other hand, the limited number of English theses suggests that the contribution of knowledge produced in this field in Türkiye to international academic circulation and impact is potentially low. To increase interaction with international literature and ensure the global sharing of findings from Türkiye, researchers need to focus more on publishing in English or at least comprehensively presenting their thesis abstracts in English. This also highlights the need to increase international cooperation and comparative studies in educational sciences.

The distribution of postgraduate theses by the universities where they were published (Table 4) reveals that while the topic of AI has garnered interest across a wide geographical area (43 different universities), academic production shows significant imbalance among universities. Gazi University being by far the institution producing the most theses indicates that this university strategically prioritizes AI in its relevant departments or has a strong specialized staff in this field. The relative concentration in universities like Bahçeşehir and Necmettin Erbakan also reflects the focus areas of specific institutions. However, the fact that the vast majority of theses (more than 71%) come from universities producing 2-3 theses and only one thesis each suggests that while institutional diversity in academic production is maintained, a large portion remains limited to singular or personal academic efforts and has not yet fully benefited from large-scale, sustainable institutional support mechanisms. This situation draws attention to potential obstacles to the national institutionalization of AI in educational sciences research. These findings partially parallel studies examining the institutional distribution of AI-based studies in the general education field, while differing in some aspects. Ateş (2025) and Temur (2025a), in their examination of postgraduate theses in education in Türkiye between 2000-2024, found that the highest number of theses were conducted at Bahçeşehir University. In this context, while Bahçeşehir University stands out in general education, Gazi University is observed to rise to a leading position in the specific context of teacher and prospective teacher education in this study. On the other hand, when Hündür et al. (2025) mapped AI-related studies in science education, it was concluded that the highest number of studies were again conducted at Gazi University. This result, The current study's findings directly resemble this, confirming that Gazi University has made a strategic investment in AI in teacher education, particularly in applied science fields, and is positioned as a research center.

The distribution of theses by the institutes where they were published (Table 5) clearly reveals the disciplinary focus of AI. The 54.54% share of the Institute of Educational Sciences proves that AI studies on teachers and prospective teachers are primarily approached from a pedagogical, didactic, and teacher training perspective. The high contribution of the Institute of Graduate Studies (28.40%) also supports this education-oriented focus. The limited contribution of other disciplines such as the Institute of Science and the Institute of Social Sciences indicates that AI research for teachers is mostly examined in the

The 14th InTraders International Conference On Multidisciplinary Studies, 27-28 October 2025, Sakarya, Türkiye context of the impact of this technology on educational processes, teacher training programs, and professional development, rather than the technological development itself. The dominant role of educational sciences in this field confirms that the focus of research is on technology integration and pedagogical transformation, rather than technology development. This is an expected situation, given the nature of teacher education, where research is primarily expected to be application and pedagogy-oriented. This finding partially differs from the distribution of research in the general education literature. Temur's (2025a) study, which examined postgraduate theses in education in Türkiye between 2000-2024, concluded that the highest number of theses were conducted at the Institute of Graduate Studies. However, the current study's findings, due to its specific focus on AI studies conducted on teachers and prospective teachers, naturally reveal that these studies are predominantly concentrated in the Institute of Educational Sciences. This concentration strongly supports that the disciplinary identity and needs of teacher education play a central role in determining the focus of AI research.

The distribution of postgraduate theses by major fields (Table 6) details the areas of expertise within educational sciences for AI studies. The highest rate (21.59%) for the Department of Computer Education and Instructional Technology (CEIT) indicates that AI is primarily perceived as an "instructional technology" and reflects the CEIT field's expertise in technology integration. Furthermore, the equal and high number of theses (f=14) in the Departments of Foreign Language Education and Mathematics and Science Education indicates that language learning and STEM education are the disciplinary areas where AI is thought to have the most potential impact. This concentration shows that researchers are focusing on AI's potential to solve pedagogical problems in these specific areas, particularly through applications such as feedback, personalized learning, and automation. The contribution of other sub-fields remained more limited, which indicates that AI research is led by specific disciplines even within educational sciences. These results largely parallel general education research in Türkiye. Temur (2025a), in his study examining postgraduate theses in education in Türkiye between 2000-2024, concluded that the highest number of theses were again conducted in the CEIT and Foreign Language Education Departments. This confirms that technology and language fields form the locomotive of AI-based education research in Türkiye. In an interdisciplinary context, Ulukok-Yıldırım and Sönmez (2025), in their WoS database review in the field of science education, found that a large majority of keywords included the concept of "computer science education." This finding emphasizes the strong connection between technology and computer sciences and pedagogical disciplines, even if AI is not a direct sub-branch. A previous study by Kavut (2022) stated that a large portion of AI-themed theses (2019-2021) were conducted in the Computer Engineering department. Rahim and Widodo (2024) also found that studies on AI were most frequently published in computer and education journals. These findings highlight the interdisciplinary

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nature of AI research and the central, mutually reinforcing role of computer science and education fields in particular. The high intensity in the field of language, in particular, shows a strong parallel with this result, considering the number and quality of studies conducted in the field of language in the context of AI by Ahmad et al. (2025). Indeed, AI plays an important role in overcoming language barriers in multilingual educational environments by offering language learning and translation services (Leonard, 2021). Furthermore, studies in the literature confirm that the integration of AI into foreign language teaching not only enriches the teaching process but also increases student engagement and success (Polyudova, 2025).

The distribution of theses by subject area (Table 7) clarifies the primary thematic intensity of research in the field. The most dominant category, "Opinions and Experiences," indicates that researchers primarily seek to understand teachers' subjective perceptions, opinions, and experiences during the process of integrating AI into education. This proves that studies in the field are in an initial and exploratory phase, and priority is given to mapping perceptions of the phenomenon before quantitative effectiveness analyses. The significant share of "Awareness Levels" and "Relational Studies" reflects an effort to measure the level of knowledge about AI and to associate AI with other pedagogical concepts (leadership, 21st-century skills). A significant subset, "Effectiveness and Comparative Analyses of Applications," shows that experimental research from which practitioners can directly benefit is also strongly present. However, the very low number of reliability and validity studies reveals a significant gap in the development and adaptation of measurement tools in the field and constitutes a methodological priority for future research. These results are in strong resemblance to AI research in general education in Türkiye. Temur (2025a), examining postgraduate theses between 2000-2024, found that the highest concentration was on "examining various opinions, perceptions, attitudes, and awareness towards AI" and "the effect of AI on various variables." Similarly, Hündür et al. (2025) also found that AI-themed studies in science education in Türkiye most frequently focused on interest, perception, motivation, and attitudes. Furthermore, Chiu et al. (2023), who examined studies in the international literature between 2012-2021, stated that the impact of AI on teachers or teachers' attitudes towards AI were among the most frequently reported themes. These data support that research at national and international levels, in its initial stages, focuses on human factors and perceptions. However, in earlier periods (2000-2019) in the international literature, "AI models" and "AI systems" were the most frequently used terms, and research largely focused on the development of new models and systems (Tu et al., 2021; Romero-Riaño et al., 2021). This situation indicates that the educational sciences literature in Türkiye differs by focusing on the pedagogical adaptation of technology and user perception, rather than the global trend focusing on technology development. However, the increase in studies on generative AI models like ChatGPT and

The 14th InTraders International Conference On Multidisciplinary Studies, 27-28 October 2025, Sakarya, Türkiye general AI topics globally in the 2020-2024 period (Yadav & Anubha, 2024) shows that research in the field of AI is increasingly moving towards more applied and current pedagogical topics, It indicates that there may be more convergence in the future with the trend of current research in Türkiye.

Despite the dominance of categories such as "Opinions and Experiences" and "Awareness Levels" in thematic analysis, the absence of the concept of "ethics" as an independent category in the topics of the examined postgraduate theses is a significant deficiency. This situation suggests that issues related to the ethical dimensions of AI, and the principles of justice and equality, are addressed only in a superficial context or among general discussions within the content of existing studies. However, the widespread adoption of AI in education systems brings serious ethical concerns such as privacy, bias, discrimination, security, and accountability (Ramos, 2025). Findings by Temur (2025) show that issues such as the digital divide, technology addiction, and intellectual property are also among the ethical problems awaiting urgent solutions. In this context, as stated by Professor Jan Willem de Graff (2019, p. 18), "data is always a limited 'reflection' of a limited part of reality." This situation reveals that AI systems have the potential to inherit biases in the data they are trained on, and as a result, carry the risk of reinforcing social inequalities (Sharma & Kumar, 2023). Furthermore, the fact that international organizations such as UNESCO (2023), UNICEF (2021), and the European Commission (2022) have put forth ethical and legal regulations regarding AI in education confirms the seriousness and strategic importance of this field at an international level. In light of these national and global concerns, it is a necessity for postgraduate theses in Türkiye to include more in-depth studies focusing on teachers' ethical perceptions and the ethical impacts of AI systems for qualitative deepening in the field.

Recommendations

In this section, the conclusions drawn from the main findings of the research are summarized, the limitations within the scope of the study are stated, and recommendations for future studies and educational policies are presented, taking into account these limitations and gaps in the current literature.

- 1) Limitations of the Study:** The findings of this study inherently possess certain limitations. The research was limited in scope to postgraduate theses published within the 2020-2025 period; therefore, it does not cover literature from other academic publication types such as articles, conference papers, or book chapters. This restricts its ability to represent the entirety of the AI education literature across Türkiye. Furthermore, the sample focus of the research was limited to teachers and pre-service teachers, excluding AI studies conducted on educational administrators, school psychological counselors, or other supportive educational personnel. Finally, thematic analysis was performed using thesis abstracts and keywords; in-depth content analysis of the full

texts of the theses was not conducted. This methodological limitation may lead to overlooking potential nuances and deeper layers of meaning in the sub-categories and content of the topics.

- 2) **Encouragement of Doctoral-Level Research:** The concentration of the vast majority of theses at the Master's level indicates the need for research with theoretical depth and a focus on long-term, causal relationships in the field. YÖK (Council of Higher Education) and universities should identify and support doctoral theses that focus on the development of theoretical models of AI in education and utilize comprehensive experimental designs as a priority research area.
- 3) **Institutional Balance and Collaboration:** Considering the concentration of academic production in certain universities (e.g., Gazi University), strategic funds and collaborations should be encouraged to direct postgraduate programs in other universities with sufficient academic infrastructure in AI towards this field. Joint thesis supervisions between institutions can facilitate the transfer of knowledge and resources.
- 4) **Expansion of Interdisciplinary Approach:** It has been observed that research is predominantly concentrated in the Institute of Educational Sciences and the Department of Computer Education and Instructional Technology. In future studies, it is recommended to collaborate with fields such as Philosophy, Law, Ethics, and Psychology within the Social and Human Sciences to deeply examine the ethical, socio-cultural, and cognitive impacts of AI in education.
- 5) **Increase in Applied and Experimental Research:** Shifting the literature from an exploratory emphasis (Opinions/Experiences) to applied effectiveness analyses is critically important. Researchers should conduct more experimental and quasi-experimental studies examining the effects of AI-supported instructional practices (e.g., personalized feedback systems, adaptive learning) on student achievement, motivation, and cognitive load.
- 6) **In-Service Training and Ethical Guidance:** Given the rapid transformative impact of AI in education, enabling teachers to adapt to this transformation is critically important (Yurtsever & Yurtsever, 2025). In this context, the Ministry of National Education and relevant institutions should organize comprehensive and continuous in-service training programs that will enhance teachers' AI literacy, their skills in using pedagogical AI applications, and provide guidance on ethical risks associated with AI use, such as data privacy, bias, and academic integrity. Additionally, teachers should be encouraged to integrate and use AI applications in their lesson processes.

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