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Theses Written by Turkish Authors About ChatGPT in The Field of Education and Training: A Content Analysis

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Research Article

Abstract

ChatGPT has undoubtedly been one of the sensational artificial intelligence (AI) chatbots, riveting international scholars from diverse disciplines. In an effort to contribute to its curricular integration or explore its impacts on pedagogical integration, this study analyzed the content of Master's theses stored in the Council of Higher Education's (CoHE) National Thesis Center (NTC) and written by Turkish authors in the field of education and training. The content analysis included (i) documentary characteristics, (ii) methodological properties, (iii) research topics, and (iv) main findings. The first analysis unit revealed institutional, provincial, regional, and collegiate variations, albeit a relatively low number of theses. A relevant finding was the absence of doctoral dissertations on ChatGPT. The second analysis unit indicated the need for more methodological robustness and variety in designing theses. The third unit of analysis shed light on under-researched topics in education and training, as well as other fields. The last analysis unit showcased ChatGPT's manifold applications across different departments, notwithstanding the voiced concerns. Overall, the study illuminates prospective research through its findings and bridges a significant literature gap.

***Keywords:** Academic writing, ChatGPT, Content analysis, Master's thesis, Turkish authors*

Cite this paper (APA)

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1. INTRODUCTION

Artificial intelligence (AI) is a set of technologies enabling computers to perform various advanced functions, including seeing, understanding, translating spoken and written language, analyzing data, offering recommendations, and more (Kreutzer & Sirrenberg, 2020). One of the most popular AI products is OpenAI's ChatGPT. It is a conversational generative pre-trained transformer that harnesses advanced natural language processing methods to generate human-like text (Sejnowski, 2024). With recent updates and advancements, ChatGPT has become capable of responding to and generating auditory and visual input (Haleem et al., 2022). This generative AI tool has marked the beginning of a new era in diverse fields, from medicine to education, since its release in November 2022 (Lambert & Stevens, 2024; Sahu et al., 2024). It has also been a research topic for thousands of studies: four in 2022, 3,669 in 2023, and 8,002 in 2024, as a quick keyword search on the Web of Science (WoS) reveals (https://shorturl.at/Y67dM). Similarly, a Scopus search has resulted in 15,069 relevant documents (https://shorturl.at/jXT8f). Additionally, a keyword search on ProQuest has yielded 14,806 theses and dissertations pertinent to ChatGPT (https://shorturl.at/2vcRQ). Equally, the cited WoS and Scopus queries have demonstrated that ChatGPT has been a research topic at conferences, with 1,484 proceeding papers in the WoS and 4,004 conference papers in Scopus. These descriptive statistics suggest that ChatGPT occupies a significant place in academic publications, including articles, reviews, proceeding papers, theses, and dissertations.

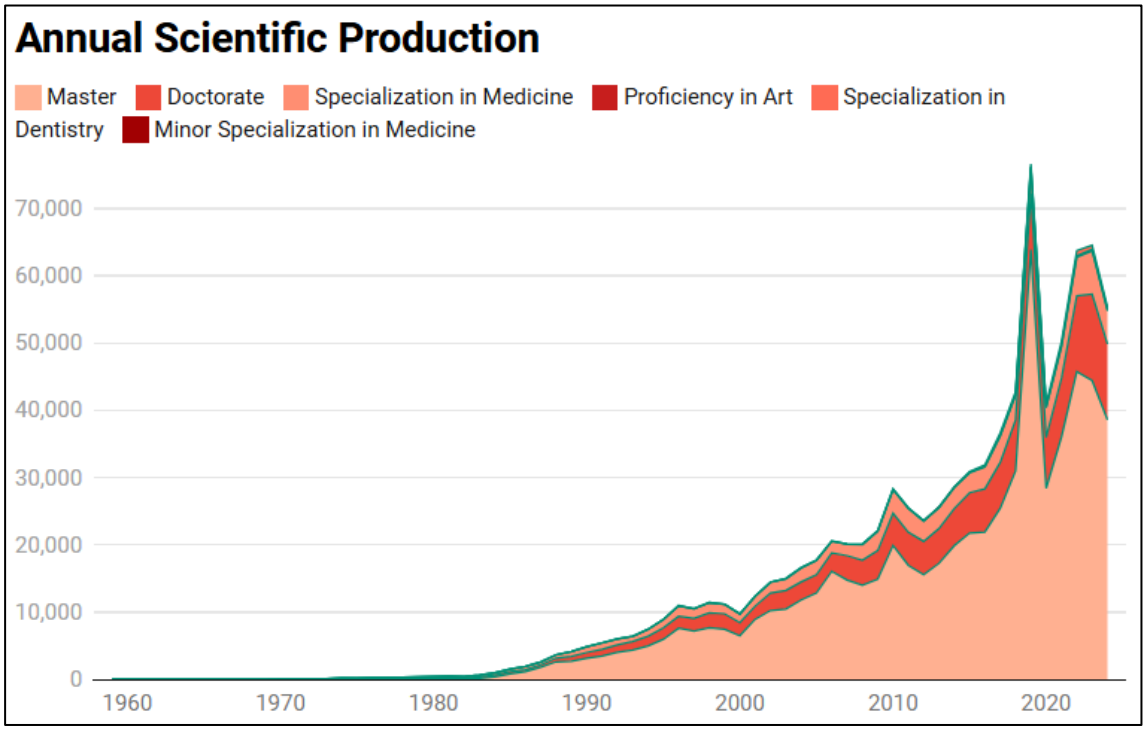

Figure 1. Annual thesis and dissertation production (1959-2024)

Theses and dissertations are two prominent scholarly outputs produced by authors in graduate education (Badenhorst & Guerin, 2015). While both share similarities, theses are generally the products of critical research required to graduate from a Master's program, and dissertations are usually lengthy academic pieces in which authors develop a relatively original concept to defend before expert academics (Blair, 2016). However, the two terms can also be used interchangeably (Remenyi & Bannister, 2022). Notwithstanding their differences, theses and dissertations are valuable academic products in which authors from different linguistic backgrounds tackle diverse topics, largely without page limits (compared to articles or proceedings). This feature allows authors to express their stance, with further flexibility, toward a research topic. Theses and dissertations might also provide specific projections about a country's academic profile. To put it differently, these scholarly works present valuable information about the research trends in the academia of a particular country. Analyzing these academic products might, in turn, guide prospective researchers on the potential research gaps in the relevant literature and provide a roadmap for future studies.

In Türkiye, theses and dissertations are submitted to the Council of Higher Education (CoHE) Thesis Center (https://tez.yok.gov.tr/). This thesis center categorizes academic products as Master's, doctorate, specialization in medicine (SiM), proficiency in art (PiA), specialization in dentistry (SiD), and minor specialization in medicine (MSiM). The descriptive statistics on its website reveal that a total of 898,436 theses and dissertations have been written by authors in 263 public and private universities. The annual scientific productions by these academic institutions are presented in Figure 1.

As Figure 1 displays, the most common academic product was Master's theses (n=634,854), followed by doctoral dissertations (n=160,160), SiM (n=95,329), SiD (n=4,317), PiA (n=2,779), and MSiM (n=946). Overall, a total of 898,436 theses and dissertations were written in 263 universities between 1959 and 2024. This implies a highly dynamic academic activity in Turkish academia. It is also manifested in Figure 1 that academic production showed an increasing tendency after the 1990s, with the least productivity in 1959, 1960, and 1962 (n=1 each) and the highest in 2019 (n=76,612). A subject-based analysis shows that these academic products have been distributed in the field of education training as follows: Master's = 66,1192, Doctoral dissertation =13,430; SiM=11; SiD=85; PiA=0; and MSiM=1, totaling up to 79,719.

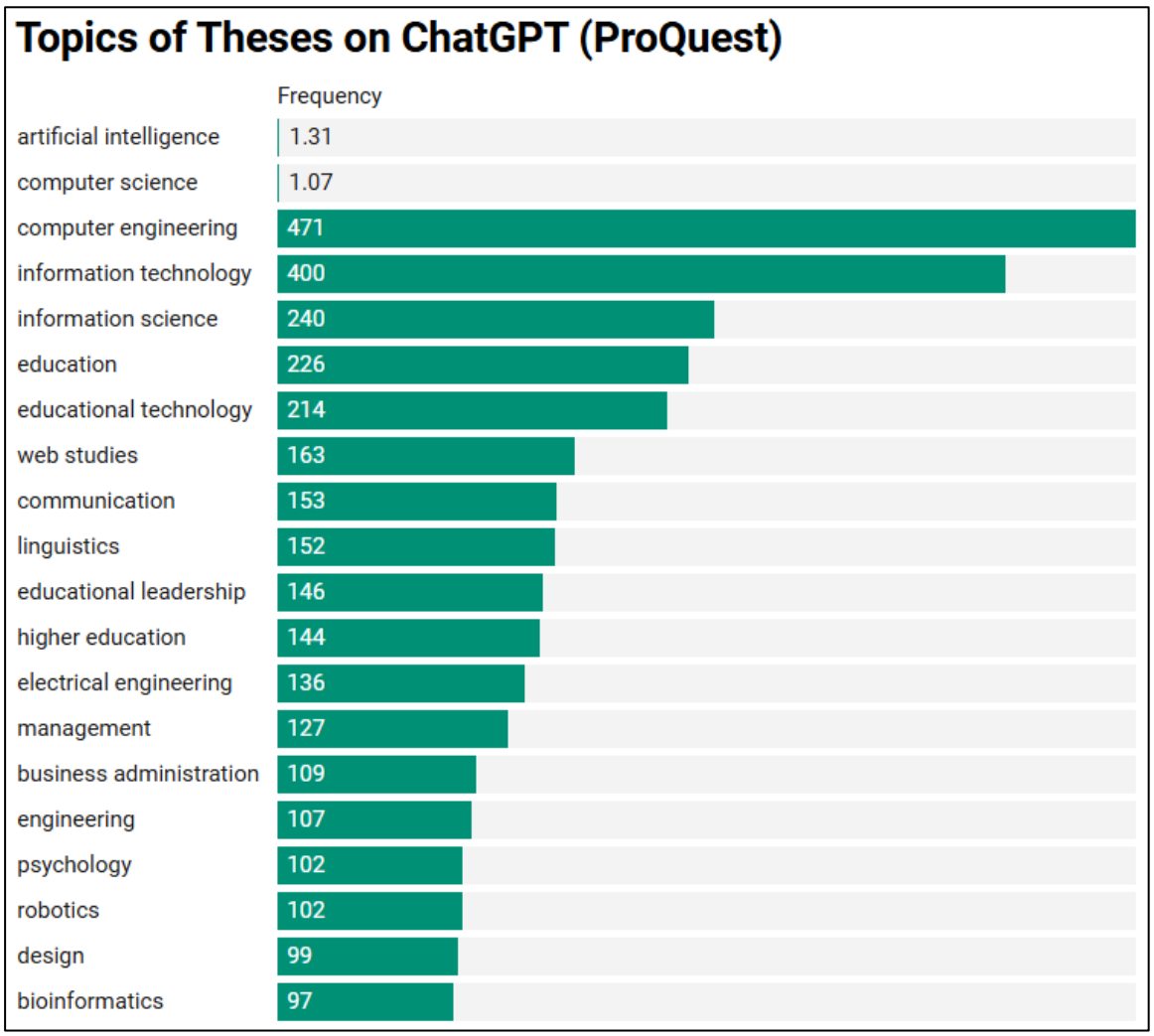

Figure 2. Topical distribution in theses on ChatGPT (ProQuest)

This volume of academic work is crucial for educational scholarship and provides a detailed account of emerging research priorities and methodological practices. Despite the growing interest in AI technologies and conversational chatbots like ChatGPT in articles, reviews, and conference papers (Akpan et al., 2025; Baber et al., 2024), limited attention has been given to systematically analyzing the content of the theses that address this technology. A keyword search on ProQuest Dissertations & Theses has yielded 3,126 theses on ChatGPT in English, Spanish, French, Korean, and Chinese languages (https://shorturl.at/LSEIk). The top

20 topics in these theses are presented in Figure 2 below.

Figure 2 indicates that most theses were about artificial intelligence (n=1,311) and computer science (n=1,073). Notwithstanding the growing interest in ChatGPT-related research in the international literature, there is little known about how Turkish authors tackle this technology in theses. To that end, this study aims to examine theses stored in the CoHE's NTC and written by Turkish authors on ChatGPT in education and training. Analyzing these academic products offers a valuable opportunity to reveal how Turkish authors conceptualize or engage with ChatGPT, including their bibliometric characteristics, methodological approaches, key thematic trends, and main findings.

Accordingly, the study attempts to conduct a content analysis of theses and dissertations written on ChatGPT in Turkish academia, with particular reference to bibliometric attributes (e.g., title, author, year, reference count, and page count), methodological characteristics (e.g., research design, sampling strategies, and data analysis methods), thematic keywords (e.g., frequent keywords and recurring topics), and main findings. In doing this, the study intends to fill the existing literature gap and provide valuable insights into how ChatGPT is positioned in Turkish academic discourse.

Taking these into consideration, the study addresses the following research questions:

RQ (1): What are the bibliometric characteristics of the published theses about ChatGPT stored in the CoHE's NTC in the field of education and training by Turkish authors?

RQ (2): What are the methodological characteristics of the published theses about ChatGPT stored in the CoHE's NTC in the field of education and training by Turkish authors?

RQ (3): What topics have the authors focused on in their theses about ChatGPT?

RQ (4): What were the main findings of the theses about ChatGPT stored in the CoHE's NTC and published in the field of education and training by Turkish authors?

2. LITERATURE REVIEW

2.1. ChatGPT Research in Education and Training

OpenAI introduced ChatGPT, a conversational generative pre-trained transformer, in November 2022. This chatbot is pre-trained and interacts with users conversationally through prompts. Its launch has sparked immense academic enthusiasm and riveted scholars from diverse disciplines (Khan et al., 2024). In the education and training field, ChatGPT research has focused on academic integrity (e.g., Cotton et al.,2024), science education (Cooper, 2023), implications for educational research and practice (Farrokhnia et al., 2024), students' perceptions (Chan & Hu, 2023), opportunities and challenges for education (Adeshola & Adepoju, 2024), impact on second language writing (Yan, 2023), relationship with human teachers (Jeon & Lee, 2023), teacher education (van den Berg & du Plessis, 2023), teachers' perceptions (Gao et al., 2024), assessment (Moorhouse et al., 2023), and several various topics. Although results have revealed a growing potential for education and training disciplines (Chang et al., 2024), researchers have voiced several concerns (Wu et al., 2024). The potential affordances and pitfalls of ChatGPT (Baidoo-Anu & Ansah, 2023; Sok & Heng, 2023; Topal, 2024) are listed in Table 1.

Table 1. ChatGPT's Potential Affordances and Pitfalls

Benefits	Drawbacks
personalized tutoring	lack of human interaction
automated essay grading	inaccurate information
language translation	bias in training data
interactive learning	lack of creativity
adaptive learning	dependency on data
enhanced student engagement	lack of contextual understanding
instant feedback	limited ability to personalize instruction
multilingual support	privacy concerns
improved accessibility	academic integrity issues

2.2. Theses and Dissertations as Academic Outputs

As mentioned earlier, theses and dissertations are two significant products through which knowledge is disseminated by authors from diverse disciplines in universities (Badenhorst & Guerin, 2015). Unlike other scholarly work (e.g., articles, reviews, or proceedings), theses are more comprehensive research products that thoroughly discuss theoretical frameworks, adopt various methodological choices, and present detailed findings. In that capacity, theses occupy a prominent role in academia in providing valuable insights into research trends, methodological priorities, and thematic focuses in a particular field.

Analyzing theses has been a common practice in educational research. For instance, Kamler (2008) highlighted the significance of co-authorship with supervisors as an essential pedagogic practice in writing doctoral dissertations. Drysdale et al. (2013) examined the research trends in theses and dissertations on blending learning. Basturkmen et al. (2014) studied the supervisors' feedback on dissertation drafts, specifically referring to the aspects of writing that received comments and how these comments were formulated. Researchers have also focused on doctoral students' thesis writing processes to explore their experiences and strategies (Odena & Burgess, 2017). In another study, Yu et al. (2019) looked into student engagement with peer feedback on Master's theses and reported dynamics and complexities among engagement types.

Yildirim (2020) analyzed the trends in doctoral dissertations in chemistry education in Türkiye. In another study, Sarıkaş and Demir (2020) surmounted the psychometric characteristics of data collection instruments used in postgraduate theses in special education. A content analysis of theses on distance learning was also performed (Kesim, 2020). Aslan et al. (2020) examined the methodological characteristics of doctoral theses on curriculum and instruction. Şeref and Karagöz (2020) explored the citation analysis of graduate theses on teaching Turkish as a foreign language. The studies conducted on graduate theses in the Turkish context that specifically used content or bibliometric analysis included doctoral dissertations in curriculum and instruction (Yağan & Çubukçu, 2021), flipped classroom model in Türkiye (Naycı, 2021), the scientific impact of Turkish educational dissertations (Aslan et al., 2021), metacognition on mathematics education (Kandal & Baş, 2022), writing for learning in science education (Arslan & Benzer, 2022), mixed methods graduate theses in special education programs (Doğan et al., 2022), theses on online distance education between 2011 and 2020 (Güdekli et al., 2022), and bibliometric analysis of doctoral dissertations in the economy, law, psychology, political science, and international relations (Aslan & Açıkgöz, 2022).

Evidently, theses and dissertations have riveted researchers from Turkish and non-Turkish contexts. The relevant literature in the Turkish context revealed the lack of research analyzing the content of graduate theses on ChatGPT, highlighting the study's significance.

2.3. Research on ChatGPT in Türkiye

A keyword search in the titles publications indexed in Scopus (https://shorturl.at/O3j1J) and WoS (https://shorturl.at/UipZ8) has revealed scant attention to ChatGPT research by Turkish academics. The results yielded six documents in the WoS and 11 in Scopus, with the prior research also indexed in the latter. Four papers were published in 2023 and seven in 2024. Regarding document type, one was a book chapter, three were conference papers, and seven were articles. These documents concerned computer science, mathematics, medicine, social sciences, dentistry, engineering, and pharmacology. In addition, they were published by Turkish authors in different institutions (e.g., universities, hospitals, and health ministries).

In their conference paper, Çam and Özgür (2023) compared the effectiveness of ChatGPT and other BERT-based models in identifying hate speech in Turkish and reported similarities. Similarly, Işık et al. (2023) utilized human and ChatGPT-generated datasets to analyze tweets posted after an earthquake disaster to contribute to providing efficient assistance to affected individuals. Yıldız and Alper (2023) compared the effectiveness of ChatGPT responses in Turkish and English regarding health-related inquiries and revealed similar accuracy levels in both, albeit less comprehensive in Turkish. In another study, Livberber and Ayvaz (2023) examined the impact of ChatGPT on academia and determined academics' perceptions of it. ChatGPT was viewed positively as a valuable tool in scientific research and education, but ethical concerns such as plagiarism and

misinformation must be addressed.

Argan et al. (2024) examined the use of ChatGPT in acquiring health information from the perspective of end users, employing the extended technology acceptance model (TAM) in a developing country. Their study provided new insights into using ChatGPT in health-based research from the user's perspective. Parallel to Çam and Özgür's (2023) study, Dehghan and Yanikoglu (2024) also evaluated ChatGPT's ability to identify hate speech in Turkish tweets in comparison to a BERT model, revealing 65.81% accuracy for the first and 82.22% accuracy for the latter. Oğuzman and Yurdabakan (2024) evaluated the effect of dental technicians' experience on the shear bond strength of ceramic fused to metal restorations, finding no statistically significant difference between untrained and conversant technicians. Finally, Yigitbay (2024) explored this technology's effectiveness in TOTEK written exams and reported a decreasing performance in accuracy through the years.

Sahin et al.'s study (2024) compared ChatGPT's success in the TNSPBE exam to human exam takers, indicating a better performance of this technology (=78.77) than humans (=62.02 ± 0.61). Demirel et al.'s (2024) book chapter dealt with ChatGPT's effectiveness in sentiment analysis and classification, particularly in Turkish texts. In their study, Ozturk et al. (2024) evaluated the tool's effectiveness in clinical cases and inquiries in Turkish and English and revealed a better performance in English prompts.

Overall, research has indicated a clear literature gap in studies examining the graduate theses on ChatGPT. Accordingly, this study will bridge this gap and contribute to the academic discourse literature.

3. METHOD

3.1. Research Design

The study adopted a content analytic approach to responding to the research questions. Content analysis is a research method that systematically examines print or electronic texts (Krippendorff, 2019). Notwithstanding the several categories, content analysis typically includes qualitative and quantitative content analysis depending on the data type (numerical vs. non-numerical) (Kuckartz & Rädiker, 2023; Riffe et al., 2023). This study utilizes both types of content analysis to explore the bibliometric/documentary and methodological trends in the Master's theses on ChatGPT stored in the CoHE's NTC and published by Turkish authors.

3.2. Instrumentation

The study's primary and only data collection instrument was 13 Master's theses written by Turkish authors about ChatGPT in education and training. The relevant theses were retrieved from the CoHE's NTC website (https://tez.yok.gov.tr/). The search revealed 24 Master's theses, with 13 written in the field of education and training. The 13 Master's theses were downloaded from the website and stored for prospective analyses. Since the database search did not yield any doctoral dissertations, there was none in the analysis. This is understandable, given the length of time it takes to write up dissertations (Krumsvik, 2022).

3.3. Data Collection

The study employed a criterion sampling technique (Screier, 2018) before data collection. Accordingly, the theses, which are the units of analysis, had to fulfill the following criteria displayed in Table 2.

Table 2. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
• Theses about ChatGPT in the field of education and training	• Theses about ChatGPT and other AI tools in other fields
• Theses written by Turkish authors	• Other theses written by non-Turkish authors
• Theses stored in CoHE's NTC	• Theses stored in other databases (e.g., ProQuest)
• Focus on only Master's theses	• Doctoral dissertations*

* Doctoral dissertations were naturally excluded due to their absence in the analyzed database.

Data were collected from the content analysis of 13 Master's theses on ChatGPT in education and training

published by Turkish authors in 2024. The theses were accessed through the Turkish CoHE's NTC (https://tez.yok.gov.tr/). The center has an open-access website that allows researchers to conduct queries about the theses and dissertations published in Turkish academia. The search can be filtered by thesis title, author, supervisor, subject, keyword, abstract, and thesis no, along with access type (authorized and unauthorized) and thesis type (Master, doctorate, specialization in medicine, proficiency in art, specialization in dentistry, minor specialization in medicine, and expertise in pharmacy).

Using the search bar on the NTC's website, the research typed in "ChatGPT" in uppercase and lowercase letters. An initial query revealed 24 Master theses in diverse fields, including education and training, child health and diseases, management information systems, music, translation and interpretation, computer engineering and science, dentistry, and mathematics. Thirteen of these theses were published in the field of education and training, constituting the primary data instrument for the study.

The procedures for data collection were summarized in Figure 3.

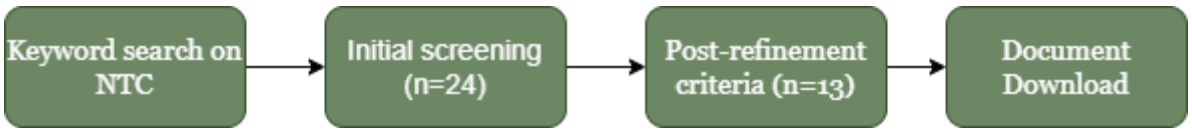

Figure 3. The procedures for data collection

3.4. Coding and Categorization

Fraenkel et al. (2022) proposed two categorization methods: before and during analysis. This study employed both approaches to content analysis. More specifically, it utilized the first to explore the bibliometric and methodological properties and the second to examine the thematic keywords and main research findings. Accordingly, the coding categories generated for the study were bibliometric characteristics (i.e., title, author, year, reference count, and page count), methodological properties (i.e., research design, sampling strategy, and data analysis method), thematic keywords, and main findings. For the first two coding categories, the researcher leveraged a data collection form (DCF) serving as a tally sheet, while the results for the latter two emerged during content analysis. Table 3 summarizes the coding categories.

Table 3. Coding Categories

Categories	Subcategories
Bibliometric characteristics	Title
	Author
	Year
	Reference count
	Page count
Methodological properties	Research design
	Sampling strategy
	Data analysis method
Thematic keywords	Not applicable
Main findings	Not applicable

3.5. Data Analysis and Trustworthiness

The collected thesis information was entered into a spreadsheet for documentary analysis. The methodological trends, on the other hand, were analyzed using a DCF designed by Goksu et al. (2022) and based on Fraenkel et al. (2012) that includes "research design/method, sample level, sample size, sample selection method, data collection tool, and data analysis method" (Goksu et al., 2022, p.2023). After carefully examining the content, the researcher downloaded the theses and completed the necessary gaps in both Excel files. Two other researchers, experts in Teaching English as a Foreign Language (TEFL), followed the same procedures for trustworthiness (Guba, 1981; Teddlie & Tashakkori, 2009).

In terms of credibility, peer debriefing was performed by the researcher and two other TEFL experts. Transferability was achieved by purposive sampling through which theses only about ChatGPT in the field of education and training were acquired. For dependability, the researcher utilized DCF and explicitly described

the data collection and analysis procedures. As for confirmability, the study was based on thesis data accessible via the NTC's website. The findings were cross-checked by two TEFL experts, resulting in increased agreement (Krippendorff's α=1) (Krippendorff, 2019). The study's trustworthiness was achieved naturalistically after fulfilling the four criteria (credibility, transferability, dependability, and confirmability) (Guba, 1981; Teddlie & Tashakkori, 2009).

The procedures for data analysis were illustrated in Figure 4.

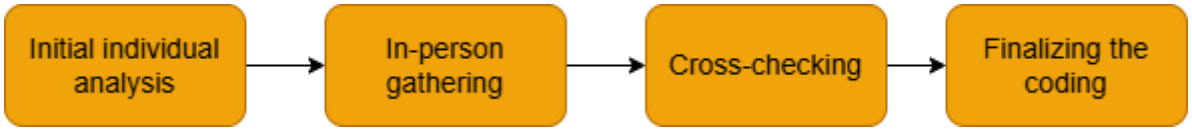

Figure 4. The procedures for data analysis

The components of trustworthiness were presented in Table 4.

Table 4. Procedures for Achieving Trustworthiness from Naturalistic Perspective

Qualitative criteria	Relevant quantitative criteria	Actions taken
credibility	internal validity	peer debriefing
transferability	external validity	purposive sampling
dependability	reliability	DCF & extensive description
confirmability	objectivity	cross-check with experts

4. FINDINGS

The study's findings were presented in order of research questions under relevant headings: documentary characteristics, methodological characteristics, research topics, and main findings.

4.1. Documentary Characteristics

The first research question explored the bibliometric characteristics of the relevant theses. Table 5 displays these characteristics containing titles, authors, years, supervisor titles, institutions, page numbers, and references.

Table 5. Documentary Characteristics of the Analyzed Theses

Thesis No	Title of Thesis	Author	PC	RC
860210	The effect of secondary school students' use of ChatGPT in self-learning on their academic success	Sevinç Uysal	83	119
905672	Is artificial intelligence the new writing teacher? A comparison of ChatGPT feedback and teacher feedback on writing proficiency in Turkish EFL classrooms	Hülya Sezer	191	259
904222	Examining the use of generative artificial intelligence tools in coding education: The case of ChatGPT	Mehmet Özçetin	135	100
867680	The effects of artificial intelligence-assisted teaching on EFL vocabulary learning: A case of ChatGPT	Abdullah Aras	103	224
878454	Merging ChatGPT with Minecraft: AI chatbots for enhanced user engagement and learning	Çağkan Umut Çelik	62	94
881033	Teachers' views on ChatGPT-generated lesson plan in 7th grade English course	Özlem Mukaddes Alsan	111	194
886808	Exploring potential of ChatGPT for assisting preservice science teachers' pedagogical content knowledge in inquiry-based lesson planning	Damla Karataş	201	237
880171	Artificial intelligence based solution strategies in science teaching: analysis of LGS questions with	Buğra Taşkıran	101	70

	ChatGPT			
899716	Examining the opinions of secondary school students and teachers on the use of ChatGPT artificial intelligence application in mathematics education	Soner Karabacak	176	193
900859	Pre-service mathematics teachers' experiences of preparing lesson plans in accordance with the 5E learning model through ChatGPT	Gülsüm Demir	220	304
901172	Employing ChatGPT to improve high school students' writing skills by providing feedback on topic-specific writing tasks	Oğuzhan Ozan	95	90
902231	ChatGPT as a material preparation tool in language classes	İnci Tuzlu	163	37
902292	Artificial intelligence-based language modelling: The effect of ChatGPT application on writing skills in the context of teaching English as a foreign language	Gizem Cengiz Kulaksız	101	233

*PC: Page count; RC: Reference count

Table 5 shows that thirteen Master's theses were written by six male and seven female Turkish authors in 2024. The average thesis was 134 pages long, totaling 1,742 pages. Equally, the authors of the relevant theses used 165,69 references on average, totaling up to 2,154. All theses were written in 2024, two years after ChatGPT's launch (Leiter et al., 2024). Concerning the language of writing, six theses were written in Turkish, and seven were in English.

As Figure 5 displays, the authors of the theses were supervised by an almost equal number of academics: professors and associate professors (n=4), and doctor lecturers (n=5).

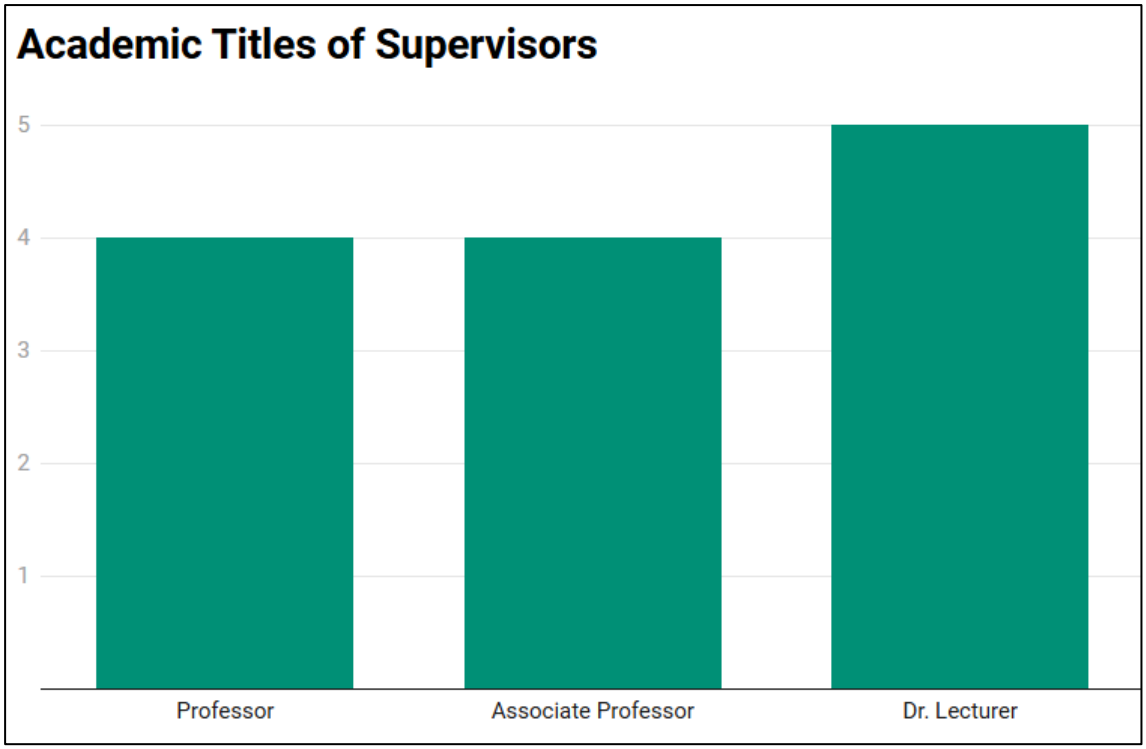

Figure 5. The distribution of supervisors' titles

Table 6 presents information about the corresponding institutions where the relevant theses were written. A quick look revealed the complete institutional diversity, with each thesis written at a different institution. Most (n=10) of these institutions were public universities, while the remaining (n=3) was private. In addition,

these universities were situated in different geographical regions, with the majority in Marmara (n=4) and Central Anatolia (n=4), followed by Black Sea (n=2), Eastern Anatolia (n=2), and Southeastern Anatolia (n=1). Provincially, most institutions (n=3) were in Istanbul, followed respectively by Eskişehir (n=2) and Ankara (n=2). The remaining universities were in six different provinces.

Table 6. The Institutions of the Turkish Authors of Theses About ChatGPT

Institution	Province	Region	Type	Website
Anadolu University	Eskişehir	Central Anatolia	Public	https://www.anadolu.edu.tr/
Atatürk University	Erzurum	Eastern Anatolia	Public	https://www.atauni.edu.tr/
Bahçeşehir University	Istanbul	Marmara	Private	https://bau.edu.tr/
Boğaziçi University	Istanbul	Marmara	Public	https://bogazici.edu.tr/
Bursa Uludağ University	Bursa	Marmara	Public	https://www.uludag.edu.tr/
Eskişehir Osmangazi University	Eskişehir	Central Anatolia	Public	https://www.ogu.edu.tr/
Gaziantep University	Gaziantep	Southeastern Anatolia	Public	https://www.gantep.edu.tr/
Hacettepe University	Ankara	Central Anatolia	Public	https://www.hacettepe.edu.tr/
Ondokuz Mayıs University	Samsun	Black Sea	Public	https://www.omu.edu.tr/tr
Tokat Gaziosmanpaşa University	Tokat	Black Sea	Public	https://www.gop.edu.tr/
Ufuk University	Ankara	Central Anatolia	Private	https://www.ufuk.edu.tr/
Van Yüzüncü Yıl University	Van	Eastern Anatolia	Public	https://www.yyu.edu.tr/
Yeditepe University	Istanbul	Marmara	Private	https://yeditepe.edu.tr/tr

Traditionally, institutes or graduate schools are the responsible institutional bodies where theses and dissertations are submitted for graduation. As Figure 6 demonstrates, most Master's theses about ChatGPT were submitted to the institute of educational sciences (n=7) of relevant universities, succeeded by institutes of graduate studies (n=3). The remaining three theses were presented to the Institute of Science, Graduate School of Education, and Institute of Social Sciences.

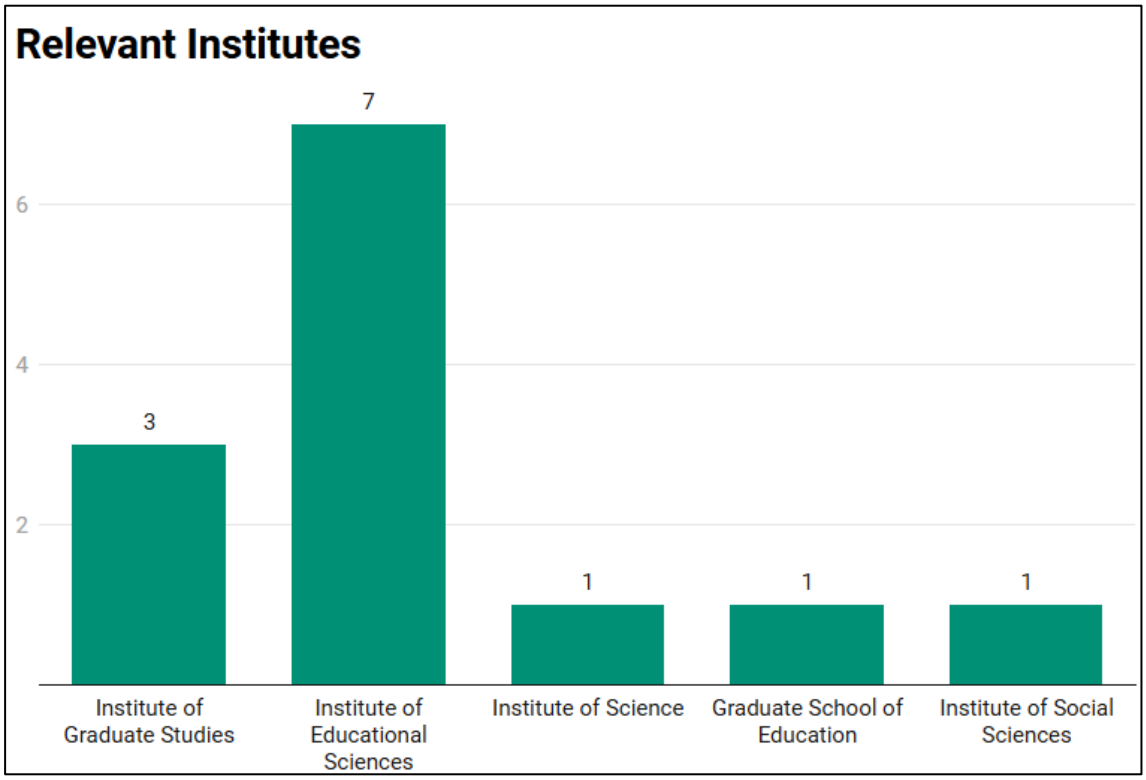

Figure 6. The distribution of relevant institutes

Departmentally, the majority of the theses belong to foreign language education (n=6 if combined with the English language education department), pursued by the Mathematics and Science Education Department (n=3). The remaining theses were written by Turkish authors in different departments, as seen in Figure 7.

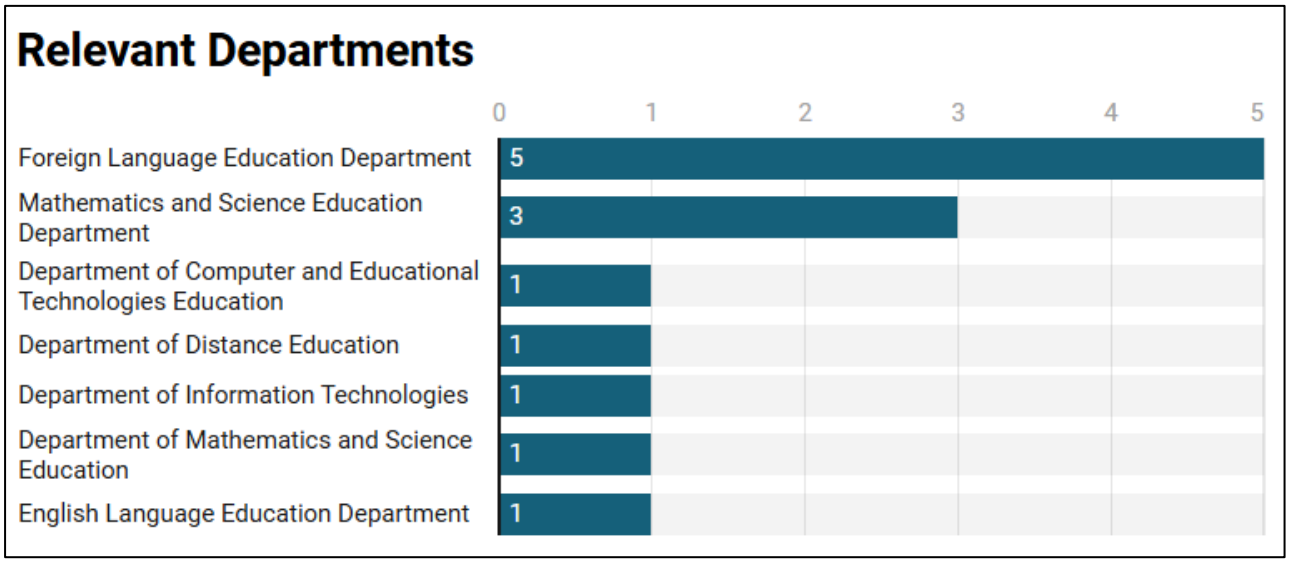

Figure 7. The distribution of relevant departments

Overall, the analysis of the documentary qualities of the relevant theses revealed variations in page number, reference count, institution, region, province, institute, and department. Conversely, the titles of supervisors were evenly distributed. Similarly, there was a slight difference in the gender distribution of the Turkish authors, with females (n=7) more than males (n=6).

4.2. Methodological Characteristics

The second research question sought to reveal the methodological qualities of the analyzed theses. These characteristics included research design/method, sampling (level, size, and method), data collection instrument, and data analysis method.

In terms of research paradigms, six studies adopted a mixed-methods approach, while seven followed a qualitative paradigm. More specifically, as Figure 8 illustrates, most thesis writers adopted a case study design (n=6), followed by quasi-experimental (n=4), explanatory sequential (n=1), phenomenological (n=1), and design and development research (n=1).

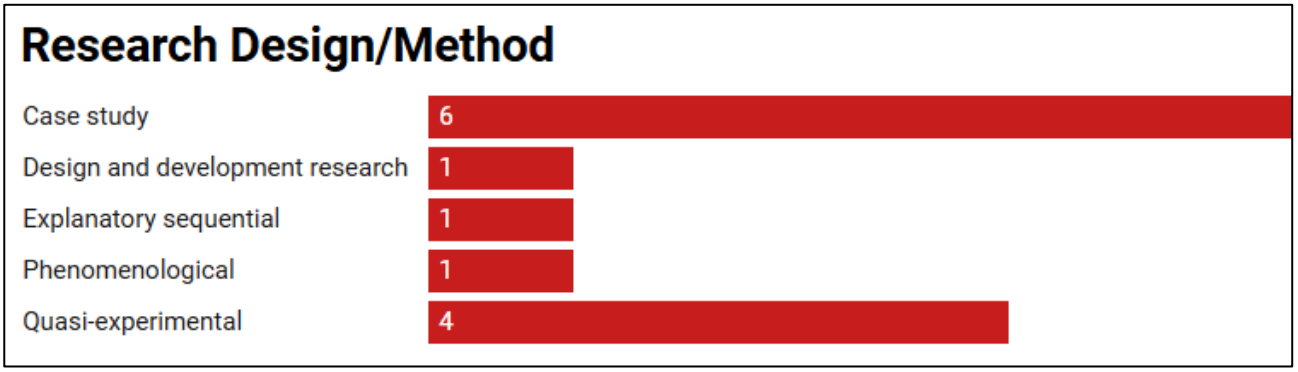

Figure 8. Research designs/methods adopted in the relevant theses

Table 7 shows the sampling information in the analyzed theses. In terms of target samples, the results can be put into three categories: education level (e.g., middle schoolers, high schoolers, and college/university students), profession (e.g., teachers of English, Math and Science, university academics, and subject matter experts), and others (e.g., minors, adults, and LGS science questions).

The theses used a total of 542 samples (M=41.69), ranging between eight and 120. The three thesis authors did not specify any sampling methods applied. In other words, the sampling methods were not explicitly written in the analyzed theses. The remaining theses equally employed convenience and purposive sampling methods (n=6 each).

Table 7. Sampling Information in the Analyzed Theses

Thesis No	Target sample	Sample size	Sampling method
860210	6th graders	40	not defined
905672	preparatory school students	71	convenience
904222	university students and academics	26	purposive
867680	high school students (10th graders)	60	purposive
878454	minors, adults, subject matter experts	13	not defined
881033	English teachers	20	convenience
886808	science teachers	10	purposive
880171	LGS science questions	120	Not defined
899716	middle school students, math teachers	33	convenience
900859	pre-service math teachers	10	purposive
901172	high school students	30	convenience
902231	ELT students and teachers	8	purposive
902292	high school students	101	convenience

4.3. Research Topics

The keywords in thesis abstracts were put to keyword analysis using an online tool. One thesis did not include any keywords, therefore excluded. The remaining overall keyword count was 104, with 56 unique words. The results are presented in a word cloud in Figure 9.

When the predictably frequent keywords (i.e., ChatGPT and artificial intelligence) are excluded, as Figure 9 displays, the theses mainly focused on ChatGPT's use in writing feedback, mathematics, language learning, self-directed learning, gamification, materials design, lesson planning, and programming.

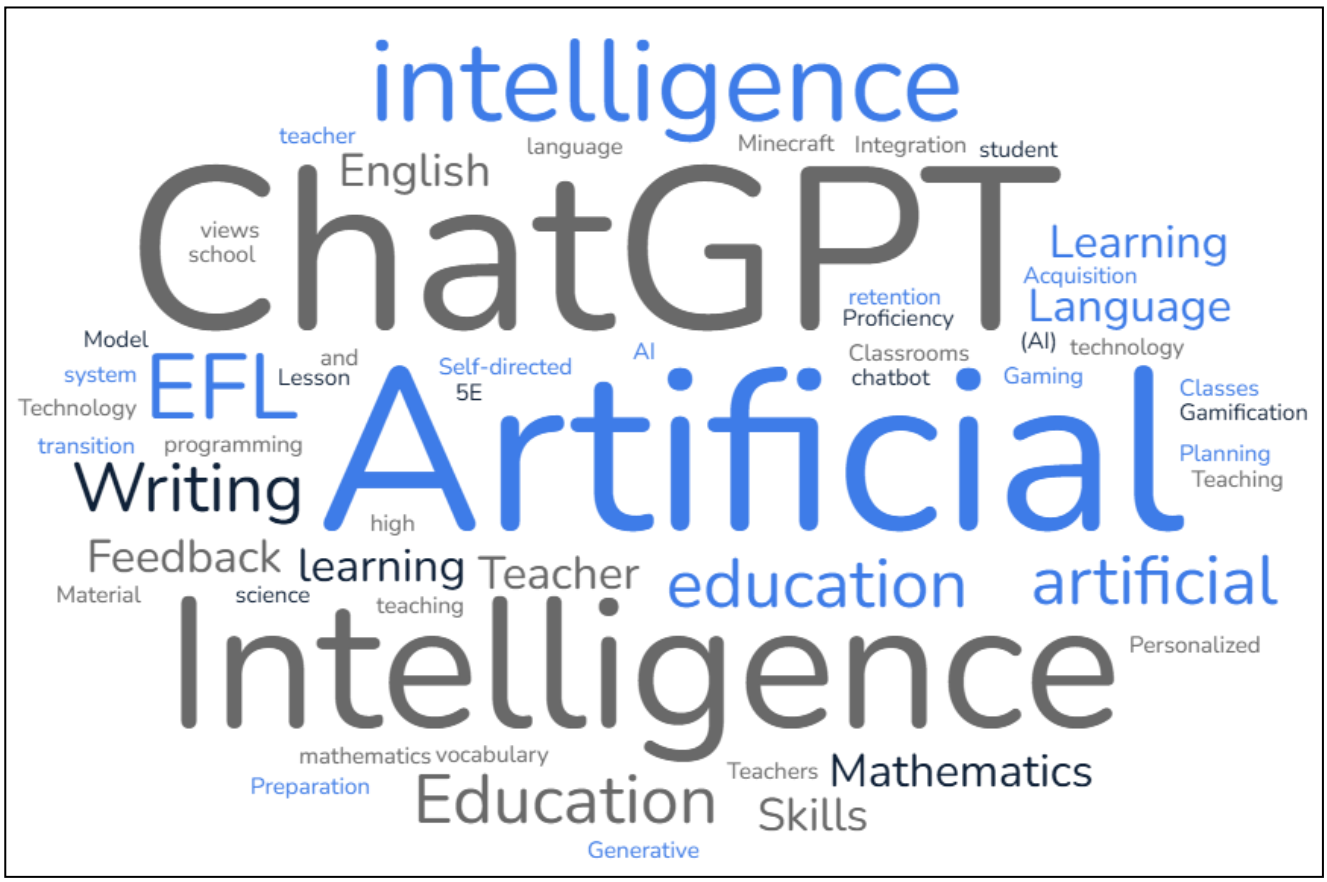

Figure 9. Most frequent keywords in the thesis abstracts.

4.4. Main Findings

4.4.1. ChatGPT's Impact on Academic Achievement and Self-Learning

In her study with middle school sixth graders, Uysal (2024) examined whether ChatGPT contributed to academic success while learning HTML. Using a control and experimental group, she discovered that ChatGPT positively impacted self-learning experiences, with statistically significant differences in the experimental group's test scores. In his Master's thesis with Digital Game Design majors, Özçetin (2024) investigated the impact of ChatGPT on coding training. His findings hinted at ChatGPT's capability for guidance, debugging, increasing the learning pace, and developing self-learning skills for learners while saving time and supporting teaching for teachers. Aras (2024) studied the effectiveness of ChatGPT Turkish EFL learners' vocabulary learning and retrieval. Results demonstrated that the experimental group's scores were higher, indicating ChatGPT's aid to vocabulary gains and retrieval. The students also reported positive feedback on the tool's ubiquity, conversational features, and rapid access to information. In his thesis, Çelik (2024) looked into ChatGPT-aided gaming experience (Minecraft) on language learning outcomes and suggested promising results for language learning and gaming experience.

Across these studies, ChatGPT appears to facilitate self-learning and academic achievement across different domains (programming, language learning, and game-based learning). The self-paced nature of ChatGPT, combined with its real-time guidance, seems to be a recurring benefit.

4.4.2. ChatGPT's Role in Lesson Planning and Pedagogical Support

Alsan (2024) surveyed Turkish EFL teachers' views on ChatGPT-generated lesson plans on wild animals at the A2 level and reported optimistic feedback as it was sufficient to fulfill students' needs and support learning outcomes. Parallel to Alsan's (2024) study, Karataş (2024) assessed ChatGPT's potential to aid preservice science teachers in pedagogical content knowledge (PCK) in inquiry-based lesson planning. Preservice teachers' interactions with ChatGPT mainly involved receiving support for instructional strategies, literacy assessment, curriculum design, and science teaching. She concluded that ChatGPT assisted preservice science teachers in different PCK dimensions, raising their inquiry levels. Demir (2024) worked with preservice mathematics teachers to investigate their views on ChatGPT vs teacher-generated lesson plans about 5E learning. She reported limited teacher knowledge about AI use, with only a small number using ChatGPT for manifold purposes. Preservice teachers also recommended ChatGPT's use for mathematics and resorted to it to modify their lesson plans. These studies highlight ChatGPT's utility in lesson planning, particularly for novice teachers or those with limited expertise in AI. However, Demir (2024) points out the challenge of low AI literacy among teachers, suggesting a need for professional development in AI-assisted teaching.

4.4.3. ChatGPT's Effectiveness in Feedback on Writing Skills

Sezer (2024) explored the effectiveness of feedback from ChatGPT and teachers in Turkish EFL learners' writing performance. Post-test writing task results revealed no statistical significance, notwithstanding positive student attitudes toward ChatGPT-based feedback's practicality and time-saving nature. Her participants further expressed their wish to receive teacher feedback. Like Sezer's (2024) study, Ozan (2024) also looked at ChatGPT's effectiveness in improving high school students' writing skills. The findings revealed an observable positive contribution of ChatGPT-driven feedback compared to traditional feedback. Parallel to Sezer (2024) and Ozan (2024), Cengiz-Kulaksız (2024) also explored ChatGPT's role in high school students' writing skills, with a particular focus on grammar, coherence, cohesion, and vocabulary. After an eight-week intervention with ChatGPT-driven feedback, the author reported moderate to high contributions in the aforementioned writing skills.

Despite finding no significant performance gains, Sezer's (2024) study acknowledged students' recognition of ChatGPT's practicality and efficiency. This suggests that students value ChatGPT's assistance, but its effectiveness in writing improvement might depend on several factors (e.g., task type, feedback depth, or duration of exposure). Ozan (2024) and Cengiz-Kulaksız (2024) observed improvements, possibly due to different methodologies (e.g., longer intervention periods or more structured feedback integration). Overall, the effectiveness of ChatGPT in writing instruction seems to depend on the context—task design, feedback

integration, and duration of use may influence learning outcomes.

4.4.4. ChatGPT's Use in Mathematics and Science Education

Karabacak (2024) explored the views of middle school students and mathematics teachers toward using ChatGPT in mathematics education and reported generally positive feedback from both stakeholders, albeit concerns over excessive detailing. Demir (2024) observed preservice mathematics teachers' reliance on ChatGPT for modifying lesson plans, though AI literacy was a limitation. Taşkıran (2024) tackled how ChatGPT approached science test questions in the high school entrance exam. The study revealed ChatGPT's success in answering and explaining the text-based questions, followed by visual ones. Despite some level-inappropriate responses, the study promoted the tool's curricular integration. Succintly, ChatGPT seems to be a great asset in mathematics and science education, especially when it comes to tackling problems and designing lessons. That said, some areas could use a bit of work, like the tendency to provide too much detail and the necessity for improved training for teachers using AI.

4.4.5. ChatGPT's Role in Language Learning Materials and Instructional Support

Tuzlu (2024) investigated ChatGPT's potential in preparing English language teaching materials and showed its efficiency in prompting creativity for materials design, leading to improved learning outcomes and increased student engagement. Similarly, Aras (2024) and Çelik (2024) found ChatGPT effective in language learning, more particularly, concerning vocabulary learning and Minecraft-based language learning. Overall, ChatGPT appears to be a valuable resource for language learning, helping with everything from creating materials to engaging directly with students. Research indicates that its flexibility and interactive features play a significant role in enhancing the learning experience.

Table 8. A Synthesis of the Main Findings

Category	Findings	Reference	Explanations
Academic achievement & Self learning	• ChatGPT enhanced self-learning and academic success in HTML, coding, and vocabulary learning. • Minecraft-based ChatGPT learning showed promise for language acquisition	(Aras, 2024; Çelik, 2024; Özçetin, 2024; Uysal, 2024)	ChatGPT fosters independent learning and accelerates knowledge acquisition across disciplines.
Lesson planning & Teacher support	• EFL teachers valued ChatGPT-generated lesson plans. • Preservice teachers used it for instructional strategies and curriculum design.	Alsan, 2024; Demir, 2024; Karataş, 2024	Limited AI literacy among teachers
Writing skills	• No significant improvement in EFL writing performance. • Positive impact found in other studies	Cengiz-Kulaksız, 2024; Ozan, 2024; Sezer, 2024	Effectiveness likely depends on feedback depth, task design, and intervention length.
ChatGPT in Mathematics & Science Education	• Beneficial for math problem-solving and lesson design. • Performed well in answering science exam questions.	Demir, 2024; Karabacak, 2024; Taşkıran, 2024	Some responses were overly detailed or level-inappropriate.
Language Learning & Material Development	• Boosted creativity in English teaching materials. • Improved vocabulary learning and retrieval.	Aras, 2024; Tuzlu, 2024	ChatGPT enhances instructional design and student engagement.

The key findings and takeaways are presented in Table 8.

In summary, ChatGPT is a promising educational tool, but AI literacy, writing effectiveness, and response quality need further investigation.

5. DISCUSSION

Since its release in November 2022, OpenAI's generative artificial intelligence (GenAI) chatbot, ChatGPT, has received immense international attention. An excessive number of academic documents (e.g., articles, reviews, and conference proceedings) have been published in international journals (Baber et al., 2024). Additionally, ChatGPT has been a research topic in theses and dissertations globally (e.g., Amer et al., 2025; Chow et al., 2024; Rababah et al., 2024). The lack of research on analyzing the content of theses written by Turkish authors has motivated this study. Accordingly, the study aimed to fill this research gap by revealing the bibliometric characteristics, methodological properties, research topics, and main findings of those theses.

The bibliometric analysis highlights key trends in Master's theses on ChatGPT, aligning with and diverging from global AI research patterns. Initially, ChatGPT research is concentrated in foreign language education (n=6) and STEM fields (n=3), consistent with global AI education studies (Kohnke et al., 2023; Wu et al., 2025). Prior research confirms AI's role in automated feedback (Shi & Aryadoust, 2024) and coding education (Başaran et al., 2025), supporting findings from Sezer (2024) and Özçetin (2024). However, further analysis is needed on the depth of AI-specific citations vs. pedagogical discussions.

The methodological approaches in the analyzed ChatGPT-related Master's theses reflect dominant trends in educational AI research while also revealing certain gaps. A mixed-methods approach (n=6) and qualitative research (n=7) dominated, with case studies (n=6) being the most used design, aligning with broader AI education research (Tlili et al., 2023; Yang et al., 2024). Equally, the use of quasi-experimental studies (n=4) is notable, as experimental designs are essential for assessing AI's causal effects in education (Cingillioglu et al., 2024). Nevertheless, the absence of large-scale randomized controlled trials (RCTs) limits generalizability and causal claims about ChatGPT's impact.

The theses targeted students (middle school, high school, university), teachers (EFL, Math, Science), and experts (academics, subject specialists), reflecting common participant profiles in studies about AI in education (Almuhanna, 2024; Sun et al., 2025). In addition, the sample sizes varied widely (8–120, M=41.69), but three studies lacked clarity on their sampling method, which raises concerns about methodological transparency. Furthermore, the reliance on convenience (n=6) and purposive sampling (n=6) limits external validity, a common critique in AI education research (Minh, 2025). The diversity in research designs suggests a balanced approach to exploring ChatGPT's educational applications. However, the absence of longitudinal studies restricts insights into the long-term effects of ChatGPT on learning outcomes (Al-kfairy, 2024; Li et al., 2024).

The keyword analysis of the thesis abstracts reflects the core thematic focus areas in Turkish Master's theses on ChatGPT, coinciding with global research priorities while also indicating potential research gaps. After excluding expected keywords (ChatGPT, artificial intelligence), the most frequent terms highlight ChatGPT's role in writing feedback, mathematics, language learning, self-directed learning, gamification, materials design, lesson planning, and programming. These themes align with global AI education research, where ChatGPT has been widely studied in language acquisition (Kohnke et al., 2023), coding education (Başaran et al., 2025), and self-directed learning (Lin, 2024). Unlike broader international trends, Turkish theses show limited focus on ethical concerns, misinformation detection, and critical thinking development, which are emerging priorities in AI-assisted education (Chang et al., 2025; Santos, 2023; Vargas-Murillo et al., 2023).

On the other hand, the presence of gamification, lesson planning, and materials design suggests a strong pedagogical interest, paralleling trends in teacher-AI collaboration (Kim et al., 2022; Kim, 2024). However, the absence of keywords related to assessment, AI literacy, and ethical AI use suggests that these areas remain underexplored in Turkish theses. Moreover, AI bias, academic integrity, and ethical AI adoption in education—widely discussed globally (Gonsalves, 2024; Lund et al., 2025)—are underrepresented in the

analyzed studies.

The findings on ChatGPT's role in education concur with global AI research, highlighting its potential for self-learning, lesson planning, feedback, STEM education, and language learning. However, variability in effectiveness and AI literacy challenges indicate areas for improvement. ChatGPT improved self-learning and academic success in HTML (Uysal, 2024), coding (Özçetin, 2024), and vocabulary learning (Aras, 2024). These results align with research on AI's role in personalized learning (Castro et al., 2024) and adaptive learning systems (Gligorea et al., 2023). Similarly, teachers and preservice teachers found ChatGPT useful for lesson planning and curriculum design (Alsan, 2024; Karataş, 2024; Demir, 2024). Similar trends are seen in AI-supported teacher education research (Lee & Zhai, 2024). Sezer (2024) found no statistical difference in writing improvement, while Ozan (2024) and Cengiz-Kulaksız (2024) reported positive effects. This discrepancy reflects findings in AI feedback research, where effectiveness depends on feedback depth, integration, and duration of use (Xu et al., 2025).

Hence, more research is needed on ChatGPT's role in different writing tasks and feedback quality. ChatGPT aided math learning (Karabacak, 2024) and successfully answered science exam questions (Taşkıran, 2024). Findings align with studies on AI in problem-solving and computational thinking (Huang & Qiao, 2024). However, concerns about excessive detail in ChatGPT's responses and teacher preparedness for AI integration remain (Demir, 2024). Furthermore, ChatGPT was effective in language learning (Aras, 2024; Çelik, 2024) and material creation (Tuzlu, 2024), supporting global findings on AI-driven language learning (Han, 2024; Kohnke et al., 2023).

The results show some valuable insights on how ChatGPT can be used in education, with a mix of different backgrounds, departments, and genders of the authors involved. Most studies used qualitative or mixed methods, with case studies being the most popular. They often selected samples based on convenience. The keyword analysis examined how ChatGPT affects writing feedback, language learning, and subjects like math and programming. While ChatGPT can boost self-learning and academic performance, issues like understanding AI, varying feedback, and needing more teacher training are essential challenges. This points out that while AI can have a role in education, areas still need more work.

6. CONCLUSION

Large volumes of scholarly work on ChatGPT are significant in revealing the emerging research trends in academia. Notwithstanding the extensive scientific production of ChatGPT in diverse fields, there is a dearth of research on analyzing the content of theses on ChatGPT written by Turkish authors in education and training. With this in mind, this study examined 13 Master's theses concerning their documentary characteristics, methodological properties, research topics, and main findings. The documentary analysis of bibliometric characteristics showed that ChatGPT research is in its infancy in theses by Turkish authors in education and training. Low frequency, (n=13) publication recency (2024), and a lack of doctoral dissertation support this claim and provide insights into the field's trajectory. In other words, future research might increase in number and lean toward dissertations by tackling ChatGPT research at the doctoral level. Equally, the limited focus on this research topic by limited departments requires additional attention from other fields (e.g., medicine, nursing, engineering, etc.), as well as from those cited in this study (e.g., foreign language education and mathematics education) but with different foci.

According to the bibliometric characteristics, Turkish theses align with global ChatGPT research but show gaps in interdisciplinary adoption, regional representation, and faculty expertise in AI pedagogy. Future studies should address these gaps to enhance the breadth and impact of AI research in education. The methodological choices align with broader AI education research, yet gaps in generalizability, sampling rigor, and long-term assessment remain. Future research should incorporate RCTs, larger samples, and longitudinal studies to strengthen the evidence base for ChatGPT's role in education.

The keyword analysis confirms that Turkish theses align with global research in AI-enhanced learning and pedagogy, but ethical and assessment-related aspects of ChatGPT remain largely unexplored. Future research should address AI bias, misinformation, and the critical evaluation of AI-generated content to ensure

a more comprehensive understanding of ChatGPT's role in education. The main findings reveal that ChatGPT enhances self-learning, lesson planning, and instructional support, but teacher AI literacy, writing feedback variability, and long-term impact need further research. Addressing these gaps will ensure more effective AI integration in education.

Notwithstanding the current study's findings and implications, it recognizes several limitations. First, the study focused on only ChatGPT as a GenAI chatbot, overlooking others (e.g., Gemini, Claude, and Copilot). However, the sensation created by ChatGPT and the interest it received from different areas influenced this choice. Future researchers might include other AI tools in their research. Second, the study was limited to Master's theses, excluding doctoral dissertations. Nevertheless, this decision was not intentional, as no doctoral dissertations written as of 2024 could be accessed through the CoHE's NTC. Another limitation could be the focus on Turkish authors. Prospective researchers might, therefore, analyze academic scholarship by non-Turkish writers since this might reveal different perceptions and perspectives.

Nonetheless, these limitations do not compromise the study's significance, as no previous research tackled this issue. The current study intends to inform prospective researchers about ChatGPT research's emerging trends and content-related characteristics with its findings.

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AUTHORS` CONTRIBUTIONS

There is only one author.

CONFLICT OF INTEREST

The author(s) certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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