

# THE IMPACT OF CHATGPT FOR HEALTHCARE EDUCATION AND TEACHERS' EDUCATION

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## ABSTRACT

The field of education is transforming, with AI playing a key role and ChatGPT emerging as a significant manifestation of this change. ChatGPT is moving beyond its role as a facilitator and becoming an active participant in the educational process, leading to a shift from passive to active learning. ChatGPT offers new opportunities in various fields, including education and medicine. This study is a literature review presenting the implications of ChatGPT's utilization in healthcare education and teachers' education that follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to examine the role of ChatGPT in healthcare education and teachers' education. The search strategy focused on identifying published scientific literature from January 1, 2023, to March 5, 2024, about ChatGPT in healthcare education and also its role in teachers' education. Ultimately, 35 and 14 articles meeting the eligibility criteria for each field were included in the review for further analysis and synthesis of findings. The findings of this study reveal that in both sectors, ChatGPT promotes enhanced accessibility and personalization by providing tailored educational resources, supporting curriculum development, and facilitating information retrieval and idea generation. Additionally, it serves as a valuable tool for language and organizational support, fostering effective communication and literacy development among learners. However, common limitations exist, including ChatGPT's inability to provide direct explanations or real examples, the risk of misinformation and bias in generated content, and concerns regarding academic dishonesty and the limitations of evaluation. Furthermore, effective utilization of ChatGPT requires educators to be familiar with AI technologies, highlighting the need for ongoing professional development and training. In conclusion, the integration of ChatGPT in these domains underscores the convergence of innovative technologies in advancing educational practices. Continued exploration and utilization of ChatGPT hold promise for further enhancing educational outcomes and fostering continuous improvement in healthcare and teacher education practices.

**Keywords:** *ChatGPT, Education transformation, AI in education, Healthcare education, Teacher education, Personalized learning, Critical thinking, Curriculum development*

## Introduction

Potasheva et al. (2019), Mhlanga (2023), Baidoo-Anu and Owusu Ansah (2023), Kalota (2024) argue that technological advances are changing and transforming education. Education and technology are interrelated and influence each other. Technology has enabled changes in education, and education has also influenced technological advances. Among modern technologies, artificial intelligence stands out as one of the most prevalent, successful, and widely used technologies in many sectors, including education and healthcare.

In the history of artificial intelligence, according to Alier, García-Peñalvo and Camba (2024), an important milestone was the launch of ChatGPT on November 30, 2022. ChatGPT is the latest achievement in artificial intelligence technology, which has gained significant importance in various fields, including education and healthcare. It is worth noting that ChatGPT was developed by OpenAI, an artificial intelligence company based in San Francisco, California. As noted by Zhang and Tur. (2022), ChatGPT has received a lot of attention and gained more than a million subscribers in the first week of 2022. On November 30, Mamykina et al. (2022) reported that ChatGPT's advanced capabilities made it a popular topic on social media and news portals, including Nature and The New York Times.

In 2023, many researchers around the world devoted their efforts to empirical studies of ChatGPT (Lingard, 2023; Pavlik, 2023; Bilal, 2023; Ali et al., 2023; Hosseini et al., 2023; Sakirin and Said, 2023; Zhang and Tur, 2023; et al.). Since ChatGPT is classified as a text generation tool, the following keywords are found in its conceptual discussion: text writing. This claim is supported by researchers such as Ortiz (2022), Lucy and Bamman (2021), Kanabar (2023), Tate, Warschauer and Gerjets (2023), who present ChatGPT as an artificial intelligence tool that generates text in their conceptual discourse on ChatGPT. For example, Ortiz (2022) emphasizes that ChatGPT is an artificial intelligence-based natural language processing system that closely mimics human communication with the end user. According to the author, ChatGPT allows users to answer questions and provide assistance, such as creating emails, writing essays, generating software code, and so on.

Lucy and Bamman (2021), Kanabar (2023), Tate et al. (2023) found that ChatGPT demonstrated exceptional abilities to perform complex tasks such as writing articles, stories, poems, essays, and summaries. The authors claim that ChatGPT can also edit texts from different perspectives and even generate and compile computer code. According to Von Garrel, and Mayer (2023), the new technology can process both textual and visual input data, including text documents, photos, diagrams, or screenshots.

Other researchers associate ChatGPT with large amounts of data and their processing. Fitria (2023) notes that OpenAI technology generates text by analyzing large amounts of training data and understanding the relationships between them. Rudolph, Tan and Tan (2023) note that ChatGPT is a pre-trained transformer that generates text that is indistinguishable from human-written text. Lingard (2023) adds that versions of ChatGPT

(e.g., 3.5 and 4.0) were pre-trained using large amounts of data up to 2021. According to the author, this allows the system to recognize language patterns and relationships that are later used to generate conversation text.

Studies in the scientific literature reveal another side of the conceptual discourse on ChatGPT, in which ChatGPT is described as an AI tool that can initiate a conversation with a user and answer their questions. These ideas are supported, for example, by Rudolph et al. (2023), who emphasize that ChatGPT can initiate conversations with users. This idea is complemented by Roose (2022), who points out that ChatGPT quickly gained a lot of attention due to its detailed answers and ability to formulate responses in various fields of knowledge. Kasneci et al. (2023), AlAfnan et al. (2023) note that ChatGPT can be used as a tool for generating answers to theoretical questions and developing initial essay ideas. Lingard (2023) adds that when a query is entered into ChatGPT, the input is analyzed and a response is generated based on knowledge acquired through online machine learning.

Although human intelligence remains unmatched in terms of adaptability and creativity, the synergy with artificial intelligence is nevertheless promising, especially in the field of healthcare, where artificial intelligence can improve personalized medicine and diagnostics, as stated by Johnson et al. (2021). Paranjape et al. (2019) add that AI chatbots, such as ChatGPT, could simplify healthcare education in the field of education, but evidence-based limitations and risks should be carefully considered. Opara, Mfon-Ette, and Aduke (2023) argue that the integration of ChatGPT into educational processes is not limited to healthcare education. According to the authors, it changes the roles of all participants, especially educators. Although AI ensures efficiency, personalization, and optimization of activities, Sun and Hoelscher (2023) argue that it is necessary to recognize the irreplaceable human qualities of teachers, including adaptability and flexibility.

It is clear that teachers remain the most important part of the education system today, as they provide subtle understanding, empathy, and mentorship that AI cannot replicate (Sun and Hoelscher, 2023). However, as Opara, Mfon-Ette, and Aduke (2023) point out, the synergy between AI and teachers is a promising way to improve educational outcomes. ChatGPT, as an artificial intelligence tool, can significantly improve teachers' skills (Sun and Hoelscher, 2023).

As Opara, Mfon-Ette, and Aduke (2023) point out, it can be a writing assistant, helping to rephrase text, develop concepts, and summarize information. Furthermore, according to Sun and Hoelscher (2023), ChatGPT can monitor student learning progress, identify gaps, and address individual needs from early childhood to various stages of learning. Sun and Hoelscher (2023) note that by integrating ChatGPT into their practice, teachers can leverage its potential to optimize teaching strategies, increase student engagement, and personalize the learning experience. According to the authors, this collaborative approach allows for the advantages of both AI and human resources to be leveraged, resulting in more effective learning outcomes.

Opara, Mfon-Ette, and Aduke (2023) point out that the role of ChatGPT in teacher training is not to replace traditional teaching methods, but to complement and enhance

them. By implementing this integration, as Sun and Hoelscher (2023) add, they can leverage the power of artificial intelligence to better serve their students and adapt to the changing educational environment.

After examining the concept of ChatGPT and the main advantages of this AI tool, the risks associated with its use cannot be ignored.

According to researchers such as Trust, Whalen and Mouza (2023), Baidoo-Anu and Owusu-Ansah (2023), Firaina and Sulisworo (2023), Cabrera, Perer and Hong (2023), Zhou Liu, Grassini (2023), Božić and Poola (2023), Kasneci et al. (2023), and other scientists and researchers, ChatGPT users face several dangers: the risk of misinformation and bias, and the risk of losing academic integrity. Deng and Lin (2022) add to these statements by emphasizing that the academic community has different reactions to ChatGPT, which reflects the ongoing discussions about the benefits and risks of advanced artificial intelligence. Although ChatGPT and similar large language models (LLMs) are known for their efficiency and accuracy, the authors argue that there are still concerns about bias in the training data, which leads to factual inaccuracies or “hallucinations”. Sallam et al. (2023) add that there are concerns about accuracy, ethics, and misinformation in healthcare and academic writing.

Other researchers delve deeper into the negative side of ChatGPT, arguing that its use raises questions related to “ethics, copyright, transparency and legal issues, bias, plagiarism, lack of originality, inaccurate content with the risk of hallucinations, limited knowledge, incorrect citations, cybersecurity issues, and the risk of infodemics” (Sallam 2023).

Rudolph et al. (2023) called ChatGPT a «bullshit spewer,” while Arif, Munaf and Ul-Haque (2023) argues that ChatGPT lacks critical thinking, requiring human intervention. Wach et al. (2023) also offer several critical comments on AI, particularly ChatGPT, listing urgent regulatory needs such as poor quality, misinformation, algorithmic bias, job losses, privacy violations, social manipulation, “erosion of ethics and integrity,” social and economic inequality, and AI-related “technostress” as causes for concern. Most importantly, according to Wach et al. (2023), ChatGPT does not understand the questions asked of it. Deepak (2023) notes that ChatGPT distorts the power relationship between AI and the user in fundamental and undesirable ways, reducing epistemic transparency and challenging the traditional search engine paradigm.

**Research problem:** Although the application of ChatGPT in healthcare and teacher training is rapidly spreading and gaining recognition and appreciation, there is a lack of systematic, up-to-date research data that clearly reveals the advantages and risks of ChatGPT and helps to establish practical limits and recommendations for the responsible integration of ChatGPT into healthcare studies and teacher training.

**The aim of this article** is to explore the potential of ChatGPT in the fields of healthcare and teacher training, while acknowledging the limitations of its use in both fields and the lack of common practice.

# Methodology

## Search Strategy regarding ChatGPT and Healthcare Education

The systematic review followed the PRISMA guidelines (Moher et al., 2009) and used data from reputable databases such as PubMed and Google Scholar. Eligibility criteria included published scientific literature related to ChatGPT in healthcare education, excluding non-English language publications, irrelevant records and non-academic sources.

The PubMed/MEDLINE search strategy from 1 January 2023 to 5 March 2024 used the keyword phrase “ChatGPT” AND “Healthcare education” and yielded 80 results. Google Scholar using Publish or Perish (version 8), “ChatGPT” and “Healthcare education” yielded 200 initial results, focusing on review articles from 2023 to 2024.

Article titles and abstracts were reviewed; duplicates ( $n = 42$ ) and non-English language publications ( $n = 40$ ) were excluded. Articles on ChatGPT outside the field of health education and non-academic sources were also excluded ( $n = 80$  and  $n = 20$ , respectively). Full-text access was attempted for the remaining publications ( $n = 100$ ); 42 articles could not be accessed in full text and were therefore excluded prior to full-text selection. Of the 58 full-text articles obtained, 23 were deemed irrelevant. Thus, 35 articles meeting the inclusion criteria were selected for the review.

**Table 1** A summary of the main benefits, limitations, and conclusions of the included research articles regarding the use of Chat GPT in healthcare education

| Author                    | Benefits                                  | Limitations                                   | Conclusions                                   |
|---------------------------|-------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Thorp (2023)              | –                                         | Content unoriginal, inaccurate, risky         | ChatGPT use: academic misconduct.             |
| Kumar (2023)              | Enhancing precision, clarity, originality | Lacks adherence, citations, accuracy          | ChatGPT boosts academic writing               |
| Wang et al. (2024)        | Versatility                               | Hallucination, fraud, plagiarism              | Guidelines vital for ChatGPT integration.     |
| Nisar and Aslam (2023)    | High level of precision (context-wise)    | Insufficient content for research purposes    | ChatGPT: self-learning potential.             |
| Lund and Wang (2023)      | ChatGPT helps review, analyze, translate. | Ethics, privacy, bias, transparency concerns. | Academic advancement,                         |
| Manohar and Prasad (2023) | ChatGPT: clear, understandable text.      | Lacks precision, reliable citations.          | Risk of misleading health care practices.     |
| Akhter and Cooper (2023)  | ChatGPT: relevant introductory summary.   | Outdated knowledge, citation errors.          | ChatGPT can't replace independent reviews.    |
| Mann (2023)               | Writing proficiency, dataset analysis.    | Diminished data quality.                      | Integration in scientific, medical journals.  |
| Huh (2023)                | Performance to improve.                   | ChatGPT performed worse than students.        | improvement expected,                         |
| Khan et al., (2023)       | Personalized learning.                    | Knowledge cutoff 2021.                        | Aids in medical fields, Human skills crucial. |

| Author                            | Benefits                                        | Limitations                                    | Conclusions                                     |
|-----------------------------------|-------------------------------------------------|------------------------------------------------|-------------------------------------------------|
| <b>Gilson et al., (2023)</b>      | Grasps context, aids group learning.            | Restricted knowledge up to 2021                | USMLE performance, virtual tutor.               |
| <b>Marchandot et al., (2023)</b>  | ChatGPT assists in literature reviews,          | iInaccuracies, bias, ethics, plagiarism risks. | ChatGPT credited for contributions.             |
| <b>Benoit (2023)</b>              | Fast, flexible, plagiarism-free text.           | Inaccurate references.                         | Medical education, patient communication.       |
| <b>Antaki et al., (2023)</b>      | Ophthalmology resident level.                   | Image processing incapacity, bias risk         | Potential in ophthalmology                      |
| <b>Hisan and Amri (2023)</b>      | Creates educational material                    | Ethics, fraud, cheating impact.                | Practical skill assessment.                     |
| <b>O'Connor (2023)</b>            | ChatGPT: personalized learning potential.       | Plagiarism, bias.                              | Improve nursing assessments.                    |
| <b>Fijačko et al., (2023)</b>     | ChatGPT: occasional accuracy.                   | Referencing issues, overly detailed responses. | Self-learning tool for life support exams.      |
| <b>Kung et al., (2023)</b>        | Aids patient communication,                     | –                                              | Unbiased studies needed.                        |
| <b>Mbakwe et al., (2023)</b>      | –                                               | Bias risk, lacks reasoning.                    | Medical education reassessment                  |
| <b>Ahn (2023)</b>                 | Understandable interaction.                     | Personalized, clear interaction.               | Explore ChatGPT's role in CPR education.        |
| <b>Cotton et al., (2024)</b>      | –                                               | Plagiarism, integrity concerns.                | Reflect on assessment tools thoughtfully.       |
| <b>Aljanabi et al., (2023)</b>    | Aids writing, code generation.                  | Inaccuracy, math handling issues.              | ChatGPT gaining scientific interest.            |
| <b>van Dis et al., (2023)</b>     | Accelerates innovation, training optimization.  | Compromised research                           | Establish rules for accountability              |
| <b>De Angelis et al., (2023)</b>  | ChatGPT speeds up academic research.            | Misinformation, fake research.                 | Balance benefits, risks; set ethical guidelines |
| <b>Chen (2023)</b>                | Breaks language barriers                        | Ethics, accuracy, citation problems.           | Authors need AI proficiency.                    |
| <b>Moons and Van Bulck (2023)</b> | Streamlines data collection.                    | Accuracy concerns, knowledge limit to 2021     | Promises value in healthcare.                   |
| <b>Cahan and Treutlein (2023)</b> | Saves time                                      | Shallow insights, lack of references.          | ChatGPT sped up editorial writing               |
| <b>D'Amico et al., (2023)</b>     | Offers patients timely, accurate treatment info | Inaccuracies, privacy, ethics, legal concerns  | Neurosurgery leads to AI integration in care.   |
| <b>Shen et al., (2023)</b>        | Generates reports, summarizes records.          | Hallucination risk, inaccurate results         | Use ChatGPT cautiously                          |
| <b>Zielinski et al., (2023)</b>   | Valuable for researchers.                       | Incorrect answers, pre-2021 knowledge          | Transparent handle of ChatGPT                   |
| <b>Polonsky and Rotman (2023)</b> | Enhances accuracy, precision.                   | IP concerns with financial gains.              | AI may be credited as an author.                |
| <b>Wang et al., (2023)</b>        | More precise than current query methods.        | Inadequate for high-recall retrieval.          | A promising research tool                       |

| Author                           | Benefits                                 | Limitations                              | Conclusions                                        |
|----------------------------------|------------------------------------------|------------------------------------------|----------------------------------------------------|
| <b>San-marchi et al., (2024)</b> | ChatGPT offers suitable responses.       | Bias risk, expertise devaluation, fraud. | ChatGPT adds value, human ingenuity remains vital. |
| <b>Duong and Solomon (2023)</b>  | Democratizes genetic information access. | Reproducibility concerns.                | Value expands in research                          |
| <b>Gordijn and Have (2023)</b>   | –                                        | Inaccuracies, copyright issues.          | LLMs could write publishable papers.               |

### Search strategy for ChatGPT and teacher education

In accordance with the PRISMA guidelines (Moher et al., 2009), the Emerald Management and Google Scholar databases were selected for the systematic review of scientific literature. One of the reasons for choosing Emerald Management was that it helped to ensure the selection of high-quality peer-reviewed journals. Meanwhile, Google Scholar allowed for broader coverage of interdisciplinary sources and faster detection of open access full-text publications.

It is also important to note that the articles had to be written in English and published between January 1, 2023, and March 5, 2024. A total of 154 records were identified: 15 scientific articles were selected for the selection process. The selection was carried out in two stages: (1) Two researchers independently reviewed the titles and abstracts of the scientific articles, removing duplicates and obviously irrelevant entries. (2) Selection was based on an evaluation of the entire text of the scientific article according to pre-agreed criteria (e.g., a clear analysis of the role of ChatGPT in teacher training, empirical or conceptual analysis, etc.). Only scientific publications that met all of the listed criteria (preprints, scientific articles) were retained. The suitability of a scientific article for this publication was decided by consensus between the two researchers, and an additional team member was involved when necessary. Fifteen scientific publications remained in the final review. It is also important to note that in 2024, when this publication was being prepared, 15 scientific publications met the selection criteria, but in the summer of 2025, one of them was retracted, so this publication presents 14 open access scientific publications.

**Table 2** The main strengths, limitations and findings of the included research articles concerning ChatGPT support for teachers in education

| Author                                    | Benefits                                  | Limitations                       | Conclusions                                       |
|-------------------------------------------|-------------------------------------------|-----------------------------------|---------------------------------------------------|
| <b>van den Berg and du Plessis (2023)</b> | Offers accessible lesson plans.           | –                                 | Approach models cautiously, evaluate limitations. |
| <b>Zhai (2023)</b>                        | ChatGPT enhances instructional practices. | Teachers need expertise.          | Teachers should watch for bias                    |
| <b>Hong (2023)</b>                        | ChatGPT improves language education.      | Ethics, professionalism concerns. | Teachers urged to adapt to tech.                  |

| Author                                   | Benefits                                                                                                       | Limitations                                                                | Conclusions                                                                                                       |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Montenegro-Rueda et al., (2023)</b>   | Fast, personalized, feedback, complex concepts                                                                 | ChatGPT doesn't replace learning processes                                 | ChatGPT enhances education, needs teacher familiarity.                                                            |
| <b>Ausat et al., (2023)</b>              | Teachers use ChatGPT for materials, questions, tests.                                                          | Generates text, lacks detailed explanations, assessments.                  | Integration and teacher training essential.                                                                       |
| <b>Trust, Whalen and Mouza (2023)</b>    | ChatGPT supports teacher tasks.                                                                                | Misinformation, bias, cheating.                                            | Education on ethical tool use.                                                                                    |
| <b>Grassini (2023)</b>                   | ChatGPT automates evaluation                                                                                   | ChatGPT promotes academic dishonesty                                       | Teacher development vital for AI utilization.                                                                     |
| <b>Baidoo-Anu and Owusu-Ansah (2023)</b> | Teachers utilize ChatGPT for learning.                                                                         | ChatGPT limitations: errors, biases, privacy.                              | Leverage ChatGPT for teaching.                                                                                    |
| <b>Firat (2023)</b>                      | Suggests personalized learning materials.                                                                      | –                                                                          | Fosters dynamic learning.                                                                                         |
| <b>Firaina and Sulisworo (2023)</b>      | Assists with translation, and questions.                                                                       | –                                                                          | Verify information with reliable sources.                                                                         |
| <b>Božić and Poola (2023)</b>            | Creates personalized student experiences.                                                                      | ChatGPT may foster academic dishonesty.                                    | ChatGPT: support, not replace, teaching.                                                                          |
| <b>Lo (2023)</b>                         | Provides personalized student experiences.                                                                     | Analyze, validate with reputable sources.                                  | ChatGPT optimizes teaching, learning.                                                                             |
| <b>Wang et al., (2023)</b>               | AI streamlines education for better outcomes.                                                                  | Address privacy, culture, language, ethics.                                | AI personalizes learning, aids assessment, identifies at-risk students. Chatbots complement human educators.      |
| <b>Marengo et al., (2024)</b>            | Personalized learning, predictive analytics, efficient automation, theoretical foundation, practical insights. | Potential bias, data privacy, tech dependency, ethics, impact on teaching. | AI enhances teaching, learning, needs research, China, USA lead research, implications: policy, pedagogy, ethics. |

# Results

## Benefits and Concerns Regarding ChatGPT Use in Health Care Education

Thorp (2023) believes that the ChatGPT has transformative potential in healthcare education, and due to its successful use in examinations such as the the United States Medical Licensing Examination (USMLE) and concerns about potential abuse leading to academic dishonesty, there is a need to re-evaluate the assessment tools, as noted by Cotton, Cotton and Shipway (2023).

In the ophthalmology exam, Antaki et al. (2023) found that ChatGPT achieves the level of the average first-year resident, highlighting the importance of critical thinking questions. In addition, van Dis et al., (2023) found that ChatGPT supports personalised learning and direct feedback in healthcare training. These ideas are echoed by Benoit (2023), who notes that recent research also shows that it can effectively create realistic clinical vignettes.

Kumar (2023), Benoit (2023) point out that although ChatGPT improves communication skills in healthcare teaching under the guidance of an academic mentor, there are concerns about copyright issues and inaccuracies in the referencing of generated clinical vignettes. Furthermore, as Khan et al. (2023) note, its accessibility motivates personal interaction, encourages independent learning and complements group learning efforts.

Fijačko, Gosak and Štiglic, et al. (2023) consider that limitations in healthcare training include concerns about the quality of the training dataset, which may lead to biased or erroneous information, especially when using older data. In addition, Huh (2023) argues that concerns include limited image processing capabilities, poor performance on certain topics (e.g., failure of Korean medical students in a parasitology exam) and the risk of plagiarism.

### Advantages and Limitations of ChatGPT in teacher education

The majority of articles in Table 2 discuss both the advantages and limitations of integrating ChatGPT in educational settings. *These articles highlight key aspects of ChatGPT's support for teachers in the educational process.*

1. **Immediate Feedback and Assessment.** Van den Berg and du Plessis (2023) stress ChatGPT's immediate feedback, reducing teacher workload and enhancing teaching quality. Likewise, Zhai (2023) found ChatGPT effective in handling complex science assessment tasks, aiding teachers in task design with comprehensive information.
2. **Personalized learning experiences.** Hong (2023) highlights ChatGPT's rapid feedback, which differs from the delayed feedback provided by teachers, preventing students from forgetting previous writings. Zhai (2023) highlights ChatGPT's applicability to both formative and summative assessment. Wang et al. (2023) emphasize its ability to accurately identify learning difficulties and monitor progress so that targeted measures can be taken. Meanwhile, Božić and Poola (2023) recommend using it for automatic essay assessment, as it saves time and provides quick feedback.
3. **Helps to create questions.** Marengo et al., (2024) state that ChatGPT can analyze students' writing, provide tailored feedback, and suggest learning materials, saving teachers time. Ausat and Massang et al., (2023) mention ChatGPT's use for generating questions and tasks automatically.
4. **Resource Recommendations.** Van den Berg and du Plessis (2023) highlight ChatGPT's advantage of providing teachers equal access to educational resources. Božić and Poola (2023) adds that ChatGPT can recommend tailored learning materials like articles, videos, and textbooks.

5. **Curriculum development.** ChatGPT is transforming education by helping teachers plan lessons and create resources. Firat (2023) and van den Berg and du Plessis (2023) highlight its ability to create structured teaching materials, increasing fairness and accessibility. Trust, Whalen, and Mouza (2023) note its usefulness in a variety of teaching tasks, while Kasneci et al. (2023) suggest using it for individualized practical tasks. Meanwhile, Grassini (2023) highlights its potential to reduce teachers' workloads.
6. **Information Retrieval and Idea Generation.** Trust, Whalen and Mouza (2023) has demonstrated in a study that ChatGPT, as one of the most advanced AI writing tools, can fulfill almost any teacher's writing requests.
7. **Language and Organizational Support.** At the semantic level, as Kasneci et al (2023) elaborate, ChatGPT can be used to highlight possible grammatical inconsistencies and to suggest adequate and personalised strategies for improvement.
8. **Facilitating Conversations.** Firaina and Sulisworo (2023) confirm ChatGPT's ability to generate discussion topics and creative writing prompts for students. Grassini (2023) extends this by proposing its use in group discussions and debates, offering personalized guidance to learners. Lo (2023) notes ChatGPT's generation of conversations on common student topics like college life.
9. **Help with text translation.** Grassini (2023) highlights ChatGPT's ability to quickly translate learning material into multiple languages, enhancing accessibility and creating a responsive learning environment. Additionally, ChatGPT supports learners with disabilities by offering services like speech-to-text and text-to-speech.
10. **Quality Reading Materials.** Hong (2023) highlights ChatGPT's integration of teaching materials for efficient lesson preparation. Wang et al. (2023) emphasize its personalized tools for language learning, while Lo (2023) underscores its role in curriculum curation and innovation. Baidoo-Anu and Owusu-Ansah (2024) note its guidance in personalized learning, and Ausat et al., (2023) mention its natural language processing for understandable texts.

*Upon review, several potential limitations of ChatGPT have emerged.*

1. **Limited number of explanations and examples.** Montenegro-Rueda et al. (2023) highlight that ChatGPT cannot provide direct explanations or real examples to elucidate concepts, unlike teachers. Ausat, Massang et al., (2023) also note this limitation, emphasizing that ChatGPT cannot offer explanations or examples like human educators. Additionally, Lo (2023) agrees that ChatGPT-generated content may not consistently align with teachers' intended educational objectives.
2. **Risk of misinformation and bias.** Concerns about misinformation and bias in ChatGPT responses emphasize the need for critical evaluation of its content. Trust, Whalen, Mouza (2023) and Baidoo-Anu and Owusu-Ansah (2023) highlight instances of misinformation and bias in ChatGPT-generated content, underlining potential privacy issues. Firaina and Sulisworo (2023) stress the importance of cross-verifying information from reliable sources.

3. **Promotion of academic dishonesty.** ChatGPT's access to generated content raises ethical issues related to academic integrity. Hong (2023) highlights issues of accuracy, data contamination, and the risk of plagiarism. Trust, Whalen, Mouza (2023), Grassini (2023), Božić, and Poola (2023) express concern about the opportunities for cheating and plagiarism created by ChatGPT.
4. **Limitations of the evaluation.** While ChatGPT is excellent at generating text, its inability to provide nuanced assessments of students' abilities beyond the existing data may limit its usefulness in assessing complex skills or understanding.
5. **Lack of familiarity with the AI technologies.** Hong (2023) stresses the importance of teachers being proficient in using AI like ChatGPT. Zhai (2023) emphasizes the need for teachers to possess professional knowledge to effectively utilize ChatGPT in teaching.

These limitations highlight the need for careful use of ChatGPT, understanding its strengths and weaknesses, and combining it with human oversight to address potential drawbacks.

## Common Aspects

This chapter examines commonalities in ChatGPT's use in healthcare and teacher education, exploring their shared implications.

1. **Enhanced Accessibility and Personalization.** In both healthcare and teacher education, ChatGPT improves access to resources and personalizes learning. By tailoring content to individual needs, it promotes inclusive education. Educators use ChatGPT to provide targeted support, addressing learners' specific objectives and challenges.
2. **Support for Curriculum Development and Lesson Planning.** ChatGPT aids in curriculum development and lesson planning for both healthcare and teacher education. Educators use it to create learning materials, develop curriculum frameworks, and innovate teaching methods. Its ability to generate content aligned with educational goals streamlines curriculum customization to meet learners' needs.
3. **Facilitation of Information Retrieval and Idea Generation.** Both healthcare professionals and teachers leverage ChatGPT for information retrieval and idea generation. In healthcare education, ChatGPT assists in accessing healthcare literature, synthesizing research, and formulating practice guidelines. Likewise, teachers use it to access educational resources, create instructional materials, and brainstorm teaching strategies, fostering pedagogical innovation.
4. **Language and Organizational Support.** ChatGPT provides language and organizational support in healthcare and teacher education. In healthcare, it aids in drafting clinical documents, creating patient education materials, and improving communication skills among professionals. Similarly, teachers use ChatGPT to analyze student writing, offer language feedback, and enhance organizational coherence in academic texts, fostering effective communication and literacy development.
5. **Promotion of Critical Thinking and Inquiry Skills.** In both healthcare and teacher education, ChatGPT nurtures critical thinking and inquiry skills. Healthcare students

use it to dissect case studies, delve into differential diagnoses, and partake in clinical reasoning, honing problem-solving and diagnostic proficiency. Likewise, teachers prompt students to assess ChatGPT-generated content critically, distinguishing trustworthy information and fostering evidence-based reasoning, thus enhancing their analytical thinking and research literacy.

## Limitations

The current review findings should be interpreted cautiously due to several factors. Variations in study quality across analyzed articles may restrict the generalizability of findings. Moreover, focusing exclusively on English articles may introduce language bias, potentially overlooking pertinent research in other languages. Excluding inaccessible studies due to data limitations might result in missing relevant information, albeit to a minimal extent. Furthermore, given the rapidly evolving nature of the field and continuous growth in research on ChatGPT applications and risks, ongoing reviews and updated analyses are imperative for comprehensive understanding and assessment.

## Future perspectives

van Dis et al. (2023) argue that there is an urgent need to develop guidelines for the ethical use of ChatGPT in research, which prioritise accountability, integrity, transparency and fairness. Lund and Ting (2023) add to these ideas by noting that further research is needed to assess the content of Big Language Patterns and the potential impact on academic and scientific progress, particularly in healthcare settings.

Shen et al., (2023) highlight that the feasibility and appropriateness of employing AI editors and AI reviewers in writing should be carefully examined in the light of past shortcomings in editorial and peer review processes. Similarly, O'Connor (2023), is of the opinion that the balance between emotional support provided by healthcare providers and the potential effectiveness of AI-based systems needs to be explored in healthcare settings.

Ahn (2023) argues that further research is needed in healthcare education to assess the impact of ChatGPT on the quality of educational content, the effectiveness of assessment tools and the improvement of students' communication skills. In addition, Fijačko et al., (2023) argue that attention needs to be paid to exploring the potential of LLMs to improve personalised learning outcomes through the use of instant feedback.

## Conclusions

The integration of ChatGPT in healthcare education and teacher education highlights the convergence of innovative technologies in advancing learning and professional development. By enhancing accessibility, supporting curriculum development, facilitating information retrieval, providing language assistance, and promoting critical thinking, ChatGPT serves as a transformative tool in both domains. Moving forward, continued

exploration and utilization of ChatGPT hold promise for further enhancing educational outcomes and fostering continuous improvement in healthcare and teacher education practices.

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