

A Review of AI Tutors in Education: Affordances, Challenges, and Emerging Trends

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ABSTRACT

The use of AI tutors has been on the rise in recent years, but very few studies have employed a narrative approach to cover a wide range of tools. This study sought to investigate the affordances, challenges, and emerging trends of AI tutors. A narrative literature review of scholarly sources was conducted in this study. Data were collected by investigating peer-reviewed articles, review articles, book chapters, conference papers, and theses from 2021 to 2026. Results revealed that students utilized AI tutors for personalized learning and writing support, which can track their performance and adjust to their needs, in addition to making them feel more confident in their writing. However, these affordances were met with challenges that included overreliance, which resulted in reduced critical thinking skills and issues concerning academic integrity. These results emphasize a balanced approach regarding the adoption of AI tutors that leverages the affordances while minimizing the challenges.

Keywords: AI tutors, ChatGPT, Khanmigo, Generative artificial intelligence (GenAI), Grammarly, Technology Acceptance Model (TAM).

INTRODUCTION

Artificial intelligence has ingrained itself in every facet of our society and has revolutionized the field of education (Rahim et al., 2023). The widespread use of generative artificial intelligence (GenAI) in education is apparent, with a growing number of users each year. In a large-scale study of over 6300 university students in 2023, researchers found that nearly two-thirds of them used AI tutors, with ChatGPT being the most used (Von Gareel & Mayer, 2023). In a more current study that measured the frequency of AI tool use among 97 pre-service teachers, an 85% usage rate was noted (Ahmed, 2026). These studies highlight the increase in AI tool usage, but moving beyond that, understanding what they are using it for is imperative.

Students are utilizing AI tutors such as ChatGPT for idea generation and writing assistance (Almumen & Jouhar, 2025). ChatGPT can help with editing, reflection, and proofreading, which are all key to a student's academic success (Aksakalli & Daşer, 2025). Additionally, it can be used as a personal AI tutor with the ability to grade assignments, translate languages, and adapt to a learner's individual needs (Baidoo-Anu et al., 2023). The affordances of ChatGPT highlight some of the reasons why students are utilizing this AI tutor.

Another popular AI tutor that has evolved from a simple grammar checker into a powerful tool is Grammarly. It has features that utilize artificial intelligence (AI) and algorithms to improve individuals' writing (Fahmi & Cahyono, 2021; Khoshnevisan, 2019, as cited in Faisal & Carabella, 2023). It analyzes writing searching for grammatical errors, spelling mistakes, and to improve the writing style (Fahmi & Cahyono, 2021). The main purpose of Grammarly is to improve individuals' writing, and thus, it is not as versatile as ChatGPT.

A more recent AI tutor that has been gaining popularity is Khanmigo. It was released in March 2023 and has been in demand in school settings. It operates as a paid subscription application designed to assist learners in various tasks through scaffolded learning activities (Shetye, 2024). Additionally, it can be used for language learning, even though that is not specifically what it was designed for. It is extremely beneficial for teachers because it is the only AI tool built into Khan Academy (Shetye, 2024). This means that teachers can access a multitude of content on topics such as coding, sciences, math, and much more.

Despite the growth in AI tutor usage, there is a lack of literature that synthesizes studies collectively. Recent studies usually explore specific tools, such as Khanmigo, investigating a particular aspect of that tool, and lack cross-platform analysis (Albadarin et al., 2024). Moreover, there are limited studies that examine both the affordances and challenges of AI tutors in educational contexts, leaving a gap in their understanding. This study aims to fill this gap by providing a review of current relevant studies that incorporate various AI tutors. Additionally, it utilizes the Technology Acceptance Model to help explain the key affordances of AI tutors. There is one research question to guide this study. (1) What are the affordances and challenges of AI tutors?

RESEARCH METHOD

A narrative literature review was used in this study. This is when an individual synthesizes existing data that was previously collected to develop new insights. This research method emphasizes the role that the researcher plays in order to interpret and produce new insights into a topic (Torraco, 2005). Additionally, there is another review called a comprehensive literature review, which involves a seven-step process. Onwuegbuzie and Frels (2015) developed the following framework to conduct a comprehensive literature review.

The Comprehensive Literature Review (CLR) framework proposed by Onwuegbuzie and Frels (2015) consists of seven interconnected stages. The process begins with exploring beliefs and topics, where researchers identify their area of interest, formulate the research topic, and develop research questions. Next is initiating the search, during which relevant literature and sources are systematically identified. The third stage, storing and organizing information, involves managing the collected materials through note-taking or digital tools such as Microsoft Excel and reference management software. Researchers then proceed to selecting and deselecting information by applying predefined inclusion and exclusion criteria to ensure that only relevant and academically rigorous studies are retained. The fifth stage, expanding the

search using MODES (Media, Observations, Documents, Experts, and Secondary data), broadens the scope of the review beyond traditional text-based literature to incorporate multiple forms of evidence, thereby enhancing comprehensiveness. This is followed by analyzing and synthesizing information, where researchers critically examine the selected literature, identify patterns, and integrate emerging themes into a coherent understanding of the topic. Finally, in the communication phase, the synthesized findings are organized and presented to the intended audience in the form of scholarly outputs, such as journal articles, theses, dissertations, or conference presentations (Onwuegbuzie & Frels, 2015).

Even though Onwuegbuzie and Frels' (2015) framework was consulted in this research, not every step was implemented. I developed a narrative literature framework to allow for a robust and rigorous literature review. Figure 1 presents the steps I took to conduct this review. Following it is a detailed description of those steps.

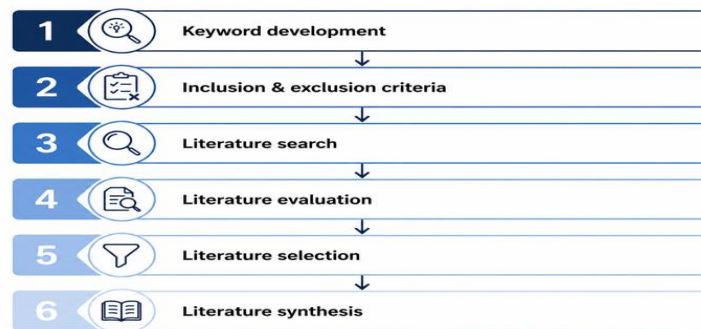


Figure 1: Narrative Review Process

The literature review was conducted systematically through several interconnected stages to ensure the selection of relevant and high-quality studies. First, appropriate keywords, including *AI tutors*, *intelligent tutoring systems*, *student perceptions*, *Khanmigo*, *ChatGPT*, and *Grammarly*, were developed to guide the literature search. Relevant studies were then retrieved from Google Scholar, Scopus, Web of Science, and ERIC and screened using predefined inclusion criteria (peer-reviewed publications published between 2021 and the present) and exclusion criteria (non-English, non-scholarly, and academically weak sources). Eligible studies were evaluated through title, abstract, and full-text screening before being critically analyzed and synthesized to identify major themes, research trends, and knowledge gaps that informed the findings and discussion of this study.

Data Collection & Analysis

The data collection in this study involved a search of scholarly databases as mentioned above. This included Google Scholar, Scopus, Web of Science, and ERIC. Keywords such as *AI tutors*, *intelligent tutoring systems*, *ChatGPT*, *Khanmigo*, *Grammarly*, and *student perceptions* were used to collect data. The inclusion criteria included scholarly sources, including peer-reviewed articles, review articles, book chapters, and theses, all published between 2021 and the present. Exclusion criteria were sources not written in English and non-scholarly works.

After scanning the abstracts, methodology, and results chapter, I narrowed down my list of articles. After I had a list of over 40 scholarly sources, I then went over them in more detail by reading them more thoroughly. Subsequently, I had more than 20 sources that I utilized in my analysis. To ensure validity and trustworthiness, I utilized a wide variety of scholarly sources. Rather than only focusing on peer-reviewed articles, I went beyond that in order to make sure my results were grounded in multiple perceptions.

The data analysis was a thematic analysis, which aims to derive meaning and develop understanding from qualitative data (Merriam & Tisdell, 2015). I conducted this analysis by reading the results and discussion chapters, searching for relevant information that aligned with the affordances and challenges of AI tutors. Through this coding, I noticed recurring themes that I noted down in the first round of coding. I then went over them again to ensure that these themes were consistent across the studies.

Theoretical Framework

I used the Technology Acceptance Model (TAM) to aid in the analysis of the results. The goal of TAM is to explain why individuals adopt a specific technology (Davis et al., 1989). There are two key concepts, which are perceived usefulness (PU) and perceived ease of use (PEOU) (Chau, 1996). PU refers to the likelihood of an individual adopting that tool, whereas PEOU is the degree to which that person thinks that it will be easy to use (Davis et al., 1989).

RESULTS AND DISCUSSION

The following presents an integrated results and discussion chapter. Table 1 lists the themes and sub-themes that were extracted from the data, followed by a detailed discussion of those themes in relation to the Technology Acceptance Model.

Table1. List of Themes & Sub-Themes

Theme	Sub-theme	Description
Theme 1: Affordances of AI Tutors	Personalized learning support	AI tutors adapt to users and provide personized tutoring
	Writing support	Able to correct students spelling, grammar, and do translation
Theme 2: Challenges of AI Tutors	Overreliance & critical thinking	Students use them too much
	Academic integrity and plagiarism	Ethical concerns around plagiarism

Theme 1: Affordances of AI Tutors

There were two sub-themes that were linked to the affordances of AI tutors. These included using them for personalized learning support and writing support. The affordances highlighted here are essential to understand popular AI tutors such as Khanmigo, ChatGPT, and Grammar and how they are being perceived by students, educators, and administrators.

Personalized learning support

One key affordance of AI tutors that was revealed through the literature is their ability to provide personalized learning support to students. They are able to provide individualized responses to questions posed by learners immediately (Kasneci et al., 2023). This instant response is extremely beneficial for students because they are able to obtain feedback right away, as opposed to waiting for a teacher. This affords them the ability to move on to other tasks and not be stuck with a question that forces them to stay stagnant.

Additionally, other studies have mentioned the ability to track student progress and adjust according to the needs of the learner as a key benefit (Hariyanto et al., 2025). Furthermore, they are able to provide tailored learning plans that match the learner's current level (Zhai, 2023). In another study, researchers used ChatGPT to engage learners through a process of conversations and found that it successfully aided them in identifying their knowledge gaps and providing personalized support (Looi & Jia, 2025). These studies point to perceived usefulness within the Technology Acceptance Model as being a factor for the adoption of AI tutors.

Moreover, an additional benefit of this personalized learning could be the ability to pose questions that learners would not normally ask, even though that was not directly identified in the literature. As learners, we might perceive some of our questions as "silly" and thus feel a sense of apprehension presenting questions to our teachers, but AI tutors remove that barrier. This sub-theme showcases the affordances of AI tutors in providing tailored learning support. Gone is the day when a one-size-fits-all approach is implemented for students, and the arrival of differentiated instruction via AI tutors.

Writing support

Another key affordance of AI tutors is with regard to writing support. Tools like ChatGPT and Grammarly can improve students' writing significantly. For example, one study found that all their participants agreed that Grammarly improved their writing and resulted in higher-quality work (Fahmi & Cahyno, 2021). Another study echoes similar findings and highlights that some of their respondents used Grammarly 100% of the time for editing (Ahmed, 2026). This indicates that perceived usefulness in relation to TAM as a key factor as to why students are adopting AI tutors. The PU in this regard is the fact that students themselves are claiming that AI tutors help them present a more polished form of writing, which is the usefulness that they perceive from them.

Additionally, Grammarly seems to not only improve people's writing but also their confidence in their writing. In Alotaibi's (2023) study, 60% of participants agreed that Grammarly improved their confidence in their writing. This is interesting because it highlights that not only do students think that their writing is improving by utilizing AI tutors, but also their own self-efficacy and confidence are being enhanced.

Collectively, these affordances emphasize the role of AI tutors as a secondary tool to support students in their learning. The literature illustrates that AI tutors are being used as a supplement to help students receive personalized feedback and writing assistance.

Theme 2: Challenges of AI Tutors

Overreliance & critical thinking

One major issue with AI tutors is the fact that students may rely too heavily on them. This overreliance can result in the reduction of their critical thinking abilities and problem-solving skills (Kasneci et al., 2023). This is because AI tutors simplify the information gathering process, which, over time, has been shown to reduce learners' critical thinking skills. If an individual is not forced to think for themselves, a logical conclusion that could be drawn is that their critical thinking will weaken over time. Another study pointed to the potential threat of ChatGPT to individuals' critical thinking if used in a compulsive manner (Dwivedi et al., 2023).

Other studies have highlighted the link between the overreliance on AI tools and reduced cognitive abilities (Marzuki et al., 2023). These studies showcase that there should be a balance of how to utilize AI tutors in a way that does not weaken cognitive abilities through the overreliance on them. Even though AI tutors are beneficial in other respects, this reliance on them can make learners lazy, and, in turn, raise concerns about students' cognitive abilities.

Academic integrity and plagiarism

Another major concern surrounding the use of AI tutors is academic integrity and plagiarism, as students can use them to cheat (Chan, 2023). Other studies have highlighted the risk of cheating and the effects that these tools have on academic honesty (Cotton et al., 2023). For example, in one survey, they found that approximately one in three university students used AI for their coursework (Intelligent.com, 2023). Additionally, students run the risk of handing in assignments that might be flagged for plagiarism with the increased use of AI tutors. These studies showcase that not only are educational institutions concerned about AI tutors and academic integrity, but students should be as well.

Together, these challenges underscore that although AI tutors are beneficial in numerous ways, overreliance on them, to the detriment of critical thinking, in addition to academic honesty, is a real concern. Overall, the findings illustrate that AI tutors provide many affordances, from personalized learning support to writing assistance. Additionally, the concept of perceived usefulness in the Technology Acceptance Model seems to be a factor in the adoption of these tools. However, these affordances were alongside challenges, which included overreliance and reduced critical thinking, as well as issues concerning academic integrity. Collectively, these results point to a balanced approach that considers both the affordances and challenges of AI tutors.

CONCLUSIONS

This study examined the affordances, challenges, and emerging trends around the use of AI tutors. Through a narrative review that utilized scholarly literature, affordances such as personalized learning support and writing support, as well as challenges such as overreliance and reduced critical thinking, and concerns about academic integrity were found. Additionally, the Technology Acceptance Model seemed

to play a role in the adoption of AI tutors, with the perceived usefulness being the key affordance. This study highlighted that a balanced approach harnessing the affordances and limiting the challenges of AI tutors was the best path to pursue. Students and teachers should utilize these tools while taking into consideration the benefits and negative aspects. For example, students can use AI tutors to help them edit their assignments, while making sure that they are the ones writing them initially.

Future research suggestions include conducting an empirical study that examines students' perceptions of AI tutors. This can be done through either a qualitative or mixed-methods study. I believe that a mixed-methods design would be more beneficial because it would allow for quantifiable data in addition to qualitative insights. Perhaps beginning with interviews to identify the common affordances and challenges of AI tutors, followed by a survey, would be the best approach. Overall, I believe that collecting original data is where future research should be directed. I pose a study that takes into account the practical values of AI tutors and explores how students perceive them.

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